SIEMENS

LOGO!Soft Comfort Online Help

Operating Instructions

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04/2026

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LOGO!Soft Comfort V9.0

1

1.1 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://www.siemens.com/cert.

1.2 Data protection

Siemens observes the data protection guidelines, especially the requirements regarding data minimization (privacy by design). This means the following for this product: The product does not process / save any personal information, but only technical functional data (e.g. time stamps). If the user links this data to other data (e.g. shift plans) or if the user saves personal information on the same medium (e.g. hard disk) and therefore creates a personal reference in the process, the user has to ensure meeting the guidelines regarding data protection.

Note

Notes on protecting administrator accounts

A user with administrator rights has extensive access and manipulation options available to the system.
Therefore, ensure there are adequate safeguards for protecting the administrator accounts to prevent unauthorized changes. To do this, use secure passwords and a standard user account for normal operation. Other measures, such as the use of security policies, should be applied as needed.

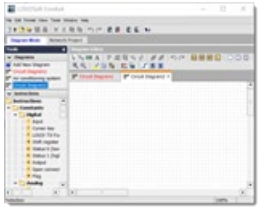
Note

To protect LOGO!Soft Comfort from any undesired manipulation when your PC suffers malicious attacks from the Internet, Siemens strongly recommends you to install a whitelist tool on the PC. Then use the tool to manage the software installed on your PC.

1.3 Welcome to LOGO!Soft Comfort V9.0!

What's new in LOGO!Soft Comfort (Page 18)

Compatibility (Page 30)



Elements of the software interface (Page 35)

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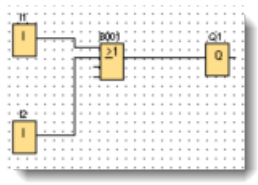

Sample applications (Page 303)

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- Constants and terminal blocks (Page 312)
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- SFBs (Page 340)
- Circuit programs (Page 516)

Tips and tricks (Page 594)

Help → Contents (Page 222)

Help → Context-sensitive help (Page 223)

1.4 USB Stick contents

The LOGO!Soft Comfort USB Stick

The LOGO!Soft Comfort USB Stick includes your installation software for LOGO!Soft Comfort and contains additional useful information.

Start.html

This file guides you through the contents of the USB Stick. It helps you to perform these tasks:

- Install LOGO!Soft Comfort
- Start LOGO!Soft Comfort

The file also provides you with access to the following items:

- Manuals
- Drivers

Folders on the USB Stick

The following list describes some of the folder contents of the USB Stick:

- The ..\Manual folder contains the current *LOGO! Manual* as a PDF file that you can read with Acrobat Reader.
- The ..\Onlinehelp folder contains the current LOGO!Soft Comfort online help as a PDF file that you can read with Acrobat Reader.

- The ..\Tools folder contains two folders and a reset file:
  - The ..\LOGO! Integrity Tool folder contains the .exe file and the current LOGO! Integrity Tool Readme as a PDF file that you can read with Acrobat Reader.
  - The ..\SIMATICSoftwareCIM folder contains the installation application, user manuals and OSS readme files.
  - The ...__reset.bm file is what you can use to reset your LOGO! BM to Factory setting. Refer to Factory Reset LOGO! (Page 103) for detailed operations.
- The ..\Readme folder contains an HTML readme file that includes information that you need to know prior to installation.
- The ..\Sample folder contains a few sample applications, which give you example solutions for a few of the many fields of applications of the versatile LOGO!.
- The USB Stick also contains the installation versions of LOGO!Soft Comfort for different operating systems:
  - The ..\Kylin folder contains the installation file for Kylin Desktop operating system.
  - The ..\Linux\Application_64 folder contains the installation files for Linux 64-bit operating system.
  - The ..\Windows\Application_64 folder contains the installation files for Windows 64-bit operating system.
  - The ..\Mac_aarch64 folder contains the installation files for Apple Macintosh operating system with an ARM 64 platform.
  - The ..\Mac_x86_64 folder contains the installation files for Apple Macintosh operating system with an Intel X86 platform.

Note

Installation files for macOS

To install LSC properly on Macintosh operating systems, you need to use the correct installation file for the corresponding architecture.

You can identify the architecture of your macOS by the device chip information. Find the device chip information through: Apple Menu -> About This Mac -> Chip information.

Simply copy the corresponding ..\Application folder to your hard disk drive and start LOGO!Soft Comfort by calling ..\Application\LOGOComfort.

1.5 What's new in LOGO!Soft Comfort?

1.5.1 What is new in LOGO!Soft Comfort V9.0?

The features described below are only used for LOGO!Soft Comfort V9.0.

New features

LOGO!Soft Comfort V9.0 provides the following new features:

- New device type in the network project mode: LOGO! 9.0, LOGO! 9.0 Slave and LOGO! 9 TDE.
- New hardware type in diagram mode: LOGO! 9.0.
- LOGO!Soft Comfort V9.0 saves the network project file as .wnp file format.
- LOGO!Soft Comfort (LSC) supports User Defined Web Pages:
  - Replacing LOGO! Web Editor, LSC V9.0 supports creating web projects in network project mode
  - LSC V9.0 supports web project simulation
  - LSC V9.0 supports downloading the network projects containing web pages to LOGO! V8.2 and later versions Base Modules (with the inserted micro SD card)
- New function blocks: Float analog flag, Network float analog input, Network float analog output, Float calculation instruction, LCD Message
- LOGO!Soft Comfort provides the LCD Message function block for message pages display on the touch screens of LOGO! BM and TDE:
  - Providing function widgets and parameter widgets for data display
  - Supporting message page background settings
  - Supporting message pages display simulation
- New data type: LSC V9.0 supports float data type for all analog function blocks
- More analog resolution options are provided: 0-1000, 0-4095, 0-10000
- Extended system limits:
  - LSC V9.0 supports the maximum of 800 function blocks in a circuit diagram
  - IO expansion capability
- Enhanced security settings:
  - LOGO! Communication
  - Audit log
  - Certificate settings
  - User management
  - Security configuration template

- Master/Slave connection configuration:
  - LSC V9.0 supports downloading slave devices configuration to slave devices through the network project download or separately
  - Devices with slave operation mode configuration automatically change to slave mode after project/device configuration download
- New configurations:
  - Firmware upgrade through LSC
  - Formatting the micro SD card through LSC
  - Centralized tag management
- Special flag changes:
  - M25, M26 don't function as backlight color flag for LOGO! BM 9.0 and TDE 9.0
  - M27 controls message page display
  - M28 = LOGO! BM displays amber backlight on the screen status bar
  - M29 = LOGO! BM displays red backlight on the screen status bar
  - M30 = LOGO! 9 TDE displays amber backlight on the screen status bar
  - M31 = LOGO! 9 TDE displays red backlight on the screen status bar
- Enhanced device online settings and more offline settings
- LOGO!Soft Comfort USB Stick replaces LOGO!Soft Comfort DVD-ROM

1.5.2 What is new in LOGO!Soft Comfort V8.4?

The features described below are only used for LOGO!Soft Comfort V8.4.

New features

LOGO!Soft Comfort V8.4 provides the following new features:

- New device type in the network project mode: LOGO! 8.4 device, LOGO! 8.4 slave device and CIM (Communicative Interface Module) device.
- New hardware type in diagram mode: LOGO! 8.4 device.
- BM memory extension: VX and VR ranges can be used from V memory area.
- New Cloud services are supported for LOGO! Base module: LOGO! BM supports IoT Cloud connection with Azure, Alibaba and general MQTT broker.
- AWS IoT service improvement:
  - LOGO! 8.4 supports using AWS Temporary Credential Account to connect BM with AWS Cloud.
  - LOGO! 8.4 supports assigning billing group to IoT thing to categorize and track cloud service costs.

- Batch download function:
  - LOGO! 8.4 supports downloading the same circuit diagram to a batch of connected LOGO! BMs in diagram mode.
  - LOGO! 8.4 also supports downloading more than one circuit diagrams to a batch of connected LOGO! BMs at the same time in network project mode.
- Sending emails: After configured in LSC, LOGO! 8.4 can send customized-content emails to configured recipients at trigger events.
- Update Cloud: LOGO!Soft Comfort supports to update Cloud version when needed.
- Integrity protection: LOGO! Integrity Tool is developed to check the integrity of your currently installed LSC version. You can find the LOGO! Integrity Tool .exe file in the DVD-ROM.
- Scanning BM: LOGO!Soft Comfort is strengthened on scanning BM with shorter time and higher accuracy.

1.5.3 What is new in LOGO!Soft Comfort V8.3?

The features described below are only used for LOGO!Soft Comfort V8.3.

New features

LOGO!Soft Comfort V8.3 provides the following new features:

- New device type in the network project mode: LOGO! 8.3 device and LOGO! 8.3 slave device.
- New hardware type in diagram mode: LOGO! 8.3 device.
- Cloud-related settings for LOGO! Base Module: Support connecting LOGO! BM with Amazon Web Services (AWS) Cloud and synchronizing the data between LOGO! BM and AWS Cloud.
- Certificate settings: Support checking the certificate information and updating the certificate.
- Enhanced security settings:
  - Updated access control settings: Support displaying the access security status and adding web user and web guest user access.
  - Circuit diagram and network project encryption: Circuit diagrams and network projects saved in LOGO!Soft Comfort V8.3 and later versions are encrypted.
  - HTTPS is supported.
- Online test of LOGO! TDE
- Message text settings: Support **Use M27 to change the character sets**.
- Zoom function: Support changing the size of text and icons for LOGO! Soft Comfort.
- Updated function block **Message text**: Support copying and pasting parameters of message texts in the same diagram.

- Multi-line function: Support selecting multiple lines and connecting multiple lines to a block.
- Ethernet connection configuration is moved to **General** tab of **LOGO! settings**.
- Support eastern character for IO status name.
- Support installing LOGO! Web Editor when you install LOGO! Soft Comfort V8.3.

1.5.4 What is new in LOGO!Soft Comfort V8.2?

The features described below are only used for LOGO!Soft Comfort V8.2.

New features

LOGO!Soft Comfort V8.2 provides the following new features:

- Support **Go online** function to scan TDE device in network project mode
- Support online and offline setting for LOGO!TDE
- Update the background color for the following special flags:
  - M8 = Initialization Flag (Displays blue in LOGO!Soft Comfort)
  - M27 = Message Character Set Flag (Displays green in LOGO!Soft Comfort)

LOGO! Access tool

LOGO! Access tool V2.0.0 provides the following new features:

- Set data synchronization period
- Show history data
- Start or stop the data synchronization

For detailed information, refer to *LOGO! Access Tool Help*.

LOGO! Web Editor

LOGO! Web Editor is a new tool used together with LOGO! Base Module (BM) and LOGO! Soft Comfort, and it provides the following features:

- Create user-defined web pages in Editor pane
- Visit the whole project through Web Server of LOGO! Base Module

For detailed information, refer to *LOGO! Web Editor Tool Online Help*.

1.5.5 What is new in LOGO!Soft Comfort V8.1?

The features described below are only used for LOGO!Soft Comfort V8.1.

New features

LOGO!Soft Comfort V8.1 provides the following new features:

- Support Modbus connection in both Network Project and Diagram Modes
- New function blocks:
  - Float/Integer Converter
  - Integer/Float Converter
- Support NTP (Network Time Protocol) configuration
- Enhanced import function in Network Project mode
- Programming improvement:
  - New device type in project mode: ModBus compatible device, LOGO! 8.FS4 device and LOGO! 8.FS4 slave device
  - New default color for reference line
  - Ability to fill a new row in data table. By pressing **Enter** in the last row, LOGO!Soft adds a new row and fills it according to the value in the previous row.
- Updated function blocks:
  - Cursor Key: Set default simulation mode to **Momentary pushbutton (make**).
  - TD Function Key: Set default simulation mode to **Momentary pushbutton (make**).
  - Flag: Updates the background color for special flag.
    - M25 = LOGO! displays white backlight
    - M26 = LOGO! TD white backlight
    - M28 = LOGO! displays the amber backlight
    - M29 = LOGO! displays red backlight
    - M30 = LOGO! TD amber backlight
    - M31 = LOGO! TD red backlight
  - Data log: New search box in property dialog.
  - Message Text
    - New search box in property dialog
    - Extended length range of bar graph in Message text (Width: 20; Height: 6).
  - Shift Register: New reset pin to reset the all shift bits and output for Shift Register.
- Installation languages: After you installed LOGO!Soft Comfort V8.1, all built-in languages (English, German, French, Spanish, Italian, Chinese) are installed by default. The display language is which you select during the installation.

LOGO! Access tool

Siemens provides a new tool, LOGO! Access Tool, to view and trace the variables in LOGO! Base module. You can also save the log files of the traced variables with this tool. LOGO! Access Tool uses the same password as Webserver. For more information on the password management, see Tools -> Transfer -> Access Control (0BA8 only) (Page 112)

1.5.6 What was new in LOGO!Soft Comfort V8.0?

The features described below are only used for LOGO!Soft Comfort V8.0.

New features

LOGO!Soft Comfort V8.0 provides a brand new user interface with the following features:

- Consistent application menu display
- New network project-based working approach
- Split display of diagram mode (Page 41) and network project mode (Page 42)
- Split display of standard toolbar (Page 42) in the general software interface, showing the programming toolbar (Page 45) under diagram mode, and showing the networking toolbar (Page 54) under project mode
- Split window (Page 220) display with focus control switching and drag-and-drop connections capabilities
- Ability to work on a network project (Page 530) with tasks of saving, loading, creating and closing the network project
- New access control (Page 112) settings to authorize online access with different access occasions
- Ability to create connections through configuring NI and NQ function blocks (Page 273)
- Ability to configure screen display for message (Page 65), power-on screen (Page 108) and flags (Page 316) into:
  - 4 lines for LOGO! devices prior to 0BA8
  - 6 lines for LOGO! devices of 0BA8
- New graphical reference for the function block of parameter box (Page 233) in FBD diagrams
- Enhanced system security through setting user passwords and access level accounts through access control (Page 112) settings

Other software updates

LOGO!Soft Comfort V8.0 also includes updates to improve the software performance and ease of use, for example:

- Support for up to 20 digital outputs and 8 analog outputs
- Support for a longer block name of up to 12 characters in ASCII format
- New layout recovery abilities after you download the circuit program (Page 98) and load it again
- New parameters of sunrise offset and sunset offset in the astronomical clock (Page 373) function block
- New access control list of up to 8 list items through dynamic IP filter (Page 154)

- New diagnostic panel (Page 153) with different kinds of error information:
  - 4 types of error information for 0BA7
  - 5 types of error information for 0BA8
- Programming improvement: (Page 225)
  - Ability to create connections without choosing the connector tool
  - Ability to add a single block with only a single click the block
  - Ability to add multiple blocks repeatedly using the stamp function by double-clicking the block
- Support for saving a diagram to SD card as a Bin file which can be executed by LOGO! Basic directly
- Zooming effects update for zoom in (Page 91) and zoom out (Page 91)
- Support for displaying 3 cams in the same panel of the Weekly timer (Page 367) function block
- Support for using comma or semicolon as CSV separator (Page 219)
- New printing defaults to only print the function blocks added in the circuit diagram
- Ability to check the open blocks in a diagram and display them in the info window (Page 38) (with the short-cut of F2)
- Support for adding and configuring a client/server connection (Page 187)

New project-based working approach

LOGO!Soft Comfort V8.0 provides a brand new working method with which you can easily build up your network project in a conceptual network view. You are even able to configure network connections by simply dragging and dropping the I/O points of the devices or the network compliant function blocks from one to another.

1.5.7 What was new in LOGO!Soft Comfort V7.0?

The features described below were new for LOGO!Soft Comfort V7.0.

New connectors

LOGO!Soft Comfort V7.0 provides new network connectors:

- Network inputs (Page 319)
- Network analog inputs (Page 323)
- Network outputs (Page 326)
- Network analog outputs (Page 328)

New SFBs

The following SFBs are new:

- Astronomical clock (Page 373)
- Analog filter (Page 414)
- Max/Min (Page 416)
- Average value (Page 421)
- Stopwatch (Page 376)

Updated SFBs

The following SFBs support new features:

- Message text (Page 464)
- Shift register (Page 484)

The analog math SFB is renamed "Mathematic instruction".

The analog math error detection SFB is renamed "Mathematic instruction error detection".

Additionally, LOGO!Soft Comfort V7.0 supports new reference parameters for some blocks, such as timer blocks and the analog filter block.

New LOGO! Base Modules

Two new LOGO! Base Modules are commercially available:

- LOGO! 12/24RCE
- LOGO! 230RCE

The main change of the functionalities of these two new base modules is that the new ones have the Ethernet capability. For detailed information about these two base modules, refer to your product information and the *LOGO! Manual*.

New features

LOGO!Soft Comfort V7.0 together with the LOGO! 0BA7 hardware series provides the following new features:

- S7 communication: Base Modules can communicate with each other on an Ethernet network as well as with SIMATIC controllers or SIMATIC HMI devices with Ethernet capability.
- UDF (User-defined function) Editor
- SD card support
- Data log
- Online test of the network transfer data and message text
- Diagnostics for networking errors and SD card Read/Write errors
- Simulation of the network

- Ability to identify LOGO! 0BA7 firmware version
- I/O name import/export
- I/O status
- LOGO! Base Module slave mode configuration
- Ability to display reference information in circuit program
- Block replacement
- Remote change of parameters

Changed functionality

LOGO!Soft Comfort V7.0 provides changes in the following areas:

- Maximum number of blocks increased from 200 to 400
- Amount of program memory (RAM) increased from 3800 to 8400 bytes
- Number of analog flags increased from 6 to 16
- Number of shift registers increased from 1 to 4, and shift register bits from 8 bits to 32 bits
- Number of open connectors increased from 16 to 64
- RTC buffering time extended from 80 hours to 20 days
- Zoom factors configurable in Print Preview
- Two additional object alignment options available
- Two additional block sorting methods available– sort by block type or name
- Text wrapping available for text boxes on a circuit program
- New color setting for UDF block frame
- Additional warning message prompt for hours counter value reset when program downloading
- One additional option on the Start Screen display
- Ability to link comments to function blocks and cut connectors
- LAN time synchronization added to the Set clock function

Note

LOGO! 0BA7 no longer supports an RTC (Real Time Clock) battery card.

1.5.8 What was new in LOGO!Soft Comfort V6.1 compared with V5.x?

New SFBs

LOGO!Soft Comfort V6.1 introduced the following SFBs:

- Pulse Width Modulator (PWM) (Page 407)
- Mathematic instruction (Page 411)
- Mathematic instruction error detection (Page 487)

Updated SFBs

The following SFBs support new features:

- Message text (Page 464)
- Operating hours counter (Page 381)
- Weekly timer (Page 367)
- Yearly timer (Page 370)
- Analog watchdog (Page 399)
- Up/Down counter (Page 378)

Additionally, LOGO!Soft Comfort supports new reference parameters for many blocks (Page 340).

New LOGO! TD module

LOGO! supports a new text display module. This LOGO! TD module extends the display and user interface capabilities of a LOGO! Base Module. LOGO!Soft Comfort provides configuration of the following LOGO! TD features:

- Power-on screen
- Function keys
- Message texts
- Backlight function

For further information about the LOGO! TD module, refer to your product information and the *LOGO! Manual*.

New LOGO! Base Modules

Two new LOGO! Base Modules (each with a built-in real-time clock) are commercially available:

- LOGO! 24C
- LOGO! 24Co

For detailed information about these two Base Modules, refer to your product information and the *LOGO! Manual*.

New LOGO! expansion module

One new LOGO! expansion module is commercially available:

- LOGO! AM2 RTD

This expansion module is equipped with two analog inputs for connection to PT100 and/or PT1000 sensors with the default temperature coefficient of α = 0.003850 for both sensor types. It can automatically recognize the sensor type, thus it is unnecessary for you to make any configuration or setting to achieve this.

For detailed information about this expansion module, refer to your product information and the *LOGO! Manual*.

New features

LOGO!Soft Comfort together with the LOGO! 0BA6 hardware series provides the following new features:

- Method to delete user program and password from LOGO! 0BA6
- Additional languages, resolution, and backlight function for the LOGO! 0BA6 onboard display
- Ability to perform online tests of LAD circuit programs
- Display of PI controller analog output value in a trend view during simulation or online test
- Modem communication between a PC and LOGO! 0BA6
- USB cable communication between a PC and LOGO! Base Module
- New memory card, battery card and combined memory/battery card for LOGO! 0BA6 devices.

Changed functionality

LOGO!Soft Comfort provides changes in the following areas:

- Number of user program blocks increased to 200 blocks
- Additional retentive memory for a total of 250 bytes
- Configuration support for all I/O changes to LOGO! Base Modules and expansion modules

Prior versions

For information about features that were new in versions prior to LOGO!Soft Comfort V6.1, refer to the documentation for earlier versions. Current and previous documentation can be found at the LOGO! Internet Web site (Page 30).

1.6 Ladder Diagram (LAD), Function Block Diagram (FBD) and User-Defined Function (UDF)

LOGO!Soft Comfort provides you with three options of creating circuit programs:

- Ladder diagram (LAD)
- Function block diagram (FBD)
- User-defined function (UDF)

Who will use the ladder diagram (LAD)?

The LAD program editor is suitable for users who are used to working with circuit programs.

Who will use the function block diagram (FBD)?

The FBD program editor is suitable for users who are familiar with the logic boxes of Boolean algebra.

What is the User-Defined Function (UDF)?

UDF is a circuit logic diagram of a group of function blocks, and can be used as a function block in an FBD.

In the following contents, a UDF is called a UDF type, and the copy of a UDF is called a UDF instance. For details, see Using the UDF in an FBD circuit program or another UDF (Page 512).

Differences between LAD, FBD and UDF in the online help

The online help primarily describes the FBD Editor, because its functionality is closely related to that of the LAD Editor. The UDF is described separately. Where LAD, FBD and UDF differ, the online help describes the differences. The following symbol in the online help indicates the difference in LAD, FBD and UDF functionality:

Converting circuit programs

For information on converting circuit programs, refer to the topics for converting LAD to FBD and from FBD to LAD.

Switching between LAD, FBD, and UDF

You can switch the editor from the Options selection of the Tools menu (Page 58).

1.7 LOGO! and LOGO!Soft Comfort on the Internet

From the Support selection at LOGO! Website (http://www.automation.siemens.com/logo/) you will find abundant information about LOGO! and LOGO!Soft Comfort:

- Updates and upgrades (Page 223) for LOGO!Soft Comfort
- Additional language packages, if the LOGO!Soft Comfort USB Stick does not contain your language
- Numerous sample programs and applications
- FAQs (frequently asked questions)
- Downloads of current manuals and training documentation
- News and other information

1.8 Compatibility

Compatibility with previous LOGO! Hardware series

For LOGO! 8 & 9 series, LOGO!Soft Comfort uses device type to distinguish different LOGO! device. For more information, you can refer to the following table.

Device	Order number and FS number	Device type in LOGO!Soft Comfort	LOGO!Soft Comfort Version
LOGO! BM	6ED1052-xxxxx-0BA8 FS01-FS03	LOGO! 8 (0BA8.Standard)	LOGO!Soft Comfort V9.0 and later versions
	6ED1052-xxxxx-0BA8 FS04-FS06	LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	
	6ED1052-xxx08-0BA0	LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	
	6ED1052-xxx08-0BA1	LOGO! 8.3	
	6ED1052-xxx08-0BA2	LOGO! 8.4	
	6ED1052-xxx08-0BA3	LOGO! 9.0	
LOGO! TDE	6ED1055-4MH00-0BA1 FS01-FS06	LOGO! TDE 6ED1055-4MH08-0BA1	
	6ED1055-4MH08-0BA0		
	6ED1055-4MH08-0BA1		
	6ED1055-4MH08-0BA3	LOGO! 9 TDE	

LOGO!Soft Comfort V9.0 brings in a new project type "wnp". You can view and edit the wnp file with LOGO!Soft Comfort V9.0 and later versions.

You can also use the current LOGO!Soft Comfort version to create circuit programs for the previous LOGO! hardware series. You cannot, however, download programs that use the new SFBs or new SFB parameters to LOGO! devices prior to the LOGO! 8.FS4 series. LOGO!Soft Comfort provides a list of hardware that is compatible with your circuit program from the Tools → Select Hardware (Page 176) menu command. You can download your circuit program to any device in the list.

You can continue to use the input connectors of some of the LOGO! 8.FS4 devices as they were prior to LOGO! 8.FS4, that is, as inputs. For 0BA7 and later versions, these inputs can

also be used for analog inputs or high-speed counters. Existing LOGO!Soft Comfort programs that use these connectors as inputs will function in the same way as they did. New programs can make use of the new analog inputs and high-speed counters.

Any differences concerning the operation of LOGO!Soft Comfort that are based on differences between the previous series and LOGO! 8.FS4 are described separately. If programming differences exist based on the LOGO! series, this online help system uses this graphic to alert you to those differences:

Compatibility with previous versions of LOGO!Soft Comfort
You can edit and expand circuit programs written with older versions of LOGO!Soft Comfort using your current LOGO!Soft Comfort version.

Compatibility with previous LOGO! memory cards

Refer to the *LOGO! Manual* for compatibility information regarding LOGO! memory cards. LOGO!Soft Comfort does not access programs stored on memory cards.

Note

LOGO! devices with AS-Interface

You can connect the modular LOGO! via a communication module to an AS-Interface (Page 32) bus.

In doing so, the AS inputs and outputs behave just like standard inputs and outputs.

Suggested operating systems

LOGO!Soft Comfort V9.0 supports the following operating systems:

- **Windows:** Windows 8.1 (64 bit), Windows 10 (64 bit) or Windows 11 with the following requirements:
  - PC with Pentium IV processor
  - 1 GB free hard disk space
  - 2048 MB RAM
  - SVGA graphics card with minimum of 1024 x 768 resolution (at least 256 colors)
- **Mac OS**: Mac OS 11 Big Sur; Mac OS 12.1 Monterey, Mac OS 13.7 Ventura, Mac OS 14.5 Sonoma, Mac OS 15.3 Sequoia.
- **Linux**: Tested with SUSE Linux 15 (64 bit), Kylin Desktop V10 SP1
- **Java Runtime Environment** Amazon Corretto 17.0.17.10.1, which is the recommended version.

See also

LOGO! Hardware (Page 517)

Here you find information about the individual hardware series. This topic also includes a table from which you can see which basic and special functions are available as of which hardware series.

1.9 LOGO! with AS-Interface (0BA0-0BA2)

1.9.1 AS-Interface

Introduction

Here in this section, you discover what you must note when using a LOGO! with integrated AS-Interface.

Converting circuit programs

The LOGO!Soft Comfort converts the circuit programs with AS-Interface inputs (Page 33) or AS-Interface outputs (Page 34) which were created for previous versions of the modular LOGO! are converted:

- When you assign a circuit program to a LOGO! Basic via Tools → Select Hardware (Page 176)
- When you download a circuit program without changes to a LOGO! Basic

If you cut one or more AS-Interface inputs or outputs of an older circuit program and pasted them into the circuit program for a LOGO! Basic, the inserted I/O is also converted in the new circuit program.

Conversion rules

The inputs Ia1 to Ia4 are converted to I13 to I16.

Outputs Qa1 to Qa4 are converted to Q9 to Q12.

After conversion, the info window shows you which AS-Interface I/O was converted to that of the modular LOGO!. If the conversion is not compatible to your physical hardware structure, you must adapt the block numbers of the relevant I/O via the block properties dialog.

Additional constants and connecting terminals

Note that LOGO! versions 0BA0 to 0BA2 do not distinguish between standard inputs and AS-Interface inputs. Due to the modular structure of the devices as of version 0BA3, the block number of a digital, analog or AS-Interface block is determined by the slot position of the expansion module.

AS-Interface inputs (Page 33)

The relevant LOGO! versions are also equipped with Ia inputs used for the ASi bus (Page 33).

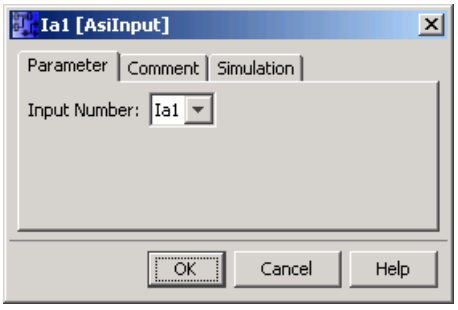
Modular LOGO! devices as of the series 0BA3 do not distinguish between normal inputs and AS-Interface inputs. The user determines the type of input based on the modules used and the order in which they are installed. This is why AS-Interface inputs are here displayed only as I input.

AS-Interface outputs (Page 34)

Outputs for the AS-Interface bus can be identified by the letter Qa (only available for the relevant LOGO! versions). Modular LOGO! devices as of the series 0BA3 do not distinguish between normal inputs and AS-Interface inputs. The user determines the type of the input, based on the inserted modules and the order in which they are installed. This is why AS-Interface outputs are only designated by the letter Q.

1.9.2 AS-Interface inputs

You can connect LOGO! versions of the type LB11 directly to an AS-Interface bus.



AS-Interface inputs are named Ia. The block number of an AS-Interface input is determined by the hardware structure.

LOGO!Soft Comfort converts circuit programs with AS-Interface I/O for use in the LOGO! Basic.

You can find relevant information in the section "Converting circuit programs (Page 32)".

1.9.3 AS-Interface outputs

You can connect LOGO! versions of the type LB11 directly to an AS-Interface bus.

AS-Interface outputs are named Qa. The block number of an AS-Interface output is determined by the hardware structure.

The output always carries the signal of the previous program cycle. This value does not change within the current program cycle.

LOGO!Soft Comfort converts circuit programs with AS-Interface I/O for use in the LOGO! Basic.

You can find the relevant information in the section "Converting circuit programs (Page 32)".

User interface

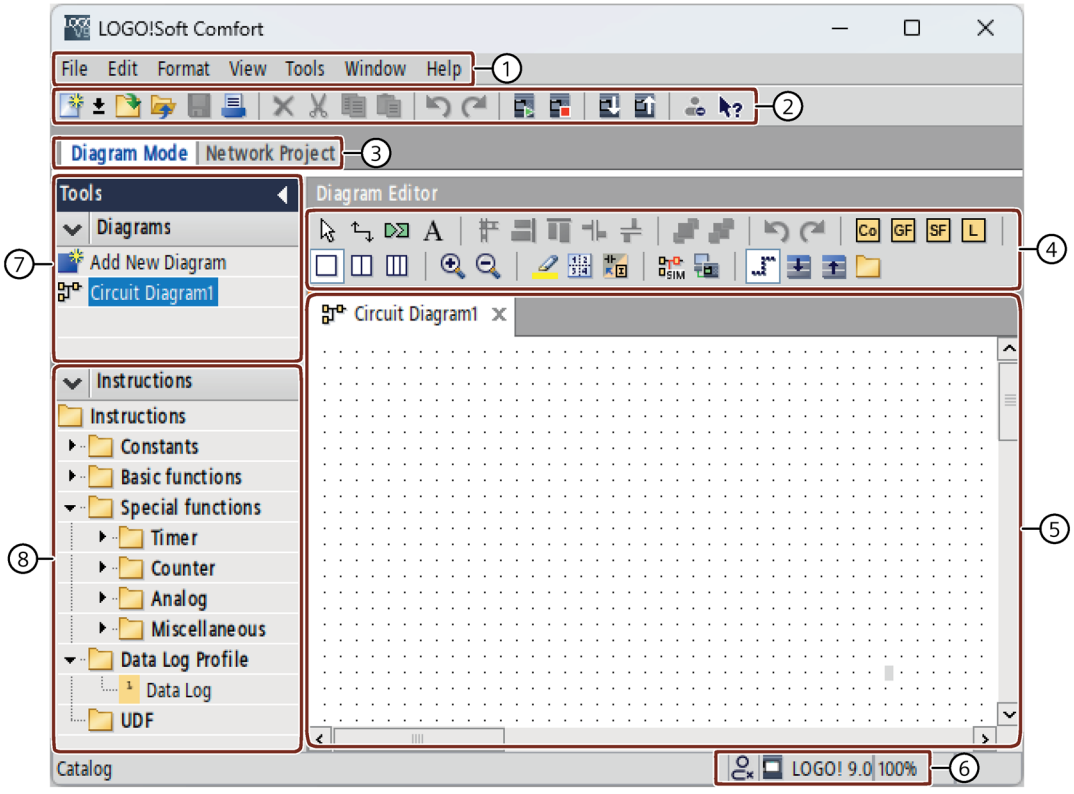
2

2.1 User interface - Overview

Programming interface

The programming interface for creating your circuit programs occupies the greater part of the screen. The icons and logical links of the circuit program are arranged on this programming interface.

To help you to maintain an overview of large circuit programs, the right side and the bottom of the programming interface contain scroll bars, which you can use for vertical and horizontal scrolling of the circuit program.



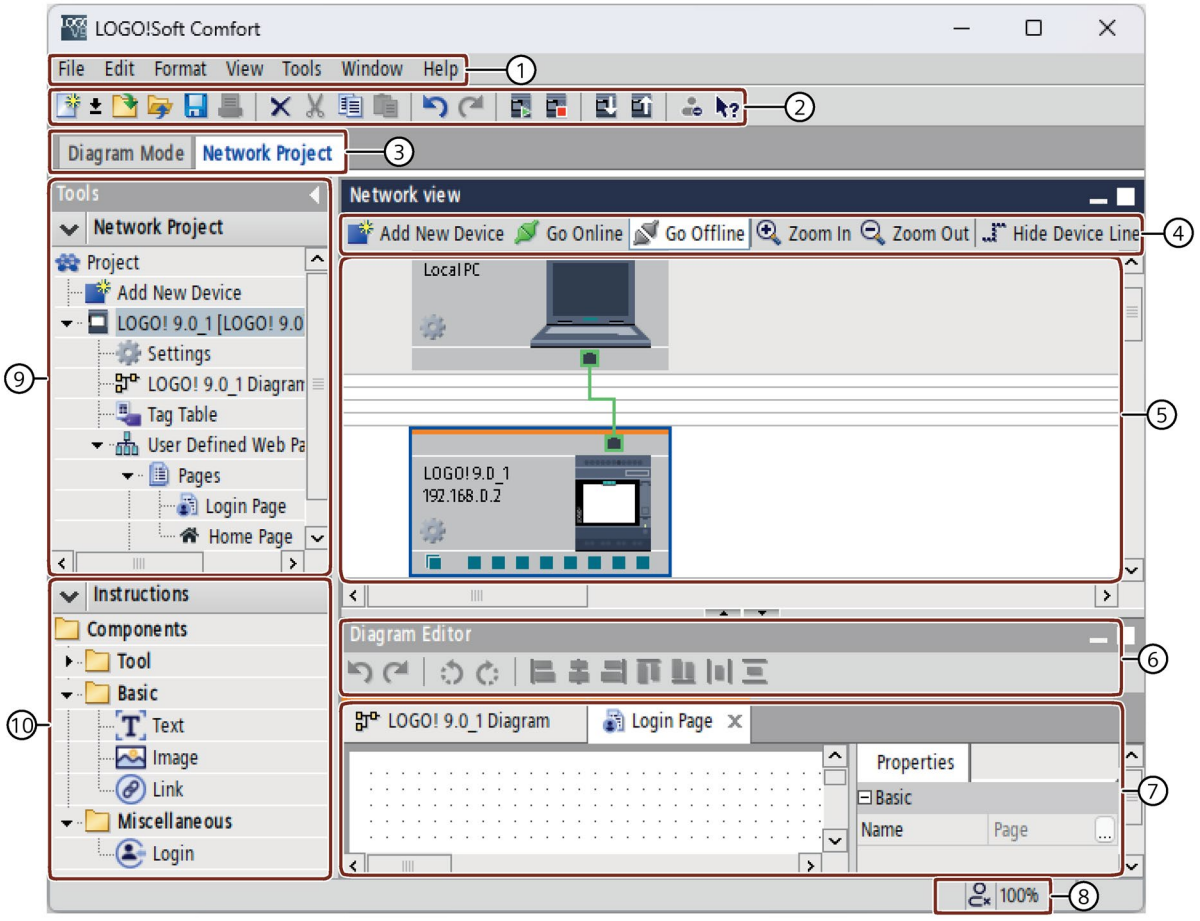
① Menu bar
② Standard toolbar
③ Mode bar
④ Programming toolbar
⑤ Programming interface
⑥ Status bar
⑦ Diagram tree
⑧ Instruction tree

Project interface

LOGO!Soft Comfort project mode starts with the empty user interface of LOGO!Soft Comfort. After you choose and add a new device in the project, LOGO!Soft Comfort enables the diagram editor frame.

LOGO!Soft Comfort displays a Network view in the project interface that shows the devices and network connections. The Diagram editor displays the program blocks and logical links of the circuit program. Initially, the circuit program is empty.

To help you to maintain an overview of large circuit project and programs, the right side and the bottom of the Network view and programming interface contain scroll bars, which you can use for vertical and horizontal scrolling of the circuit program.



① Menu bar
② Standard toolbar
③ Mode bar
④ Networking toolbar
⑤ Network view
⑥ Programming toolbar (diagram and Web project (Page 531))
⑦ Programming interface (diagram and Web project (Page 531))
⑧ Status bar
⑨ Device tree
⑩ Instruction tree (diagram FB and Web project component (Page 531))

Menu bar

The top of the LOGO!Soft Comfort window contains the menu bar (Page 57). Here, you can find various commands for editing and managing your circuit programs, as well as functions for defining your default settings and for transferring of the circuit program to and from LOGO!.

Toolbars

LOGO!Soft Comfort provides the following four toolbars:

- Standard toolbar (Page 42)
- Programming toolbar (Page 45)
- Simulation toolbar (Page 43)
- Networking toolbar (Page 54)

Standard toolbar

The standard toolbar (Page 42) appears above the programming interface. Initially, LOGO!Soft Comfort shows you a reduced standard toolbar that provides only the essential functions.

The standard toolbar provides direct access to the essential functions of LOGO!Soft Comfort.

After you have opened a circuit program for editing on the programming interface, you can see the complete standard toolbar.

You can use the icons to create a new circuit program or to download, save an existing program or project, cut/copy and paste objects, undo/redo the last action, or initiate data transfer to and from LOGO! devices.

Programming toolbar

The top of the programming interface contains programming toolbar (Page 45). You can use the icons on this toolbar to change to other editing modes, or for quick and easy creation or editing of a circuit program.

You can use the icons to connect/comment/align the blocks, redo/undo the last action, add the functional blocks, split windows, simulation/online test the diagram and expand/collapse the parameter box.

The LAD Editor no longer contains the Basic function (GF) icon, because you create logical "AND" and "OR" links by interconnecting individual blocks.

Simulation toolbar

This toolbar (Page 43) is only relevant for the simulation of circuit programs.

Status bar

The status bar (Page 39) is located at the bottom of the program window. It shows the currently active tool, the program status, the zoom factor, the page number of the circuit program and the selected LOGO! device.

2.2 Description of the Info Window

Content

The Info Window shows the following information:

- Error messages generated at the start of simulation
- LOGO! devices that are determined for a program download, as determined by the Tools → Determine LOGO! (Page 175) menu command or the [F2] function key.
- The date and time of the message
- The name of the circuit program for which the message was generated

If you have opened more than one circuit program, you can determine to which program the message belongs.

At the start of simulation mode, the function analyzes the circuit program with regard to its resources and the LOGO! to be used. The Info Window displays the resources used and the errors that occurred.

The Info Window displays all information in successive order. Use the scroll bar to browse all the information pages. LOGO!Soft Comfort deletes all information from the Info Window when you close LOGO!Soft Comfort.

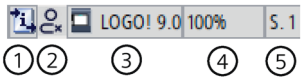
Operation

You can open and close the Info Window with the View → Info window (Page 90) menu command or the [F4] function key (Page 39). The Info window usually appears below the programming interface and at the right side of the block tree

You can clear messages by clicking in the info window.

2.3 Description of the status bar

The status bar consists of four sections and contains useful information about your circuit program.



① Information field: displays the currently used tool (Page 45).

② Displays the login user role. To learn more about user management, refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109).

This status is only available for LOGO! 9 and later versions devices.

- There is no user logged in.
- The current login user is Admin.
- The current login user is Maintainer.
- The current login user is Operator.
- The current login user is Viewer.

③ Displays your selected LOGO! by means of a LOGO!Soft Comfort tooltip. If you have not yet selected a LOGO!, or want to change the selection, you can double-click the LOGO! icon to display the Tools → Select Hardware (Page 176) dialog.

④ Shows the currently set zoom factor (Page 91).

⑤ Displays the current circuit program page.

2.4 Function keys and shortcuts

LOGO!Soft Comfort provides the following function keys and shortcuts for frequently called functions:

Function keys in LOGO!Soft Comfort:

[F1]	Calls the context sensitive Online Help (Page 223)
[F2]	Tools → Determine LOGO! (Page 175)
[F3]	Simulation start/exit (Page 182)
[F4]	View → Info Window (Page 90)
[F5]	Connector tool (Page 47)
[F6]	Constants and connectors tool (Page 312)
[F7]	Basic functions tool (Page 335)
[F8]	Special functions tool (Page 340)
[F9]	Text tool/Insert comments tool (Page 48)
[F10]	Opens the menu bar (Page 57)
[F11]	Cut/Join tool (Page 48)

Shortcuts in LOGO!Soft Comfort:

	In the File menu (Page 57)**:**
[Ctrl+N]	File → New (Page 58) (opens the default editor specified under Tools/Options/Editor)
[Ctrl+O]	File → Open (Page 58)
[Ctrl+F4]	File → Close (Page 60)
[Ctrl+S]	File → Save (Page 61)
[Ctrl+Shift+F1]	File → Print preview (Page 63)
[Ctrl+P]	File → Print (Page 63)
[Alt+Enter]	File → Properties (Page 66)
[Alt+F4]	File → Exit (Page 79)
	In the Edit menu (Page 80)**:**
[Ctrl+Z]	Edit → Undo (Page 80)
[Ctrl+Y]	Edit → Redo (Page 81)
[DELETE]	Edit → Delete (Page 81)
[Ctrl+X]	Edit → Cut (Page 81)
[Ctrl+C]	Edit → Copy (Page 81)
[Ctrl+V]	Edit → Paste (Page 81)
[Ctrl+A]	Edit → Select all (Page 84)
[Ctrl+G]	Edit → Go to block (Page 85)
	In the View menu (Page 88)**:**
[Ctrl+M]	Select Connections (Page 90)
[Ctrl+mouse wheel]	View → Zoom in (Page 91) View → Zoom out (Page 91)
	In the Tools menu (Page 92)**:**
[Ctrl+D]	Tools → Transfer: PC → LOGO! (Page 98)
[Ctrl+U]	Tools → Transfer: LOGO! → PC (Page 101)
[Ctrl+H]	Tools → Select Hardware (Page 176)
[Ctrl+-]	Tools → Compare (Page 176)

How to access functions via the shortcut menu (Page 596)

2.5 Diagram mode

In diagram mode, you can create, edit, simulate download and upload your circuit program. The programming interface for creating your circuit programs occupies the greater part of the screen. The icons and logical links of the circuit program are arranged on this programming interface. The diagrams tree and instructions tree are arranged on the left of the programming interface.

- Diagram tree (Page 41)
- Instructions tree (Page 41)
- Diagram editor (Page 41)

2.5.1 Diagram tree

You can manage your diagrams in the circuit diagram tree. This diagram tree lists all the diagrams you newly created or opened. You can switch to a diagram by double clicking its name in the diagram tree.

You can open and close this diagram tree via the icons or of the diagram and instructions trees.

2.5.2 Instruction tree

This instruction tree provides a hierarchical list of all elements you can use to create your circuit program.

How to select blocks and place them into your circuit program quickly (Page 594)

2.5.3 Diagram editor

The diagram editor is the working space for the circuit program. It displays all the opened and newly created circuit programs. You can switch to a certain circuit program by clicking its title on top of the editor. You can view two or three circuit programs at the same time by splitting the working space to two or three windows.

Note

Only the LOGO! 0BA8 (and later versions) circuit programs in the project mode supports two-side programming.

When you edit the circuit diagrams in split windows in project mode, you can connect the blocks between different LOGO! 0BA8 (and later versions) circuit programs. For more information on two sides programming, see Two-side programming (Page 256).

2.6 Network project

In the project mode, you can configure your network project and manage the circuit program. The network view for configuring the network occupies the greater part of the screen. When you add a new device in the network, LOGO!Soft Comfort creates a new circuit diagram automatically. The Network project tree and instruction tree appear to the left of the programming interface.

- Network project tree (Page 42)
- Network view (Page 42)
- Diagram editor (Page 41)
- Instruction tree (Page 41)

2.6.1 Network project tree

You can manage your devices in the network project tree. This tree lists all the devices in the network project. You can add new devices and configure their settings in the network project tree.

You can open and close the network project and instructions trees via the icons or .

2.6.2 Network view

The network view is the working space for configuring the network and displays all the devices you have added to the network. You can add/delete devices, configure the settings of each device and set the Ethernet connections in the network view.

2.7 Toolbars

2.7.1 Standard toolbar overview

The icons of the standard toolbar provide quick access to commands that are also available on the menu.

The following commands are found in the standard toolbar:

	File:	New (Page 58)
		Open (Page 58)
		Close (Page 60)
		Save (Page 61)
		Print (Page 63)
	Edit:	Delete (Page 81)
		Cut (Page 81)
		Copy (Page 81)
		Paste (Page 81)
		Undo (Page 80)
		Redo (Page 81)
	Tools:	Start LOGO! Mode (Page 102)
		Stop LOGO! Mode (Page 103)
		PC → LOGO! (Download) (Page 98)
		LOGO! → PC (Upload) (Page 101)
		Log Out (Page 103)
	Help:	Context-sensitive help (Page 223)

2.7.2 Simulation toolbar and status window

The toolbar

When you open simulation mode, LOGO!Soft Comfort displays the simulation toolbar, which contains the following icons.

- Icons (for example, switches) for operator control of the inputs (Page 242)
- An icon for the simulation of a power failure (Page 244) , for testing the switching response with reference to retentivity characteristics after power failure
- Icons (for example, bulbs) for monitoring outputs (Page 243)
- Simulation control icons
- Time control icons
- Data Table icon

Click "<<" to hide a partial area of the toolbar. To show this area again, click ">>".

Simulation control icons

	Start simulation
	Stop simulation
	Hold simulation (pause)
	Simulate network. If no IP address is configured for a circuit program in LOGO!Soft Comfort, the network simulation icon is inactive (grey-colored).
	Show message window

Time control icons

If you have programmed a time-sensitive circuit, you can use the time control to monitor the reaction of your circuit program.

	Start simulation for a specific time or number of cycles. Set the period and the number of cycles using the following icons.
	Set the period and the time base for a time-limited simulation or set a specific number of cycles
	Display the current time in LOGO!Soft Comfort
	Modify the current time in LOGO!Soft Comfort

Data Table icon

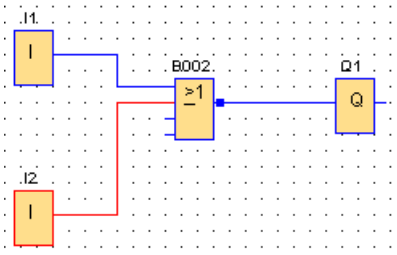
You can view VM (Variable Memory) values in a data table. For simulation, the values are updated each cycle. For online test, the values are updated after each communication.

Status display

Prerequisite: You can enable the display of signal states and process variables with the Tools → Options: Simulation (Page 218) command.

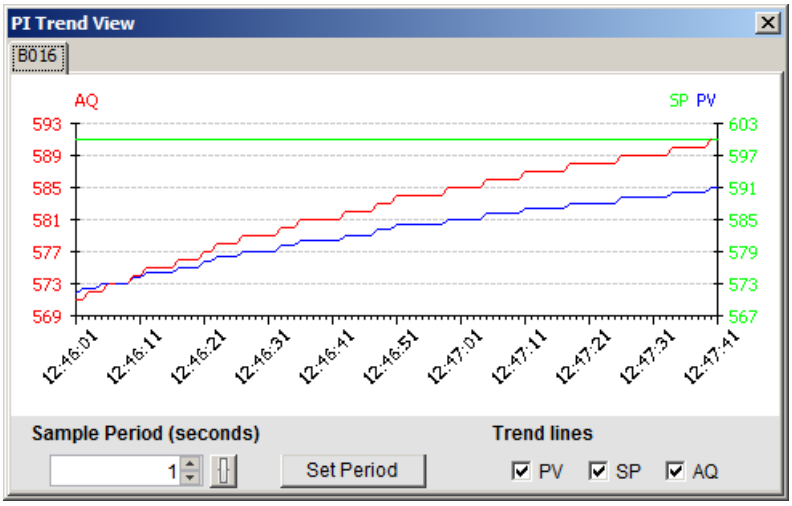
The colored indication identifies the "1" or "0" status of a connecting line. By default, connection lines carrying a "1" signal are red while the lines carrying a "0" signal are blue.

Example for the FBD Editor:



PI controller trend view

If your circuit program includes one or more PI controller function blocks, the simulation displays a trend view window of the analog output that shows the change in the AQ and PV values relative to the SP parameter over time. The trend view is continually updated while the simulation is in progress, at the frequency of the sample period that you configure. You can enable or disable the individual displays of the AQ, PV, and SP trend graphs as you choose.



If your circuit program has more than one PI controller function block, the trend view has a separate tab for each PI controller.

2.7.3 Programming toolbar

The programming toolbar contains integral icons for creating, editing and testing programs. Each one of these tools represents a programming mode, in which mouse operations have different effects.

	Edit:	Selection tool (Page 47)
		Connector tool (Page 47)

		Cut/Join connection (Page 48)
		Text tool/insert comments (Page 48)
	Format:	Align Automatically (Page 83)
		Align Vertically (Page 82)
		Align Horizontally (Page 82)
		Horizontally Distribute Space (Page 83)
		Vertically Distribute Space (Page 83)
		Bring to Front (Page 85)
		Send to back (Page 85)
	Edit	Undo (Page 80)
		Redo (Page 81)
		Constants and Connectors (Page 312)
		Basic functions (FBD and UDF editors only) (Page 335)
		Special functions (Page 340)
		Data Log Profile (Page 497)
	View:	Undo split (Page 221)
		Split into two windows (Page 221)
		Split into three windows (Page 221)
		Zoom in (Page 91)
		Zoom out (Page 91)
		Select Lines (Page 90)
	File:	Page Layout (Page 48)
	Tools:	Circuit program conversion (Page 48)
		Simulation (Page 182)
		Online test (Page 50)

Hidden parameter box line (Page 51)

Expand all parameter box (Page 52)

Collapse all parameter box (Page 52)

Message Graph Library (Page 52)

2.7.3.1 Selection tool

You can use the selection tool to select and move blocks, text and connecting lines. You can select objects individually with a left-click; you can select multiple objects with [Ctrl]+Click, or you can use the mouse as a "lasso" to surround objects with a rectangle and capture them as a selection.

You can use the selection tool to select multiple lines and connect multiple lines which have the same output function block to a block.

To select multiple lines, use one of the following methods:

- Keep the left mouse button pressed and draw a frame, and then release the mouse button.

  Note

  If there is a function block in the frame, no line is selected.

- Hold down the CTRL key and press the left mouse button, and then select lines as you need.

To connect multiple lines which have the same output function block to a block, select the connector with a left-click and move the connector to another function block as you need.

You can call the selection tool in any other tool by pressing the [ESC] key or by clicking on the icon in the programming toolbar.

Selecting objects (Page 236)

2.7.3.2 Connector tool

You can use this tool to connect blocks. To do so, move the mouse pointer to a block input or output and press the left mouse button. Keep the mouse button pressed and drag the mouse pointer from your selected source terminal to the target terminal. Now release the mouse button to anchor the connecting line to both terminals. LOGO!Soft Comfort displays the connecting lines as a straight line between the first terminal and the mouse pointer while you are dragging the mouse. Once you anchor the connection line, LOGO!Soft Comfort displays the connection line as a combination of horizontal and vertical lines, which you can manipulate using the selection tool (Page 47).

For more information on how to connect the blocks, refer to Connecting blocks (Page 230) .

2.7.3.3 Cut/Join

You can use this tool to cut and join connections between blocks. Left-click the Cut/Join icon to activate the tool. To cut a connection, left-click the relevant line while the Cut/Join tool is active. When you cut a connection of two blocks, a reference to the partner block appears beside each of the block. The reference displays the page number, block number and the I/O of the partner block.

Cut connections (Page 238)

2.7.3.4 Text tool

You can use this tool to insert or edit user-defined text objects in the programming interface. You can create labels for specific blocks. These labels remain with the block whenever you move or delete the block. You can associate only one label per block. For each label, you can specify the font type, font size, and font color. To create an associated label, click directly on the required block when the text tool is selected.

There can only be one associated label for each block.

You can configure "Wrap Text" format for the label text figures. You can adjust the size of a text figure typically by dragging the rectangle handles. You cannot enlarge or reduce the dimension of text figures that are not in Wrap Text format.

See also Documentation of the circuit program (Page 239)

2.7.3.5 Page Layout

In the **Page Layout** tab, you can specify how and on how many pages to print your circuit program. You can preview the pagination in this tab. If you choose more than one program page, LOGO!Soft Comfort indicates the page breaks with green lines. When you subsequently print the circuit program, LOGO!Soft Comfort uses this pagination. Note that connections extending to other pages are simply cut off when you print the hardcopy. Siemens recommends you create cross-references by splitting the file at this position with the help of the Cut/Join tool (Page 48). In the File → Page Setup (Page 63) menu you can specify the paper size, page alignment and margins.

The total number of pages(horizontal x vertical) must not exceed 100.

The standard toolbar (Page 42) also contains an icon for this menu command.

2.7.3.6 Conversion tool

Use this function to convert your circuit program between LAD and FBD.

The following rules apply to the conversion from LAD to FBD:

- A series circuit of contacts is converted into an AND block.
- A parallel circuit of contacts is converted into an OR block.
- User-defined comments are not included, as their position in the circuit program cannot be defined based on blocks.
- Crosslinks (connections where a block output is connected to multiple block inputs and at least one of the inputs is connected to multiple block outputs) are converted into an OR block.
  Inputs for the OR block are all block outputs of the crosslink.
  The output of the OR block is connected to all block inputs of the crosslink.
- Internal flags are resolved, and the current paths are linked.

This function is inactive in the UDF Editor.

Use this function to convert your circuit program between FBD and LAD.

- An AND block is converted into a series contact circuit
- An OR block is converted into a parallel contact circuit
- Comments for basic functions are not applied in LAD, as a basic function is converted into multiple contacts. Thus, the comment cannot be assigned definitely.
- In LAD, input comments are assigned to all contacts of this input.
- User-defined comments are not included, as their position in the circuit program cannot be defined based on blocks.
- XOR blocks must be converted into corresponding LAD logic consisting of positive and negative contacts.

Note

When converting between LAD and FBD, the total number of blocks in your circuit program can sometimes increase. This could cause the permitted number of blocks for your LOGO! to be exceeded.

You cannot, therefore, always convert FBD programs to LAD.

Remedy: Under Tools -> Select Hardware (Page 176), select the hardware series that you are using. Start converting to LAD. Then under Tools -> Determine LOGO! (Page 175), see which hardware series is compatible with the circuit program.

If your circuit diagram contains a UDF block, you cannot use this function to convert it from FBD to LAD.

2.7.3.7 Online test

The online test and simulation (Page 182) modes allow you to monitor the execution of your circuit program and how it reacts to the various input states.

For LOGO!Soft Comfort V8.3 and later versions, if LOGO! TDE device is connected with LOGO! Base Module, when you perform an online test for LOGO! Base Module, messages shown on the connected TDE device are displayed.

Difference from simulation mode

In simulation mode you execute your circuit program on the PC. To do so, you do not require a LOGO!. You can preset the status of inputs on the PC.

During an online test, LOGO! executes the circuit program and you can monitor this "work" of LOGO!. The status of the inputs corresponds with the actual states at LOGO! inputs.

Prerequisite for an online test

You must link your PC to a LOGO!. LOGO!Soft Comfort uses the interface you specified in Tools → Transfer (Page 92) to link to LOGO!.

You can test a circuit program in either FBD or LAD format and you must transfer it to LOGO! for the online test.

The circuit programs in LOGO!Soft Comfort and on LOGO! must be identical. Upload the program from LOGO! to your PC, or download the program from your PC to LOGO! if necessary.

You can monitor the parameters of up to 30 blocks. The number of blocks you can monitor simultaneously decreases when you monitor blocks that contain a high number of parameters (for example, analog SFBs).

LOGO! 9 and later versions:

When you start online test for LOGO! 9 and later versions, if the parameters of the circuit diagram in LOGO!Soft Comfort and LOGO! are not identical, LOGO!Soft Comfort will remind you to synchronize all parameters. You can choose to synchronize the parameters from LOGO! to LOGO!Soft Comfort or vice versa.

Note: If the parameters in the VM area are configured to be modified through the network (e.g. Modbus or S7), this will result in a parameters synchronization conflict, as the parameters are constantly changing.

Starting the online test

Click the online test icon in the programming toolbar.

If LOGO! is in STOP, start it with the start button.
Result: LOGO! executes your circuit program.

Switching LOGO! to STOP

If you want to stop LOGO! via LOGO!Soft Comfort, click the stop icon .

Devices of the 0BA4 series and later support online tests.

Possible errors

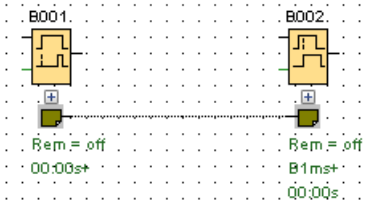
The following types of errors can occur:

- Your LOGO! does not support the online test.
  Remedy: Install a LOGO! device of the 0BA4 or later series.
- The programs on your PC and on LOGO! are different.
  Remedy: Upload the circuit program from LOGO! to your PC, or download the program from your PC to LOGO!.
- You are attempting to monitor too many parameters/blocks simultaneously.
  Remedy: Reduce the number of simultaneously monitored parameters/blocks.
- The communication between your PC and LOGO! is down.
  Remedy: Re-establish the connection.

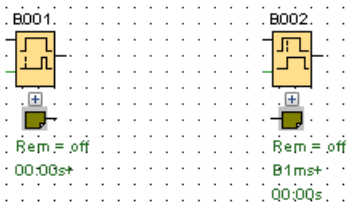
This menu command is inactive in the UDF Editor.

2.7.3.8 Showing/hiding reference line (0BA8 and later versions only)

You can use this tool to show and hide reference line between parameter boxes. When the parameter boxes are hidden, you can press this button to show or hide the reference line between boxes.



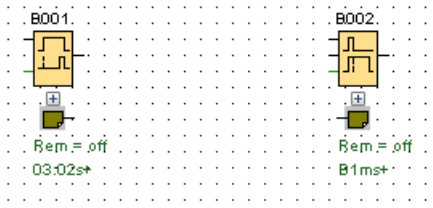
Show the reference line



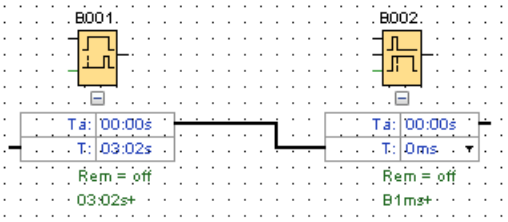
Hide the reference line

2.7.3.9 Expanding all parameter boxes (0BA8 and later versions only)

You can use this tool to expand all the parameter boxes. When you press this button, all the parameter boxes in the working circuit program are expanded.



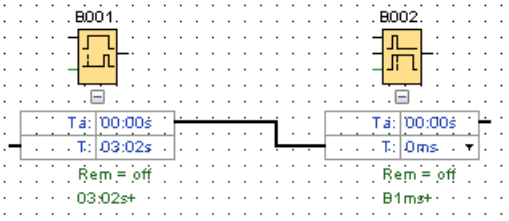
The parameter boxes are collapsed.



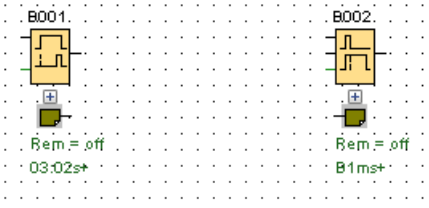
The parameter boxes are expanded.

2.7.3.10 Collapsing all parameter boxes (0BA8 and later versions only)

You can use this tool to collapse all the parameter boxes. When you press this button, all the parameter boxes in the working circuit program are collapsed.



The parameter boxes are expanded.

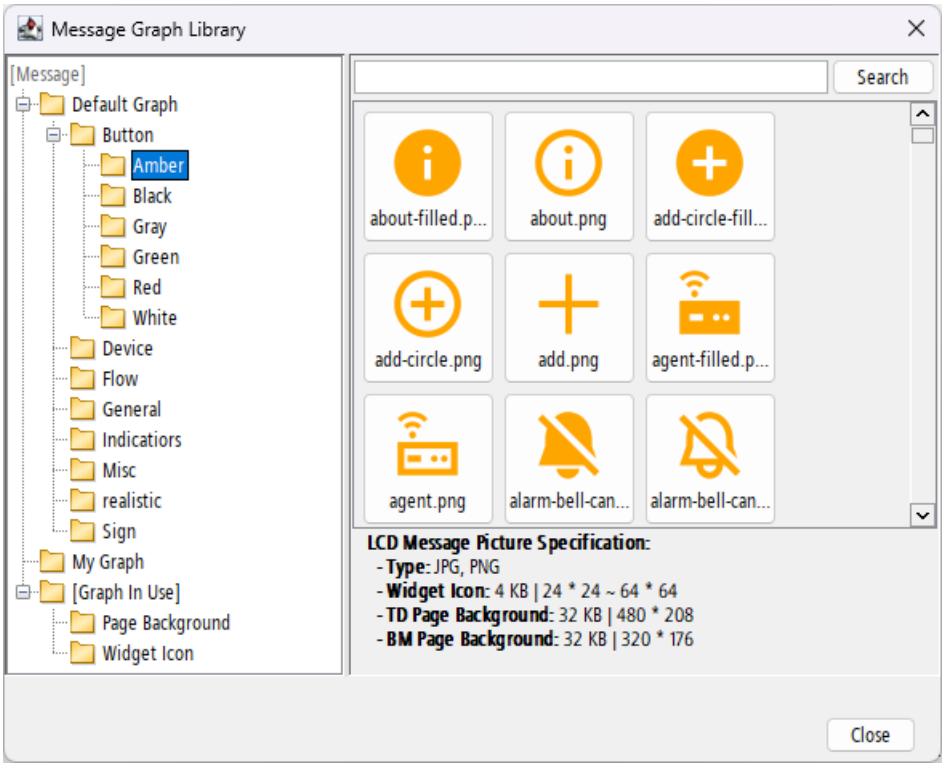


The parameter boxes are collapsed.

2.7.3.11 Message Graph Library (LOGO! 9 and later versions only)

Click Message Graph Library to view and manage graphs used in the LCD Message blocks.

You can also find this tool in the LCD Message function block (Page 449) parameter configuration page.



0BA0 : 0BA9

LOGO! 9 and later versions only:
Message Graph Library is only available for LOGO! 9 and later versions.

Default Graph folder

In this folder you can find the LOGO!Soft Comfort built-in graphs.

My Graph folder

In this folder you can upload and view your own graphs. LSC allows you to upload graphs and folders containing graphs.

To upload a graph from your PC, click the Upload button to open the local file system, then choose the graph to upload.

To import a folder containing graphics, right-click the My Graph folder, then click Import Folder to open the local file system. Choose the folder to import.

Note

PC administrator privileges

To import a folder of graphs from your PC, the PC administrator privileges are required. Make sure you run LOGO!Soft Comfort as an administrator.

To guarantee better performance of graph displaying on device screen, it is recommended to follow these specifications when uploading your own graphs. If the uploaded graphs exceed the recommended size, they will be compressed to the appropriate size.

- JPG and PNG formats are allowed
- Recommend graph size:
  - Widget icon graph size ≤ 4 KB, 64 x 64 pixels
  - TD message page background graph size ≤ 32 KB, 480 x 208 pixels
  - BM message page background graph size ≤ 32 KB, 320 x 176 pixels

Graph in Use folder

This folder contains graphs used in all LCD Message blocks in the current circuit diagram.

By right-clicking the graph, you can select to delete the graph used in the LCD Message block. LSC will remind you which function block the graph is used in, and confirm the deletion. Once confirmed, the graph will be deleted from the folder and removed from the message display.

LSC limits the number of graphs used in a circuit diagram to ensure good program performance:

- Message page background: max. 8 graphs
- Widget icon: max. 64 graphs

2.7.4 Networking toolbar (0BA8 and later versions only)

The network toolbar appears above the Network view and contains the following icons:

Add new device (Page 252)

Go Online (Page 55)

Go Offline (Page 56)

Zoom In (Page 91)

Zoom Out (Page 91)

Show/Hide device line (Page 57)

Network Batch Download (Page 163)

2.7.4.1 Going online (0BA8 and later versions only)

You can use this tool to test online connection for LOGO! and LOGO! TDE (6ED1055-4MH08-0BA1, LOGO! 9 TDE) devices.

Note

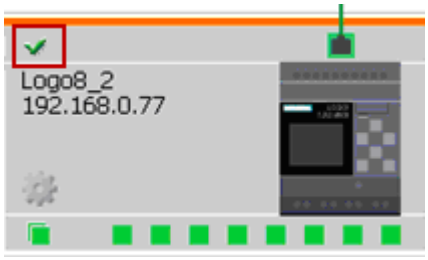
Network requirements for going online

The **Go online** function does not work if your network is in a public or unidentified work environment. It works only when your network is in a private, home or work network environment. Make sure you set your network location correctly before going online.

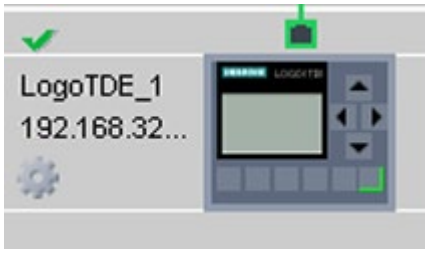
For devices that are configured in a network project, you can press the **Go online** button to detect the status of each LOGO! or LOGO! TDE (6ED1055-4MH08-0BA1, LOGO! 9 TDE) device.

If the configured device is accessible, LOGO!Soft Comfort shows a green check mark on the top-left corner of the device image.

LOGO! device



LOGO! TDE 6ED1055-4MH08-0BA1 device



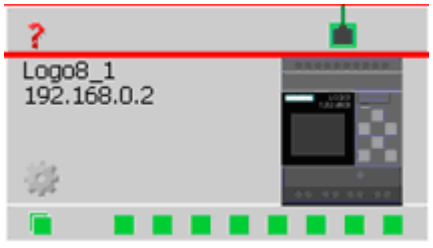
Note

Changing IP address for LOGO! 9 (or later versions) device

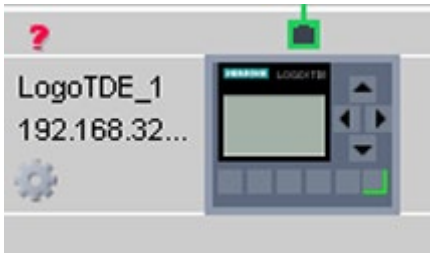
To change the IP address of the detected LOGO! 9 (or later versions) device in the network view, ensure that the device is in STOP mode and that the Allow unauthorized IP setting (Page 105) is enabled for the device.

If the configured device is inaccessible, LOGO!Soft Comfort shows a question mark in the top-left corner of the device image.

LOGO! device



LOGO! TDE 6ED1055-4MH08-0BA1 device

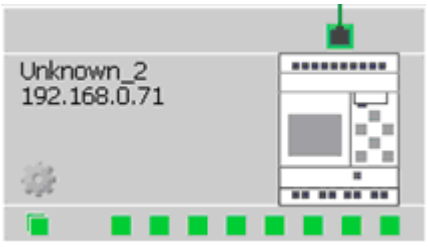


Note

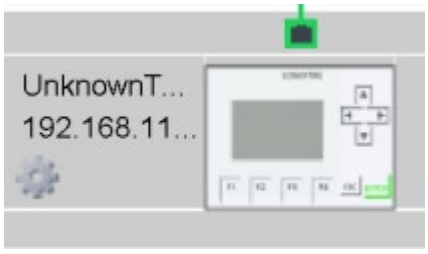
To make sure the Go online function works properly, you must connect the devices to the PC in the Network view.

For devices which are in the same subnet as the selected network card and are not configured in the network project, you can press the **Go online** button to detect it and add it to the project. LOGO!Soft Comfort adds the detected device to the project as an unknown device.

LOGO! device



LOGO! TDE 6ED1055-4MH08-0BA1 device



For more information on the configuration of device connection, refer to Ethernet Connection Configuration (Page 266).

Note

Online settings for LOGO! devices and LOGO! TDE

When **Go Online** is still in process, scanning devices is not available in configuring online settings for LOGO! devices and LOGO! TDE (6ED1055-4MH08-0BA1, LOGO! 9 TDE) device. You need to terminate the **Go Online** process before configuring online settings.

For information on LOGO! devices and LOGO! TDE online settings configuration, refer to Device setting configuration (Page 258).

2.7.4.2 Going offline (0BA8 and later versions only)

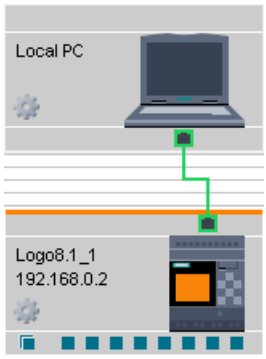
Click Go offline to stop scanning online devices.

Note

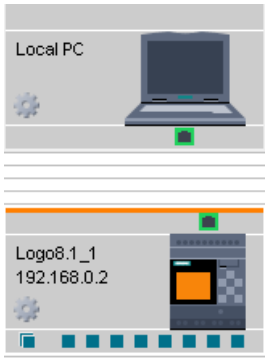
If you want to add an unknown device in your project, configure it after you detected it. When you click Go offline, LOGO!Soft Comfort removes all unknown devices in the network view and all the accessible status.

2.7.4.3 Show/Hide device line

You can use this tool to show and hide cable line between local PC and the devices in the network view.



show device line



Hide device line

2.8 Menu bar

The menu bar contains administrative and editing functions for the circuit program and provides access to the context-sensitive help.

- File menu (Page 57)
- Edit menu (Page 80)
- Format menu (Page 87)
- View menu (Page 88)
- Tools menu (Page 92)
- Window menu (Page 220)
- Help menu (Page 222)

2.8.1 File menu

The File menu command contains commands for file management. Included are also commands for downloading, saving or creating circuit programs, for setting general file properties and for printing:

- New (Page 58)
- Open (Page 58)
- Close (Page 60)

- Close All Diagrams (Page 61)
- Save (Page 61)
- Save As (Page 62)
- Page Setup (Page 63)
- Print Preview (Page 63)
- Print (Page 63)
- Message Text Settings (Page 65)
- Properties (Page 66)
- Exit (Page 79)

Available in the LAD Editor only: Convert (LAD > FBD) (Page 48)
Available in the FBD Editor only: Convert (FBD > LAD) (Page 48)

2.8.1.1 File -> New

The command opens a new window with an empty programming interface for programming in LAD, FBD or UDF, depending on your set mode. Depending on your default setting, LOGO!Soft creates a window with a number of tabs in which you can specify the properties of the circuit program you are going to create. You can access this window later to either enter or modify the properties with the File → Properties (Page 66) menu.

An icon for this menu command is also found in the standard toolbar (Page 42).

Note

This function is only active in diagram mode.

Switching between LAD, FBD

You select the editor for creating a new circuit program from the Tools → Options: Standard Editor (Page 216) menu command.

Select either "FBD Diagram Editor" or "LAD Editor" from the Standard Editor drop-down list. LOGO!Soft Comfort creates new circuit programs in either LAD or FBD according to your selection.

2.8.1.2 File -> Open

The command opens a dialog box from which you can select and open a previously created circuit program or project for further editing. Circuit programs created in LOGO!Soft Comfort

have the file extensions *.lsc, *.lld, *.bin, and *.lma. Projects created in LOGO!Soft Comfort have the file extension *.lnp, *.mnp, *.snp and *.wnp. LOGO!Soft comfort opens the loaded circuit program in a new window.

The types of files that you can open are listed below:

- LOGO!Soft Comfort File FBD (*.lsc)
- LOGO!Soft Comfort File LAD (*.lld)
- LOGO! UDF File (*.lma)
- LOGO!Soft Standard File (*.lgo)
- Portable Document Format (*.pdf)
- JPG File (*.jpg)
- Bitmap File (*.bmp)
- Binary dump (*.bin)
- LSC Network Project File (*.lnp)
- LSC Network Project File (*.mnp)
- LSC Network Project File (*.snp)
- LSC Network Project File (*.wnp)

Note

For a new network project, the saved project type varies:

- For a new project, if the hardware devices include LOGO! V8.0 or earlier versions devices, the project is saved as (*.lnp) file.
- For a new project, if the hardware devices include LOGO! V8.2 devices or Modbus devices, the project is saved as (*.mnp) file.
- For a new project, if the hardware devices include LOGO! V8.3 or LOGO! V8.4 devices, the project is saved as (*.snp) file.
- A new project is saved as (*.wnp) file in one of the following conditions:
  - if the hardware devices include LOGO! V9.0 or later version devices;
  - if the hardware devices include a LOGO! 9 TDE device;
  - if the project contains User Defined Web Projects (Page 531).

Note

You can open only one project in the Network view at the same time. That means if you open a new project, LOGO!Soft comfort will close the project you are editing now. If you have not saved the current project, you are prompted in a dialog to save it.

Note

The circuit diagram is always opened in diagram mode no matter you are in diagram mode or project mode. If you want to implement a circuit program on a device in your network project, right-click the device and select import in the shortcut menu.

An icon for this menu command is also available in the standard toolbar (Page 42).

Circuit programs of LOGO!Soft Standard

You can also import files created with LOGO!Soft Standard (file name extension = *.lgo). Use the "File type" menu item to select the type of file you want to display. LOGO!Soft Comfort generates a graphical layout of the circuit program.

Note

LOGO! 0BA8 and later versions do not support the .lgo type of files.

Alternatives

You can also open a circuit program by one of the following means:

- In Windows you can also drag and drop a LOGO!Soft Comfort circuit program file to the programming interface. When you "release" this file on the diagram tree, LOGO!Soft Comfort opens it in a new window.
- In Windows you can also drag and drop a LOGO!Soft Comfort project file to the programming interface. When you "release" this file on the network project tree, LOGO!Soft Comfort opens and the project you are editing is closed.
- If you double-click a file with the extension *.lsc, *.lld, *.bin or *.lma in the file manager, LOGO!Soft Comfort automatically opens the file.

Recently-opened files

At the end of **File** menu you see a list of files that were recently opened in LOGO!Soft Comfort.

2.8.1.3 File -> Close

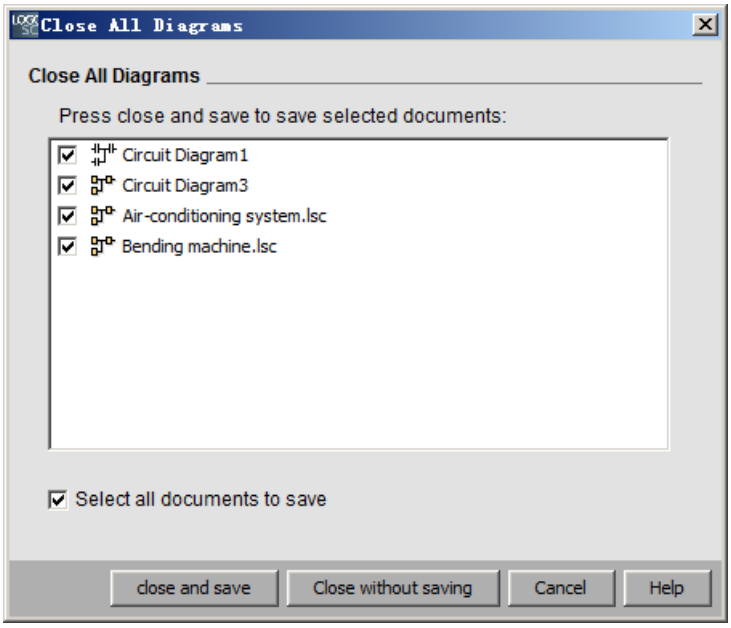
Click the **Close** menu command to close the active window. If you have not yet saved the current circuit program or project, LOGO!Soft Comfort prompts you to save it.

The standard toolbar (Page 42) also contains an icon for this menu command.

As an alternative, you can right-click the tab of a circuit program and select the **Close** menu command from the shortcut menu.

2.8.1.4 File -> Close All

A click on this menu command closes all open windows. If you have not yet saved one or more of the current circuit programs, LOGO!Soft Comfort prompts you to select the program to be saved in a dialog. LOGO!Soft Comfort saves all selected programs.



Note

A click on the **Close All** menu command in the project mode just hides the diagrams. When you click the device, its diagram opens again and all the changes you made remain.

2.8.1.5 File -> Save

When you initially save a newly created program or project, a window opens in which you can specify the path and file name under which you want to save your circuit program. You can find additional information under File → Save as (Page 62).

If you are saving a modified version of an existing program or project, LOGO!Soft Comfort performs a quick save. The revised version overwrites the old version at the same path and name as the source file.

The standard toolbar (Page 42) also contains an icon for this menu command.

As an alternative, you can right-click the tab of a circuit program and select the Save menu command from the shortcut menu.

Note

Saving a project automatically saves all of the diagrams. If you want save a diagram in the project separately, click the device it belongs and select export in the shortcut menu.

Note

- Circuit diagrams saved in LOGO!Soft Comfort V8.3 or later versions are encrypted.
- Network projects saved as (*.snp) or (*.wnp) file are encrypted.

2.8.1.6 File -> Save As

A dialog opens for you to specify the path and file name under which the current circuit program or project is to be saved. This allows you to save modified programs under a different name or folder, and thus keep previous versions for retrieval.

The types of files that you can save are listed below:

- LOGO!Soft Comfort File FBD (*.lsc)
- LOGO!Soft Comfort File LAD (*.lld)
- LOGO! UDF File (*.lma)
- LOGO!Soft Standard File (*.lgo)
- Portable Document Format (*.pdf)
- JPG File (*.jpg)
- Bitmap File (*.bmp)
- Binary dump (*.bin)
- LSC Network Project File (*.lnp)
- LSC Network Project File (*.mnp)
- LSC Network Project File (*.snp)
- LSC Network Project File (*.wnp)

Binary dump file is only for FBD programs to be saved on an SD card: (*.bin)

The default LOGO!Soft Comfort file name extension is *.lsc for FBD programs, *.lld for LAD programs, or *.lma for UDF programs. You can also export your program to an older LOGO!Soft version if you select the file type *.lgo, the program format of LOGO!Soft Standard. LOGO!Soft Comfort does not save graphical information about block positions when you save your program. If your circuit program contains functions not supported in LOGO!Soft Standard, LOGO!Soft Comfort generates an export error message.

You can also save the circuit program in a graphical format: *.jpg, *.bmp or *.pdf. However, note that such files do not contain logic elements; you cannot reopen them in LOGO!Soft Comfort.

The PDF file offers a special feature. Saving your circuit program in *.pdf format gives you an AcrobatReader document that is easily distributable. For example, you could distribute this document to users who do not have LOGO!Soft Comfort, and thus enable them to view your project in AcrobatReader and make hard copies.

As an alternative, you can right-click the tab of a circuit program and select the **Save as** menu command from the shortcut menu.

2.8.1.7 File -> Page Setup

This command opens a dialog box in which you can specify the page settings for creating circuit programs. Here you can specify the paper format, page margins or whether to print in portrait or landscape format.

LOGO!Soft Comfort offers multi-page printout feature, with the position of page breaks indicated on-screen. The print area is user-definable.

You can paginate your circuit program via the menu command File → Properties (Page 66).

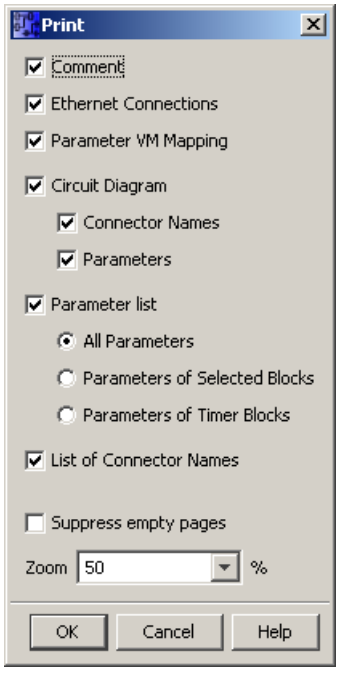
To set the printers, select the File → Print (Page 63) menu command. Finally, you can specify the scope of your hard copy with Tools → Options: Print (Page 217).

2.8.1.8 File -> Print preview

The print preview option shows what a hard copy of your circuit program looks like. You can choose the relevant icons to scroll the pages. You can also click the "Zoom In" or "Zoom Out" button, which allows you to zoom in or out per 25% increments. You can also print directly from the preview dialog.

2.8.1.9 File -> Print

This command opens a dialog with which you can select the information to print. You can also open this dialog from the Tools → Options: Print (Page 217).



Note

The first option refers to comments that you input in the "Comment" tab of "Properties" dialog. Refer to "File -> Properties - Additional info (Page 73)" for further information.

The last option allows you to exclude pages that do not contain any graphical objects. If you exclude empty pages, your printout will have gaps in the page numbering where the blank pages were.

In the printer dialog, you can specify your default printer and the print properties. In the control panel of your computer you can specify advanced printer settings.

The AcrobatReader *.pdf format provides a further print option. You can save your program in AcrobatReader document format and distribute it to users who do not have LOGO!Soft Comfort and can then use AcrobatReader to view and print out your circuit program.

The standard toolbar (Page 42) also contains an icon for this menu command.

Set the page format under File → Page Setup (Page 63)

2.8.1.10 File -> Message text Settings (LOGO! 9 and later versions)

Use this command to configure message page settings that apply to all message pages:

- Message Page 1: only display message page 1 on the BM.
- Message Page 2: only display message page 2 on the BM.

- Use M27 to change the message page: this determines whether message page 1 or message page 2 is displayed. If M27 = 0 and you select this checkbox, LOGO! BM displays message page 1; if M27 = 1 and you select this checkbox, LOGO! BM displays message page 2.
- Filter time: the filter time determines the frequency at which the LOGO! BM refreshes the AI, AQ or variable values displayed by the integer/float number widgets in a message page. The setting value ranges from 100 ms to 1000 ms. The setting value represents the default filter time of the Integer/Float number widgets. Alternatively, you can configure the filter time for each integer/float number widget separately.

See the LCD Message block (Page 449) description for details on how these settings apply.

The function for configuration message texts is inactive in the UDF Editor.

LOGO! 9 and later versions:
Message page settings are only available for LOGO! 9 and later versions.
Message text settings (Page 65) including character setting are not available for LOGO! 9 and later versions.

Note

UTF-8 encoding supported

LOGO! 9 and later versions support UTF-8 encoding for message texts.

The supported character sets are ISO-8859-1, ISO-8859-5, ISO-8859-9, ISO-8859-16, GB-2312/GBK, Shift-JIS.

2.8.1.11 File -> Message Text Settings (0BA8 and earlier versions)

Use this command to configure message text settings that apply to all message texts:

- Character Set 1: This specifies the primary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.
- Character Set 2: This specifies the secondary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.
- Use M27 to change the character sets: This determines whether the message texts of the primary character set or the secondary character set are displayed. If M27=0 and you select this checkbox, LOGO!Soft Comfort displays the message texts of the primary character set (Character Set 1). If M27=1 and you select this checkbox, LOGO!Soft Comfort displays the message texts of the secondary character set (Character Set 2).

- Analog input filter timer: This time determines the frequency at which LOGO! refreshes the analog values in a message text. The value is in milliseconds.
- Ticker Timer Setting: For messages that tick, the ticker timer determines how fast or slow a message text ticks or scrolls on the LOGO! onboard display. The value is in milliseconds, and you can use the adjacent button to access a scroll bar to set the ticker timer.

Supported character sets

LOGO!Soft Comfort, the LOGO! onboard display, and the LOGO! TD support the following character sets:

Character Set in LOGO!	Common Name	Support Languages	Internet Reference
ISO-8859-1	Latin-1	English German Italian Spanish (partly) Dutch (partly)	http://en.wikipedia.org/wiki/ISO/IEC_8859-1
ISO-8859-5	Cyrillic	Russian	http://en.wikipedia.org/wiki/ISO/IEC_8859-5
ISO-8859-9	Latin-5	Turkish	http://en.wikipedia.org/wiki/ISO/IEC_8859-9
ISO-8859-16	Latin-10	French	http://en.wikipedia.org/wiki/ISO/IEC_8859-16
GB-2312/GBK	Chinese	Chinese	http://en.wikipedia.org/wiki/GB2312
Shift-JIS	Japanese	Japanese	http://en.wikipedia.org/wiki/Shift-jis

See the message text function (Page 458) description for details on how these settings apply.

The function for configuration message texts is inactive in the UDF Editor.

2.8.1.12 File -> Properties

File -> Properties when the project window is the active window

If you select the File -> Properties menu command when the project window is the active window, LOGO! displays the "**Project overview properties**" dialog. In this dialog you configure properties such as Project name, Author and Customer. In the Comment field, you can enter a description of the project or notes related to the project. In the "Network Project Password" field, you can set password for the network project or modify the network project password.

Note

Network project password rule is as follows:

- The maximum length of password is 10.
- ASCII characters are supported.

File -> Properties when the diagram editor is the active window

If you select the File -> Properties menu command when the diagram editor is the active window, LOGO! displays the "LOGO! settings" dialog. In this dialog, you can configure offline and online settings for LOGO!.

To make all the configuration in offline settings take effect, you need to download the configuration to the BM. While in online settings, changes and configurations take effect immediately.

LOGO! 9 and later versions:
Offline settings contain Diagram settings and Device settings.
The configurations in Diagram settings are downloaded/uploaded with the circuit diagram; the configurations in Devices settings are downloaded/uploaded depending on your configuration.

When you create a new diagram, the LOGO! settings window appears automatically to configure the diagram settings and device settings.

You can set the following parameters for a LOGO! Base Module in offline or online:

Offline settings

Diagram settings

- Program name (Page 69)
- Program password (Page 71)
- Message text (Page 64)
- Additional info (Page 73)
- Statistics (Page 74)
- Comment (Page 74)
- Modbus address space (Page 74)
- Cloud data transfer settings (Page 116)
- Email Event Settings (Page 76)

Device settings

- General (Page 68)
- Hardware type (Page 69)
- I/O settings (Page 69)
- I/O names (Page 85)
- Power on (Page 72)
- Operating mode (Page 106)
- LCD setting (Page 73) (LOGO! 9 and later versions only)
- Time settings (Page 166)
- Dynamic server IP filter (Page 154)
- Certificate Settings (Page 144)
- Trust CA settings (Page 165) (LOGO! 9 and later versions only)
- Email Settings (Page 150)
- Access control settings (Page 112)
- Template (Page 77) (LOGO! 9 and later versions only)

Online settings

- Connect to LOGO! (Page 92)
- Show FW version (Page 104)
- Assign IP address (Page 105)
- Time settings (Page 166)
- I/O settings (Page 69)
- Message setting (Page 64)
- Operating mode (Page 106)
- Clear program and password (Page 104)
- Power on (Page 72)
- LCD setting (Page 73) (LOGO! 9 and later versions only)
- TD power-on screen (Page 108) (0BA6 to 0BA8 versions only)
- Hours Counter (Page 151)
- Upload data log (Page 105)
- Diagnostics (Page 153)
- Access control settings (Page 112)
- Dynamic server IP filter (Page 154)
- Clock Sync with EM Switch (Page 104) (0BA8 versions only)
- Cloud data transfer settings (Page 116)
- Cloud connection setting (Page 119)
- Certificate Settings (Page 144)
- Trust CA settings (Page 165) (LOGO! 9 and later versions only)
- Email Settings (Page 150)
- Audit Log (Page 170)(LOGO! 9 and later versions only)
- Format SD card (Page 173) (LOGO! 9 and later versions only)
- Factory reset (Page 103) (LOGO! 8.FS4 and later versions only)
- Firmware Upgrade (Page 174) (LOGO! 9 and later versions only)

2.8.1.13 File -> Properties - General

In this tab, you can set the name and IP for your device. You can input the address, subnet mask and gateway to assign an IP to the LOGO! Base Module. You can configure the Ethernet connection for your device.

Program name:

- For LOGO! 9 and later versions devices, you can name the circuit program in the Diagram settings (Page 69).
- For 0BA8 and previous versions devices, you can name the circuit program in the General tab in Offline settings.

In the **Ethernet connections** (Page 187) field, you can enable S7 access, LOGO! Communication or Modbus access and configure the Ethernet connection.

2.8.1.14 File -> Properties - Program name (LOGO! 9 and later versions only)

In this tab, you can name your circuit program. The program name cannot exceed 16 characters in length.

0BA0 : 0BA9

0BA8 and previous versions:

You can name the circuit program for 0BA8 and previous versions devices through the menu command: File -> Properties - General (Page 68).

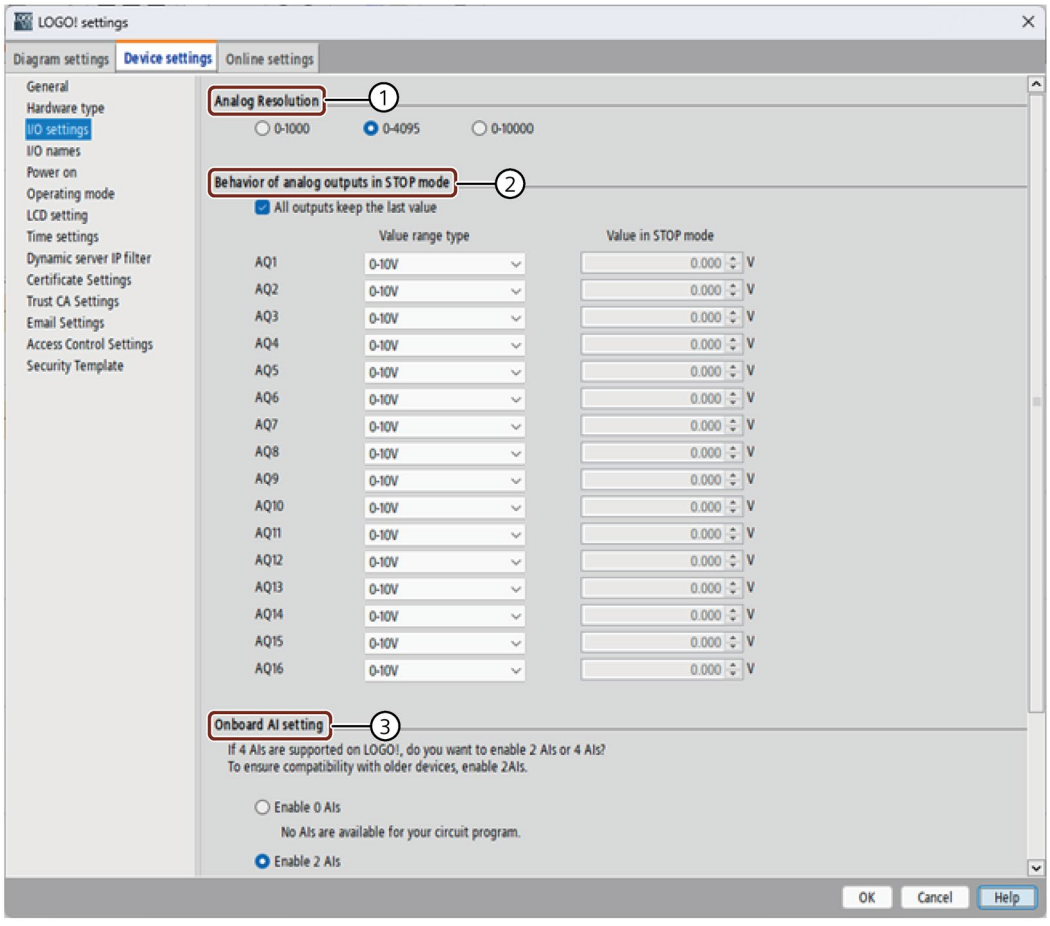
2.8.1.15 File -> Properties - Hardware type

This tab shows the basic information of LOGO! Basic, such as known blocks, constants/connectors, and the number of digital inputs.

2.8.1.16 File -> Properties - I/O settings

When you download the circuit program, LOGO!Soft Comfort also transfers the I/O settings to LOGO!.

For LOGO! 9 and later versions devices, I/O settings is available for configuration in both Offline settings and Online settings.



With the setting ①, you can set the analog resolution. This setting is only available for LOGO! 9.0 and later versions devices.

For integer data type parameters from analog function blocks, the value range varies according to the analog resolution you set.

Note

The analog resolution is set to 0 - 1000 by default. To apply the change of analog resolution, you need to check and reconfigure all the block parameters in your diagram and UDF (if any), then download the diagram and device configuration to the device.

Changing the analog resolution also changes the supported decimal place of the analog output value in STOP mode:

- 0 - 1000: supports 2 decimal places
- 0 - 4095: supports 3 decimal places
- 0 - 10000: supports 3 decimal places

Note

Analog resolution compatibility

LOGO! 0BA8 and earlier versions only support the analog resolution 0 - 1000.

If the analog resolution 0 - 4095 or 0 - 10000 is configure for the diagram, you are not allowed to change the HW type from LOGO! 9.0 or later versions to LOGO! 8.4 or earlier versions.

With the setting ②, you can set what the analog outputs of LOGO! should be when LOGO! is in STOP mode and the range of the outputs value. Your choices are as follows.

For "Behavior of analog outputs in STOP mode", select one of the following choices:

- All outputs keep the last value
- AQ1 to AQ 16 are set to values that you define

For "Set analog outputs value range type", select one of the following choices:

- 0 to 10 V
- 4 to 20 mA
- 0 to 20 mA

Note

When using the LOGO! AM4 AI/AQ analog modules, if you short-circuit the input terminals, then you need to set the analog output value range type as 0 to 10 V; if you don't short-circuit the input terminals, then you need to set the analog output value range type as 4 to 20 mA or 0 to 20 mA.

For detailed information of LOGO! AM4 AI/AQ wiring, refer to the section *Wiring LOGO!* in *LOGO! System Manual*.

With the setting ③, you can choose to enable the optional AI3 and AI4 on the LOGO! 0BA6 and later version devices that have an option of four analog inputs. For LOGO! 0BA6 and later version devices that support four analog inputs, you can choose how many to use. Your choices are as follows:

- Enable 0 AIs: No AI available for use in your circuit diagram.
- Enable 2 AIs: Only AI1 and AI2 corresponding to input terminals I7 and I8 are available for use in your circuit program.
- Enable 4 AIs: AI1 and AI2 corresponding to input terminals I7 and I8 are available for use in your circuit program. Additionally, AI3 and AI4 corresponding to input terminals I1 and I2 are available for use.

LOGO! 9 devices support 16 analog inputs and 64 digital inputs.

0BA0 - 0BA8:

- analog resolution setting is not available for LOGO! BM prior to LOGO! 9.
- LOGO! 0BA8 devices support 8 analog inputs and 24 digital inputs.
- For LOGO! BM prior to LOGO! 9, I/O settings is only available in offline settings.

2.8.1.17 File -> Properties - Program password

When you transfer the circuit program, LOGO!Soft Comfort also transfers the password specified in **Program password** tab to LOGO!.

You can assign a password to your circuit program or change or delete an already assigned password.

To assign a new password, you must enter the password in the two text boxes for **New password** and then confirm with OK. The password can have a maximum of 10 characters.

To change the password, you must first enter the existing password in the **Old password** text box and the new password in the two boxes for **New password** and then confirm with OK.

You can delete your assigned password at any time. To do this, enter the existing password in the box **Old password** and leave the two **New password** boxes empty. Then confirm with OK.

Note

For FBD, LAD and BIN circuit diagram, you can set the password in this tab.

The FBD, LAD and BIN circuit diagram password rule is as follows:

- The maximum length of password is 10.
- Only English characters (uppercase or lowercase letters) are supported.
- Do not assume case sensitivity.

The password protects your circuit program on LOGO!. You can open or edit circuit programs from LOGO!Soft Comfort at any time regardless of whether the program is password-protected or not. For password-protected circuit programs, you must enter the password to view or change the program on LOGO!, or to load the circuit program from LOGO! to the computer.

The presence of tabs and fields on the Properties dialog depend on the LOGO! module that you select from the Tools -> Select Hardware (Page 176) menu command.

This property is only for FBD and LAD Editors.

2.8.1.18 File -> Properties - Power on

When you transfer the circuit program, LOGO!Soft comfort also transfers the display content on LOGO! after power on to LOGO!.

For LOGO! 9 and later versions devices, Power on is available for configuration in both Offline settings and Online settings.

With **Display content on LOGO! after power on**, you can set what LOGO! shows on the onboard display when you switch on LOGO! and when no message page display is triggered. Your choices are as follows:

LOGO! 9 (and later versions)

- Display the date and time
- Display inputs and outputs
- Display analog inputs and analog output
- Display M flags
- Display cursor keys
- Display menu

0BA8 (and earlier versions)

- Display the date and time
- Display inputs and outputs
- Display menu

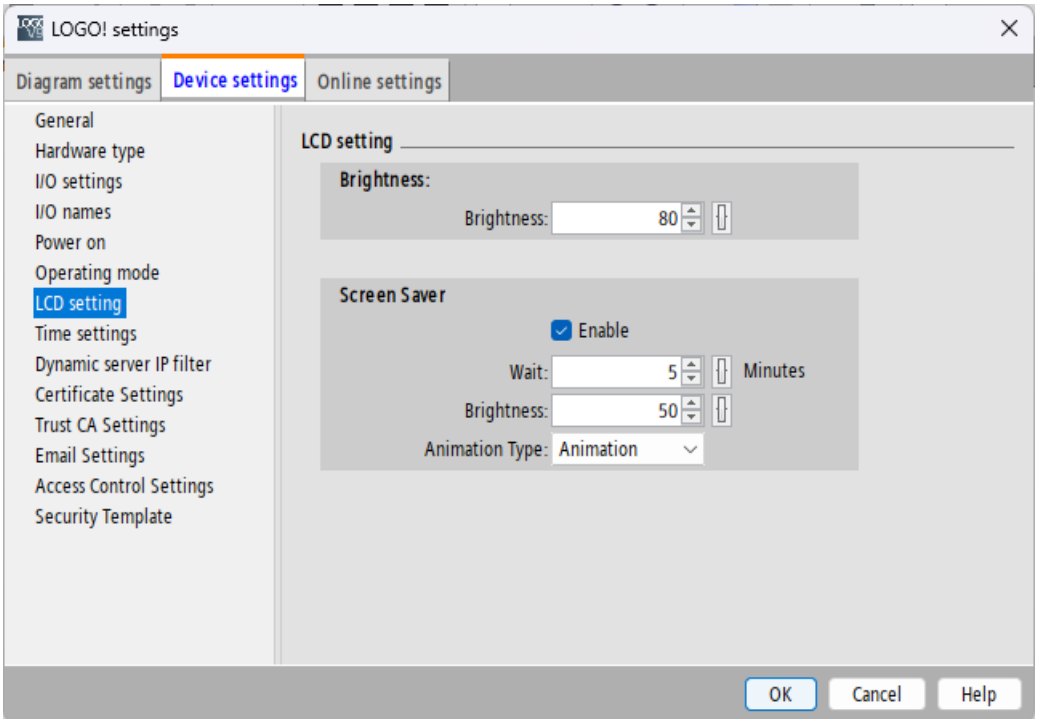
- The presence of tabs and fields on the Properties dialog depend on the LOGO! BM that you select from the Tools -> Select Hardware (Page 176) menu command.
- For LOGO! BM prior to LOGO! 9, Power on is only available in offline settings.

This property is only for FBD and LAD Editors.

2.8.1.19 File -> Properties - LCD setting (LOGO! 9 and later versions only)

Use this command to configure BM screen display brightness and the screen saver. You can configure the LCD settings in both Device settings (Offline settings) and Online settings.

These LCD settings are also available through the menu Setup -> LCD on the BM device. Refer to *LOGO! System Manual* to learn the detailed information.



Note

LCD lifetime

High brightness and continuous displaying lead to a shorter lifetime for the LCD. To protect the LCD, it is recommended that you set a low display brightness and enable the screen saver.

0BA0 : 0BA9

This configuration is only available for LOGO! 9 and later versions.

2.8.1.20 File -> Properties - Additional Info

In this tab, you can enter details of the current circuit program. This dialog includes input boxes for project-related and internal company data, as well as the version of your circuit program.

As an alternative to a text string for your company name, you can specify a *.bmp or *.jpg file with your company logo for the Company field. This feature lets you create a customized layout of your program files.

How to identify your circuit program version (Page 596)

2.8.1.21 File -> Properties - Statistics

This tab shows the creation date of the circuit program and the last author.

2.8.1.22 File -> Properties - comment

In this tab, you can enter a description of the circuit program or notes relating to it. When you print your circuit program using the File → Print (Page 63) menu command, you can choose to print this comment on a separate printed page.

2.8.1.23 File -> Properties - Modbus address space

In this tab, you can view the mapping relationship between ModBus address and LOGO! resource.

The following table lists the Modbus space address for LOGO! 9.0 device:

Type Name	LOGO! Resource	Modbus Address	Direction	Unit
I	1 - 64	Discrete input 1 - 64	R	bit
Q	1 - 60	Coil 8193 - 8252	R/W	bit
M	1 - 128	Coil 8257 - 8384	R/W	bit
V	0.0 - 850.7	Coil 1 - 6808	R/W	bit
AI	1 - 16	Input Register 1 - 16	R	Word
VW	0 - 848	Holding Register 1 - 425	R/W	Word
AQ	1 - 16	Holding Register 513 - 528	R/W	Word
AM	1 - 128	Holding Register 529 - 656	R/W	Word
FAM	1 - 32	Holding Register 721 - 784	R/W	Double word
VX	0.0 - 2047.7	Coil 16385 - 32768	R/W	bit
VR	0.0 - 511.7	Coil 32769 - 36864	R/W	bit
VXW	0 - 2046	Holding Register 801 - 1824	R/W	Word
VRW	0 - 510	Holding Register 1825 - 2080	R/W	Word

The following table lists the Modbus space address for LOGO! 8.4 devices:

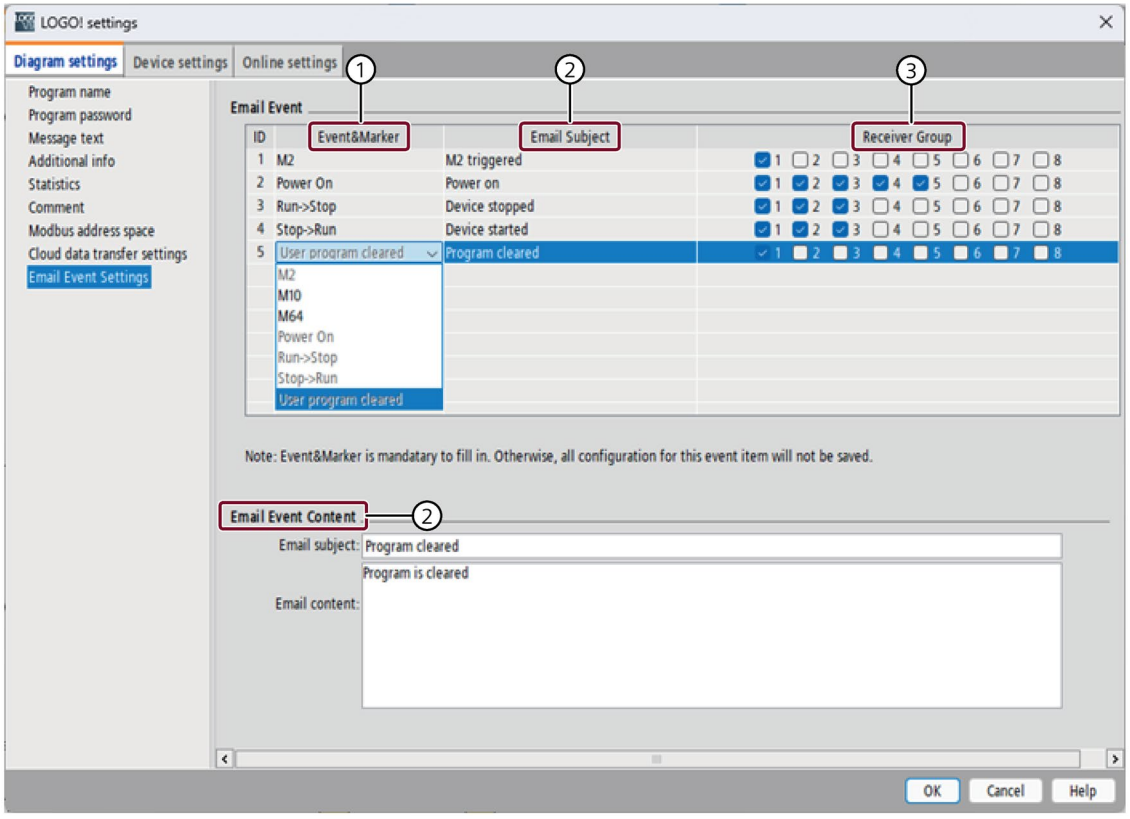
Type Name	LOGO! Resource	Modbus Address	Direction	Unit
I	1 - 24	Discrete input 1 - 24	R	bit
Q	1 - 20	Coil 8193 - 8212	R/W	bit
M	1 - 64	Coil 8257 - 8320	R/W	bit
V	0.0 - 850.7	Coil 1 - 6808	R/W	bit
AI	1 - 8	Input Register 1 - 8	R	Word
VW	0 - 848	Holding Register 1 - 425	R/W	Word
AQ	1 - 8	Holding Register 513 - 520	R/W	Word
AM	1 - 64	Holding Register 529 - 592	R/W	Word
VX	0.0 - 2047.7	Coil 16385 - 32768	R/W	bit
VR	0.0 - 511.7	Coil 32769 - 36864	R/W	bit
VXW	0 - 2046	Holding Register 801 - 1824	R/W	Word
VRW	0 - 510	Holding Register 1825 - 2080	R/W	Word

The following table lists the Modbus space address for LOGO! 8.1, LOGO! 8.2 and LOGO! 8.3 devices:

Type Name	LOGO! Resource	Modbus Address	Direction	Unit
I	1 - 24	Discrete input 1 - 24	R	bit
Q	1 - 20	Coil 8193 - 8212	R/W	bit
M	1 - 64	Coil 8257 - 8320	R/W	bit
V	0.0 - 850.7	Coil 1 - 6808	R/W	bit
AI	1 - 8	Input Register 1 - 8	R	Word
VW	0 - 848	Holding Register 1 - 425	R/W	Word
AQ	1 - 8	Holding Register 513 - 520	R/W	Word
AM	1 - 64	Holding Register 529 - 592	R/W	Word

2.8.1.24 File -> Properties - Email Event Settings (0BA8 and later versions only)

In this tab, you can configure events that trigger the connected BM to send customized emails to the configured email receiving groups.



In column ① , you can select the email trigger event in the drop-down menu: **Power On**, **Run -> Stop**, **Stop -> Run**, **User program cleared**. Except these four default system events, you can also find M flag events in the drop-down menu after adding M flag blocks in your circuit diagram. You can configure 16 M flag events at most. The configured M flag blocks display green backlight.

Note

Event&Marker is mandatary to fill in. Otherwise, all configuration for this event item will not be saved.

Note

Special M flags **cannot** be configured as email trigger event: M8, M25, M26, M27, M28, M29, M30, M31

Refer to section "Flags (Page 316)" for more information.

To add a new row and an event, you can right-click any existing row, and select "**Insert Row**" in the shortcut menu; To delete a row, you can right-click the row you want to delete and select **"Delete**" in the shortcut menu.

In column ② , the customized email subject displays here once you finish inputting email subject and content. Email subject and email content cannot be empty, otherwise, the configuration will fail. The inputting and transferring of email subject and content supports texts with UTF-8 coding format.

Note

Email subject and content rules

- The size of each email subject should not exceed 127 bytes.
- The size of each email content should not exceed 511 bytes.
- You cannot perform the combination operation of pressing Enter key, pressing Dot key, then pressing Enter key in any part of the email content, otherwise, the email content is invalid.

In column ③, you can select receiving groups for each event. You can configure receiving groups in Online settings → Email Settings (Page 150).

Note

Email sending frequency

The frequency of BM sending emails cannot be customized, as BM sending email is triggered by the configured event.

Depending on the cases of BM loading and network communication speed, fast frequency of email sending may result in sent emails being ignored.

Note

Email sending failure log

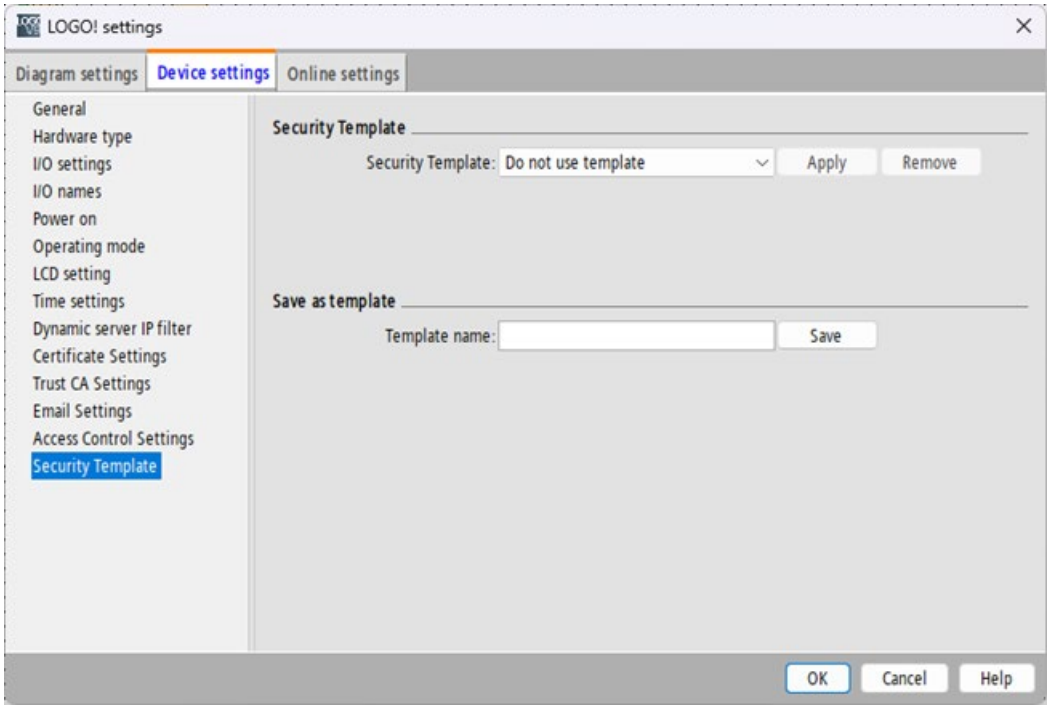
LOGO! BM can keep at most 16 error logs of email sending failure. Each error log contains information of log ID, time stamp, trigger source and failure cause.

You can check these error logs on BM through Diagnostics → Email → Mail Logs.

2.8.1.25 File -> Properties - Security template (LOGO! 9 and later versions only)

In this tab, you can manage the security configuration templates.

Refer to Configuring security settings (LOGO! 9 and later versions only) (Page 226) to learn more about security configuration.



Using a template

To use an existing security configuration template, follow these steps:

1. Click the down arrow to open the template list.
2. Select the template in the drop-down list.
3. Click Apply button. A dialog appears to confirm the operation.
4. Click Yes to implement the action, or click No to cancel using the template.

If you want to use part of the selected template, check the corresponding box of the template items. LOGO!Soft Comfort will implement the selected security configuration items in the template.

Removing a template

To remove an existing template from your PC, follow these steps:

1. Click the down arrow to open the template list.
2. Select the template in the drop-down list.
3. Click Remove button. A dialog appears to confirm the operation.
4. Click Yes to implement the action, or click No to cancel removing the template.

Creating a template

To create a security configuration template, follow these steps:

1. Configure the security related items in the Diagram settings and Device settings.

   Note

   In LOGO! Offline settings (Diagram settings and Device settings), you need to click OK button in each configuration page to save the settings. Otherwise, the settings won't be saved in your security configuration template.

2. Name your template.

   Note

   Template name limit

   - The template name cannot exceed 32 characters in length
   - The template name cannot contain these special characters: / \ : * ? " < > |

3. To save the template, click Save button.

2.8.1.26 File -> Recent Files

Click on this menu, and it displays in the sub-menu at most 8 latest project or circuit diagram files that you have saved. You can click the file in the sub-menu to open the project or circuit diagram.

2.8.1.27 File -> Exit

The Exit command closes LOGO!Soft Comfort

If you are editing a circuit program or project and have not yet saved it, LOGO!Soft Comfort prompts you about your project.

In diagram mode interface you can state which circuit programs are to be saved. Alternatively, you can exit LOGO!Soft Comfort without saving circuit programs. To do this, click **Close without saving**. In the network project interface, you can click **Yes** to save the project or click **No** to exit without saving it.

A quick way of closing LOGO!Soft Comfort without saving the data (Page 597)

2.8.2 Edit menu

The Edit menu provides commands for editing your circuit program. The programming toolbar contains some of the basic commands for creating and editing circuit programs.

- Undo (Page 80)
- Redo (Page 81)
- Delete (Page 81)
- Cut (Page 81)
- Copy (Page 81)
- Paste (Page 81)
- Align - Align vertically (Page 82)
- Align - Align horizontally (Page 82)
- Align - Horizontally distribute space (Page 83)
- Align - Vertically distribute space (Page 83)
- Align - Align automatically (Page 83)
- Select All (Page 84)
- Go to block (Page 85)
- Bring to front (Page 85)
- Send to back (Page 85)
- Input/output names (Page 85)
- Block properties (Page 86)
- Block properties (all blocks) (Page 86)
- Cut connections (Page 218)
- Edit UDF properties (Page 87)

2.8.2.1 Edit -> Undo

This command allows you to undo the previous actions. Position your mouse pointer on the undo menu command and hold it there briefly. The tooltip (Page 90) opens and shows you the actions you can undo by clicking the menu item. You can undo up to 30 actions.

The standard toolbar (Page 42) and programing toolbar (Page 45) also contain an icon for this menu command.

2.8.2.2 Edit -> Redo

This command reverts the last undo action. Click the menu command to view the tooltip (Page 90) for the action to be redone.

The standard toolbar (Page 42) and programming toolbar (Page 45) also contain an icon for this menu command.

2.8.2.3 Edit -> Delete

The command deletes selected objects, without copying them to the clipboard. You can retrieve deleted objects with the **Undo** function.

If you want to delete a device in project mode, a window opens upon delete. You can confirm the deletion with **Yes** or cancel the deletion with **No** or **cancel** in the window.

The standard toolbar (Page 42) also contains an icon for this menu command.

2.8.2.4 Edit -> Cut

The command deletes one or more selected objects, for example, blocks and/or connecting lines, from the programming interface and copies them to the clipboard.

The standard toolbar (Page 42) also contains an icon for this menu command.

Note

You cannot cut the device in Network project interface.

2.8.2.5 Edit -> Copy

Use this command to copy one or more selected objects, for example, blocks, text, device, or connecting lines, to the clipboard.

The standard toolbar (Page 42) also contains an icon for this menu command.

2.8.2.6 Edit -> Paste

The command copies the clipboard content to the programming interface. LOGO!Soft Comfort distributes the devices evenly on the right of the existing devices. LOGO!Soft Comfort inserts the objects at the mouse location or below the objects you previously selected.

The standard toolbar (Page 42) also contains an icon for this menu command.

You can only paste the clipboard content if sufficient resources are available. Blocks require a certain amount of resources (Page 520), depending on the block type. LOGO!Soft Comfort generates an error message if your system does not provide sufficient resources.

You cannot paste connecting lines with open ends. You can only paste connecting lines if they connect two blocks, and you copied them to the clipboard together with those blocks

2.8.2.7 Edit -> Align

This command offers various options of aligning labels and function blocks:

- Align Vertically (Page 82)
- Align Horizontally (Page 82)
- Horizontally Distribute Space (Page 83)
- Vertically Distribute Space (Page 83)
- Align Automatically (Page 83)

2.8.2.8 Edit -> Align -> Align Vertically

This command aligns the selected object vertically to the objects with the highest block number or to the object you first selected in the circuit program.

The programming toolbar (Page 45) also contains an icon for this menu command.

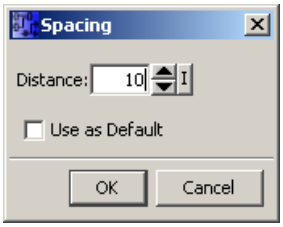
2.8.2.9 Edit -> Align -> Align Horizontally

This command aligns the selected object horizontally to objects with the highest block number or to the object you first selected in the circuit program.

The Programming toolbar (Page 45) also contains an icon for this menu command.

2.8.2.10 Edit -> Align -> Horizontally Distribute Space

Use this command to set the horizontal space between objects you select. After you select this menu command, the following dialog appears:

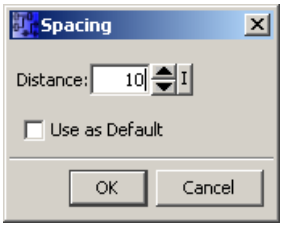


You can choose the distance from 10 to 3000 pixels, in increments of 5 pixels. You can also select the "Use as Default" check box to set the default distance.

The programming toolbar (Page 45) also contains an icon for this menu command.

2.8.2.11 Edit -> Align -> Vertically Distribute Space

Use this command to set the vertical space between the objects you select.

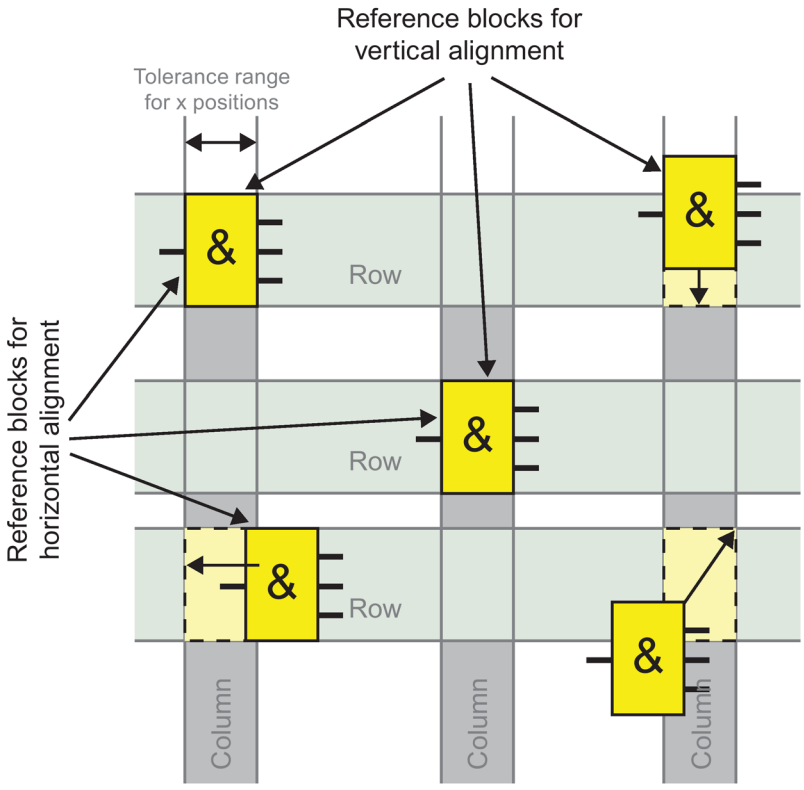


You can also choose the distance from 10 to 3000 pixels, in increment of 5. You can also select the "Use as Default" check box to set the default distance.

The programming toolbar (Page 45) also contains an icon for this menu command.

2.8.2.12 Edit -> Align -> Align Automatically

Use this command to align the selected objects automatically in vertical and horizontal direction. LOGO!Soft Comfort aligns slightly offset or adjoining blocks along a common line. The reference for vertical alignment is the relevant upper block of a column. The reference for horizontal alignment is the block at the extreme left of a line.



The Programming toolbar (Page 45) also contains an icon for this menu command.

2.8.2.13 Edit -> Select all

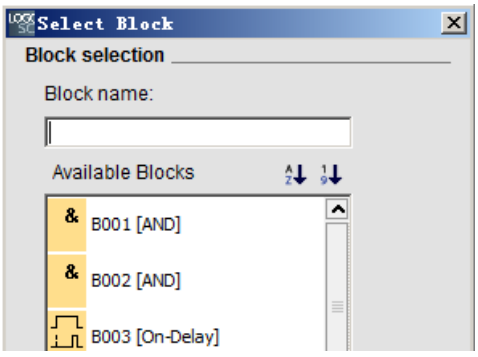
You can use this command to select all objects (blocks, connecting lines and labels) on the programming interface.

Note

The network project interface doesn't include this function.

2.8.2.14 Edit -> Go to block

You can use this command to view a list of all blocks used in a circuit program, including information about the block number, block name and block type. By default, LOGO!Soft Comfort sorts the blocks in the list by type. You can also sort the blocks by name or number. LOGO!Soft Comfort supports fuzzy search for blocks. You can enter a short description, for example, *p?, in the searching field. Then LOGO!Soft Comfort lists all the blocks whose names contain the letter **p**. Here, "*" indicates a string and "?" indicates a character.



You can also select a block from the list directly to highlight it on the programming interface.

2.8.2.15 Edit -> Bring to front

You can use this command to bring one of a number of overlapping objects to the foreground.

2.8.2.16 Edit -> Send to back

You can use this command to bring one of a number of overlapping objects to the background.

2.8.2.17 Edit -> Input/output Names

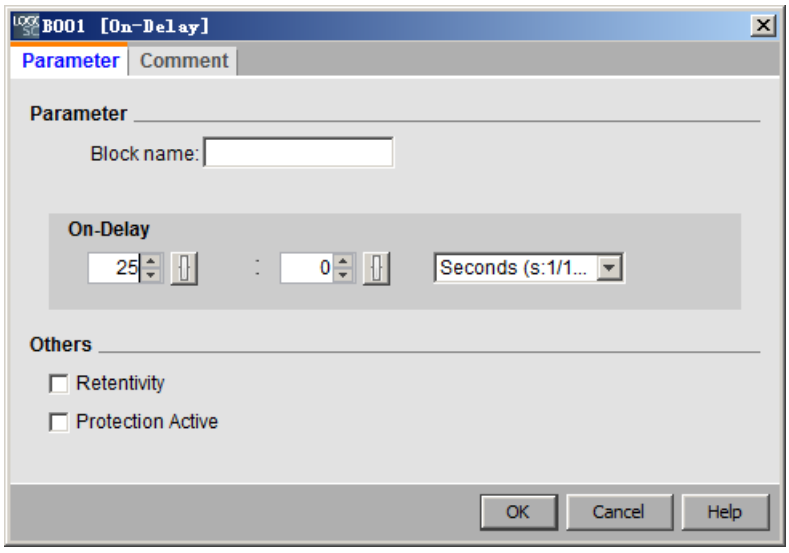
This command enables you to enter names for the input and output terminals (connector names). Use the Tools → Options → Preference (Page 217) menu command to specify whether to display the connector names on the programming interface. Use the Tools → Options → Print (Page 217) menu command to open a dialog to specify whether to include the connector names and connection list in the printed copy of your circuit program.

In the Connector Names dialog, after entering input and output terminal names, you can click the **Export** button to save the name records as a .CSV file. Also, you can click the **Import** button to import a .CSV file from your PC containing the terminal name information to LOGO!Soft Comfort.

This menu command is inactive in the UDF Editor.

2.8.2.18 Edit -> Block properties

This command displays the block properties of a block that you have selected on the programming interface.



The block properties dialog box consists of several tabs. Every block has a Comment tab, where you can enter relevant block comments. For some blocks a Parameter tab is available where you can describe specific block parameters. You configure input simulation parameters from the Simulation tab.

You can also configure the block properties by right-clicking the required block, and selecting the block properties menu command from the shortcut menu.

2.8.2.19 Edit -> Block properties (all blocks)

This command opens a window with two sections. In the left section, you can see all the blocks that your program uses. Click a block to view its corresponding parameters in the right column. You can now edit these parameters and set the changes by clicking the **Apply** button.

LOGO!Soft Comfort displays the modified block in blue in the selection list, if you select another block without clicking apply button to accept the parameter changes. LOGO!Soft Comfort discards all changes you click the **Cancel** button. You can confirm all your entries and exit the dialog with **OK**.

You can sort all the available blocks by name or by number by clicking the corresponding button on the upper-right of the list area.

Here, you can also make a fuzzy search for blocks. For details, see Edit -> Go to block (Page 85).

If you select the "Select block from drawing" check box, when you select subsequent blocks from the list, LOGO!Soft Comfort highlight them in the circuit program.

Special functions (Page 340)

Basic functions (Page 335)

Constants and connectors (Page 312)

Data Log (Page 497)

UDF (Page 500)

2.8.2.20 Edit -> Edit UDF properties

Use this menu command to configure UDF (User-defined function) properties. For more information about the configuration for UDF properties, refer to "Configure UDF properties" in Editing the UDF (Page 503).

This menu command is available only in the UDF Editor.

2.8.3 Format menu

This menu provides formatting options for labels and function groups. You can define the font, the font size and style as well as the alignment of selected objects with the following menu commands.

- Font (Page 87)
- Wrap Text (Page 87)
- Format Grid (Page 88)
- Snap to Grid (Page 88)

2.8.3.1 Format -> Font

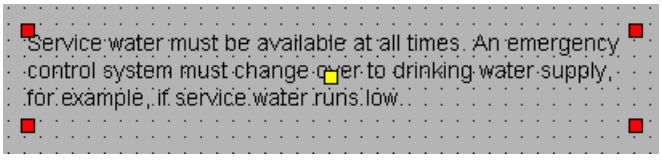
You can use this tool to specify the font type, size, style, and the text color. Perform the following steps to redefine the format of existing text objects.

1. Select the objects that you want to format.
2. Configure the font attributes.
3. Click OK to apply your configuration

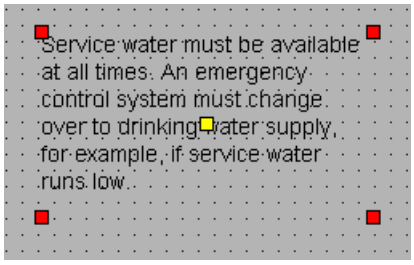
You can choose to set particular default formats. Then, LOGO!Soft Comfort displays new text objects with these default settings.

2.8.3.2 Format -> Wrap Text

You can insert comments or edit user-defined text objects in the programming interface by using the Text Tool (Page 48). You can enlarge or reduce the size of a text figure, typically the figure width by dragging the rectangle handles. For example:



When dragging the handle of the figure above to reduce the figure width, the figure automatically shrinks to fit the width.



2.8.3.3 Format -> Format grid

This tool helps you to organize the various objects of your circuit program on the programming interface. The grid is visible by default.

You can adjust the grid pattern (spacing) in increments of 5 points.

If you have enabled the "Snap Block to Grid" function, LOGO!Soft Comfort aligns the objects with the relevant grid intersections. This helps you to avoid a vertical or horizontal offset of the objects. To finely position objects on your programming interface, disable the "Snap Block to Grid" function.

If you have enabled the "Snap Connection to Grid" function, LOGO!Soft Comfort aligns the connection lines between objects with the relevant grid intersections. To allow connection lines to stay unaligned with grid lines on the programming interface, disable the "Snap Connection to Grid" function.

You can hide the grid with the Visibility check box.

You can select the "Use as Default" check box to keep your settings as the default for LOGO!Soft Comfort circuit programs.

2.8.3.4 Format -> Snap to grid

If you have made changes to the grid pattern, or inserted objects while you disable the grid, the position of objects may be offset when you align them to the grid points. Use this command to correct the offset of selected objects and to realign them.

2.8.4 View menu

From the View menu, you can choose the current working mode, decide to show or hide various toolbars and trees under each mode, and set the zoom factor for the display of your circuit diagram or network project. The View menu contains the following commands.

- Diagram Mode (Page 89)
- Project Mode (Page 89)

- Toolbars (Page 89)
- Tree (Page 90)
- Select Lines (Page 90)
- Info Window (Page 90)
- Status bar (Page 90)
- Tooltips (Page 90)
- Zoom (Page 91)
- Zoom In (Page 91)
- Zoom Out (Page 91)

2.8.4.1 View -> Diagram mode

This command lets you hide/show the diagram mode user interface (Page 41).

The default user interface shows both diagram mode and network project.

The check mark besides the options "Diagram mode" and "Network project" indicates your current working mode. You can hide one of the modes by deselecting that mode from the user interface.

Note

You cannot deselect both modes. You must have at least one of the two modes visible as the current working mode.

2.8.4.2 View -> Network Project

This command lets you hide/show the Network project overview (Page 42).

The default user interface shows both the diagram mode and the network project.

The check mark besides the options "Diagram mode" and "Network project" indicates your current working mode. You can hide one of the modes from the user interface by deselecting that mode.

Note

You cannot deselect both modes. You must have at least one mode visible as the current working mode.

2.8.4.3 View -> Toolbar

This command lets you hide or show the standard toolbar (Page 42).

2.8.4.4 View -> Tree

This command lets you hide or show the trees on the left part of the interface:

- The diagram tree (Page 41) and the instructions tree (Page 41) under diagram mode.
- The network project tree (Page 42) and the instruction tree (Page 41) under project mode.

2.8.4.5 View -> Select Lines

With this tool, you can show all connections (lines) that lead to or away from a selected block in color.

If you select a single connection configured with this function, LOGO!Soft Comfort highlight the selected connection in color.

Also, if you select a block configured with this function, LOGO!Soft Comfort show the reference block of the selected block with its frame in red.

Under Tools > Options: Preference (Page 217) you can set whether to label the connections or not. Under Tools > Options: Colors (Page 219) you can set the colors to use to display the connections.

2.8.4.6 View -> Info Window

Use this menu command to show or hide the Info Window (Page 38). You can also use the function key (Page 39) [F4]. The Info Window lies below the diagram editor frame and at the right side of the instructions tree frame.

Note

LOGO!Soft Comfort hides the info window by default. You need to perform this command to show the info window if needed.

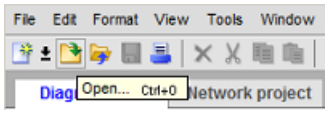
2.8.4.7 View -> Status Bar

Use this menu command to hide or show the status bar (Page 39).

2.8.4.8 View -> Tooltips

In LOGO!Soft Comfort, you can use the mouse-over-button function to display the icon name, which represents the tooltip.

This helps you to quickly recall the function of the icon, without having to call the menu or the help.



2.8.4.9 View -> Zoom

LOGO!Soft Comfort offers a variety of options for enlarging or reducing the size of the circuit program or circuit project display. By selecting Zoom, you open a dialog box in which you can set the zoom factor from a default list or in the relevant box.

If you choose an unfavorable zoom factor, the objects may appear out of focus on your screen. You should therefore use the default zoom factors wherever possible. This effect has no influence on the layout of the printed circuit program.

LOGO!Soft Comfort provides a quick and easy way of zooming your circuit program/project window. (Page 597)

2.8.4.10 View -> Zoom In

LOGO!Soft Comfort defines the zoom factor as the below defined increments:

25 (min) → 50 → 75 → 100 (default) → 150 → 200 → 250 → 300 → 400 (max)

The zooming base point differs based on what you have selected:

- With no block selected, zooming in starts from the top left corner.
- With one block selected, zooming in starts from the chosen block.
- With multiple blocks selected, zooming in starts from a central point of the chosen blocks.

The standard toolbar (Page 42) also contains an icon for this menu command.

LOGO!Soft Comfort provides a quick and easy way of zooming your diagram editor/network view window. (Page 597)

2.8.4.11 View -> Zoom Out

LOGO!Soft Comfort defines the zoom factor as the below defined increments:

400 (Max) → 300 → 250 → 200 → 150 → 100 (default) → 75 → 50 → 25 (Min)

On any occasions, zooming out always starts from the top left corner.

The standard toolbar (Page 42) also contains an icon for this menu command.

LOGO!Soft Comfort provides a quick and easy way of zooming your circuit program/project window. (Page 597)

2.8.5 Tools menu

The tools menu provides the following menu commands:

- Transfer (Page 92)
- Determine LOGO! (Page 175)
- Select Hardware (Page 176)
- Compare (Page 176)
- Simulation (Page 182)
- Simulation parameters (Page 182)
- Connect modem (Page 184)
- Disconnect modem (Page 187)
- Ethernet Connections (Page 187)
- Parameter VM Mapping (Page 197)
- Tag Table (Page 212)
- Audit Logs (Page 170)
- Options (Page 215)

2.8.5.1 Tools -> Transfer

You can transfer data between a LOGO! Base Module and LOGO!Soft Comfort with the Transfer menu commands.

Prerequisites

To transfer data between the LOGO! Base Module and the LOGO!Soft Comfort, you must configure a communication interface.

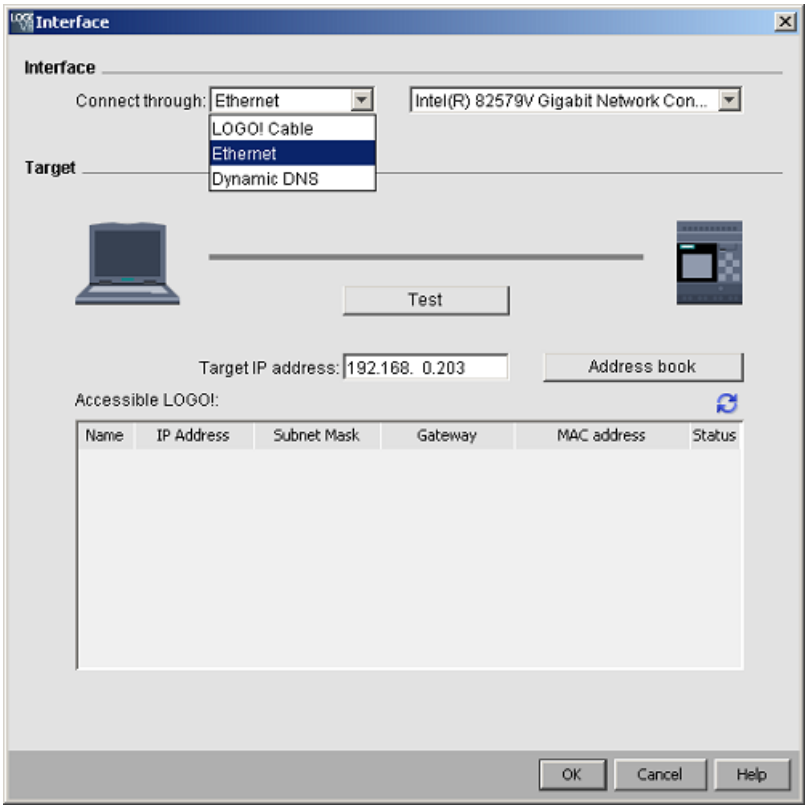
Whenever you select a menu command in this menu, LOGO!Soft Comfort displays the Interface dialog. Use this dialog to establish communication between the LOGO! Base Module and LOGO!Soft Comfort.

Note

When you establish the communication between LOGO! 9 (or later versions) BM and LOGO!Soft Comfort for the first time, LSC reminds you to configure the password for user "admin". After the password configuration, you will finish the communication setup and log in LOGO! BM as the user admin. To learn how to configure users and passwords for LOGO! BM, refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109). To learn more about LOGO! user management, refer to section *Security* in *LOGO! System Manual*.

Note

The first time when you establish communication between LOGO!Soft Comfort and LOGO! 8.3 Base Module, a window appears for your to choose whether to trust LOGO! 8.3 product root CA. If you select "Yes", it continues the connection process; if you select "No", the connection fails. After you choose not to trust LOGO! 8.3 product root CA, every time you try to connect LSC to LOGO! 8.3 BM, you will be reminded by a window that LOGO! 8.3 product root CA is not trusted and LOGO! 8.3 device is not accessible. You can change the option of whether to trust LOGO! 8.3 product root CA in Tools -> Options: Security (Page 219).



Note

For the data transfer, the LOGO! Base Module must not be in RUN mode or editing mode.

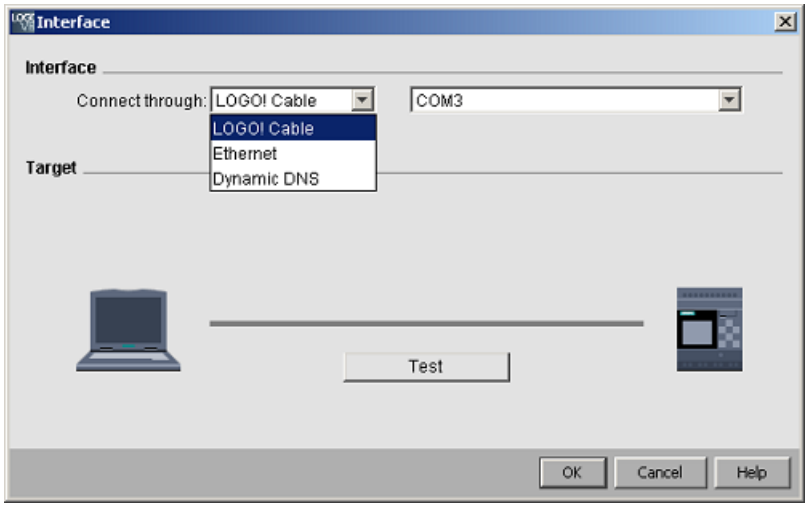
Transfer through LOGO! PC Cable (0BA6 and prior only)

For the data transfer through LOGO! PC Cable, you need to manually choose LOGO! Cable as the communication interface, and set the LOGO! COM port in the drop-down box.

Note

If you have LOGO!Soft Comfort V9.0 installed on an Apple Macintosh operating system with an ARM 64 platform, you cannot connect LSC to LOGO! 0BA6 devices through LOGO! Cable.

You can identify the architecture of your macOS by the device chip information. Find the device chip information through: Apple Menu -> About This Mac -> Chip information.

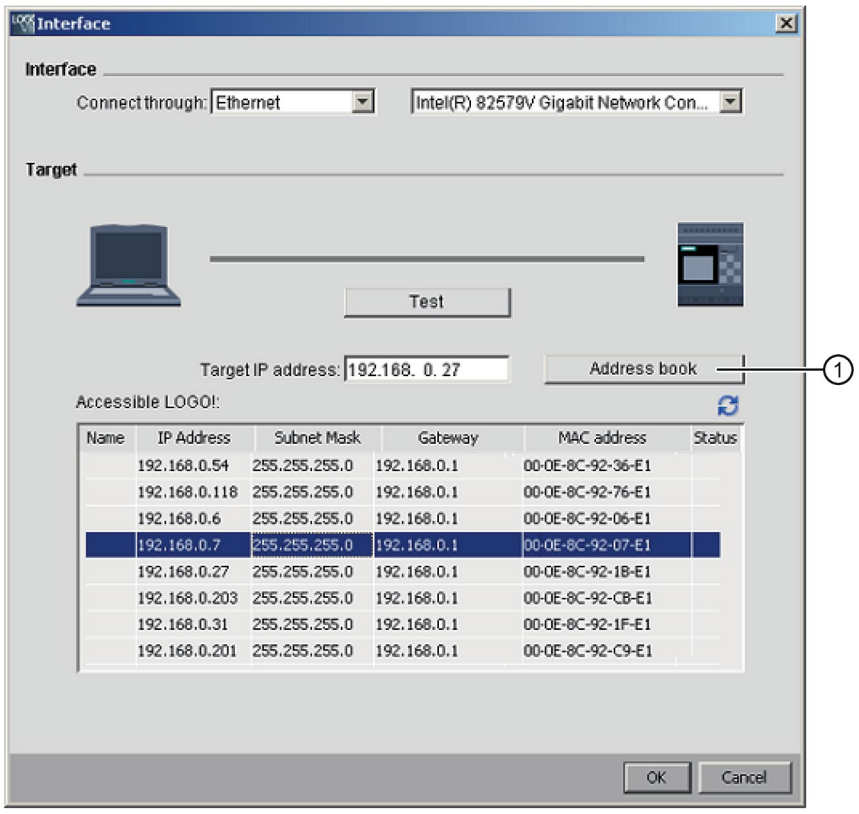


Transfer through Ethernet (0BA7 and later only)

If you select Ethernet for the communication, you can either choose a target IP address from the accessible LOGO! list or enter a known IP address.

You can also store the LOGO! information in the address book in case you need to use them in the future.

Perform the following steps to detect a valid LOGO! Base Module automatically.



1. Click "①" on the above screen to show the address book.
2. Enter the IP address of the LOGO! Base Module.
3. Keep the default subnet address of "255.255.255.0" unchanged.
4. Enter the correct gateway IP address. Make sure you have completed this step if your LOGO! Base Module is in the same LAN (Local Area Network or not).
5. Save the item in your address book.

Note

For LOGO! 8.2 and earlier versions BM connection, you must enter correct IP address and select correct network adapter.

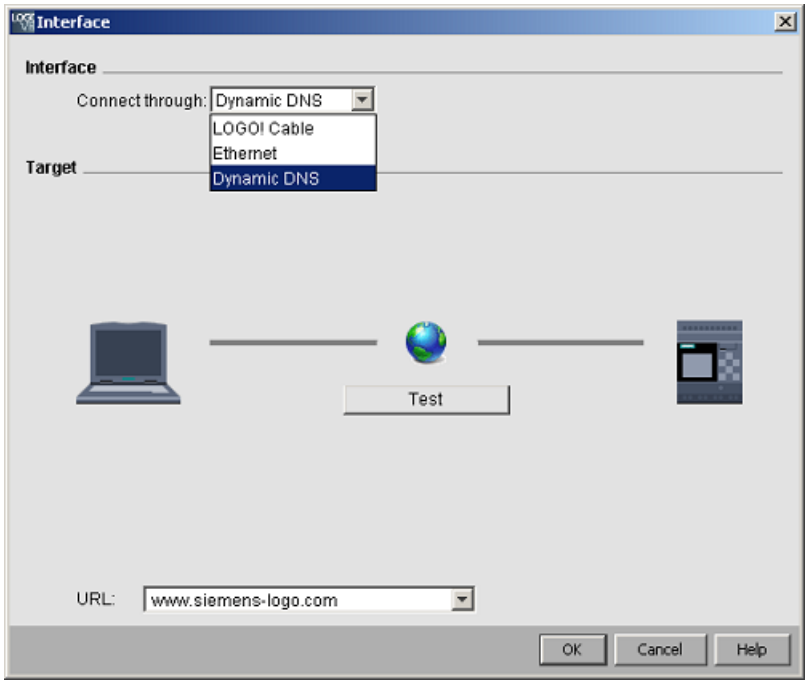
For LOGO! 8.3 and later versions BM connection, you only need to enter correct IP address and LSC will try all listed network adapters.

You can click to acquire the new accessible LOGO! Base Module 0BA8.

LOGO!Soft Comfort saves the scanned LOGO! Base Modules to the accessible LOGO! list for future use.

Transfer through Dynamic DNS (0BA7 and later only)

If you select Dynamic DNS for the communication, you can enter a known URL address or click the arrow in the URL textbox to recall an URL address you entered before:



You must configure your router in order to access the LOGO! Base Module through dynamic DNS. Make sure you have completed the following settings before connection:

- The remote LOGO! Base Module has a valid dynamic DNS account for routing.
- The local router has added the dynamic DNS of the remote LOGO! Base Module as a HTTP virtual server.

Note

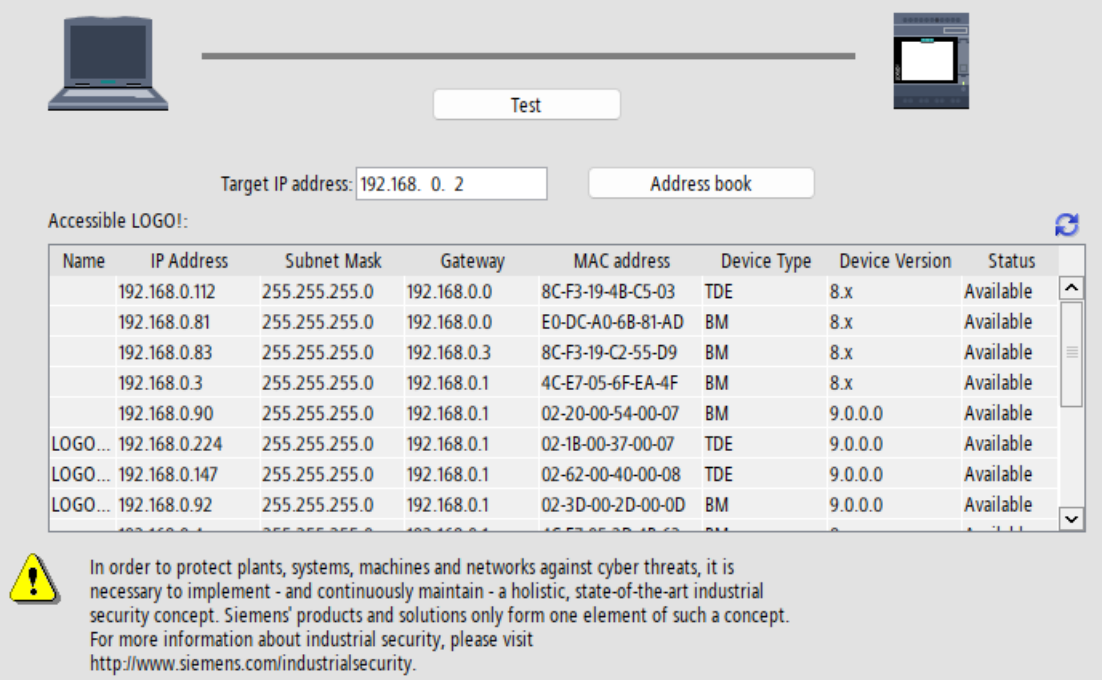
LOGO! 8.1 and 8.2 devices communicate with a remote LOGO! Base Module with TCP protocol through private port 8080.

LOGO! 8.3 and later versions devices communicate with a remote LOGO! Base Module with HTTPS protocol through private port 8443.

Connection test

After you select the desired connection interface, you can test the connection in the same dialog.

Click Test button to check if the connection is ready.



The grey connection line turns green and you see a check mark icon above the line if your connection is successful.

You can also copy your circuit programs to the SD card in the above screen.

Note

For LOGO!Soft Comfort V9.0 and later versions, the Accessible LOGO! lists the scanned LOGO! devices with the device type and device version information.

For LOGO! 0BA8 devices, the device version is displayed as "8.x". For LOGO! 9 and later versions, the displayed device version is the exact firmware information of the device.

Menu commands overview

The **Tools** → **Transfer** menu contains the following menu commands:

- Tools → Transfer: PC → LOGO! (Page 98)
- Tools → Transfer: LOGO! → PC (Page 101)
- Tools → Transfer: Start LOGO! (Page 102)
- Tools → Transfer: Stop LOGO! (Page 103)
- Tools → Transfer: Log Out (Page 103)
- Tools → Transfer: Factory Reset LOGO! (Page 103)
- Tools → Transfer: Synchronize clock with EM (Page 104)
- Tools → Transfer: Show FW version (Page 104)
- Tools → Transfer: Clear User Program and Password (Page 104)

- Tools → Transfer: Upload Data log (Page 105)
- Tools → Transfer: Configure Network Address (Page 105)
- Tools → Transfer: Configure Master/Slave Mode (Page 106)
- Tools → Transfer: Set Clock (Page 166)
- Tools → Transfer: Summer time/Winter time (Page 166)
- Tools → Transfer: NTP Settings (Page 166)
- Tools → Transfer: Set LOGO! TD Power-on Screen (Page 108)
- Tools → Transfer: Access Control (Page 112)
- Tools → Transfer: Cloud Settings → Cloud Data Transfer Settings (Page 116)
- Tools → Transfer: Cloud Settings → Cloud Connection Settings (Page 119)
- Tools → Transfer: Certificate Settings (Page 144)
- Tools → Transfer: Trust CA settings (Page 165)
- Tools → Transfer: Audit Log Settings (Page 170)
- Tools → Transfer: Email Settings (Page 150)
- Tools → Transfer: Firmware Upgrade (Page 174)
- Tools → Transfer: Hours counter (Page 151)
- Tools → Transfer: I/O Status (Page 152)
- Tools → Transfer: Diagnostic (Page 153)
- Tools → Transfer: Dynamic Server IP Filter (Page 154)
- Tools → Transfer: Configure TDE Device (Page 155)
- Tools → Transfer: Batch Download → Diagram Batch Download (Page 160)
- Tools → Transfer: Batch Download → Network Batch Download (Page 163)

2.8.5.2 Tools -> Transfer -> PC -> LOGO!

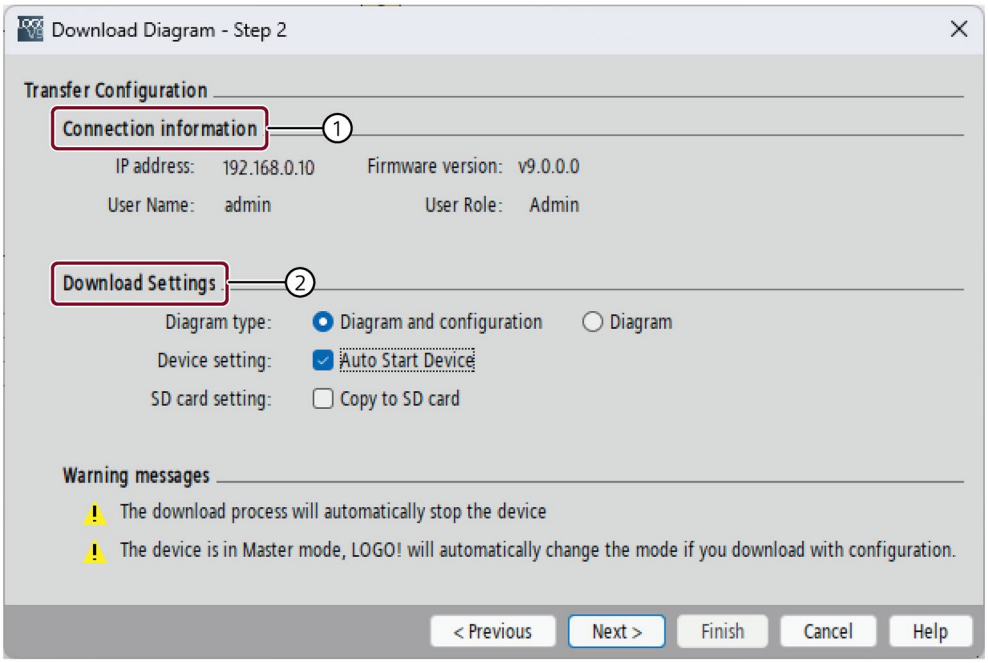
LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.
→Tools → Transfer: **PC** → **LOGO!**

You can use this menu command to download a circuit diagram created with the LOGO!Soft Comfort from PC to the LOGO! Base Module. You can also use the button in the standard toolbar (Page 42) for such purpose.

Download to LOGO! 9

When downloading from LOGO!Soft Comfort to LOGO! 9, you can choose to download the circuit diagram with device configuration.

Transfer configuration



① Shows the connected LOGO! BM information: IP address, firmware version, the user name and user role.

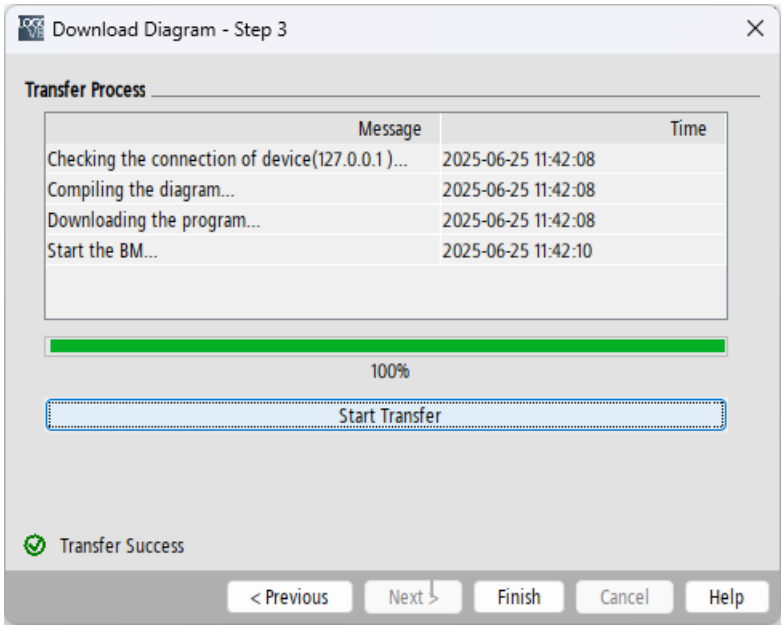
② Configurations before the download:

- Diagram type: select whether to download the circuit diagram with or without the BM device configuration.
- Device setting: if you enable Auto Start Device, the BM will start running the diagram automatically after the successful download.

  If you choose not to enable it, LOGO!Soft Comfort will remind you whether to start BM after the download completes successfully.
- SD card setting: if you enable Copy to SD card, the circuit diagram (with or without the device configuration) will be copied into the SD card in the BM after the successful download.
- Other possible options: Overwrite IP Address and Device Name, Overwrite IP Address, Overwrite Device Name, AI setting. These checkboxes are only available when the configurations (IP information, device name, AI setting) on the BM are different from those on LSC. Check the boxes to overwrite with the configuration from LSC.

Note the warning messages on the window before starting the transfer.

Transfer process



After clicking Start Transfer, the transfer starts. You can see the detailed transferring process messages and the time in the window. LOGO!Soft Comfort will remind you in the window if the download succeeds or fails.

Preparations

Prior to the download, the system determines the minimum LOGO! version required for your circuit program. The modular LOGO! always provides all available I/O resources (Page 527) for your circuit program. You are free to install an appropriate number of expansion modules in the base device.

Error messages

LOGO!Soft Comfort aborts the transfer and displays an error message if the LOGO! Base Module does not have enough resources for program transfer. The error dialog displays unknown LOGO! versions prompts you to continue or cancel the download.

The status bar displays transfer messages and the Info Window displays transfer messages as well as detailed error messages.

Layout recovery (0BA8 and later versions only)

When you download a circuit program (FBD only) to your LOGO! Base module, LOGO!Soft Comfort also downloads the program layout. The LOGO!Soft Comfort reads the layout information and recovers it automatically when you open it again.

The layout memory size in a LOGO! Basic is up to 512 KB. You can check the available memory size from the info window by determining LOGO! (Page 175) before saving a circuit diagram.

2.8.5.3 Tools -> Transfer -> LOGO! -> PC

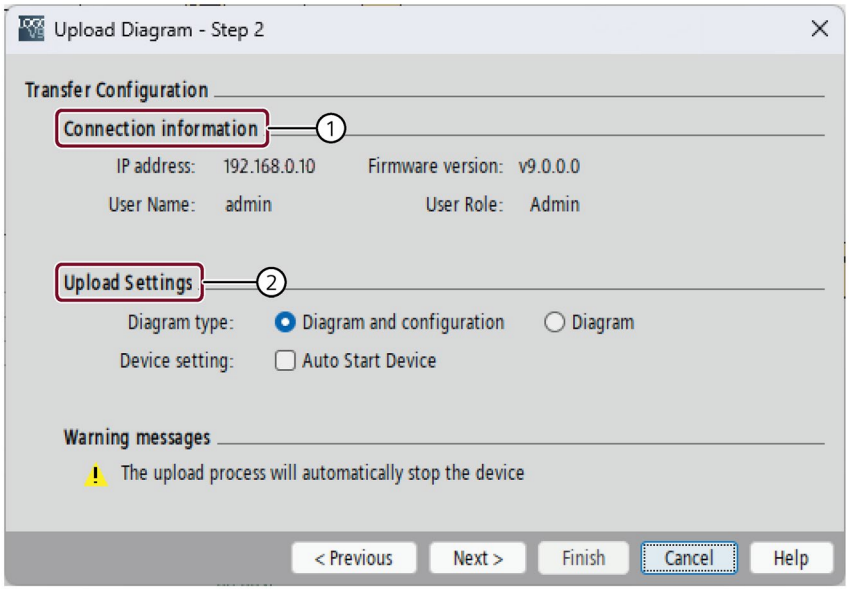
LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information. →Tools → Transfer: **LOGO!** → **PC**

You can use this menu command to upload a circuit diagram from the LOGO! Base Module to PC. You can also use the button in the standard toolbar (Page 42) for such purpose.

Upload from LOGO! 9

When uploading from LOGO! 9 to LOGO!Soft Comfort, you can choose to upload the circuit diagram with device configuration.

Transfer configuration



① Shows the connected LOGO! BM information: IP address, firmware version, user name and user role.

② Configurations before the upload:

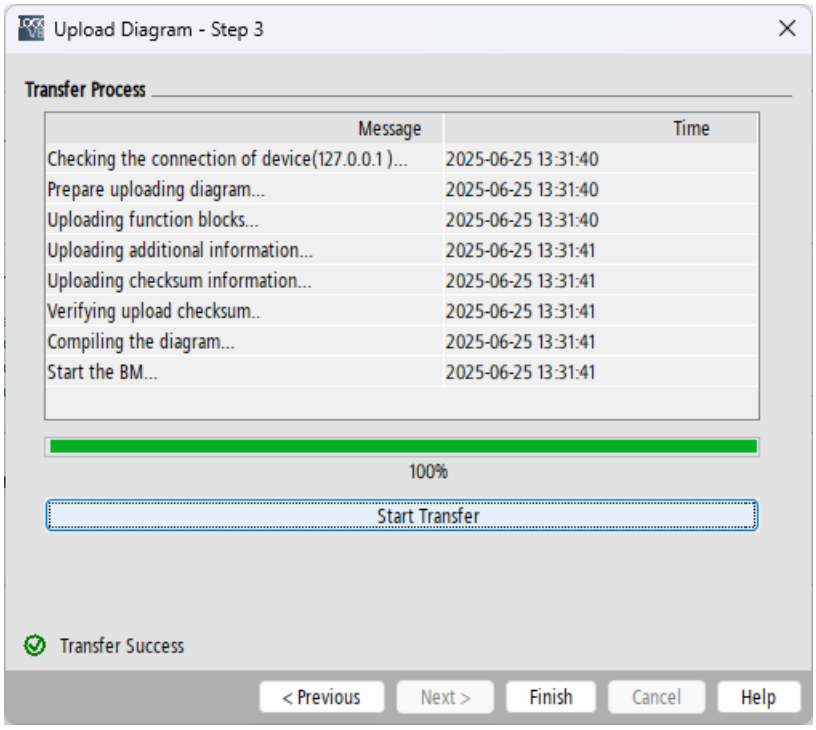
- Diagram type: select whether to upload the circuit diagram with or without the BM device configuration.
- Device setting: if you enable Auto Start Device, the BM will start running the diagram automatically after the successful upload.

Note

IP address upload

If you choose to only upload the diagram and without device configuration from BM to LSC, the IP address information will not be uploaded to LSC. In a network project, LSC will assign an unused IP address to the uploaded diagram. In diagram mode, the IP settings of the uploaded diagram will be blank.

Transfer process



After clicking Start Transfer, the transfer starts. You can see the detailed transferring process messages and the time in the window. LOGO!Soft Comfort will remind you in the window if the upload succeeds or fails.

Cutting connections

If you have set the "Cut connections during import/upload" check box under Tools → Options: Cut connections (Page 218), LOGO!Soft Comfort cuts the relevant connections during the upload from LOGO! to the PC according to the rules set in this dialog.

Password

When you upload a password-protected circuit program from LOGO! to the PC, LOGO!Soft Comfort prompts you to enter a password. If you do not enter the correct password, LOGO!Soft Comfort aborts the transfer and displays an error message.

2.8.5.4 Tools -> Transfer -> Start LOGO!

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

→ Tools → Transfer → **Start LOGO!**

When you click this symbol, LOGO!Soft Comfort switches the connected LOGO! Base Module from STOP mode to RUN mode.

As an alternative approach, you can also click the button on the Standard Toolbar (Page 42).

Note

This function is only available with devices of the 0BA6 hardware series or later.

2.8.5.5 Tools -> Transfer -> Stop LOGO!

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

→ Tools → Transfer → **Stop LOGO!**

When you click this symbol you change the mode of a connected LOGO! from RUN mode to STOP mode.

As an alternative approach, you can also click the button on the Standard Toolbar (Page 42).

Note

This function is only available with devices of the 0BA6 hardware series or later.

2.8.5.6 Tools -> Transfer -> Log Out (LOGO! 9 and later versions only)

Use this command to log out LOGO!Soft Comfort and disconnect from the LOGO! BM. You can choose to log out the current user or all connected BM sessions.

You can also check and log out the current user in the access control settings. Refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109) to learn the detailed information.

2.8.5.7 Tools -> Transfer -> Factory Reset LOGO! (LOGO! 8.FS4 and later versions only)

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

When you select this function, LOGO!Soft Comfort reset the connected LOGO! Base Module to Factory setting.

For LOGO! 9 and later versions, you can select to reset the BM to factory setting while retaining its network settings.

If LOGO!Soft Comfort cannot communicate with your LOGO! BM, you can use the reset file in the LOGO!Soft Comfort USB Stick or DVD-ROM to reset the LOGO! BM to Factory setting. Proceed in the following steps:

1. Copy the __reset.bm file in the USB Stick (Page 16) into the root directory of a SD card.
2. Insert the SD card into the LOGO! BM.
3. Power on the LOGO! BM to execute factory reset. After the BM is reset to Factory setting, the __reset.bm file in the SD card is deleted automatically.

Note

The __reset.bm file can only be used to reset Factory setting for LOGO! BM 8.3 and later versions.

LOGO! 9 and later versions:

When there is a diagram bin file and a __reset.bm file on the inserted micro SD card, LOGO! will proceed as follows:

1. Run __reset.bm file then delete it.
2. Restart after the factory reset then load the diagram bin file.

After the factory reset, you are required to set the Admin password on LOGO!Soft Comfort when connecting to LOGO!, or on LOGO! BM.

2.8.5.8 Tools -> Transfer -> Synchronize clock with EM (0BA8 only)

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This command allows you to either enable or disable the clock synchronization among LOGO! Base Module and its connected expansion modules.

With this command:

- You can choose to synchronize the clock of the LOGO! expansion modules to be the same as that on the LOGO! Base Module.
- You can also choose to allow different clock settings on the LOGO! Base Module and its connected LOGO! expansion modules.

2.8.5.9 Tools -> Transfer -> Show FW version

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This command allows you to identify the firmware version of the LOGO! Base module.

2.8.5.10 Tools -> Transfer -> Clear User Program and Password

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This command allows you to clear the circuit program in the connected LOGO! device and the program password if a password exists.

You must respond to a confirmation dialog to ensure that you do intend to clear both the circuit program and the password (if configured) from the LOGO! device. After you confirm the command, LOGO!Soft Comfort performs the clear operation. If you do not confirm the command, LOGO!Soft Comfort performs no action. The circuit program and password (if configured) remain in the LOGO! device.

Note

LOGO! devices prior to version 0BA6 do not support this function. If you attempt this command on an earlier device, LOGO!Soft Comfort displays a message that states that the device does not support this function.

2.8.5.11 Tools -> Transfer -> Upload Data Log (0BA7 and later versions only)

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This menu allows you to upload a data log from the EEPROM or SD card to the connected PC.

You can upload your data log and browse to a desired directory and save your data log document.

LOGO!Soft Comfort uploads the file from the EEPROM and saves it as a .CSV file that you can open from Microsoft Excel or a text editor.

Note

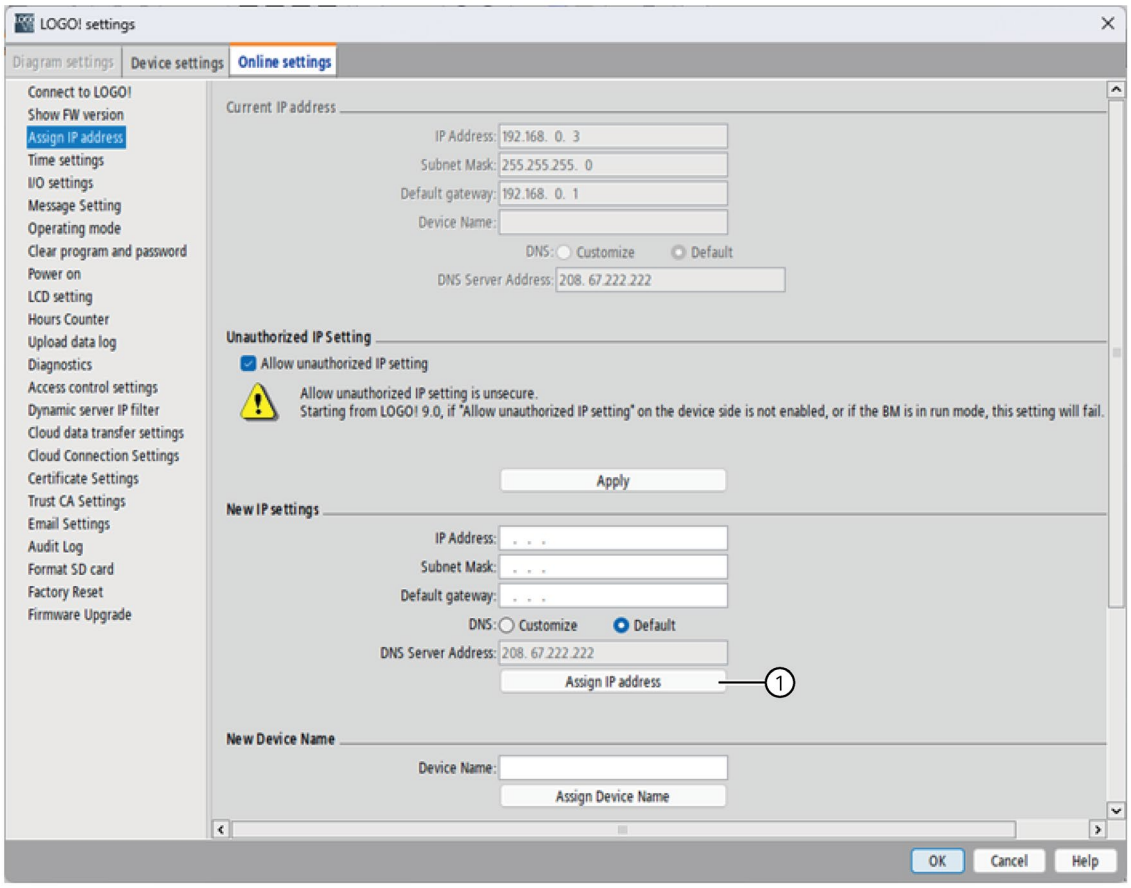
One data log file contains at most 20000 lines. If you want to upload new data log files generated by the same circuit program, to prevent data loss, Siemens suggests you re-upload the last old data log file as new data might be written in this file.

For more information about data log, refer to the section Data Log in *LOGO! System Manual*.

2.8.5.12 Tools -> Transfer -> Configure Network Address (0BA7 and later versions only)

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

With this menu command, you can change the IP address, subnet mask and default gateway of the LOGO! Base Module:



Allow unauthorized IP setting is disabled by default in LOGO!Soft Comfort. If this option is enabled, when using the Go Online (Page 55) function, you can change the IP address of the detected LOGO! 9 (or later versions) device in STOP mode.

Click "①" to implement the change.

Note

Allow unauthorized IP setting is not secure.

0BA0 : 0BA9

LOGO! 9 and later versions only:

The option of allowing IP setting unauthorized is only available for LOGO! 9 and later versions.

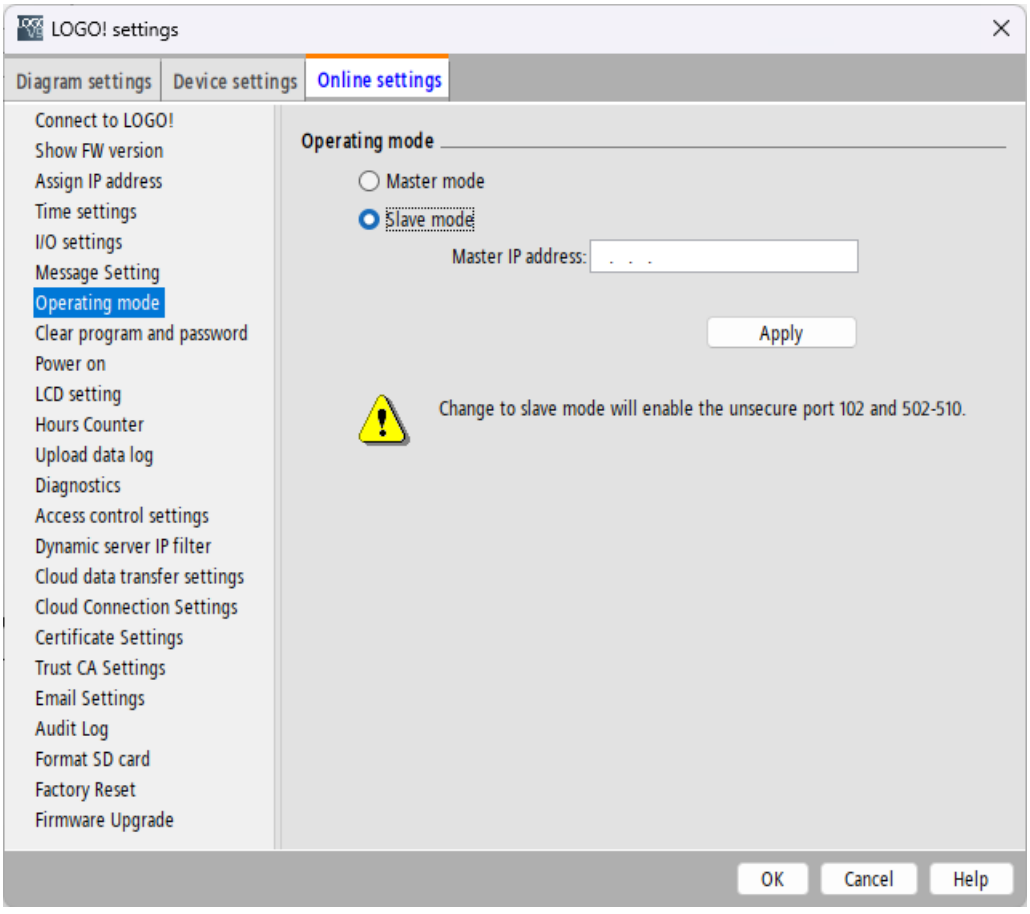
2.8.5.13 Tools -> Transfer -> Configure Master/Slave Mode (0BA7 and later versions only)

Use this menu command to switch a LOGO! Base Module between master mode and slave mode.

For LOGO! 9 and later versions devices, you can configure master/slave mode in both Device settings and Online settings in LSC. If you configure the operating mode in online settings,

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

If you set the connected LOGO! Base Module to slave mode, you must enter the destination IP address of the module:



Note

LOGO! restarts automatically whenever you make the following changes in LOGO!Soft Comfort:

- Mode switch (from master mode to slave mode or vice versa)
- Change to the master IP address in slave mode

0BA0 : 0BA9

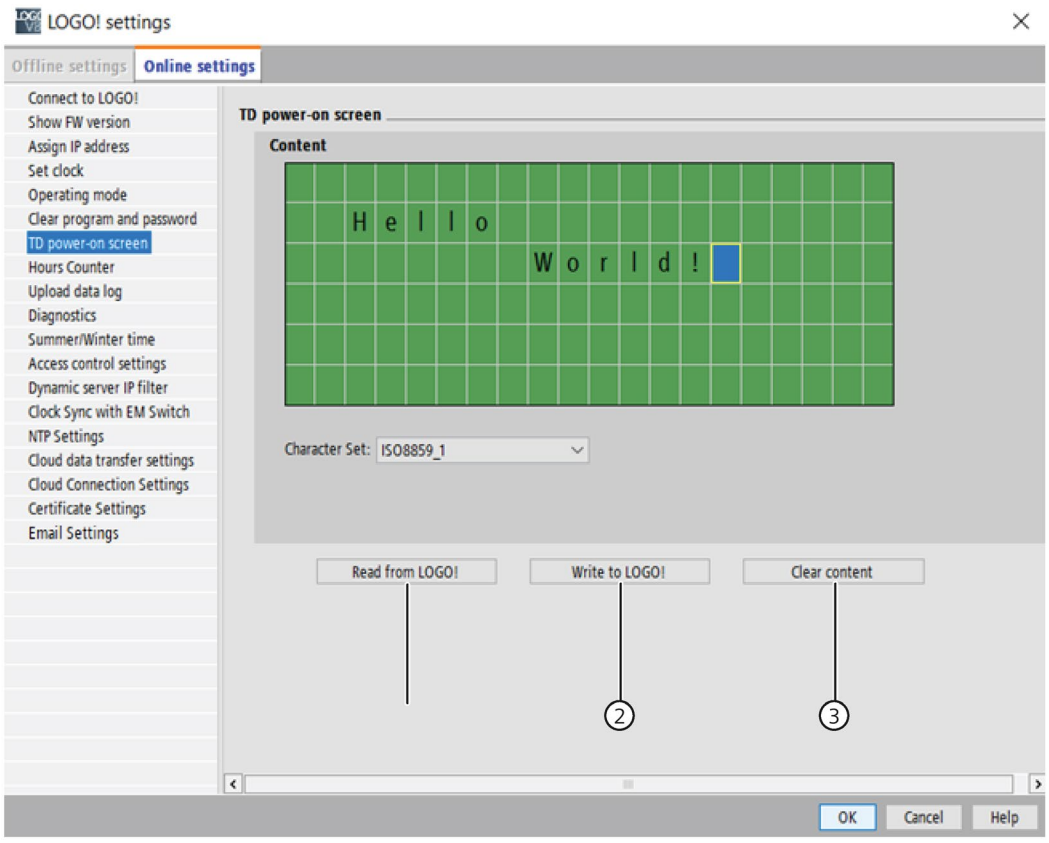
0BA0 - 0BA8:

For LOGO! BM prior to LOGO! 9, the operating mode is available to configure only in online settings.

2.8.5.14 Tools -> Transfer -> Set LOGO! TD Power-on Screen (0BA6 to 0BA8 versions only)

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

Use this command to configure a power-on screen for the LOGO! TD/LOGO! TDE from the character set that you select:



Click "①" to load the previously-configured power-on screen that is stored in the memory of the LOGO! Base Module.

Click "②" to copy the currently-configured screen to the LOGO! Base Module memory.

The LOGO! Base Module updates the LOGO! TD/LOGO! TDE with the power-on screen that stored in memory.

Select a character set for the power-on screen and then use the keyboard to type characters into the display window text edit area.

You can click "③" to switch back to empty screen.

The power-on screen can only contain simple text strings.

Note

LOGO! devices prior to version 0BA6 do not support this function. If you attempt this command on an earlier device, LOGO!Soft Comfort displays a message that states that the device does not support this function.

Copying and pasting text characters

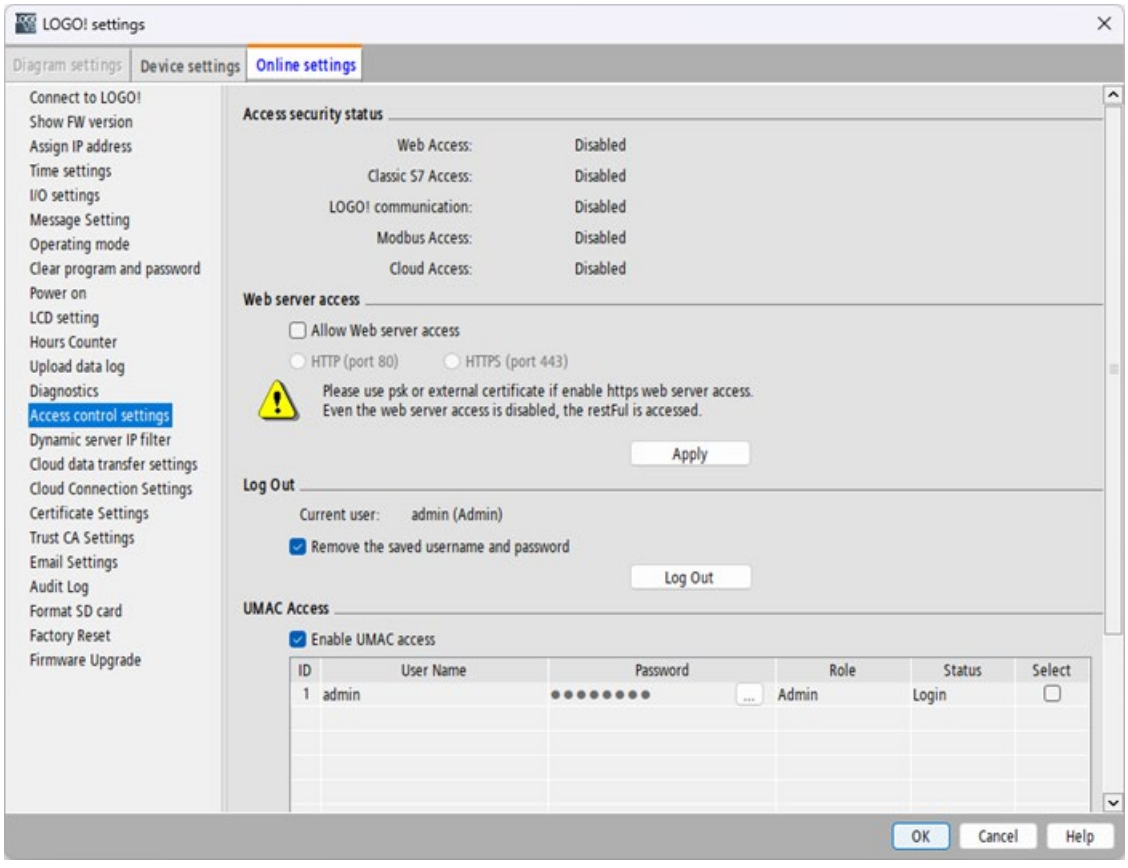
Whenever you enter characters into the display window text edit area, you can use the keyboard shortcuts for copy (Ctrl+C) and paste (Ctrl+V). You can copy and paste characters between any documents on your computer, text in a message text, text in an I/O status name, or text in the LOGO! TD/LOGO! TDE Power-on screen text edit area. LOGO!Soft Comfort verifies that any characters to be pasted are valid for the selected character set.

You cannot use cut (Ctrl+X) to cut characters for pasting, except from a document on your computer. LOGO!Soft Comfort does not support the cut operation from the message text, I/O status name, or LOGO! TD Power-on screen editing dialogs.

2.8.5.15 Tools -> Transfer -> Access control (LOGO! 9 and later versions only)

Use this command to authorize access and manage LOGO! users:

- Web server access
- Log out the current user
- UMAC (User Management & Access Control)
- User management



For LOGO! 9 and later versions devices, except logging out the current user, all the other access configurations are available in both Device settings and Online settings.

If you configure the access control for LOGO! BM in online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

When creating a new diagram, you can access the Access control configuration without the Admin login requirement. If you upload an existing diagram with the UMAC users information, Admin login is required when access the Access control configuration.

Access security status

Here you can have an overview of all the access security status.

Web server access

Here you enable Web server access through Local Area Network (LAN) connection.

Click the checkbox to enable Web server access. LOGO! provides you the following options of connection protocols to the web server:

- HTTPS: encrypted and secure. Port 443 is enabled.
- HTTP: not encrypted. Port 80 is enabled. The LOGO! BM data may be accessed without authorization. The connection between LOGO! BM and other devices may be hacked.

When you enabled the Web sever access, HTTPS is selected by default.

Note

Access web server through HTTPS

To access the web server through HTTPS, other than enabling HTTPS, you need to configure the web access certificate as well. To learn how to configure the web access certificate, refer to Tools -> Transfer -> Certificate Settings (Page 144).

After that, you need to install the generated PSK certificate or the trusted external certificate to the your web browser. To learn how to install the PSK certificate to the web browser, refer to *LOGO! System Manual*.

To learn more about LOGO! Web server and network security, refer to *LOGO! System Manual*.

Log out

You can see the current login user name here and log out the current user.

Besides, to log out LOGO!Soft Comfort, you can also use the Log Out command in the standard toolbar (Page 42) or use the command through Tools -> Transfer -> Log Out (Page 103).

UMAC Access

Here you can check the box to enable the UMAC (User Management & Access Control). UMAC is enabled by default.

LOGO! provides the following user roles for access control:

- Admin

  As an Admin, you can the full access to LOGO!. When you power-on the LOGO! BM for the first time or after the factory reset, you are required to set the Admin password for LOGO!.

- Maintainer

  Except UMAC settings, certificate settings, trust CA settings, dynamic server IP filter and factory reset through LSC, the Maintainer has access to the rest of the LSC settings or commands.

- Operator

  The Operator has very limited access to modify or change settings in LSC. The Operator can configure some basic settings, that is, online test, time settings, message settings and LCD settings. Other than these, the Operator can only view the configurations in LSC.

- Viewer

  The Viewer can only change the LCD settings in LSC. Other than this, the Viewer can only view the configurations in LSC.

Note

Neither the Maintainer, Operator, nor Viewer can view the UMAC configuration in LSC. Neither the Operator nor the Viewer can view the audit logs in LSC.

Here you can create and manage the LOGO! users. LOGO! only supports one Admin role, and at most 11 user roles.

To create an user, follow these steps:

1. Right-click the user table, then select Insert Row. Or click the Insert Row button.
2. In the created new row, you need to set the user name, password, select a role.

   Note

   Password: protect the access with a strong password

   For access security, Siemens recommend that you set a strong password.

   Strong passwords are at least eight characters in length; mix letters, numbers, and special character; are not words that can be found in a dictionary; and are not names or identifiers that can be derived from personal information. Keep the password secret and change it frequently.

3. Click Apply button to apply the new role settings.

Once the role is created successfully, an user ID is generated for the role.

Except the user name, you can change the password or role for an existing user or users in a batch. After change the password or user role, check the box to select the users you want to change, then click Apply button.

To delete an existing user or users in a batch, check the boxes to select the users you want to delete, then click Delete Row button, then click Apply button to apply the operation.

Note

You cannot delete the Admin or change the user role.

The user name of Admin is admin by default. You cannot change the user name of Admin.

2.8.5.16 Tools -> Transfer -> Access Control (0BA8 only)

LOGO!Soft Comfort requires you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

Use this command to authorize access and configure passwords to user profiles on different access occasions.

When establishing communication connection with the LOGO! Base Module and LOGO! TD/LOGO! TDE through Ethernet or Dynamic DNS, LOGO!Soft Comfort displays the access security status for different access approaches and allows the following access approaches:

- LSC & LWE access
- Web server access
- LOGO! TD / LOGO! TDE access
- BM Administrator access

From the access control dialog, scroll down to see all the access types and the configuration options.

Once you enable a user profile, you can then enable and set its password.

When you apply your modification, LOGO!Soft Comfort will switch your LOGO! Base Module from STOP to RUN mode.

Note

Password: Protect the access with a strong password.

Strong passwords must mix letters, numbers, and special characters, are not words that can be found in a dictionary, and are not names or identifiers that can be derived from personal information. Keep the password secret and change it frequently.

LOGO!Soft Comfort supports all password inputs including letters, numbers, and special characters with ASCII character set.

The maximum length of password is 10.

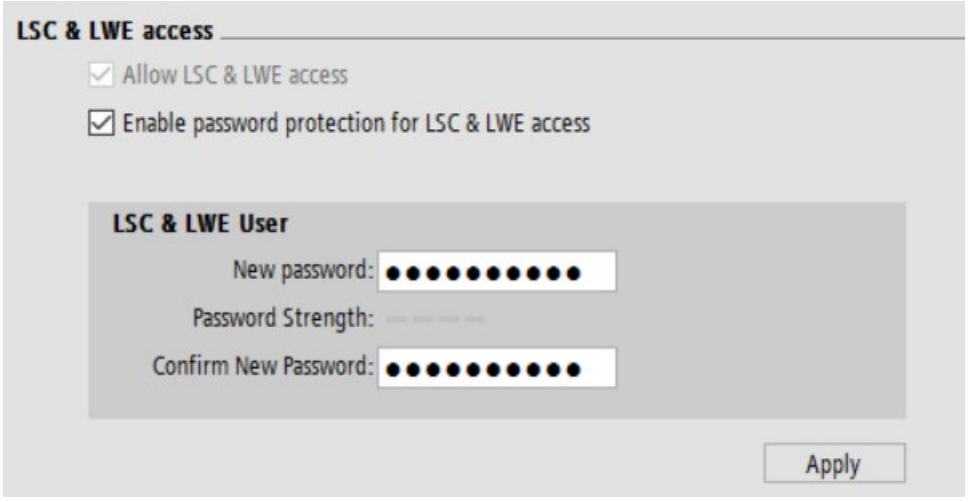
Password strength is displayed after you enter a new password.

Access security status

The access security status is displayed as follows:

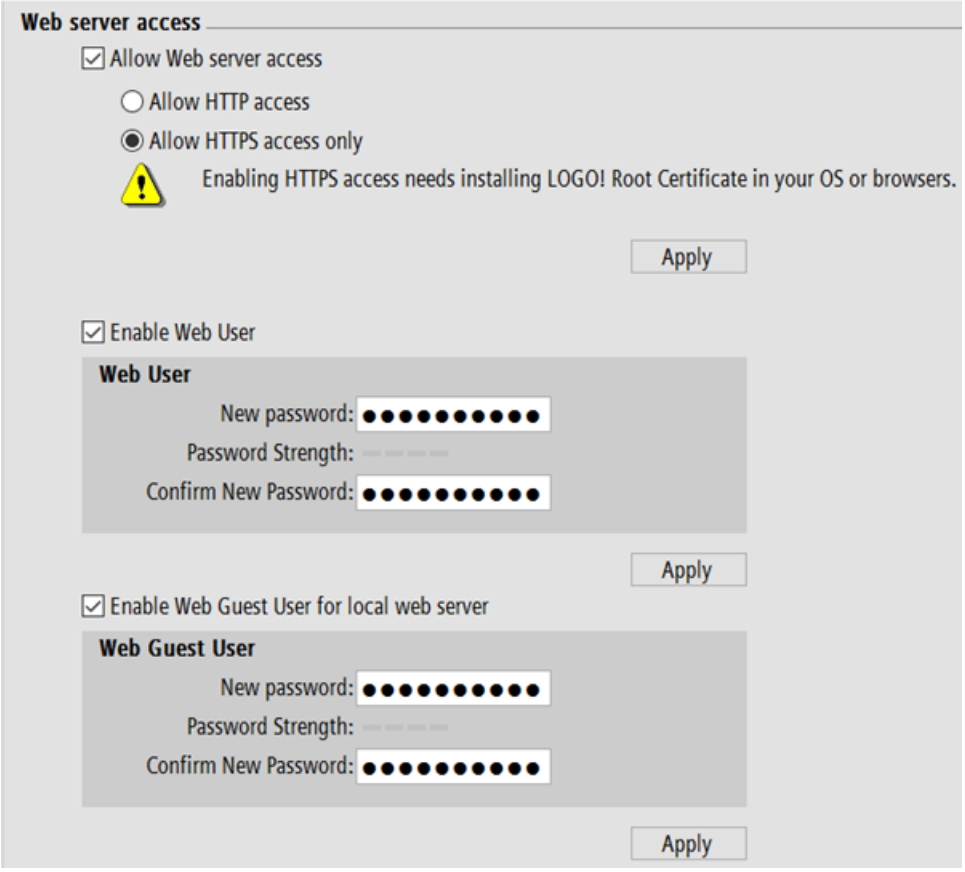
LSC & LWE access

Here you enable LSC & LWE user access and change the logon password.



Web server access

Here you enable Web server access through Local Area Network (LAN) connections.



To enable the web server access, you need to select the checkbox "Allow Web server access" and select "Allow HTTP access (Web Server and LOGO! APP)" or "Allow HTTPS access only" firstly, and then you can select different user roles as you need.

Here is the detailed information for each checkbox:

- Allow Web server access:
  - Allow HTTP access (Web Server): HTTP is not encrypted. The LOGO! BM data may be accessed without authorization and the connection between LOGO! BM and other devices may be hacked.
  - Allow HTTPS access only: HTTPS is encrypted and this access approach is secure. If you select HTTPS access, the device performance is affected.

    Note

    If you select the checkbox "Allow HTTPS access only", you need to install the LOGO! Root Certificate in your operating system or browsers. On how to install the LOGO! Root Certificate, refer to the chapter "Security -> Installing LOGO! Root Certificate" of *LOGO! System Manual*.

- Enable Web User: Here you access the web server as a web user and change the logon password.
- Enable Web Guest User for local web server: Here you access the web server as a web guest user and change the logon password.

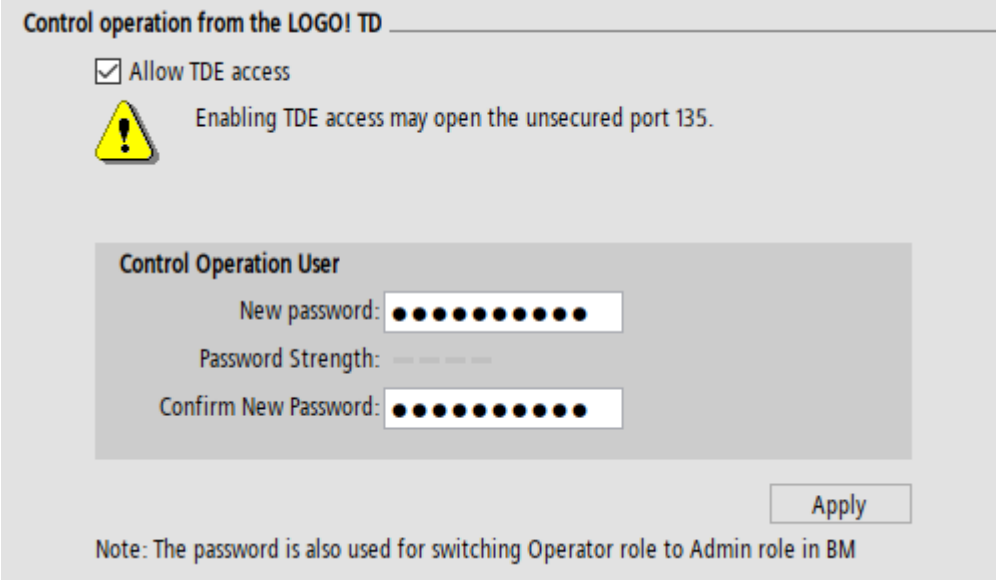
For more details about the Web server, refer to the Web server section of *LOGO! Manual*.

For more details about different users, refer to the Network Security section of *LOGO! Manual*.

LOGO! TD/ LOGO! TDE access

Here you enable access to LOGO! Base Module from LOGO! TD/LOGO! TDE and change the logon password.

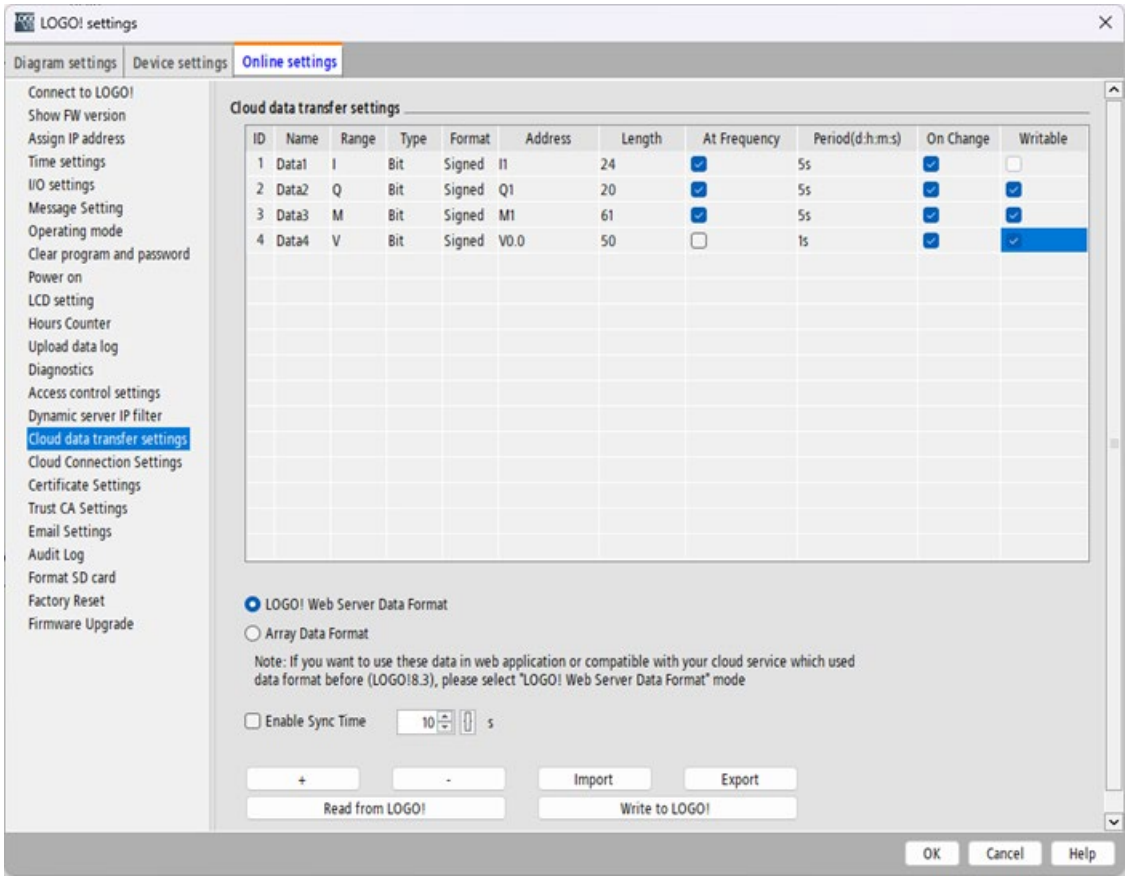
The LOGO! TD/TDE logon password is also the password used to switch the menu access of Operator to Administrator in LOGO! Base Module. Refer to the section *Configuring menu access protection for LOGO!* in *LOGO! System Manual* for more information.



2.8.5.17 Tools -> Transfer -> Cloud Settings -> Cloud Data Transfer Settings (0BA8 and later versions only)

This menu allows you to configure the Cloud data transfer.

For LOGO! 9 and later versions devices, Cloud data transfer settings are available in both Device settings and Online setting in LSC. If you configure the cloud data transfer in online settings, LOGO!Soft Comfort requires you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.



The following table lists the definition for each item:

Item	Definition
ID	**Note**: The maximum number of data record is 64.
Name	Name of cloud data. **Note**: Name can contain letters, numbers, special characters "-" and "_", and the maximum size of the name is 15 byte.
Range	Memory area in LOGO! BM.
Address	Memory address.
Type	Data type.
Format	Data display format at Cloud. This item is only available for LOGO! 9 and later versions.
Length	Data length.
At Frequency	Enable the data synchronization between LOGO! BM and cloud on a customized frequency.
Period (d:h:m:s)	Time intervals that LOGO! BM synchronize the date with cloud. **Note:** The maximum time intervals is 23 days: 23 hours: 59 minutes: 59 seconds.
On Change	If the value is changed, you can select this checkbox to synchronize the changes to cloud.
Writable	Write the data from Cloud to LOGO! BM.
LOGO! Web Server Data Format	Choose the data format as hex string. **Note**: The maximum of total data record is 160 bytes.

Item	Definition
Array Data Format	Choose the data format as integer array. **Note**: • The maximum of total data record is 160 bytes; • The total Length of all the Cloud Data should not exceed 160.
Enable Sync Time	Once enabled, the LOGO! BM will send the BM time to the Cloud at the frequency you set. This setting is available only for LOGO! 9 and later versions devices.
+	Add a row.
-	Delete a row.
Import	Import cloud data transfer settings table.
Export	Export cloud data transfer settings table.
Read from LOGO!	Read the data transfer settings from LOGO! BM.
Write to LOGO!	Write the data transfer settings to LOGO! BM.

The following table lists whether the specific memory area is writable.

Memory Area	Block Number	Writable
I	• LOGO! 9: I1-I64 • 0BA8: I1-I24	No
Q	• LOGO! 9: Q1-Q60 • 0BA8: Q1-Q20	Yes
M	• LOGO! 9: M1-M128 • 0BA8: M1-M64	Yes
AI	• LOGO! 9: AI1-AI16 • 0BA8: AI1-AI8	No
AQ	• LOGO! 9: AQ1-AQ16 • 0BA8: AQ1-AQ8	Yes
AM	• LOGO! 9: AM1-AM128 • 0BA8: AM1-AM64	Yes
FAM	• LOGO! 9: FAM1-FAM32	Yes
V	V0-V850	Yes
VX	VX0-VX2047	Yes
VR	VR0-VR511	Yes
Cursor Key	C1-C4	No
Function key	F1-F4	No
Shift Register	S1.1-S1.8 S2.1-S2.8 S3.1-S3.8 S4.1-S4.8	No

The following table lists the specific memory areas for which **On Change** checkbox is disabled.

Memory Area	Block Number
AI	• LOGO! 9: AI1-AI16 • 0BA8: AI1-AI8
AQ	• LOGO! 9: AQ1-AQ16 • 0BA8: AQ1-AQ8
AM	• LOGO! 9: AM1-AM128 • 0BA8: AM1-AM64
FAM	• LOGO! 9: FAM1-FAM32

0BA8:
For LOGO! 8.4 and 8.3 devices, Cloud data transfer settings are available only in online settings.

2.8.5.18 Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings (0BA8 and later versions only)

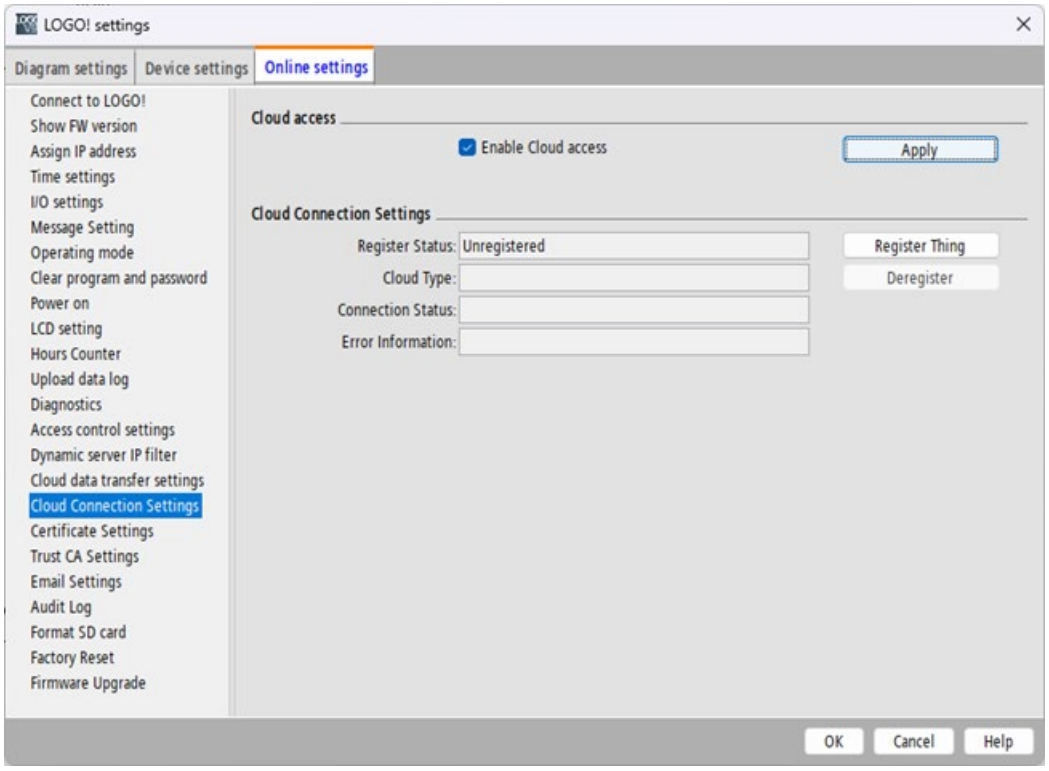
LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

With this menu command, you can configure the Cloud connection for LOGO! BM.

Note

LOGO! BM time

Before you configure Cloud connection, make sure the time and date of the LOGO! BM are correct. Otherwise, Cloud connection will fail.



Note

- LOGO! 8.4 (and later versions) Base Module supports Cloud connection with AWS, Azure, Alibaba or general MQTT broker.
- LOGO! 8.3 Base Module only supports AWS Cloud connection.

Enable Cloud access

You can enable Cloud access as follows:

1. Select the checkbox "Enable Cloud access".

   Note

   - For LOGO! 8.4 (and later versions) Base Module, you can enable Web Server access and Cloud access at the same time.
   - For LOGO! 8.3 Base Module, you **cannot** enable Web Server access and Cloud access at the same time.

2. Click the "Apply" button.

Register a LOGO! BM in AWS IoT

Requirements

Ensure that the following conditions are met before you register a LOGO! BM in AWS IoT:

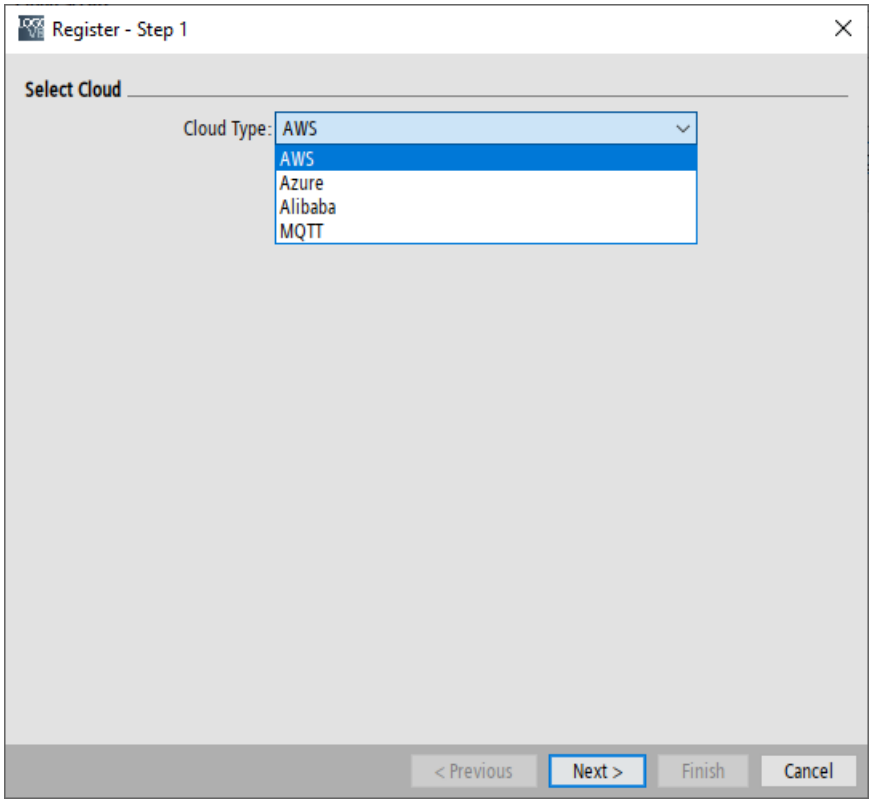
- The Cloud access must be enabled.
- An AWS account is created.
- The access key is applied.

Procedures

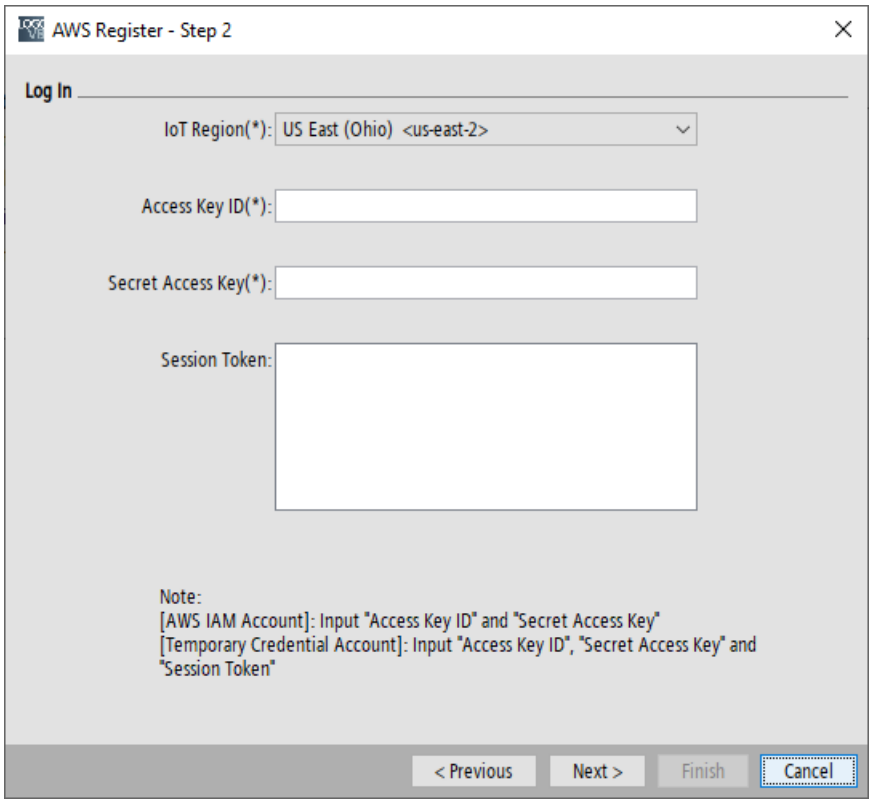
Perform the following steps to register a LOGO! BM in AWS IoT:

1. Navigate to "Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings" tab and click the "Register Thing" button. Then a "Register" dialog is displayed.

   Select the Cloud type "AWS" and click the "Next" button.

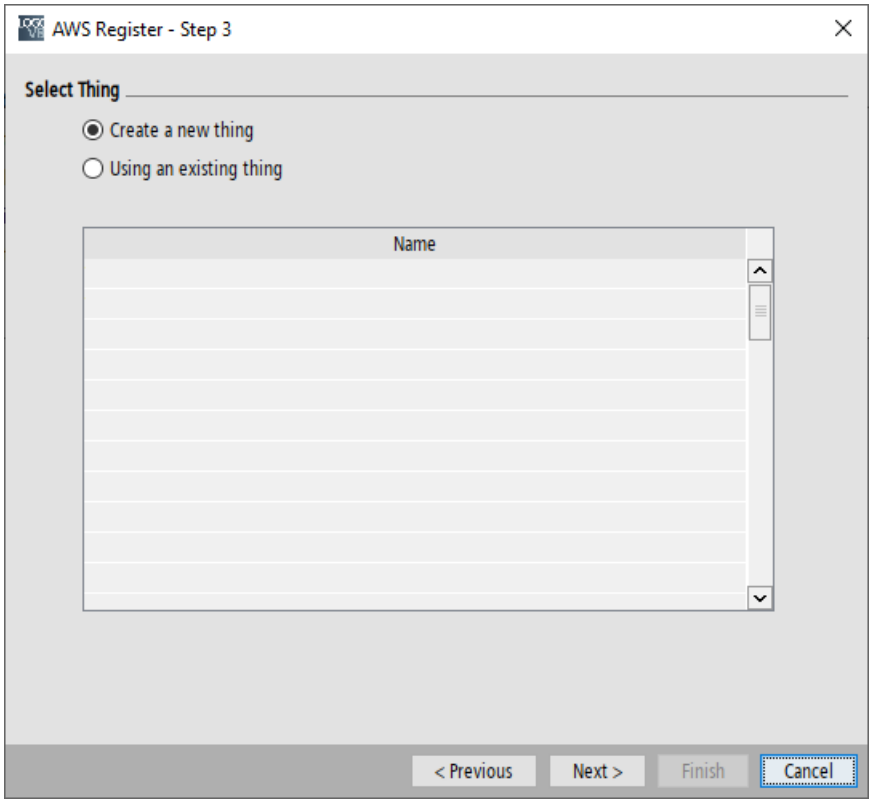


2. Select the IoT Region, enter the "Access Key ID" and "Secret Access Key". If you use AWS Temporary Credential Account (TVM) for the register, you need also enter "Session Token". Then click the "Next" button.



3. Select the checkbox "Create a new thing" or "Using an existing thing". Then click "Next" button.

   If you select "Create a new thing", proceed with step 4. If you select "Using an existing thing", proceed with step 5.



4. Enter the name. Then click "Next" button.

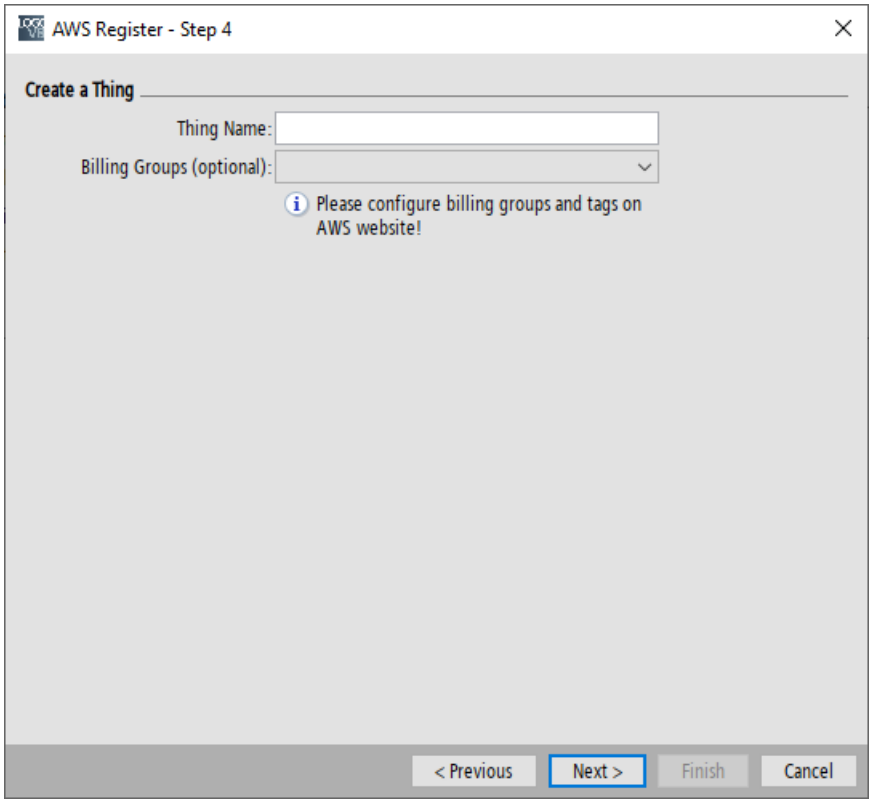
   Naming rule:

   – The length of the name cannot exceed 128 characters.

   – The name consists of any letters, the hyphen "-" and the underline "_".

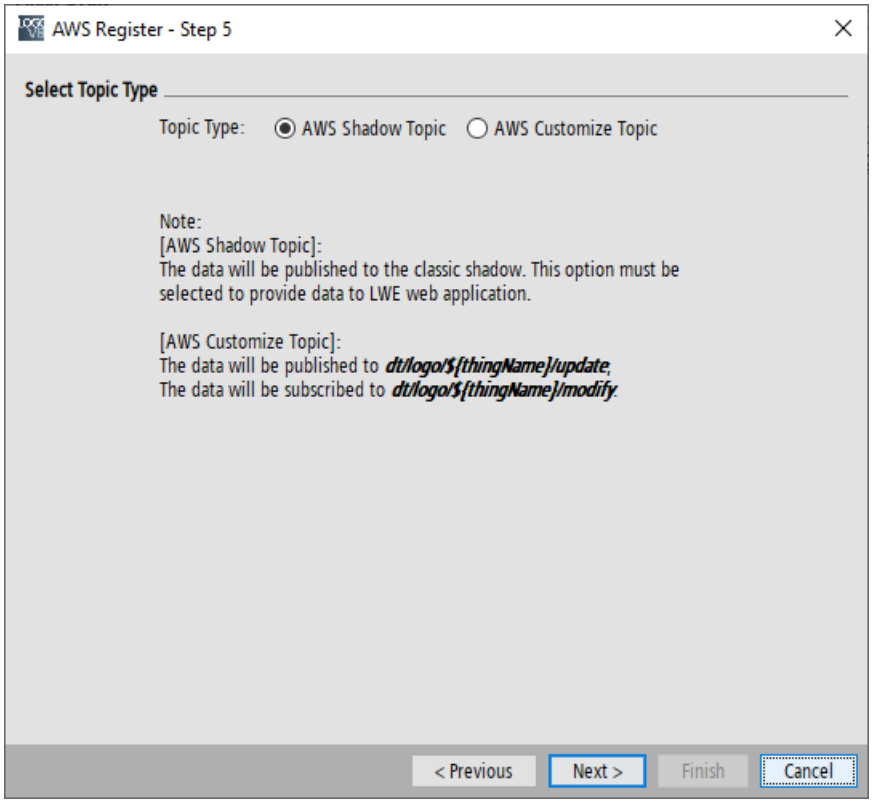
   For the detailed information, refer to AWS IoT thing naming rule.

   After creating a billing group and assign tags to it on AWS website, you can assign the configured billing group to the IoT thing to categorize and track your IoT service related costs.



5. Select topic type for the register. Then click "Next" button.

   If the registered IoT thing will be used in your LWE project, which will be deployed to AWS as a WebApp, you should select Shadow Topic, and configure the cloud data as "LOGO! Web Server Data Format" in Cloud Data Transfer Settings (Page 116).

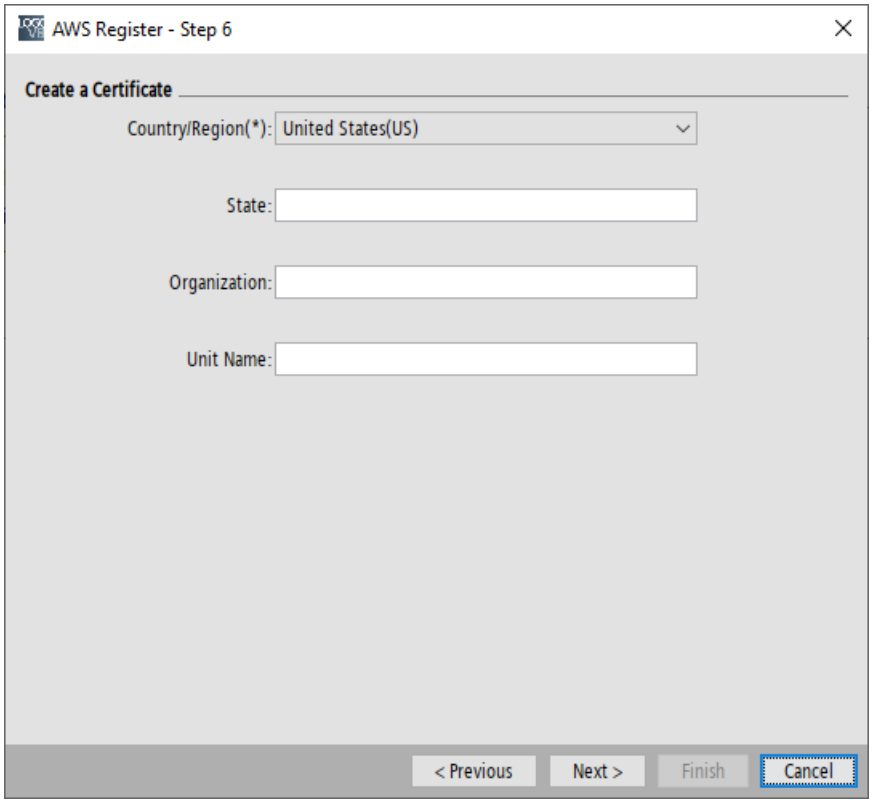


Note

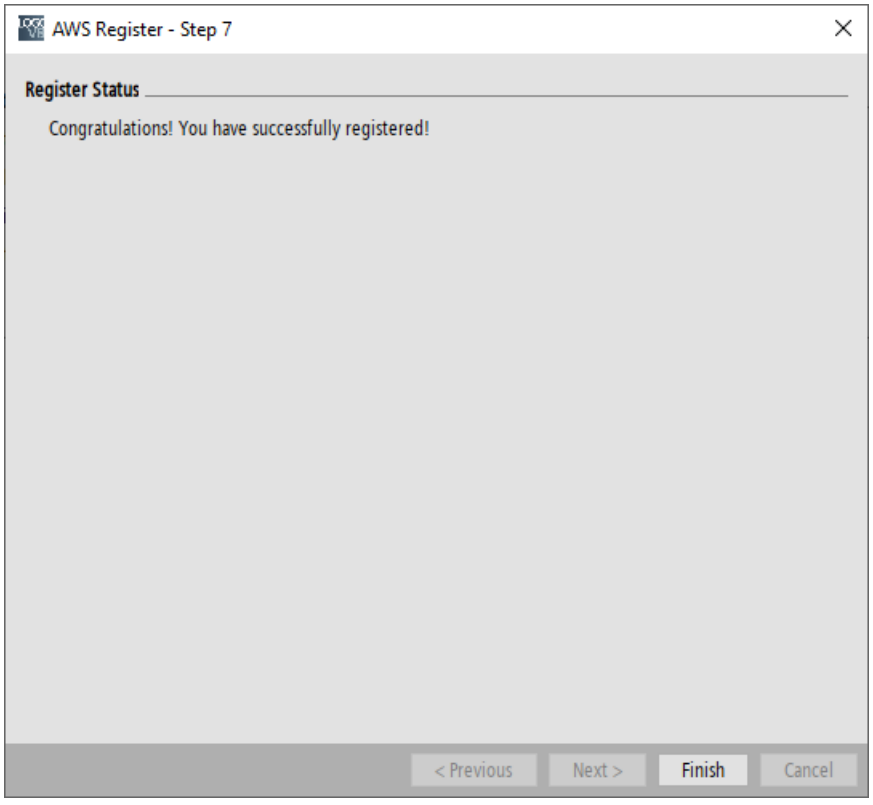
For LOGO! 8.3 Base Module, you don't need to select topic type but proceed with step 6 directly.

6. Create a certificate by entering the following information:

Item	Rule
Country/Region	Select from the drop-down list.
State Organization	Naming rule: • The length of state name or organization name cannot exceed 16 characters. • The state name or organization name consists of any alphanumeric characters, white space, the hyphen "-", the underline "_" and the colon ":". For the detailed information, refer to AWS IoT thing service related rule.
Unit Name	Naming rule: • The length of unit name cannot exceed 16 characters. • The unit name consists of any alphanumeric characters. For the detailed information, refer to AWS IoT thing service related rule.



7. Click the "Next" button, and then the "Register Status" page shows that your registration is successful. Click "Finish" button to close the registration dialog.



Register a LOGO! BM in Azure IoT

Requirements

Ensure that the following conditions are met before you register a LOGO! BM in Azure IoT:

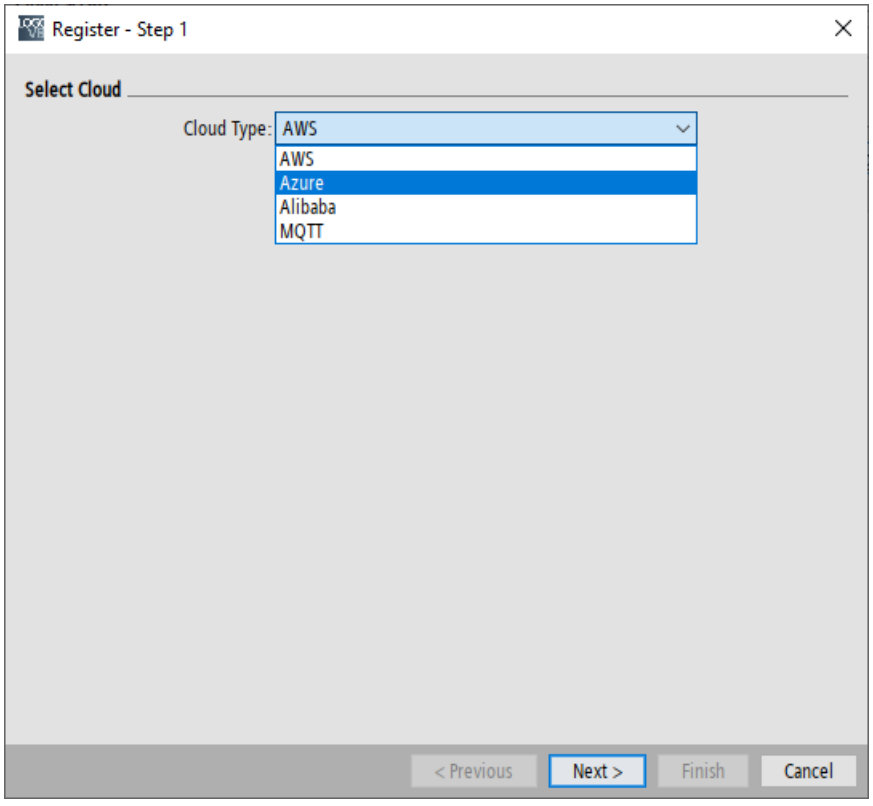
- The Cloud access must be enabled.
- An Azure account is created.
- An IoT Hub primary connection string is applied.

Procedures

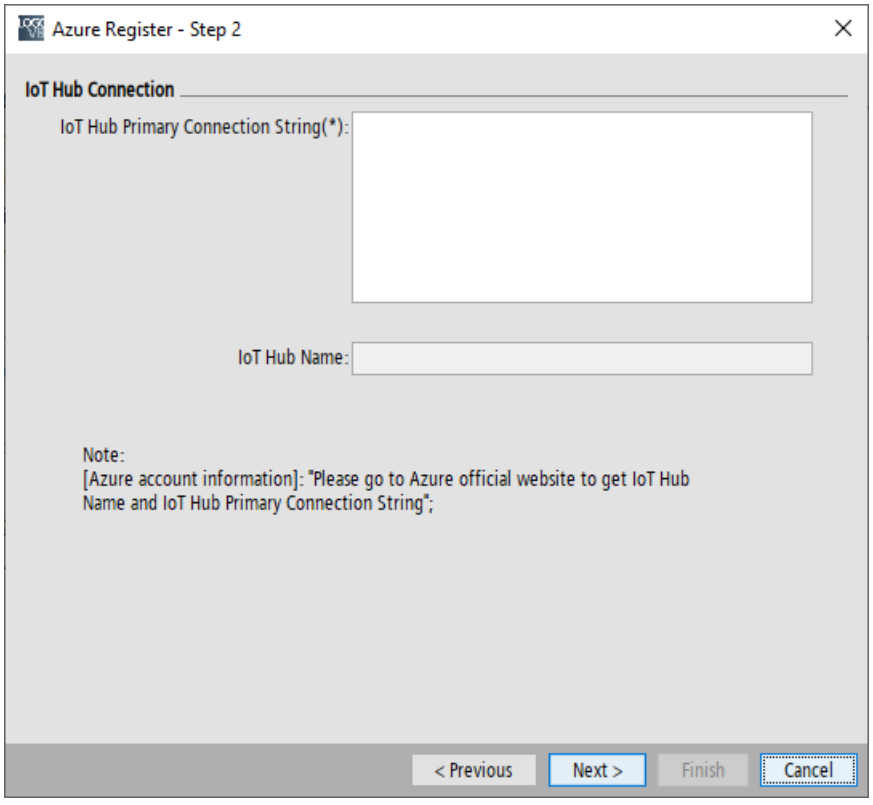
Perform the following steps to register a LOGO! BM in Azure IoT:

1. Navigate to "Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings" tab and click the "Register Thing" button. Then a "Register" dialog is displayed.

   Select the Cloud type "Azure" and click the "Next" button.

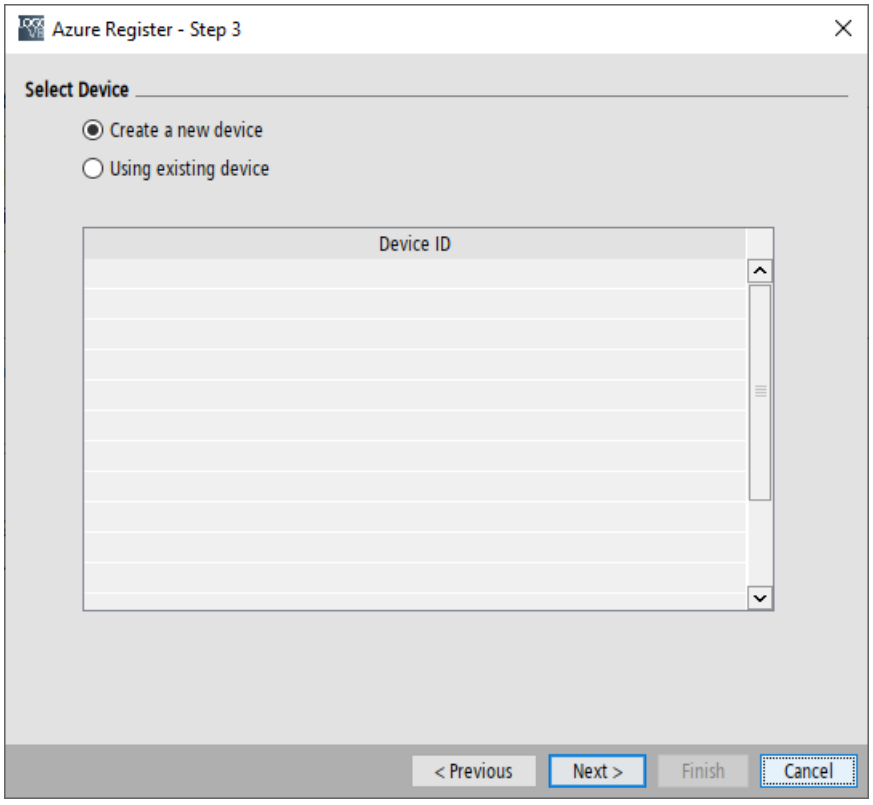


2. Enter the "IoT Hub Primary Connection String". Then click "Next" button.



3. Select "Create a new device" or "Using existing device". Then click "Next" button.

   If you select "Create a new device", proceed with step 4; if you select "Using an existing device", proceed with step 5.



4. Enter the device ID. Then click "Next" button.

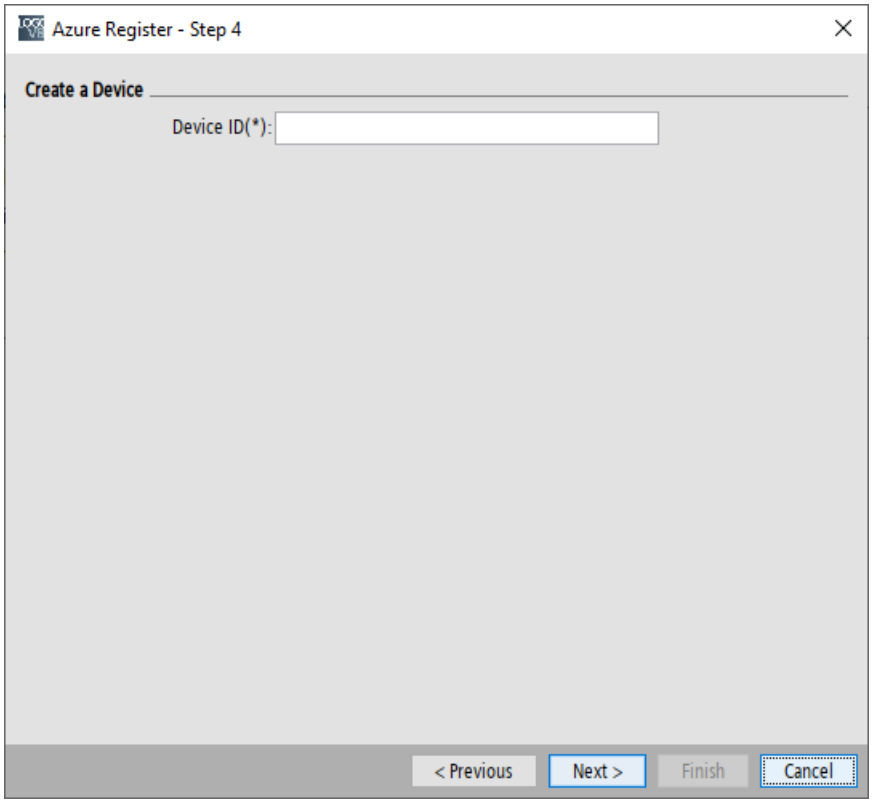
   Naming rule:

   – The length of the device ID cannot exceed 128 characters.

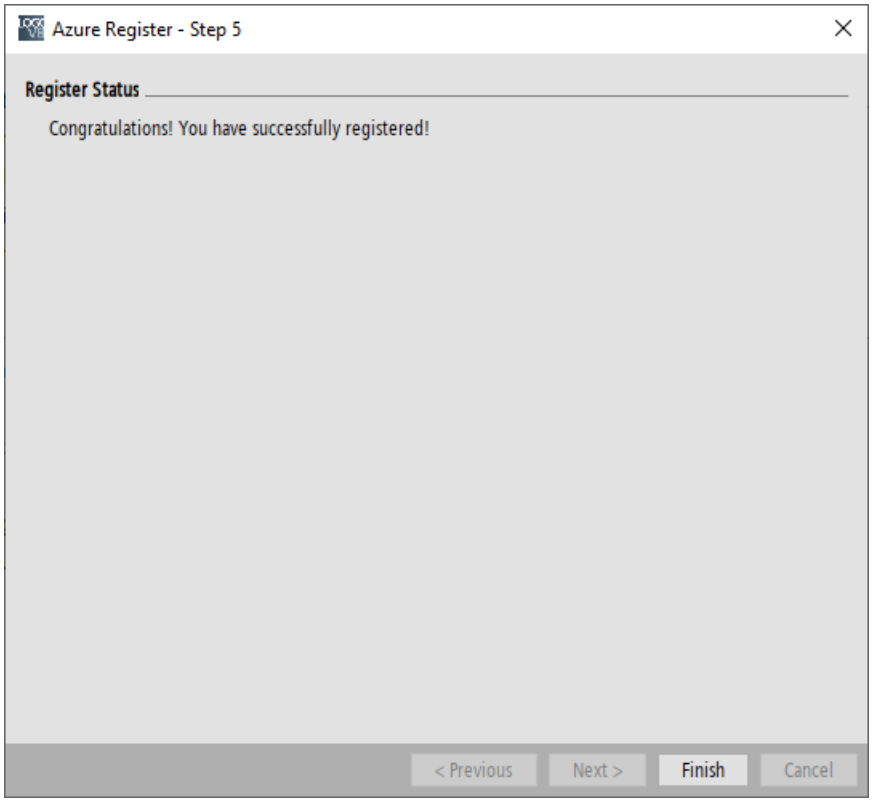
   – The device ID can consist of any upper-case or lower-case letters, numbers and certain special characters - . _ * ! ( ) , : = @ $ '.

Note

If you create Device ID in Azure platform with other special characters than above ones, it cannot be displayed in the existing device list in step 3.



5. The Register Status page shows you that your registration is successful. Click "Finish" button to close the registration dialog.



Register a LOGO! BM in Alibaba IoT

Requirements

Ensure that the following conditions are met before you register a LOGO! BM in Alibaba IoT:

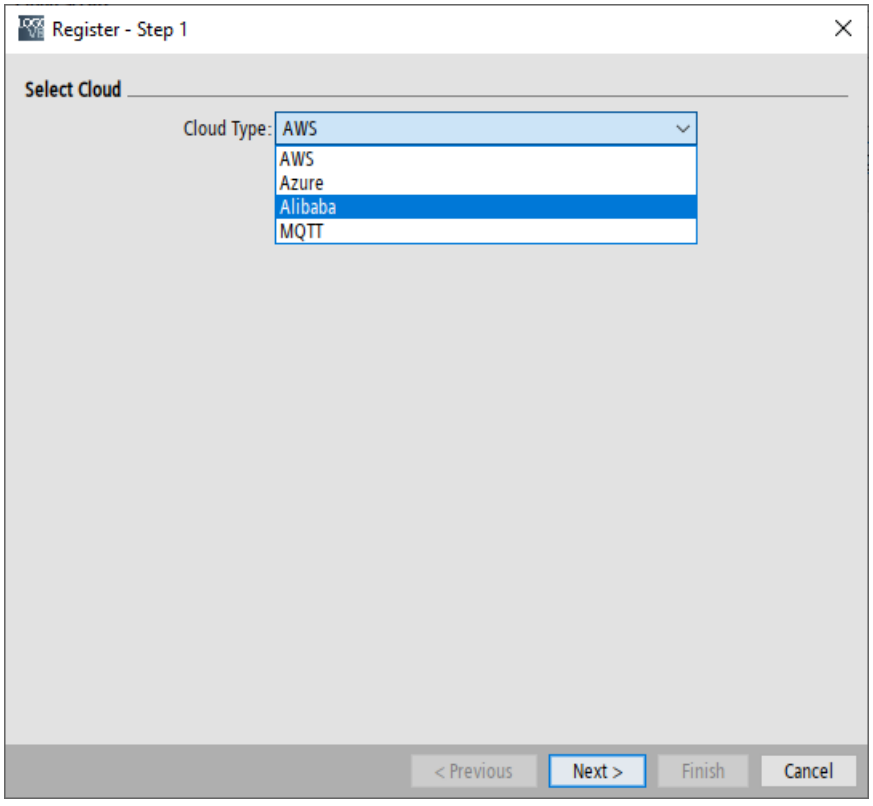
- The Cloud access must be enabled.
- An Alibaba account is created.

Procedures

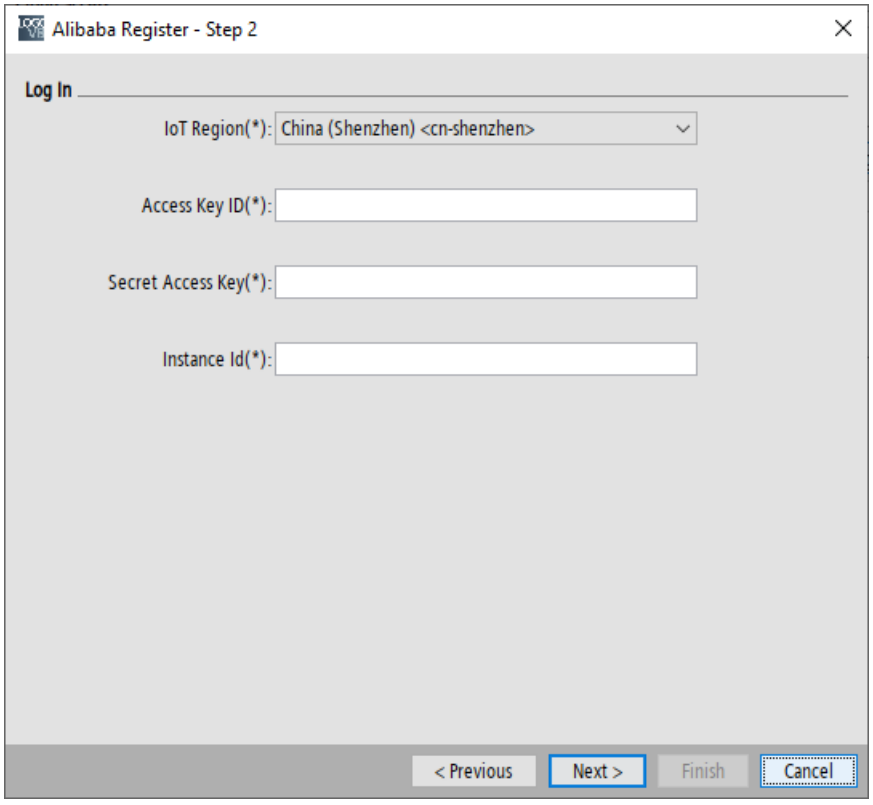
Perform the following steps to register a LOGO! BM in Alibaba IoT:

1. Navigate to "Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings" tab and click the "Register Thing" button. Then a "Register" dialog is displayed.

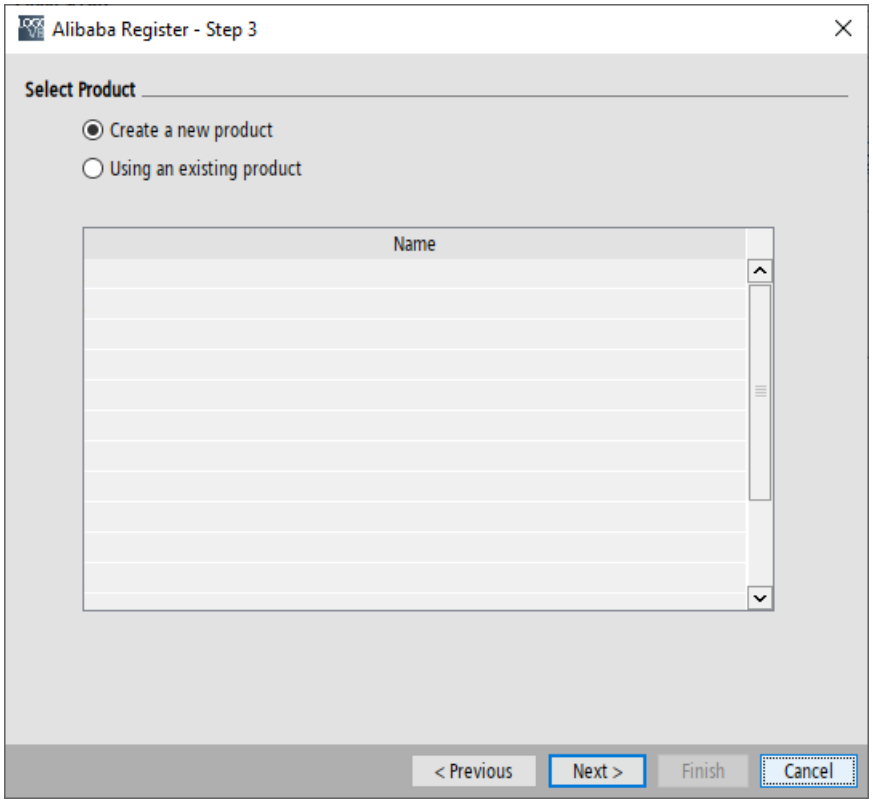
   Select the Cloud type "Alibaba" and click the "Next" button.



2. Enter "IoT Region" "Access Key ID" "Secret Access Key" and "Instance ID". The "IoT Region" should be consistent with the region that is configured when creating the "Instance ID" on Alibaba website.



3. Select "Create a new product" or "Using an existing product". Then click "Next" button.

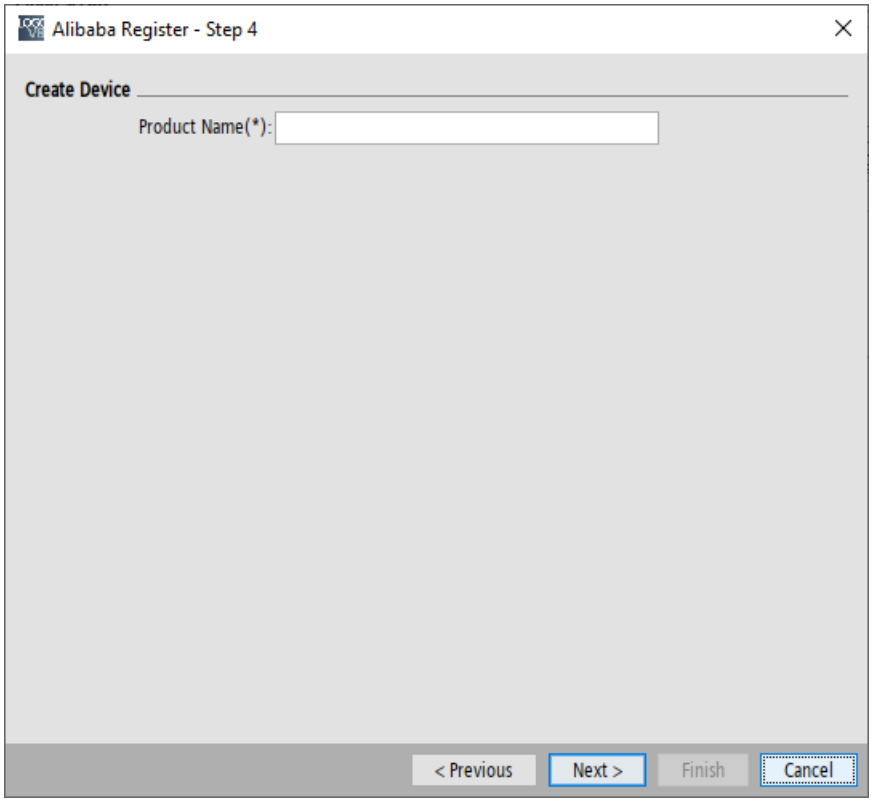


4. If you select "Create a new product" in step 3, here you need to enter the new product name. Then click "Next" button.

   Naming rule:

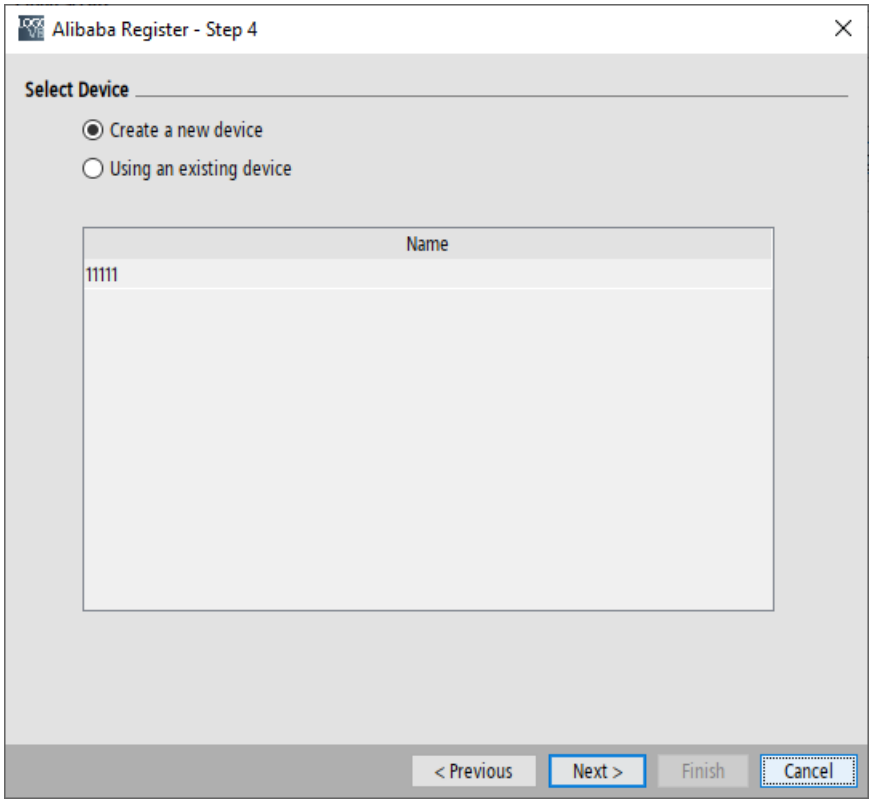
   – The length of the product name is between 4 to 30 characters.

   – The product name consists of any Chinese characters, letters, numbers and the special character underline "_". One Chinese character counts as two characters.



If you select "Using an existing product" in step 3, here you need select "Create a new device" or "Using an existing device". Then click "Next" button.

If you select "Create a new device", proceed with step 5; if you select "Using an existing device", proceed with step 6.

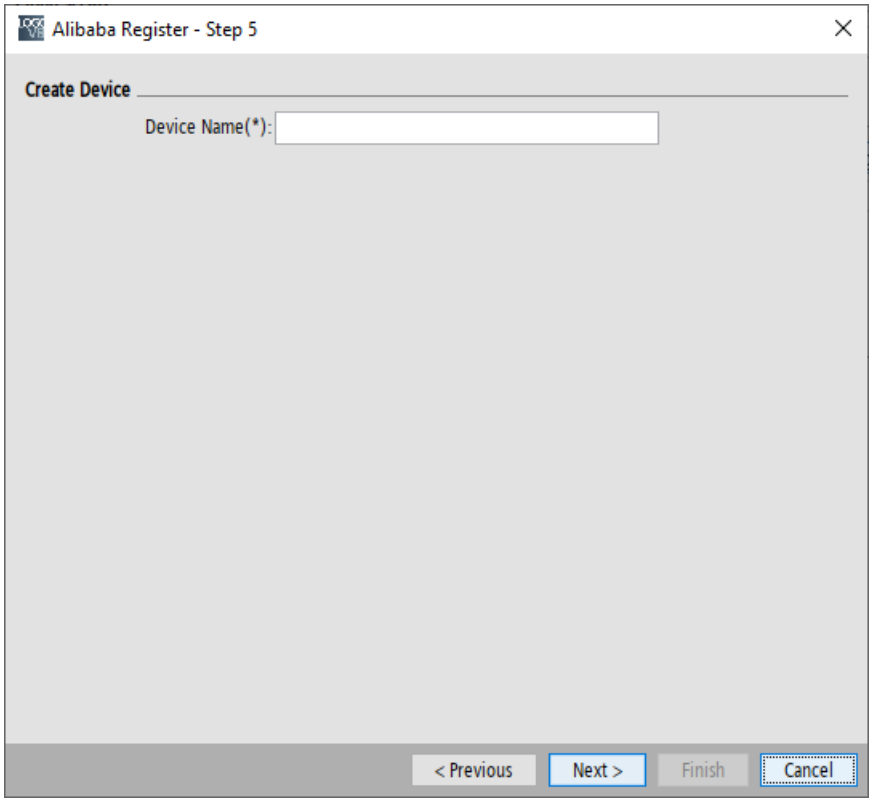


5. Enter device name. Then click "Next" button.

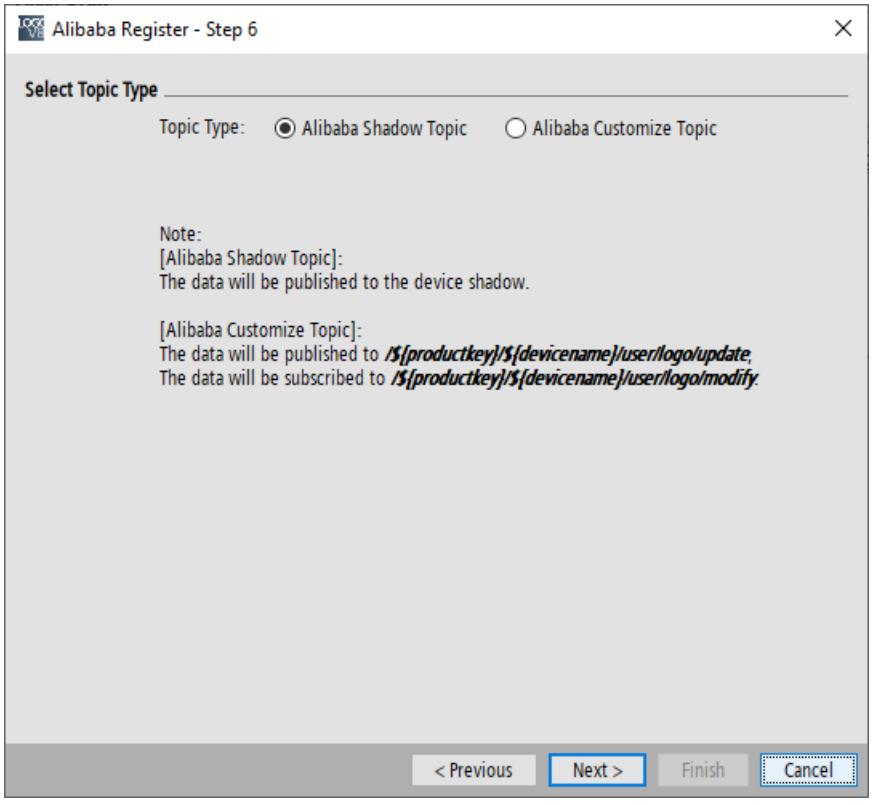
   Naming rule:

   – The length of the device name is between 4 to 32 characters.

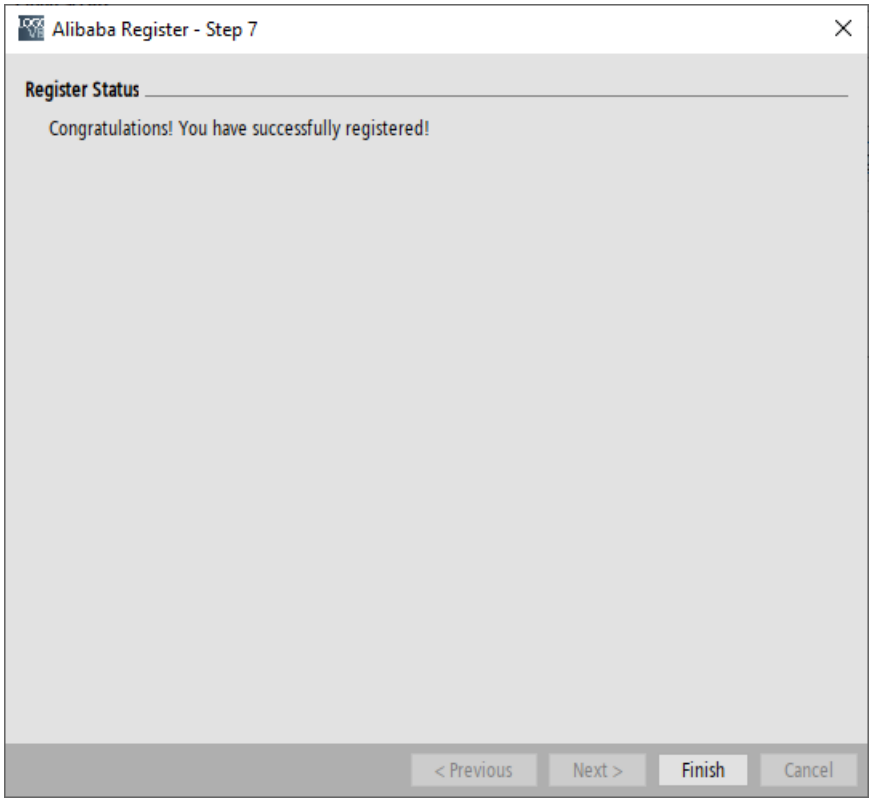
   – The device name consists of any Chinese characters, letters, numbers and certain special characters: hyphen "-", underline "_", at sign "@", period "." and colon ":".



6. Select topic type for the register. Then click "Next" button.



7. The Register Status page shows you that your registration is successful. Click "Finish" button to close the registration dialog.



Register a LOGO! BM in MQTT broker

Click here (Page 601) to learn about how to establish IoT Cloud connection between LOGO! 8.4 and Hive MQTT.

Click here (Page 613) to learn about how to establish IoT Cloud connection between LOGO! 8.4 and Mosquitto MQTT.

Requirement

Ensure that the following conditions are met before you register a LOGO! BM in MQTT broker:

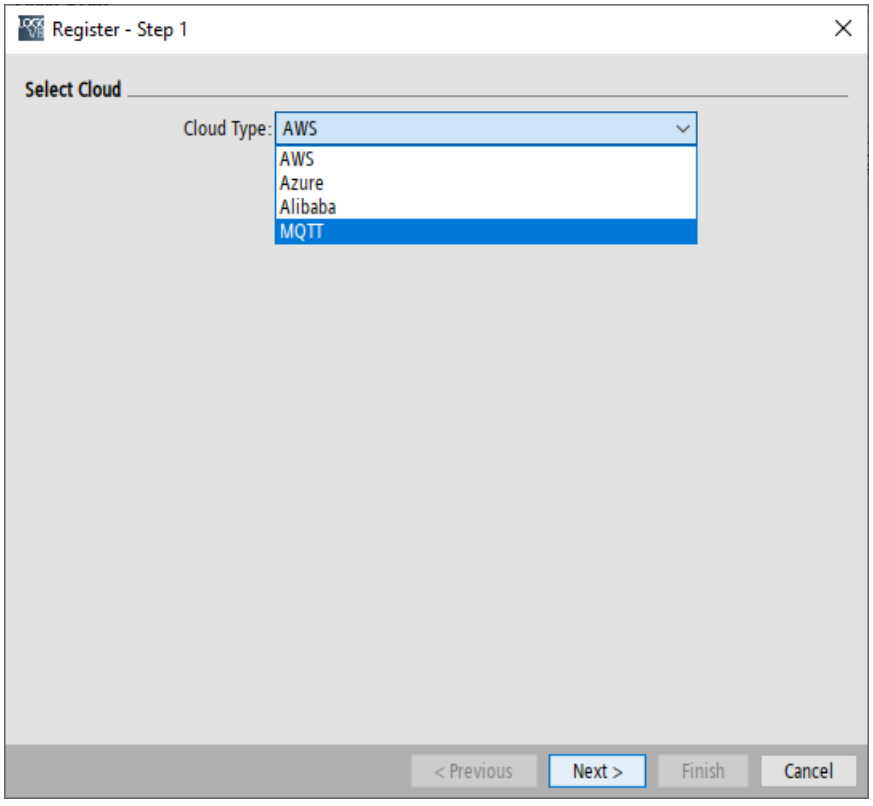
- The Cloud access must be enabled.
- The corresponding MQTT broker account is created.

Procedures

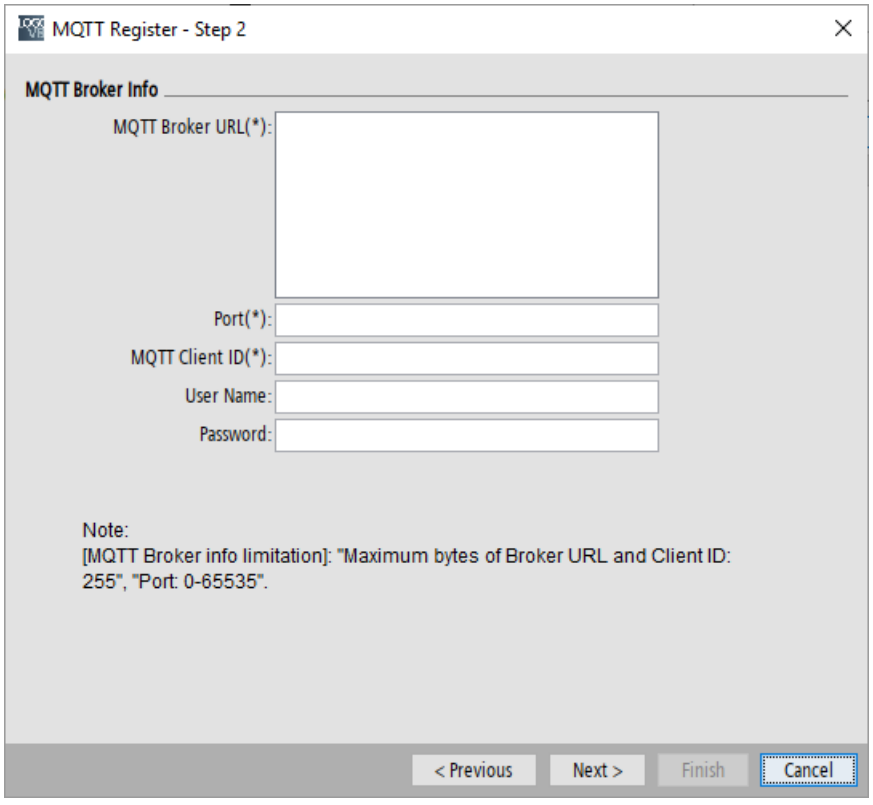
Perform the following steps to register a LOGO! BM in MQTT broker:

1. Navigate to "Tool s-> Transfer -> Cloud Settings -> Cloud Connection Settings" tab and click the "Register Thing" button. Then a "Register" dialog is displayed.

   Select the Cloud type "MQTT" and click the "Next" button.

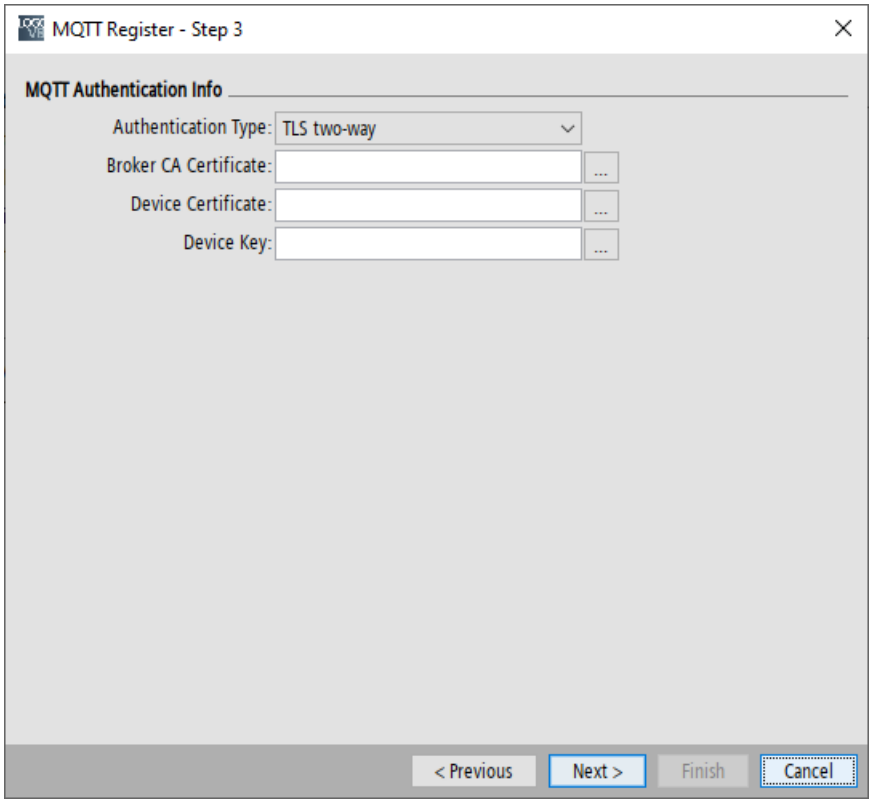


2. Enter "MQTT Broker URL" "Port" and "MQTT Client ID". Then click "Next" button.

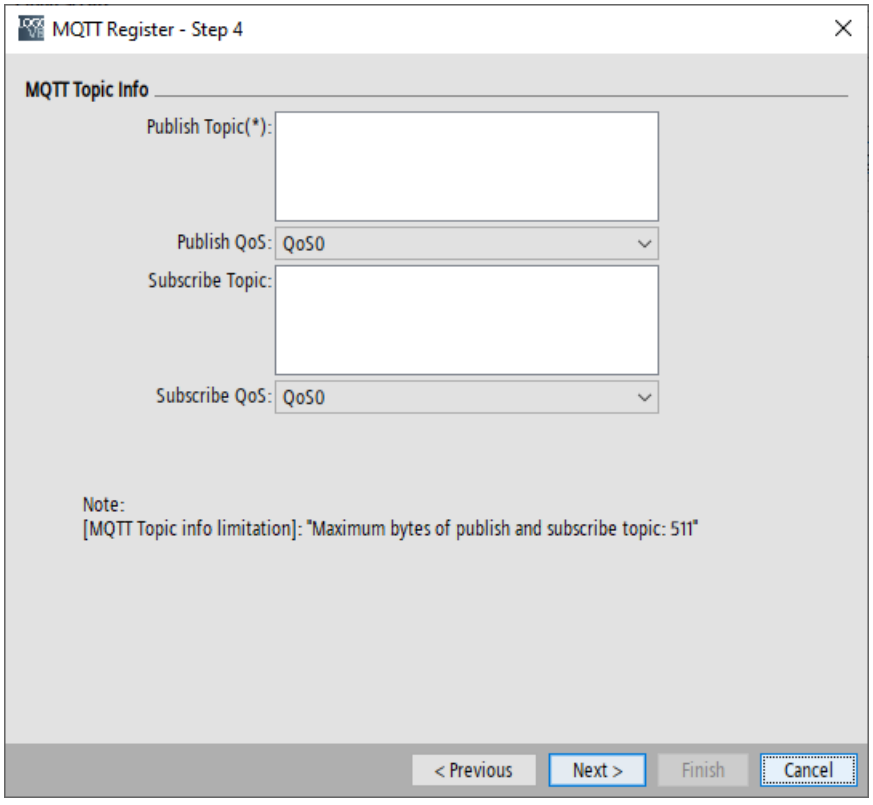


3. Select Authentication Type: TCP, TLS without authentication, TLS one-way or TLS two-way. If you select TCP or TLS without authentication, click "Next" button to proceed with step 4; if you select TLS one-way, you need upload Broker CA Certificate to authenticate the server; if you select TLS two-way, you need to upload Broker CA Certificate, Device Certificate and Device Key, to authenticate the client and the server. Then click "Next" button.

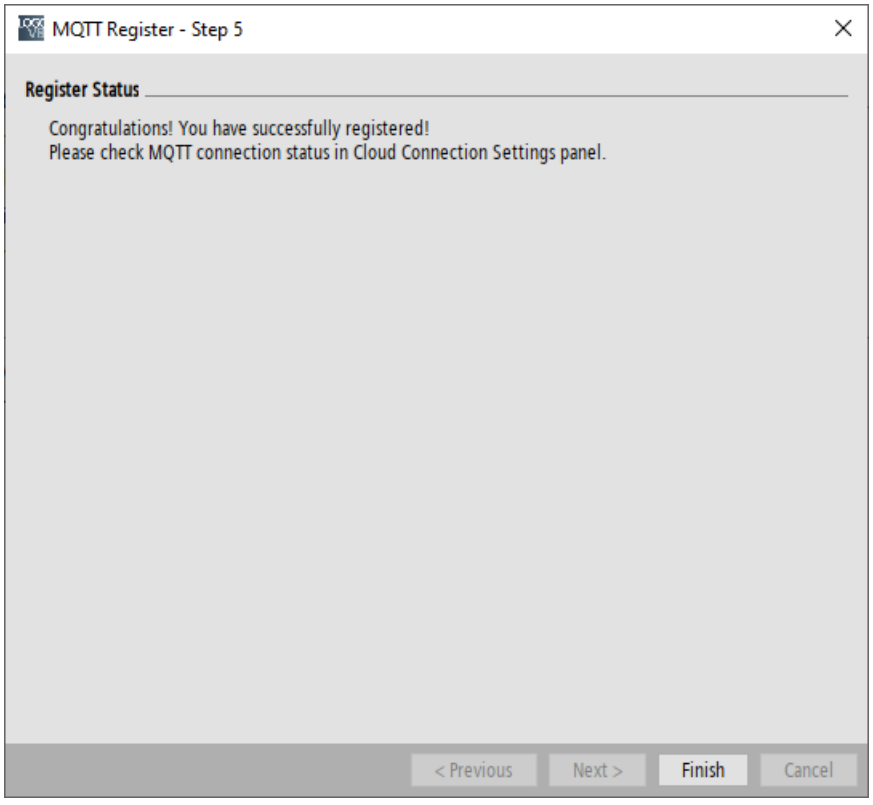
   To learn more about authentication type, refer to section *Cloud IoT connection -> Secure Cloud connection* in *LOGO! System Manual*.



4. Enter "Publish Topic". Then click "Next" button.



5. The Register Status page shows you that your registration is successful. Click "Finish" button to close the registration dialog.



Deregister a LOGO! BM

If the LOGO! BM you want to register has been registered, you can deregister this LOGO! BM by clicking the "Deregister" button.

Note

Deregistering a LOGO! BM doesn't delete the thing that is registered in AWS IoT, which deletes the following items in LOGO! BM: AWS endpoint, the certificate that is created for registering a thing, and the name of registered thing.

2.8.5.19 Tools -> Transfer -> Certificate Settings

Certificate settings for LOGO! 9.0 and later versions devices

You can configure certificates for LOGO! 9 and later version devices in both Device settings and Online settings in LOGO!Soft Comfort. When you configure certificates in Online settings, LSC requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

For different communication scenarios, LOGO!Soft Comfort provides you different certificate strategies to ensure secure communication.

Communication	Applicable certificate strategy
• LSC & TDE access • LOGO! communication	• Build-in certificate (default setting) • PSK certificate • External certificate
Web access with HTTPS mode	• PSK certificate (default setting) • External certificate

Select the certificate strategy from the drop-down list for each communication scenario, then click the Apply button.

To learn more about LOGO! certificate strategy, refer to the "Security" section in LOGO! System Manual.

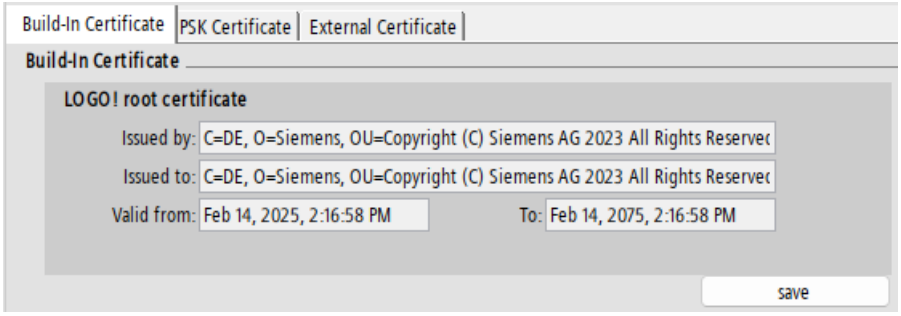
Note

LOGO! web server access

To access the LOGO! web server, you need to enable the web server access first. Refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109) for detailed information.

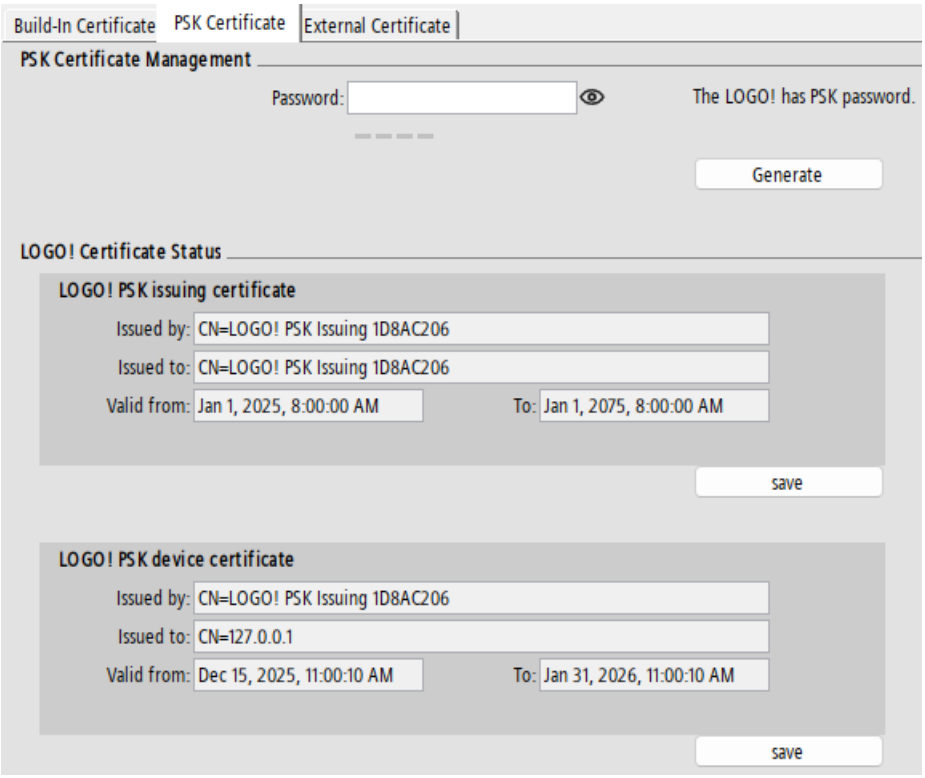
Besides, you need to install the PSK or external certificate on the supported web browser. To learn how to install the PSK certificate on the web browser, refer to *LOGO! System Manual*.

Build-in Certificate



LOGO! build-in certificate includes LOGO! root certificate, LOGO! issuing certificate and LOGO! device certificate. You can view the brief information of each build-in certificate in LOGO!Soft Comfort. To download these certificates, click Save button to save the certificate in your PC. Or you can find the LOGO! build-in certificates in LOGO!Soft Comfort USB stick (Page 16).

PSK Certificate



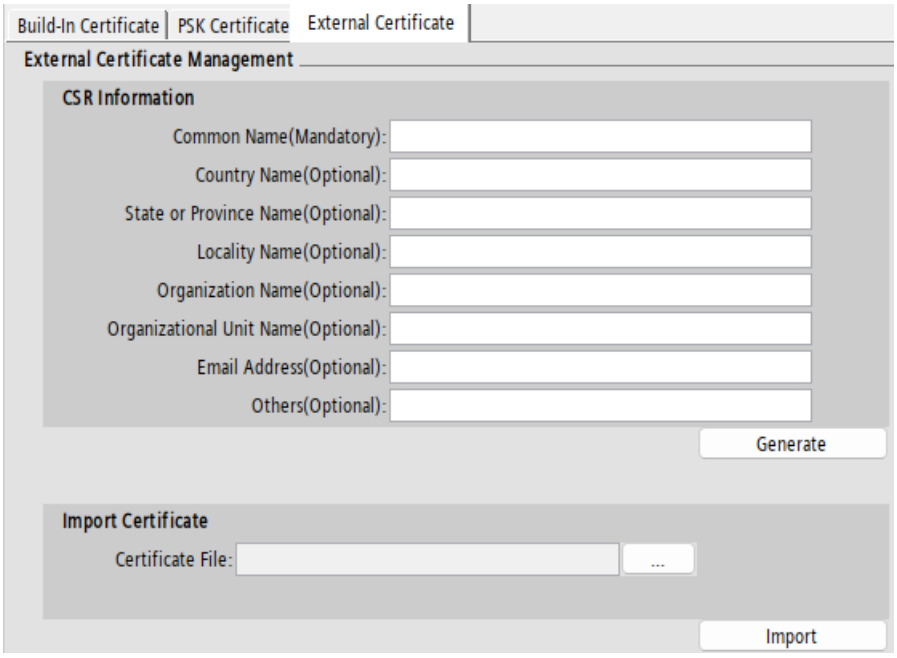
To generate a PSK (Pre-shared Key) certificate, you need to enter a password, then click the Generate button. LOGO! Soft Comfort will display the brief information of the generated PSK issuing certificate and PSK device certificate. Click the Save button to download and save the certificates to your PC.

Note

The PSK certificate password rule is as follows:

- ASCII characters are supported.
- The maximum length of password is 12.

External Certificate



Enter the CSR (Certificate Signing Request) subject, then click Generate button to generate the .CSR file. You need to save the .CSR file to your PC and use the third-party certificate authority to generate the external certificate.

Click ... button to import the generated external certificate. LOGO!Soft Comfort displays the brief information of the imported certificate.

Note

You can only generate the .CSR file in LOGO!Soft Comfort Online settings.

Note

CSR information input limits

Note the following input limits for CSR information:

- Common Name is mandatory to input.
- When the Common Name is set as a domain name, you must input it as the domain name format: example.com or *.example.com.
- ASCII characters are supported.
- Except the "Others" field, the length limit for all input field is 64 bytes.
- Country Name must be two upper case letters, for example, US, DE.
- Email Address must be in the email address format: user@example.com.
- For the "Others" field, the input format is, key=xxx. Use a comma to separate each pair when there are multiple pairs. "xxx" stands for the value you want to input. The key can only be: serialNumber, postalAddress, postalCode, title.

Note

Certificates validity period

For PSK certificates and external certificates, the device certificate's validity period is 47 days, while the issuing certificate's validity period is longer.

Verification of the certificate chain fails if the issuing certificate's validity period falls outside the device certificate's validity period.

To ensure that the PSK and external certificates work properly, it's recommended that you regularly check the their validity periods and regenerate them when necessary.

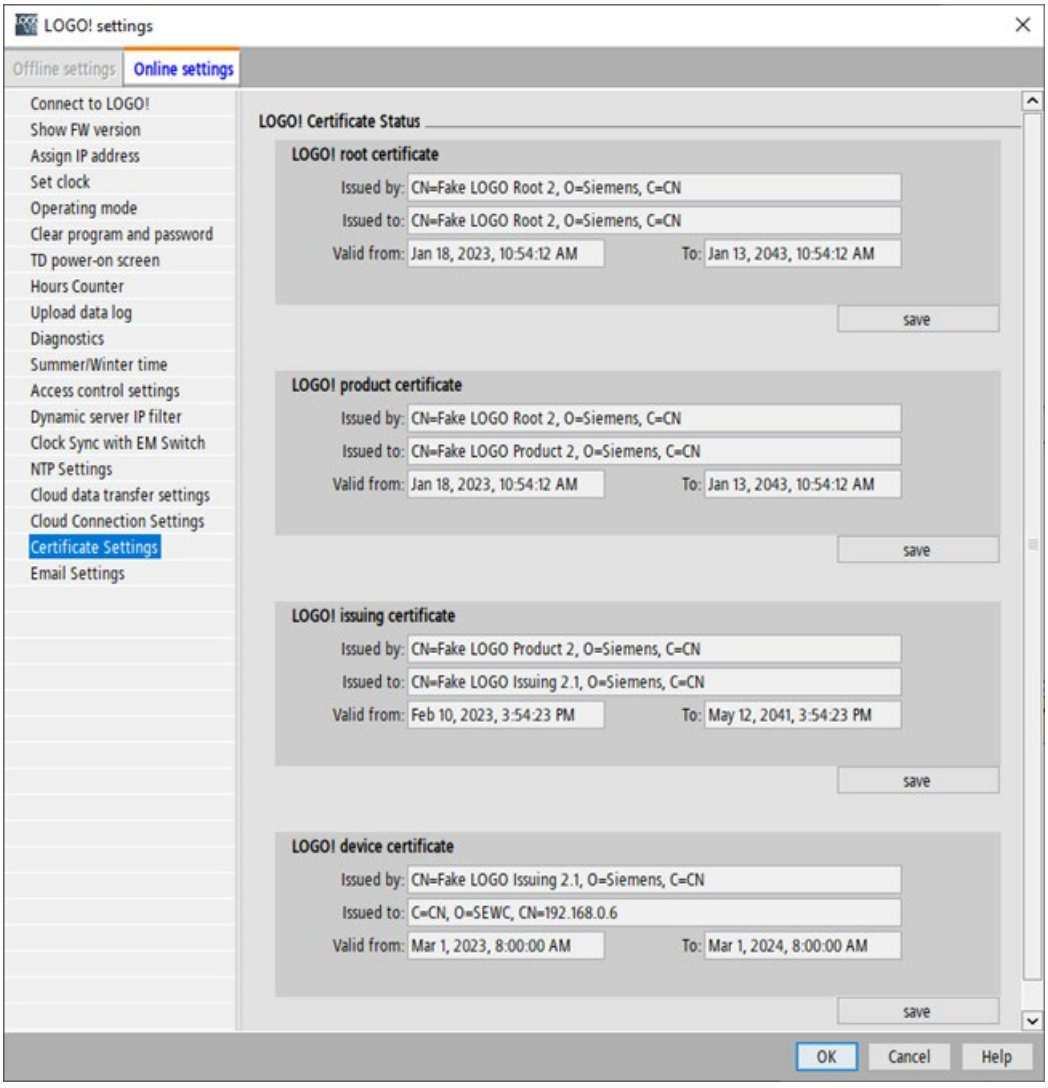
To set up the communication between devices, you need to import and trust the certificate from the communication server/client in one of the following cases:

- Using external certificate strategy
- Using different PSK passwords for the devices
- Using different certificate strategies for the devices

To learn how to manage the trusted external certificates, refer to LOGO! settings -> Online settings -> Trust CA settings (LOGO! 9 and later versions only) (Page 165).

Certificate settings for LOGO! 8.4 and 8.3 devices

This menu command allows you to check the status of all LOGO! certificates. You can also download and save each LOGO! certificate to your local file system.



You can check the valid period of all LOGO! certificates.

To save certain LOGO! certificate, click the **Save** button below corresponding certificate, then you can choose the path to store the certificate file.

0BA0 : 0BA9

0BA8:

For LOGO! 8.4 and 8.3 devices, certificate settings are available only in online settings.

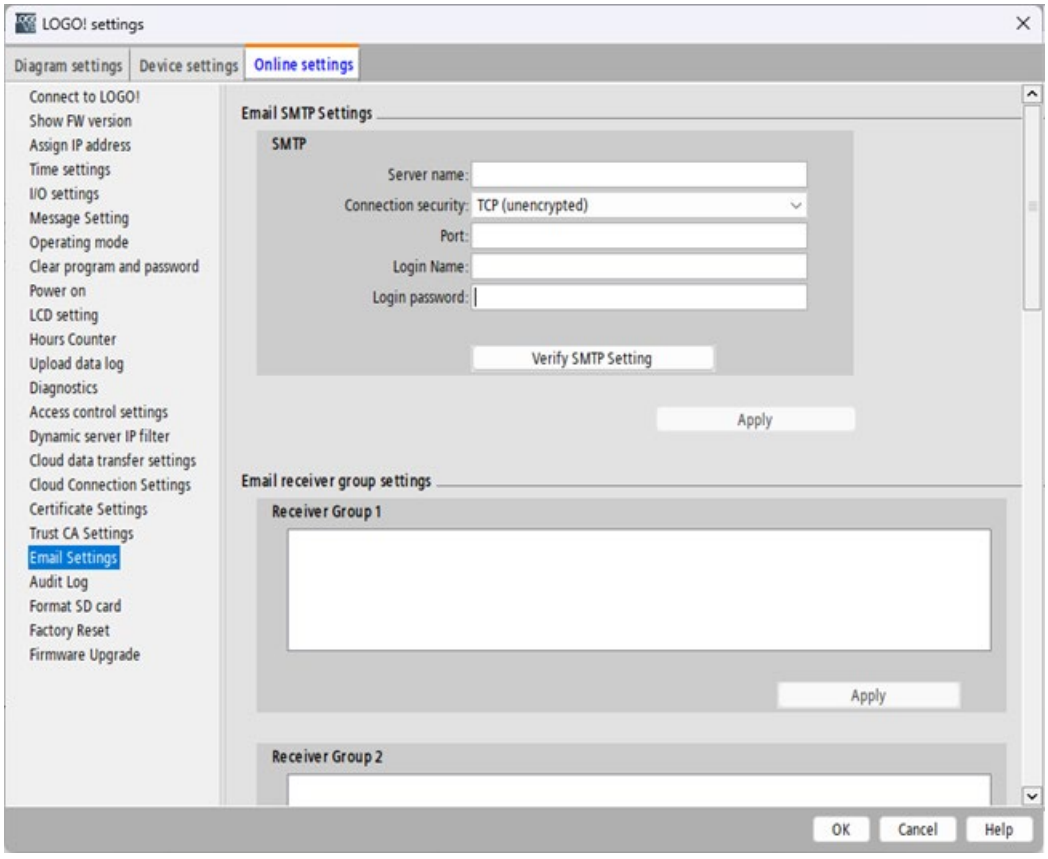
2.8.5.20 Tools -> Transfer -> Email Settings (0BA8 and later versions only)

This command allows configured email groups to receive customized notification email from the connected BM at trigger events.

For LOGO! 9 and later versions devices, Email settings are available both in Offline settings and Online settings in LSC. If you configure the email settings in online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer" (Page 92) for complete information.

SMTP Settings

LOGO! BM uses SMTP (Simple Mail Transfer Protocol) to send emails to the configured receivers.



Follow below steps to finish SMTP setting:

1. Input all required SMTP server information. You can get all the required SMTP configuration information from certain mail server official document.

   Note

   LOGO!Soft Comfort supports three types of connection security: TCP (unencrypted), STARTTLS and TLS. If you choose STARTTLS or TLS, for communication security, you can choose to upload CA certificate to verify the SMTP server. If the verification fails, then the configured emails cannot be sent out successfully, and you can check the error log in BM through: Diagnostics → Mail → Mail Logs. Refer to Troubleshooting (Page 598) to learn more about email sending error.

2. Click **Verify SMTP setting** button to verify your SMTP setting. The Send test email dialog pops up.
3. Input appropriate email addresses to receive the test email. Use semicolon to separate each email address apart when inputting more than one email address.
4. Click **Send test email** button to start the test process. The test status information displays on the dialog.

Note

SMTP server information

LOGO! BM keeps the configured SMTP information. You can find it on BM through: Diagnostics → Email → SMTP Info.

Email receiver group settings

You can configure 8 email receiving groups at most. Each email receiving group can contain 1 KB characters at most. You can use semicolon to separate each email address apart when inputting more than one email address in the email receiving group.

0BA8:
For LOGO! 8.4, Email settings are available only in online settings.

2.8.5.21 Tools -> Transfer -> Hours Counter

LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

Use this menu command to read the hours counter of the connected LOGO!.

See Hours counter (Page 381) for more information.

You can also access the hours counter from the LOGO! devices. You do not have to enter a password to read the hours counter even when the target program is password-protected.

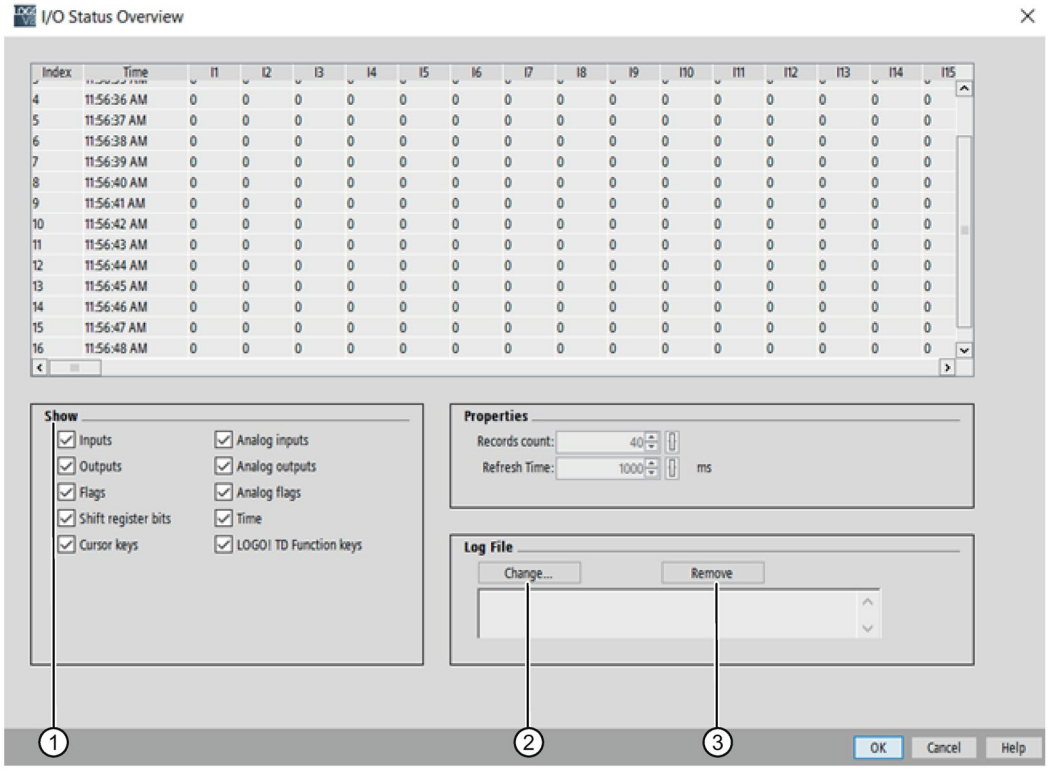
Note

Only the LOGO! devices of 0BA3 and later versions support this function.

2.8.5.22 Tools -> Transfer -> I/O Status (0BA7 and later versions only)

LOGO!Soft Comfort requires that you confirm the connection interface from the "Interface" dialog for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

Use this menu command to display and save I/O status information:



Configuring the status display

Under "①" in the screen above, you can select which I/O to display in the status window.

Configuring the status display properties

Here you can define the maximum number of status records. You can choose from 20 to 100.

Here you can also define the interval between I/O status refreshes. You can choose a refresh time from 500 ms to 30000 ms.

Configuring the log file

You can export all I/O status information to a .CSV file. You can change or remove the path for saving the log file.

To save the I/O status information to a .CSV file, follow these steps:

1. Click "②" in the screen above and specify a path for saving the log file.
2. You can also remove the log file if you click "③" in the screen above.
3. Save the I/O status information to the specified log file.

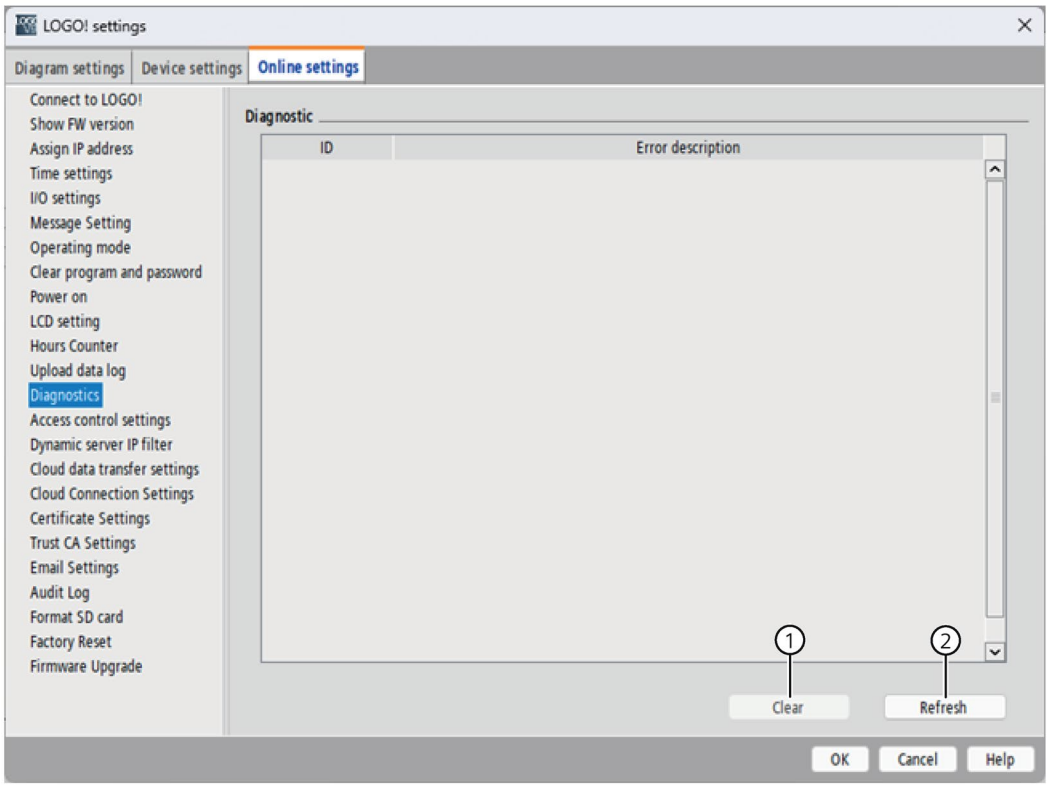
If you do not specify a log file, LOGO!Soft Comfort closes the I/O Status Overview without saving it to a file.

2.8.5.23 Tools -> Transfer -> Diagnostic (0BA7 and later versions only)

LOGO!Soft Comfort requires that you confirm the connection interface from the "Interface" dialog for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

The diagnostic function tracks the following types of basic error information:

Device	Error description
LOGO! BM 9 LOGO! BM 0BA8	• Ethernet link errors • Expansion module changed • SD card read/write errors • SD card does not exist • SD card is full
LOGO! BM 0BA7	• Network access errors • Expansion module bus errors • SD card read/write errors • SD card write protection



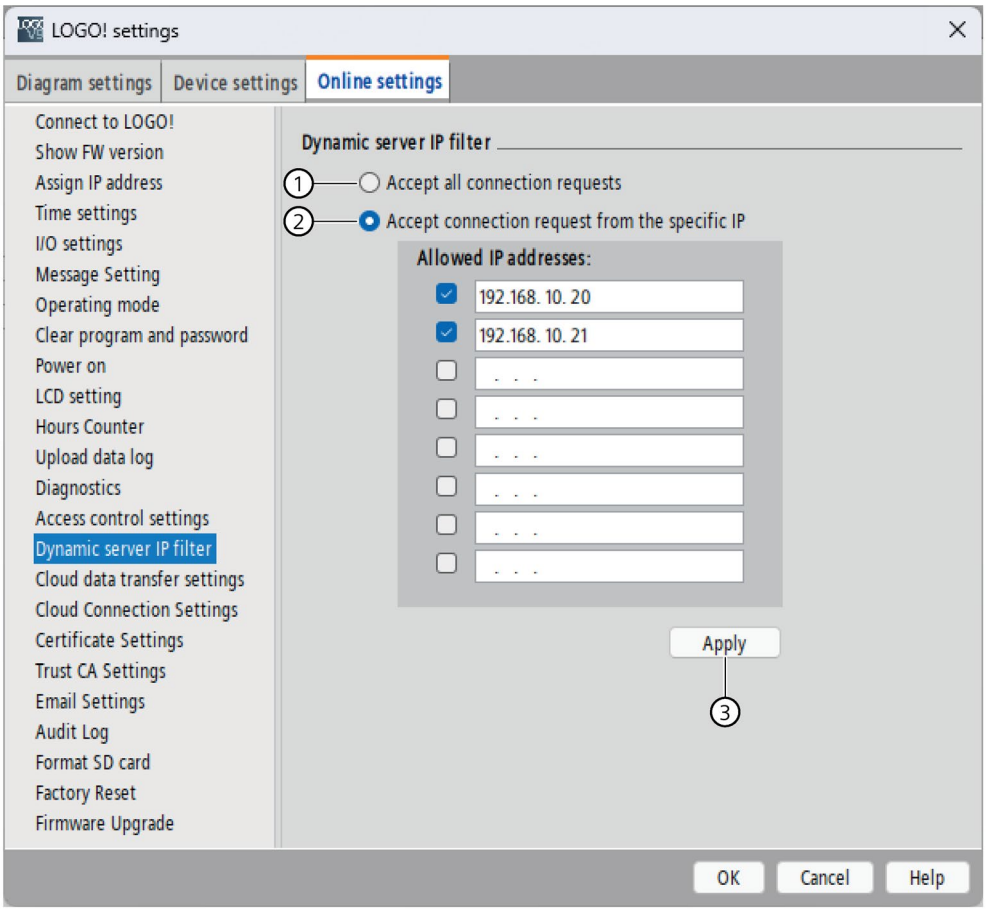
You can use this LOGO!Soft Comfort command to get the error information.

By clicking "①", you can delete all the error records you selected. By clicking "②", you can get the latest error information of the connected Base Module.

2.8.5.24 Tools -> Transfer -> Dynamic Server IP Filter (0BA8 and later versions only)

Use this menu command to show and configure the ACL (Access Control List) of the connected LOGO! Base Module.

For LOGO! 9 and later versions devices, Dynamic server IP filter is available for configuration in both Device settings and Online settings in LSC. If you configure the dynamic server IP filter in online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.



If you click checkbox "①", LOGO! Base Module allows access requests from all IP addresses.

If you click checkbox "②", LOGO!Soft Comfort provides an allowed IP addresses list of eight check boxes, each with an IP address input box for IP filtering configurations.

Click a checkbox in the list, input the IP address of the LOGO! Base Module and click "③" to authorize its access.

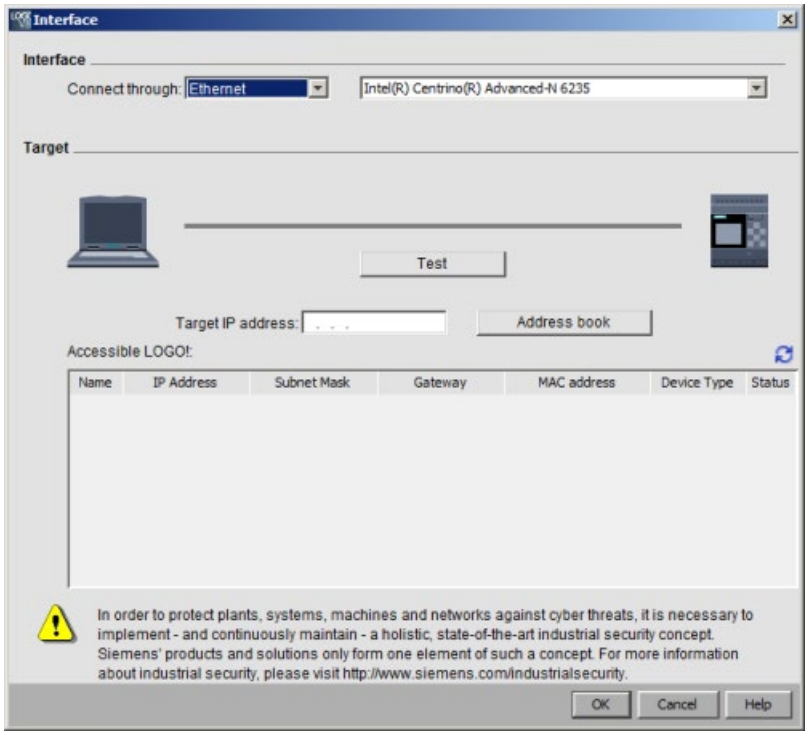
0BA0 : 0BA9

For LOGO! BM prior to LOGO! 9, Dynamic server IP filter is available to configure only in online settings.

2.8.5.25 Tools -> Transfer -> Configure TDE Device (LOGO! TDE 6ED1055-4MH08-0BA0 and later versions)

With this command, you can establish communication between the LOGO! TDE and LOGO!Soft Comfort.

When you select this menu command, LOGO!Soft Comfort displays the following **Interface** dialog.



Note
LOGO! 9 TDE

Only LOGO!Soft Comfort V0.90 or later versions can communicate with LOGO! 9 TDE.

Note
LOGO! 9 TDE

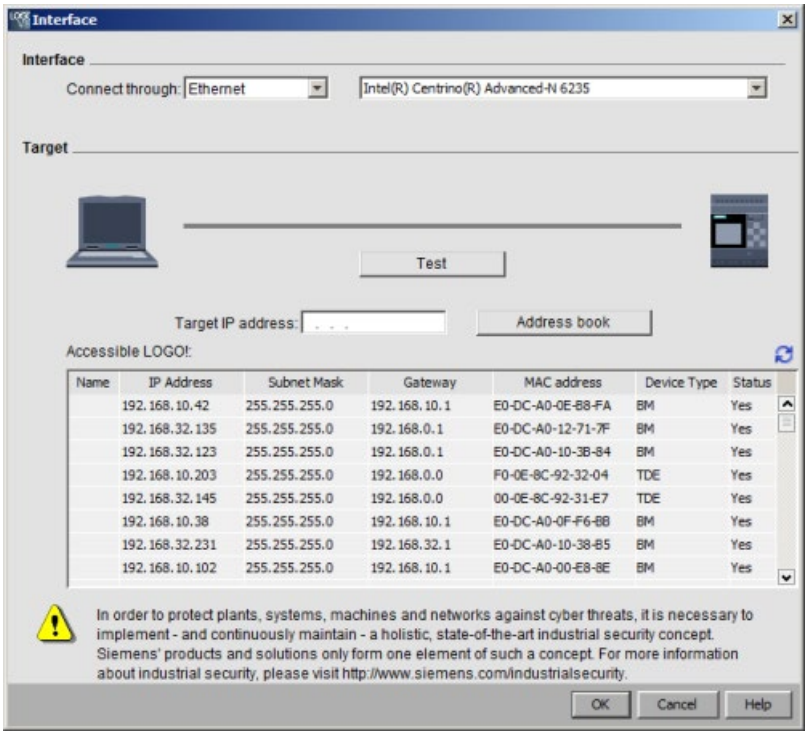
When you establish the communication between LOGO! 9 TDE and LOGO!Soft Comfort for the first time, LSC reminds you to configure the password for user "admin". After the password configuration, you will finish the communication setup and log in TDE as the user admin.

Transfer through Ethernet

If you select Ethernet for the communication, you can either choose a target IP address from the accessible LOGO! TDE list or enter a known IP address.

You can also store the LOGO! TDE information in the address book for your future use.

Perform the steps below to detect a valid LOGO! TDE automatically.



1. Click **Address book** button on the above screen to show the address book.
2. Enter the IP address of the LOGO! TDE. Keep the default subnet address of "255.255.255.0" unchanged.
3. Enter the correct gateway IP address. Make sure you have completed this step if your LOGO! TDE is in the same LAN.
4. Save the item in your address book.

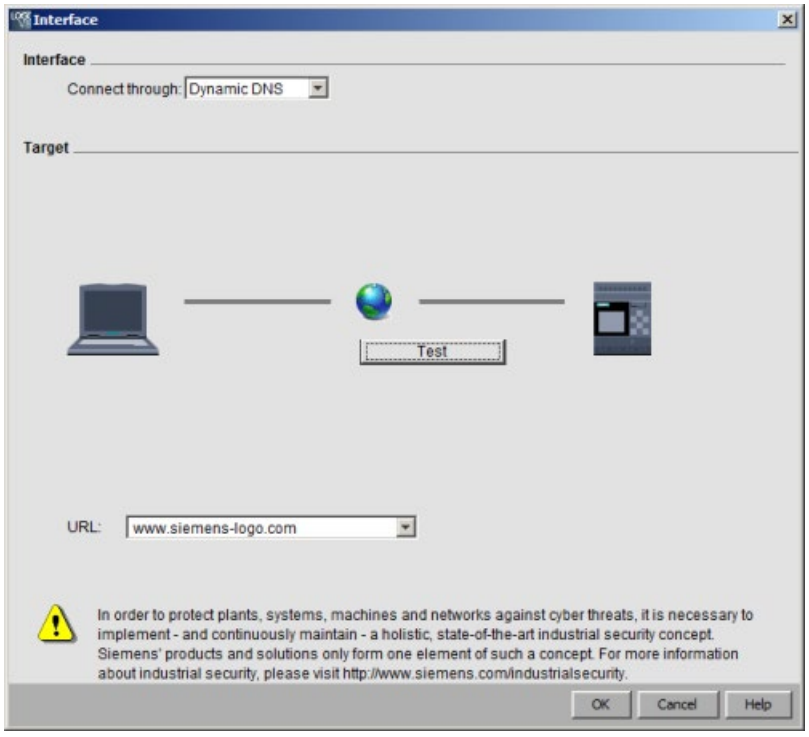
You can click to acquire the new accessible LOGO! TDE.

LOGO!Soft Comfort saves the scanned LOGO! TDE to the accessible LOGO! list for your future use.

Transfer through Dynamic DNS

If you select Dynamic DNS for the communication, enter an URL address to the URL textbox.

You can recall the URL address you entered before by clicking the arrow in the URL textbox.



You must configure your router in order to access the LOGO! TDE through dynamic DNS. Make sure you complete the following settings before connection:

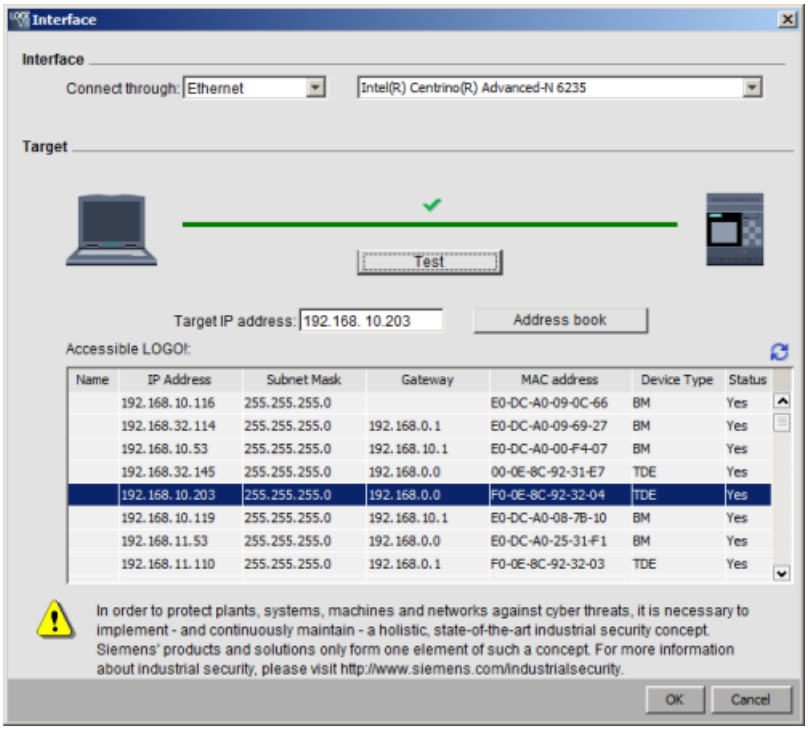
- Set a valid dynamic DNS account to remote LOGO! TDE
- Add the dynamic DNS of the remote LOGO! TDE to the local router as a HTTP virtual server

Connection test

After you select the desired connection interface, you can test the connection in the same dialog.

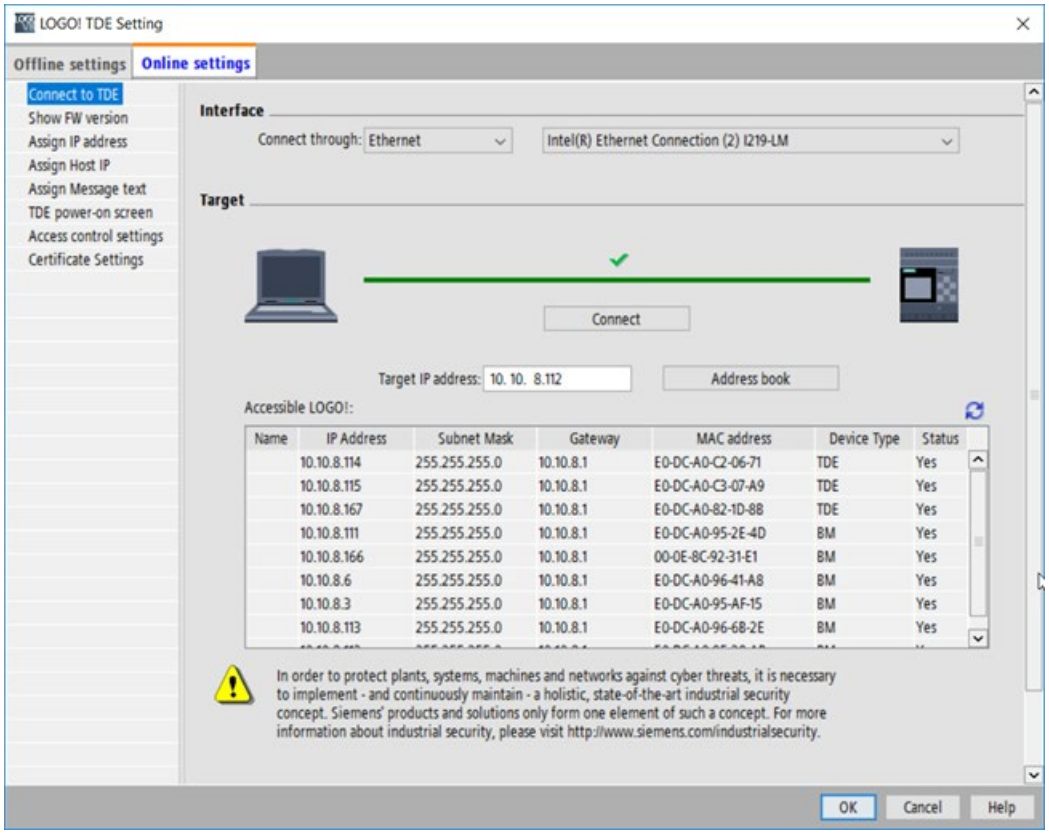
Click **Test** button on the following screen to check if the connection is ready.

The grey connection line turns green and you see a check mark icon above the line if your connection is successful.



Then you can see the LOGO! TDE is connected to the LOGO!Soft Comfort. After clicking the **OK** button, the **LOGO! TDE settings** dialog appears.

In the **LOGO! TDE settings** dialog, the Online setting tab is editable.

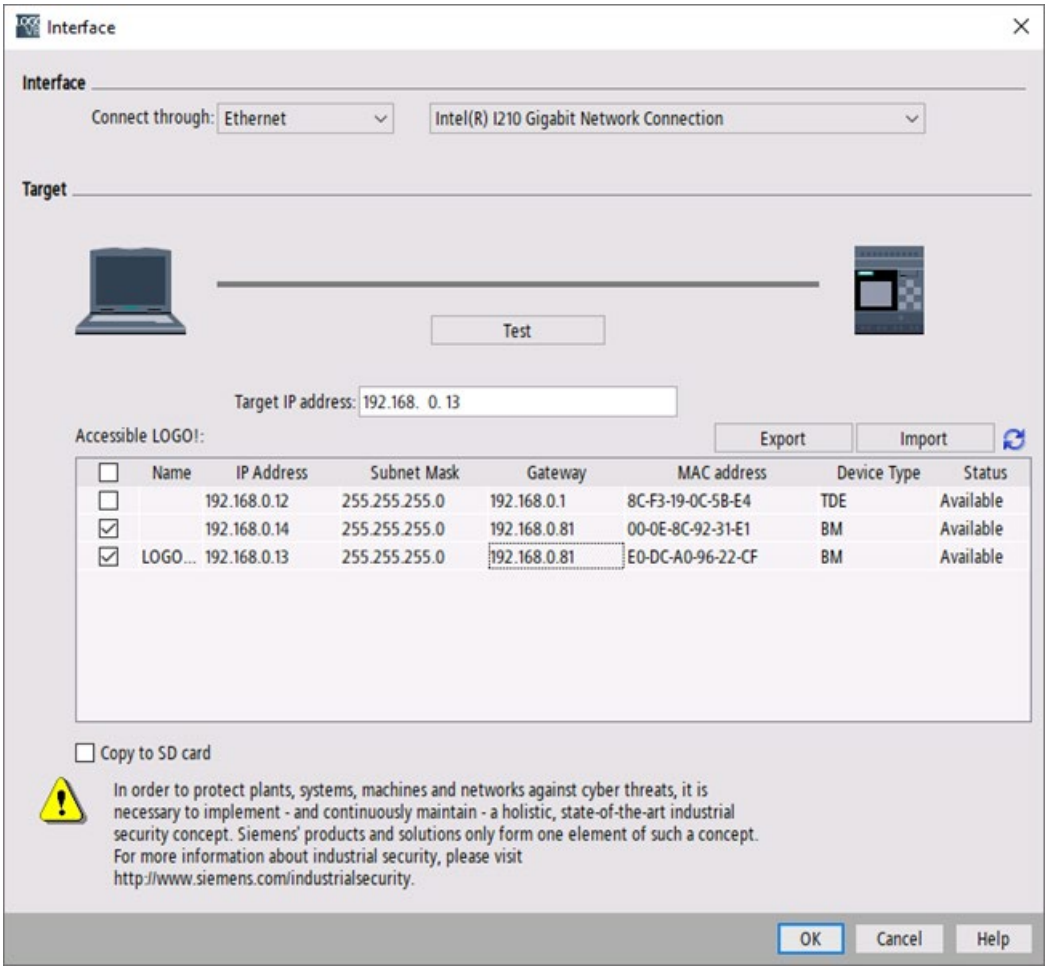


For the detailed information on LOGO! TDE Online setting, refer to Configuring LOGO! TDE online settings (Page 261).

2.8.5.26 Tools -> Transfer -> Batch Download -> Diagram Batch Download (LOGO! 8.4 and later versions only)

With this demand, you can download current circuit diagram to the connected target LOGO! devices in a batch. This command is only available when you are in Diagram Mode.

When you select this menu command, LOGO!Soft Comfort displays the following interface dialog:



To proceed the batch download function, you should firstly get the information of all the connected LOGO! devices. There are two ways to get these devices:

- Click to acquire available devices in the network, which will then be displayed in the Accessible LOGO! table.
- Click **Import** button and the Import IP Address dialog pops up for you to add devices manually. Click **OK** button then the devices that you have added will be displayed in the Accessible LOGO! table.

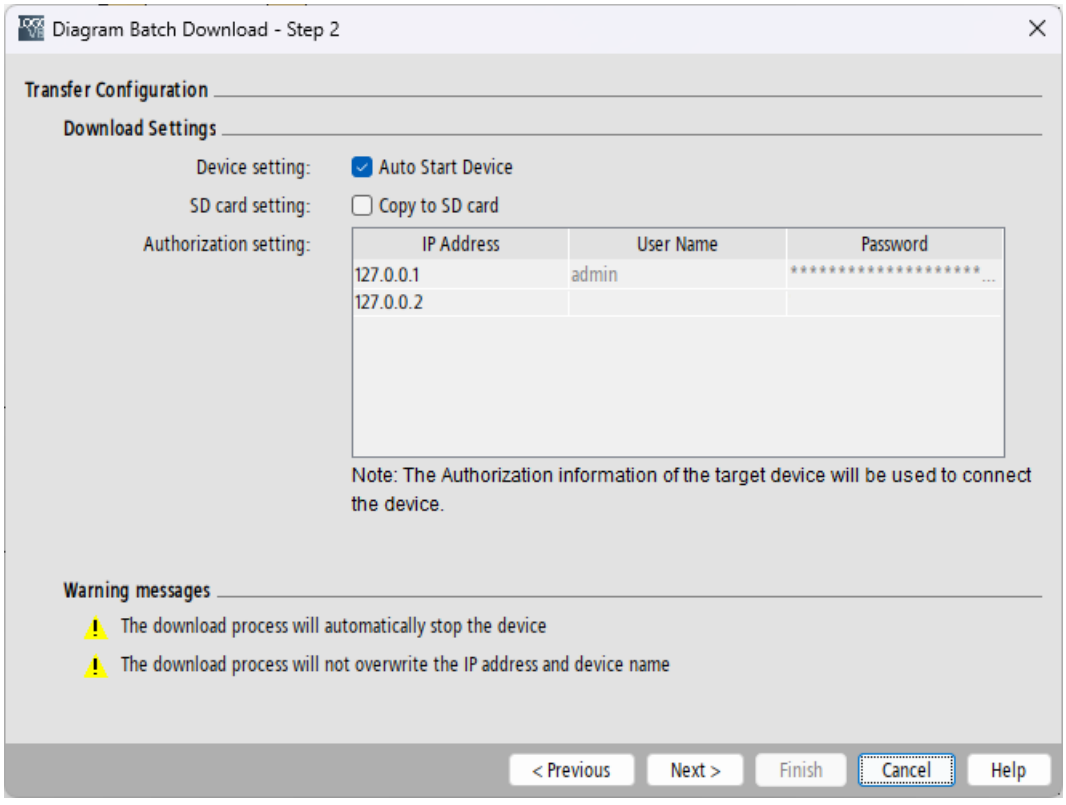
After getting all accessible devices displayed in the Accessible LOGO! table, you can click checkboxes in the table to select devices you want to download the diagram into. By clicking the checkbox in the first row of the table, you can select all devices displayed in the table.

You can sort each column of the Accessible LOGO! table by number or letter through clicking each column title.

Click **OK** button to continue the process.

Batch download to LOGO! 9 (or later versions) devices

If there are LOGO! 9 (or later versions) devices in the target devices list, a transfer configuration window will appear for more configurations.



For LOGO! 9 (or later versions) devices, you need to input the correct user name and password for the corresponding device.

Click Next.

Click Start Transfer. Then you can see the detailed transfer process. When the download finishes, you can see the download result of each target device. If you have entered wrong user name or password for the device in the Authorization setting, then download to the device fails.

Note

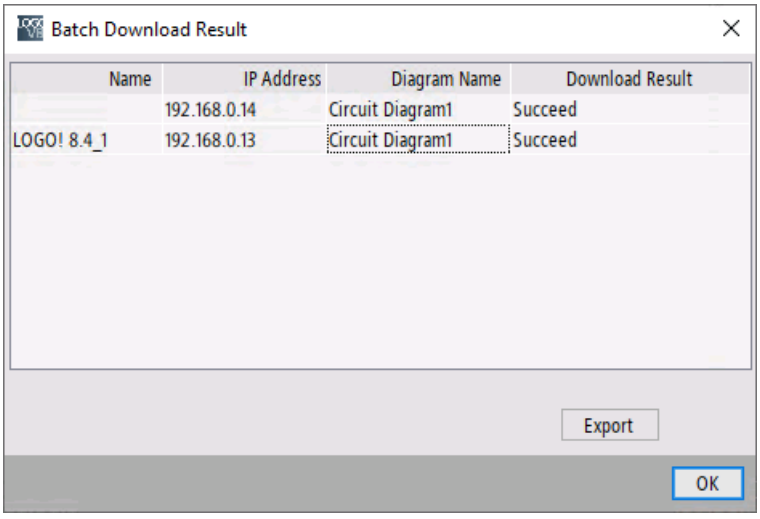
Message block

If the circuit diagram contains Message text blocks, the download to LOGO! 9 devices will fail. You need to manually convert the Message text block to LCD Message block. To learn more about converting the message blocks, refer to LCD message (LOGO! 9 and later versions) (Page 449).

Batch download to LOGO! 8.4 devices

If the download target devices are LOGO! 8.4 devices, LOGO!Soft Comfort will directly start downloading.

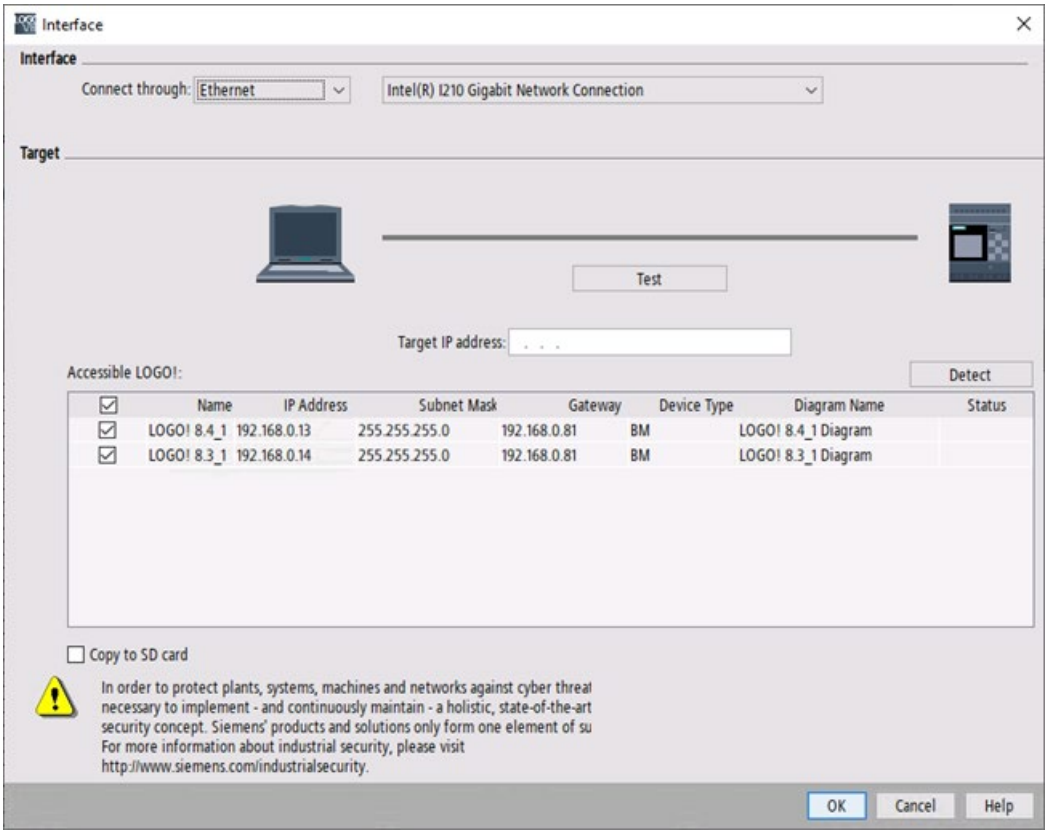
After the process finishes, the Batch Download Result dialog pops up. You can check if the diagram downloading to each target device succeeds or not.



2.8.5.27 Tools -> Transfer -> Batch Download -> Network Batch Download (LOGO! 8.4 and later versions only)

With this demand, you can download each circuit diagram to the corresponding LOGO! device in a batch. This command is only available when you are in Network Project.

When you select this menu command, LOGO!Soft Comfort displays the following interface dialog:

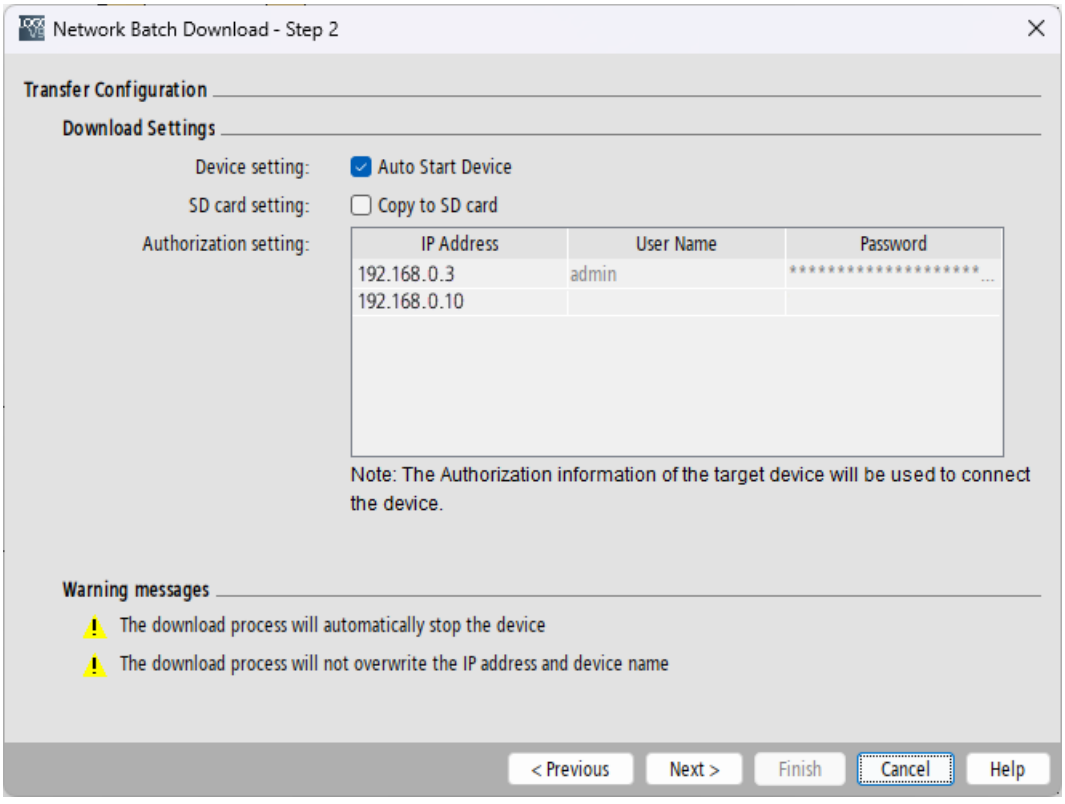


You can find all LOGO! devices you have added displayed in the Accessible LOGO! table. You can click checkboxes in the table for the batch download. By clicking the checkbox in the first row of the table, you can select all devices and their corresponding diagrams displayed in the table.

You can sort each column of the Accessible LOGO! table by numbers or letters through clicking each column header.

Click **OK** button

Batch download to LOGO! 9 (or later versions) devices



For LOGO! 9 (or later versions) devices, you need to input the correct user name and password for the corresponding device.

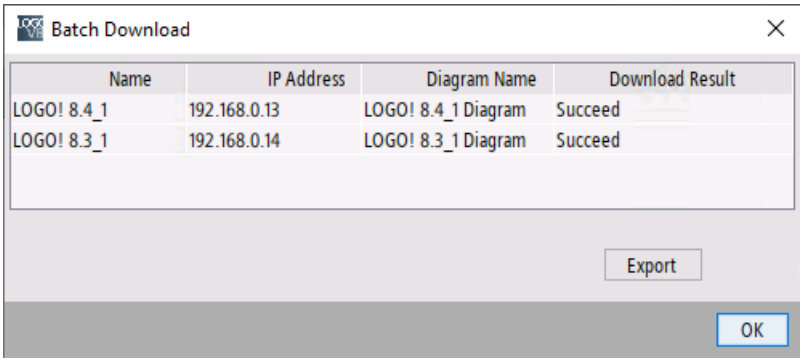
Click Next.

Click Start Transfer. Then you can see the detailed transfer process. When the download finishes, you can see the download result of each target device. If you have entered wrong user name or password for the device in the Authorization setting, then download to the device fails.

Batch download to LOGO! 8.4 devices

If the download target device is LOGO! 8.4 device, LOGO!Soft Comfort will directly start downloading.

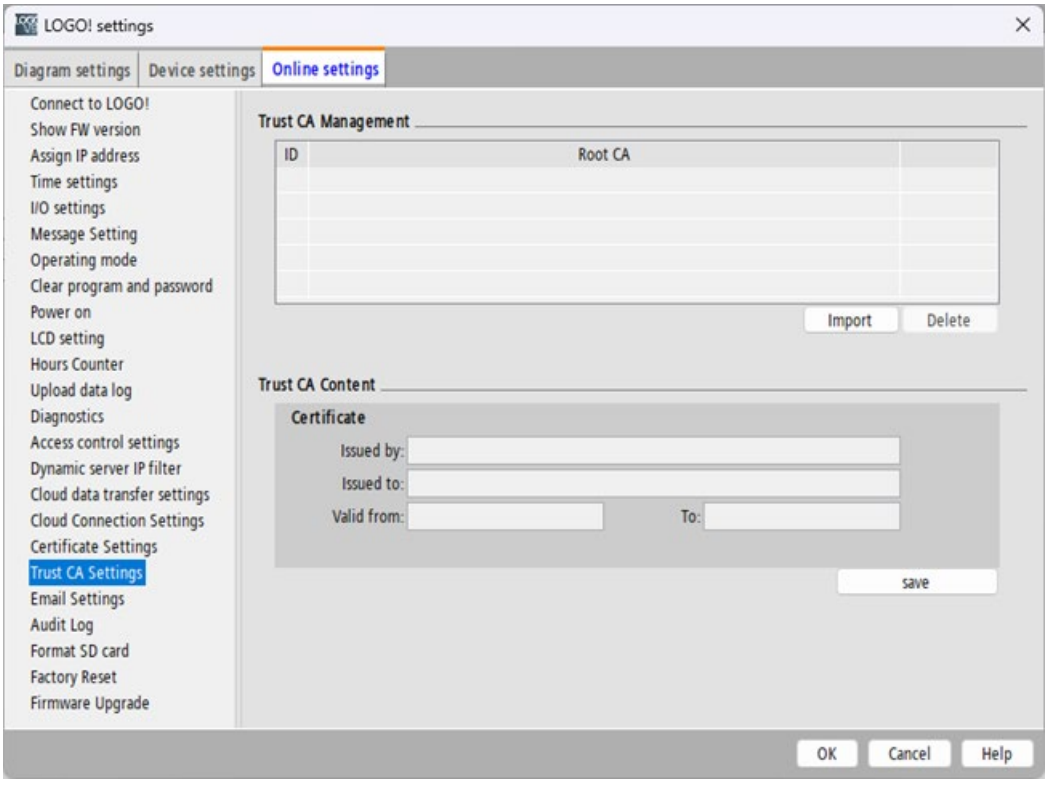
After the process finishes, the Batch Download Result dialog pops up. You can check if each diagram downloading to the corresponding device succeeds or not.



2.8.5.28 LOGO! settings -> Online settings -> Trust CA settings (LOGO! 9 and later versions only)

You can configure the trust CA for LOGO! 9 and later version devices in both Device settings and Online settings in LOGO!Soft Comfort. When you configure trust CA in Online settings, LSC requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This menu command allows you to manage the trusted CA certificates.



Click Import button to upload the trust CA certificate. LOGO!Soft Comfort displays the brief information of the imported certificate. LOGO!Soft Comfort supports the import of up to four trust CA certificates here.

Note

Certificate strategy

To ensure stable and secure communication, it's recommended to use the same certificate solution for the communication server and client.

If the server and client use different certificate solutions, you need to import and trust the corresponding certificate from the server/client. Otherwise, the communication server and client cannot set up the connection.

2.8.5.29 LOGO! settings -> Online settings -> Time settings

This menu command provides you the following time configurations for LOGO! Base Modules:

- Batch Clock setting
- Set Clock (date and time settings)
- NTP Settings
- Time Zone
- Summertime/Wintertime

For LOGO! 9 and later versions devices, except Set Clock, all the other time settings are available for configuration in both Device settings and Online settings. Set clock is only available in online settings in LSC.

If you set time for LOGO! BM in online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

Enabling batch clock setting (LOGO! 9 and later versions only)

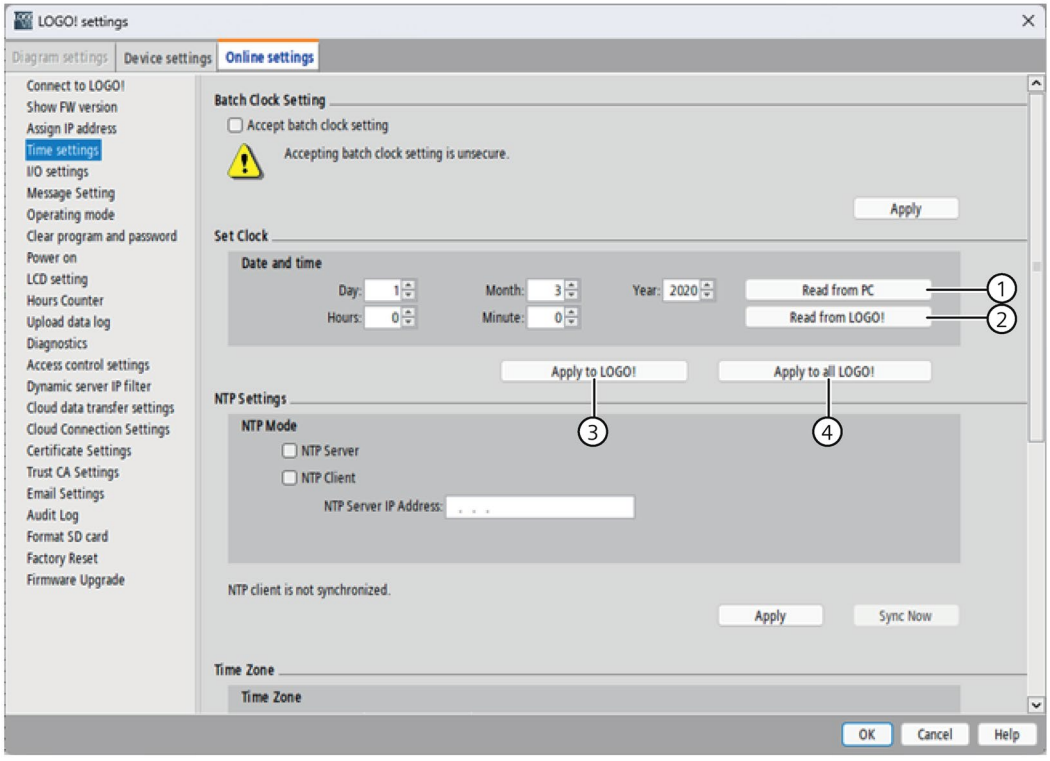
After you enable batch clock setting, when you set the date and time and apply the settings to all LOGO!, all LOGO! BMs in the network will update to the configured date and time.

Note

Enabling batch clock setting is not secure.

Setting the date and time for LOGO! Base Modules

LOGO!Soft Comfort allows you to read the date and time from the PC or the LOGO! Base Module directly:



Click "①" to read the date and time from the connected PC, or to click "②" and acquire it from the connected LOGO! Base Module.

Click "③" to save the date and time displayed to the LOGO! Base Module connected with the LOGO!Soft Comfort.

Click "④" to save the date and time displayed to all the LOGO! Base Modules in the Local Area Network (LAN).

0BA0 : 0BA9

For LOGO! 9 and later versions, **Apply to all LOGO!** function works only when the batch clock setting is enabled.

LOGO!Soft Comfort synchronizes the time and date among Base Modules in the same network segment with the local PC.

Manual input of values

You can enter the date and time values by entering in the number input box or by clicking the UP and DOWN arrow icons. LOGO!Soft Comfort automatically corrects any invalid date values.

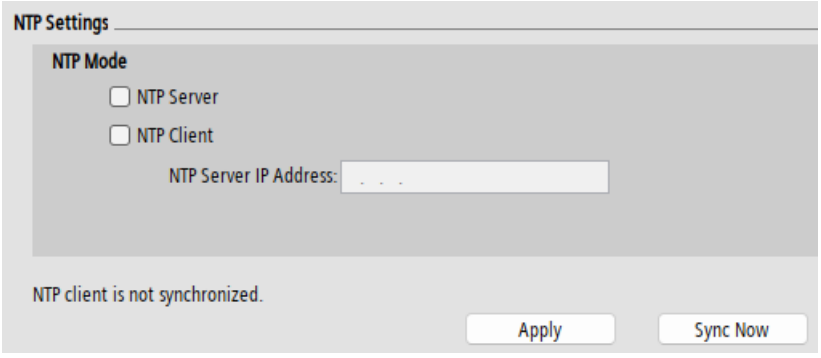
NTP Settings (LOGO! 8.FS4 and later versions only)

Here you can set BM as NTP (Network Time Protocol) server or client. The NTP function is disabled if neither mode is selected.

If you set a LOGO! Base Module as NTP client, you must enter the NTP server IP address for the module.

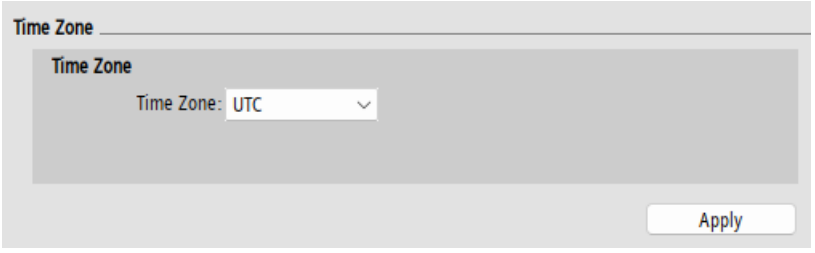
Note

Currently, LOGO! can only recognize IP address but not host name. Please parse the NTP server host name to IP address first.



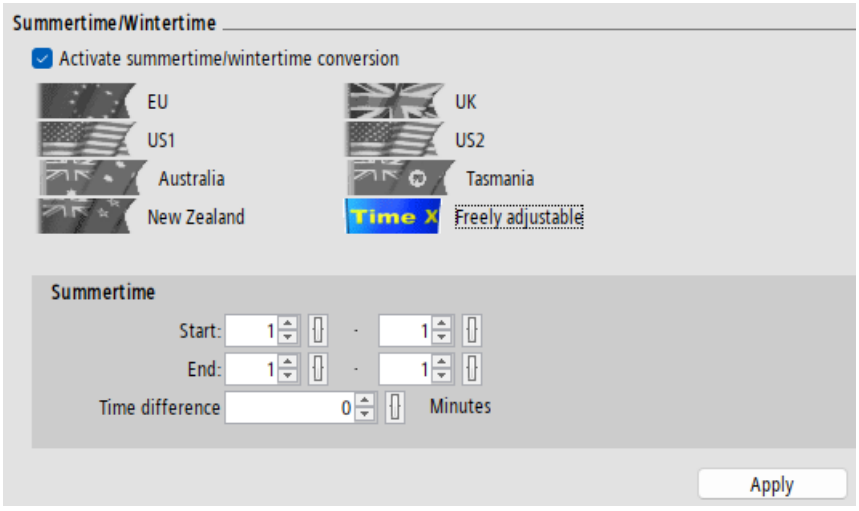
Time Zone Settings

Here you can set the time zone for the LOGO!.



Setting the Summertime/Wintertime

This menu command lets you set an automatic conversion of the summer and winter time for the LOGO! Clock:



When you enable summer/winter time conversion, you can specify a country-specific time conversion:

- EU: European Union
- UK: United Kingdom of Great Britain and Northern Ireland
- US1 / US2: United States of America
- Australia
- Tasmania
- New Zealand
- Freely adjustable: customized switchover dates and times

For the "Freely adjustable" selection, you specify the month and day of the switchover. The start time of summer time is 02:00 + the entered time difference; the end time is 03:00 – the entered time difference.

The United States of America redefined the Daylight Saving Time / Standard Time calendar in 2007. US1 is the convention in effect prior to 2007 and US2 is the convention defined in 2007 where Daylight Saving Time is in effect from 2:00 a.m. on the second Sunday in March until 2:00 a.m. on the first Sunday in November according to the local time zone.

Note

LOGO! devices as of series 0BA3 and later support the summer/winter time conversion.

LOGO! devices as of series 0BA6 and later support the US2 selection.

0BA0 - 0BA8:
For LOGO! BM prior to LOGO! 9, all the time settings are available to configure only in online settings.

2.8.5.30 LOGO! settings -> Online settings -> Audit Log (LOGO! 9 and later versions only)

Audit Logs overview

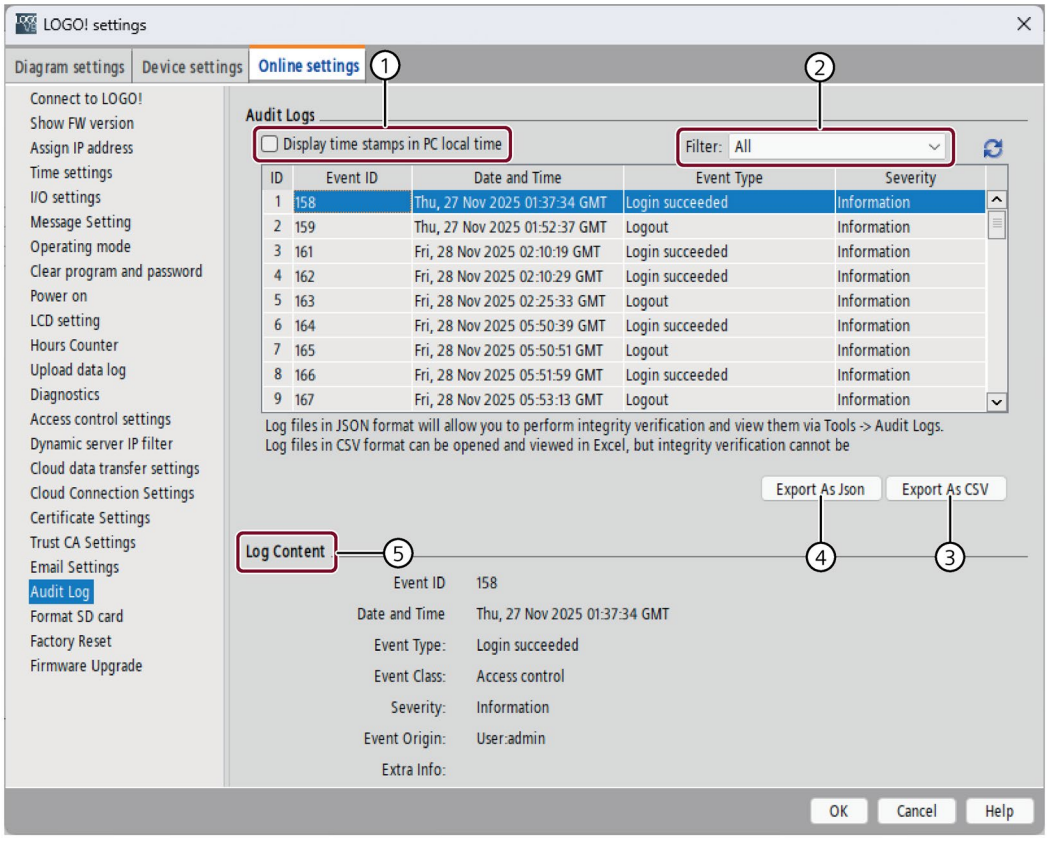
LOGO! 9 Base Module generates and records BM operations as the audit logs. LOGO!Soft Comfort allows you to view, export and import the BM's audit logs. Audit logs are displayed in the same language as the display language of LOGO!Soft Comfort. To learn how to change LSC display language, refer to Tools -> Options: General (Page 216).

Audit log	Description
Event ID	The ID of the audit log event. The maximum value for this ID is 0x7FFFFFFF. LOGO! BM can only store up to 64 audit log records. When the number of records exceeds this limit, the oldest records are overwritten by newly generated audit logs. The internal audit log storage is split into security and non-security regions; overwrites occur independently within each region (i.e., each region only overwrites records in its own area). Note: When an overwrite event occurs, an audit log named as "Audit log first-time overwritten" will be generated and recorded. This audit log will never be overwritten by any newly generated audit logs.
Date and Time	The BM date and time when the event occurs.
Event Type	The brief description of the event, for example, circuit diagram stopped/started, SD card inserted/pulled out, device IP changed and so on.
Event Class	LOGO! BM records the following types of audit event: • Access control • Request error • System • Backup and recovery • Configuration change • Auditable log
Severity	The severity level of event impacting the system: • Critical • Error • Warning • Info • Debug

Audit log	Description
Event Origin	The origin of the audit event: • Bootloader • SD card • Certificate management module • Device info module • Diagram management module • Communication management module • Time management module • EM module • Auditable log management module • Driver • Power • User management module
Extra Info	Additional information of the event.

Exporting audit logs

Export the online audit logs to your PC through LOGO! settings -> Online settings -> Audit Log. To access the Online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.



All audit logs from the connected BM are displayed in the table. Click ① to convert the BM's timestamp of audit log events to the PC local date and time.

Click ② to filter the audit logs by the event type.

Click to retrieve all audit logs from the BM. Note: An additional audit log entry will be generated for this retrieval action.

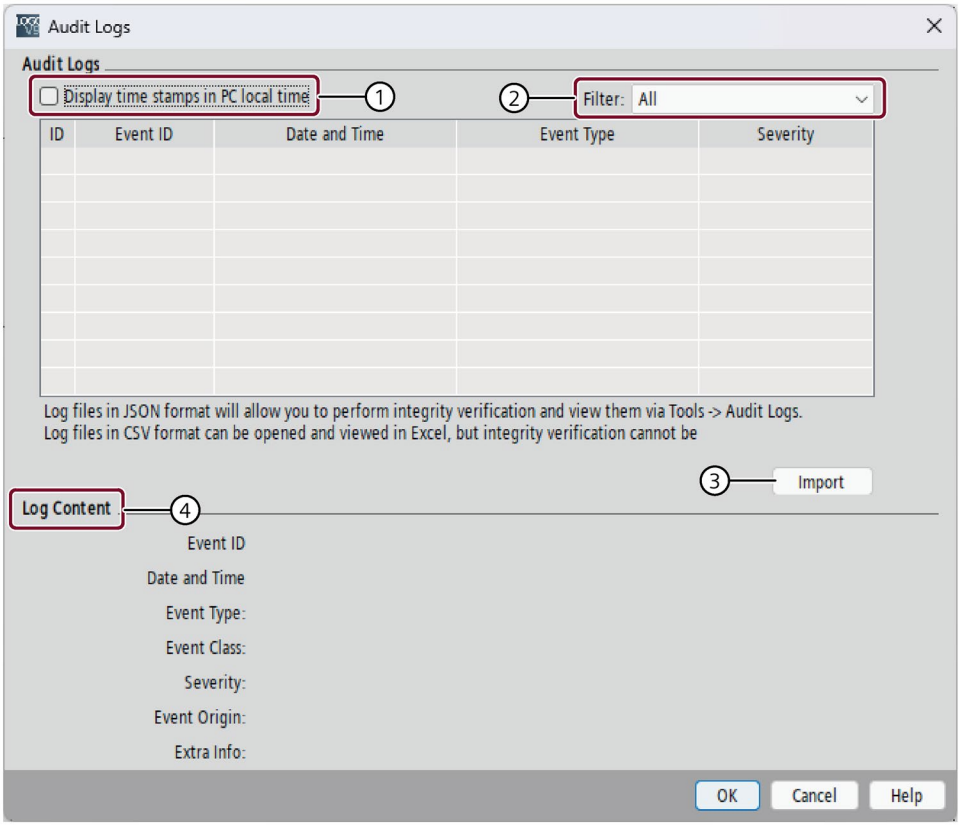
Click ③ to export the audit logs as a CSV file and save it to your PC.

Click ④ to export the audit logs as a JSON file and save it to your PC.

When you select an audit log in the table, its detailed information of the audit log will be displayed in ⑤.

Importing audit logs

Select the command Tools -> Audit Logs to import offline audit logs into LSC.



Click ③ to import an audit log file from your PC to LSC, then you can view the imported audit logs in the table.

Click ① to convert the BM's timestamp of the audit log events to the PC local date and time.

Click ② to filter the audit logs by the event type.

When you select an audit log in the table, its detailed information will be displayed in ④.

Note

LOGO!Soft Comfort verifies the integrity of the imported audit logs. If any changes have been made to the imported file, LOGO!Soft Comfort will reject the import.

2.8.5.31 LOGO! settings -> Online settings -> Format SD card (LOGO! 9 and later versions only)

To access the Online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This command allows you to format the micro SD card in the connected LOGO! BM.

To format the micro SD card, press Apply button. A dialog appears to confirm the operation. Click Yes to implement the action.

Formatting the micro SD card works only when the connected BM is in STOP mode. If the BM is in RUN, when using the command, LSC will remind you to switch BM to STOP mode.

When the operation finishes, a dialog will appear to inform you whether the operation succeeds or fails.

Note

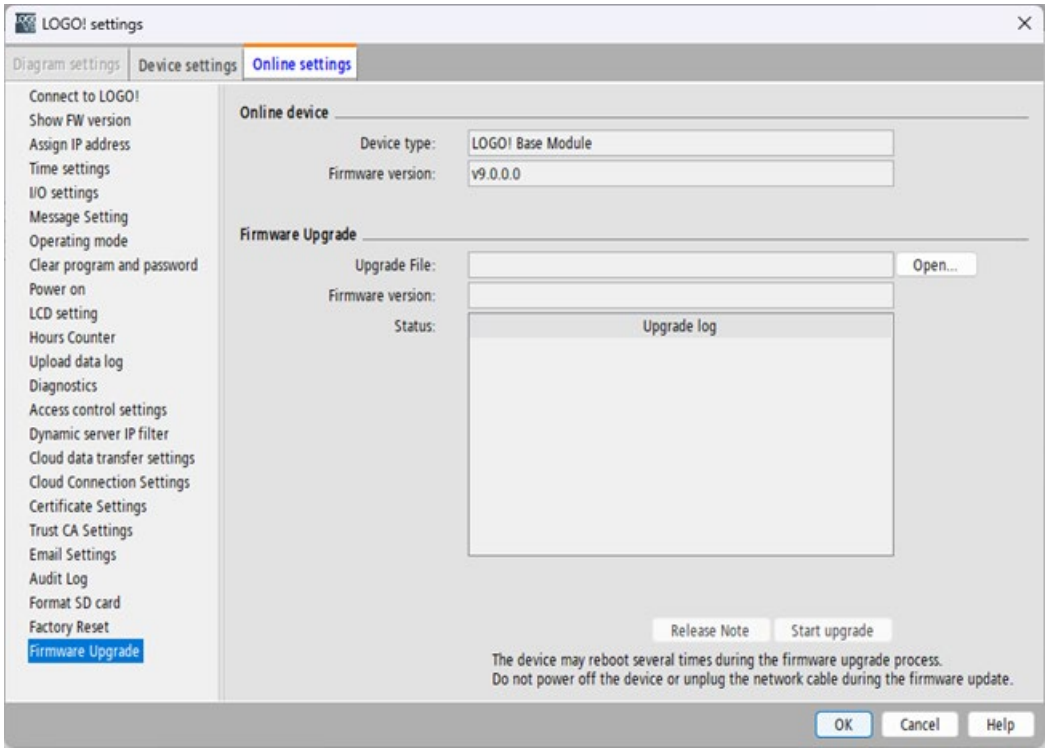
Abnormal power-off

Abnormal power-off of the BM during micro SD card formatting may damage the file system of the micro SD card, and cause the BM to not recognize the micro SD card after power-on. To recover the micro SD card, you can start the formatting again.

2.8.5.32 LOGO! settings -> Online settings -> Firmware Upgrade (LOGO! 9 and later versions only)

To access the Online settings, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

This command allows you to upgrade the firmware of the connected LOGO! 9 or later versions devices.



Upgrade preparations

Before upgrading the LOGO! firmware, you need to make the following preparations:

- Check the LOGO! device version

  Upgrading firmware through LOGO!Soft Comfort is only supported for LOGO! 9 and later versions devices.

- Check the LOGO!Soft Comfort version

  Firmware Upgrade command is only available for LOGO!Soft Comfort V9.0 or later versions.

- Download the `LOGO_device_upgrade_package.duf` file from SiePortal (https://sieportal.siemens.com/en-ww/home) or ID Link

  To learn more about the ID Link, refer to the *LOGO! System Manual*.

Firmware upgrade procedures

1. Click the Open button to upload the `LOGO_device_upgrade_package.duf` file.

   After the upgrade file is uploaded to LSC, the firmware version in the upgrade file will be displayed. If the firmware version in the upgrade file is not higher than the firmware version of the connected LOGO! BM, LSC will notify you that the upgrade cannot proceed.

2. Click the Start upgrade button. LSC will start the firmware upgrade.

   LSC displays the upgrade process in the Status area. During the upgrade, for LOGO! devices with an LCD screen, it will display the upgrade process on the screen; for LOGO! devices without an LCD screen, the amber LED on the device will flash rapidly.

LOGO! will restart automatically when the firmware upgrade completes.

You can also upgrade LOGO! firmware using micro SD card. To learn the detailed information, refer to the LOGO! System Manual.

2.8.5.33 Tools -> Determine LOGO!

When you click this menu command, LOGO!Soft Comfort calculates the minimum LOGO! version requirements for the LOGO! circuit program. LOGO!Soft Comfort shows the result in the status bar (Page 39). The info window displays all versions to which you can download the program. You can also use the function key (Page 39) [F2] to execute this menu command.

2.8.5.34 Tools -> Select Hardware

You have two options of selecting the device when you create your program or project in LOGO!Soft Comfort:

- You can first create your program or project and then determine the required LOGO! by using the Tools → Determine LOGO! (Page 175) dialog.
- You can first determine the LOGO! version for which you want to create your circuit program or project by calling the **Tools** → **Select Hardware** dialog. You can also select the device by double-clicking the LOGO! icon in the status bar.

The device selection dialog shows you all the blocks and memory resources available.

If your program contains certain blocks with special functionalities, the hardware selection dialog offers you only the LOGO! device compliant with these blocks.

If you are working on a network project, the hardware selection dialog offers you only the LOGO! devices that support Ethernet connections.

2.8.5.35 Tools -> Compare

You can use this function to compare two circuit programs.

LOGO!Soft Comfort does not recognize differences in the graphical block layout and in comments.

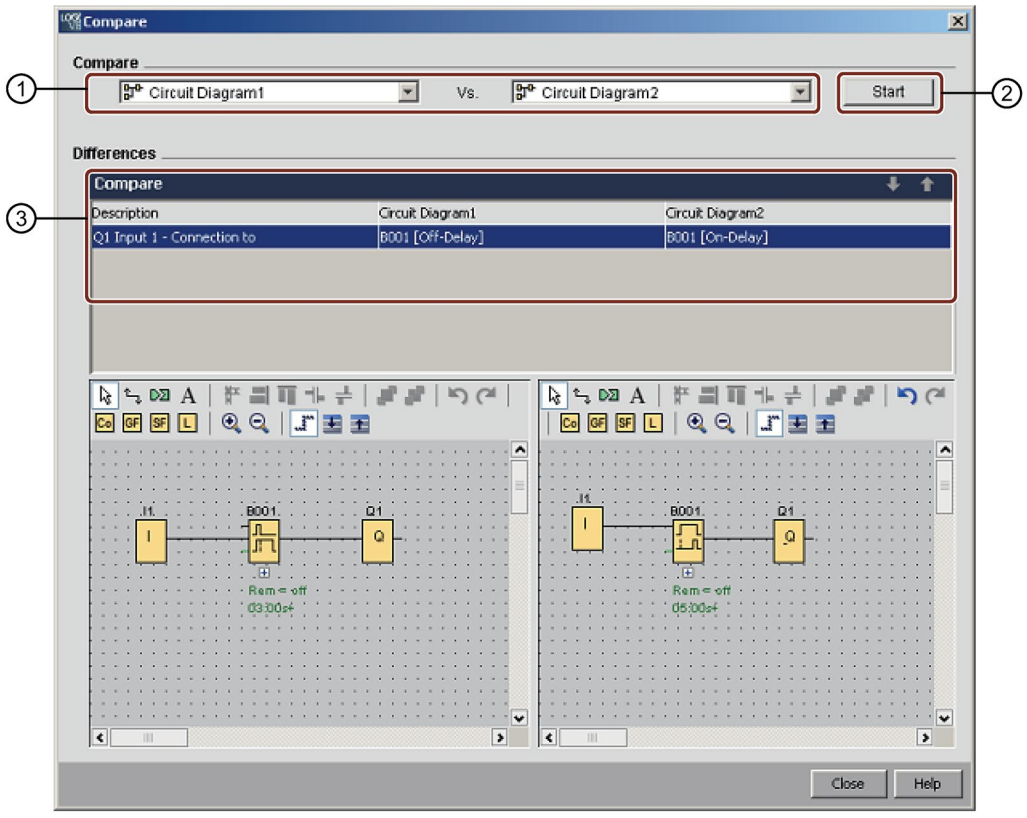
Overview

You can use this function to compare two circuit programs. You can either compare two circuit programs that are both open in LOGO!Soft Comfort, or you can compare a program in LOGO!Soft Comfort with the other one in the LOGO! device.

Note

You can compare only circuit programs of the same type, that is: *.lsc with *.lsc, *.lld with *.lld, or *.lma with *.lma.

The following screenshot provides an overview of the compare dialog.



① Select the two circuit programs to compare.

- To compare two local diagrams, you can split the diagram editor into two windows and drag the diagrams to each window. See Window -> Split into two windows (Page 221) for more information.
- To compare your local diagram with the diagram on a connected LOGO! Base Module, LOGO!Soft Comfort requires that you confirm the connection interface before communication. See Tools -> Transfer (Page 92) for more information.

② Click "②" to run the comparison.

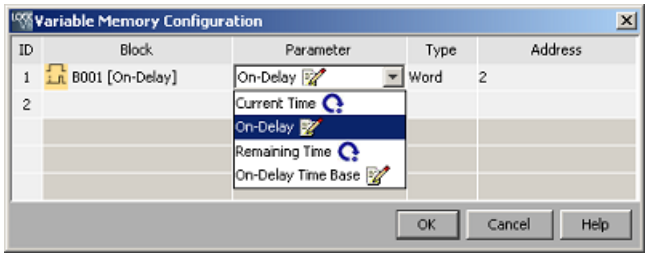
③ Here LOGO!Soft Comfort shows you the differences in the two programs:

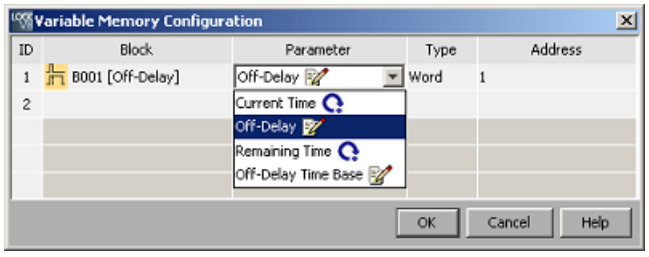
- Number of blocks
- Block parameters
- Additional/missing blocks
- Different hardware
- Different message text FBs (both text and bar graph)
- Different connections
- Different parameter VM mapping lines
- Different Ethernet connections
- Certain different diagram settings and device settings (only for LOGO! 9 and later versions)

Compare two circuit programs with parameter VM mapping settings

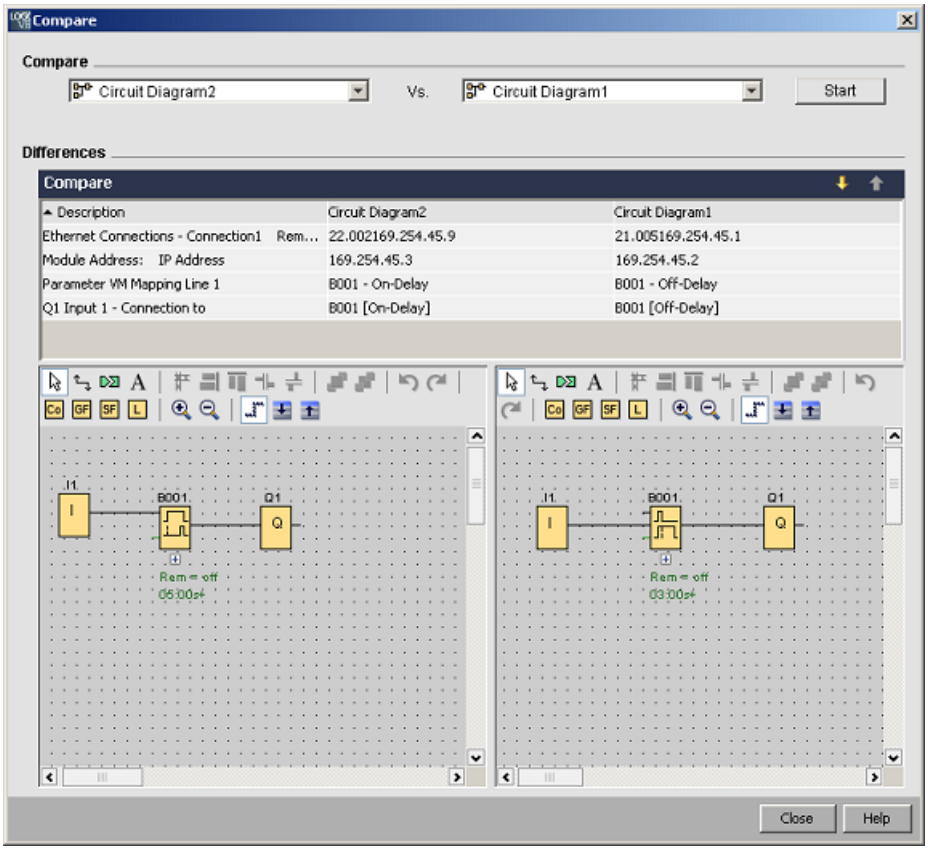
When you compare two circuit programs with parameter VM mapping settings, LOGO!Soft Comfort compares two lines and displays the comparison results. LOGO!Soft Comfort only displays the differences between the first two different lines because once two lines differ, LOGO!Soft Comfort stops comparing subsequent lines.

Configure different VM mapping settings on the two circuit programs. See Tools -> Parameter VM Mapping (0BA7 and later versions only) (Page 197) for more information.





After you have set the module address and Ethernet connections, you can start to compare the two circuit programs.



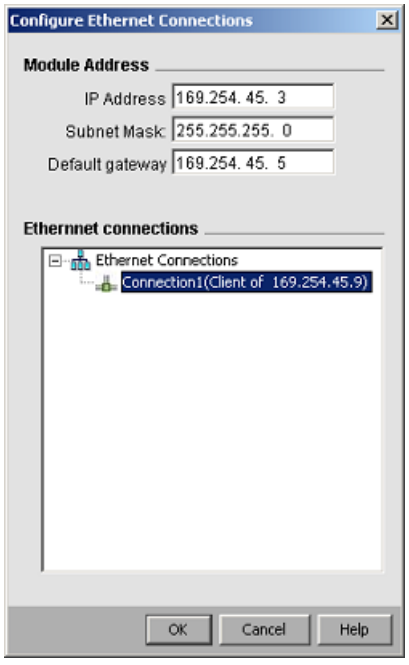
Result: As shown in the following result display, the parameter names in parameter VM mapping line 1 of the two circuit programs are different.

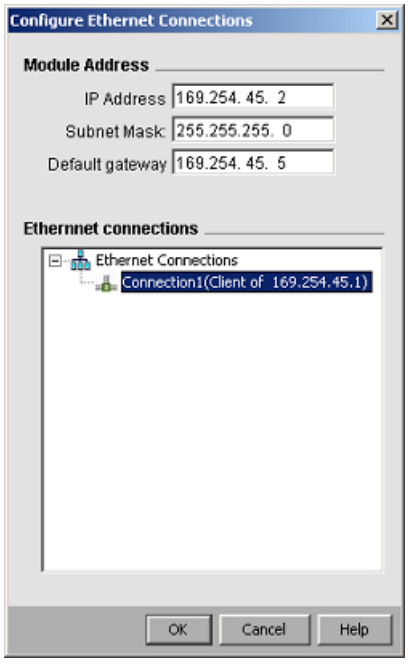
Compare two circuit programs with Ethernet connections

When you compare two circuit programs with Ethernet connections, LOGO!Soft Comfort compares their configurations of Ethernet connections, and then displays the comparison results.

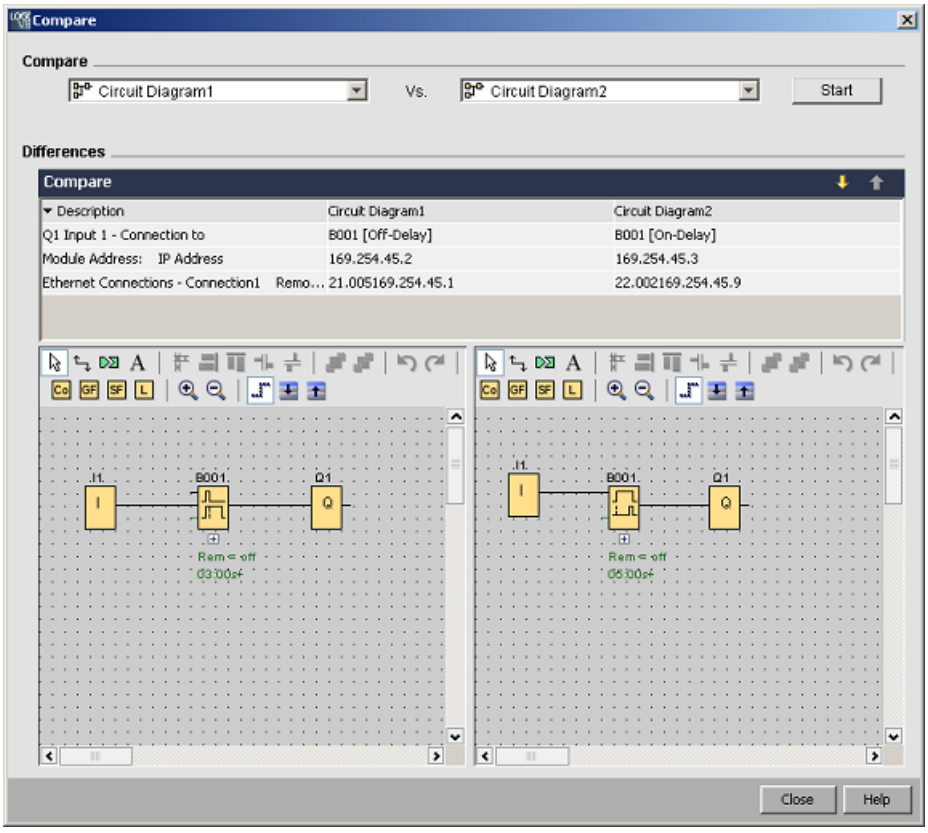
During the comparison of Ethernet connections, once a difference occurs in a connection setting, LOGO!Soft Comfort stops comparing subsequent settings.

Set module addresses and Ethernet connections following instructions in the Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) section:





Compare the two diagrams.



Result: As shown in the result display above, the two compared circuit programs have different module address settings and different IP address settings for two Base Modules that are both used as clients.

Editing

You can edit the two circuit programs in the diagram comparison windows.

Different hardware

If you have configured different LOGO! devices in the two programs, you will see a considerable number of messages. To avoid such messages, make sure both devices are the same.

Programs with internal markers

When you compare circuit programs with internal markers, in some circumstances LOGO!Soft Comfort reports more differences than there really are.

2.8.5.36 Tools -> Simulation

Introduction

Program simulation allows you to test a program and modify its parameters. This ensures the program in the LOGO!Soft Comfort is fully functioning and optimized, ready for your download.

Simulation mode

Click the SIM icon in the programming toolbar to start the simulation. This changes the program to simulation mode.

For more information, see Simulation. (Page 43)

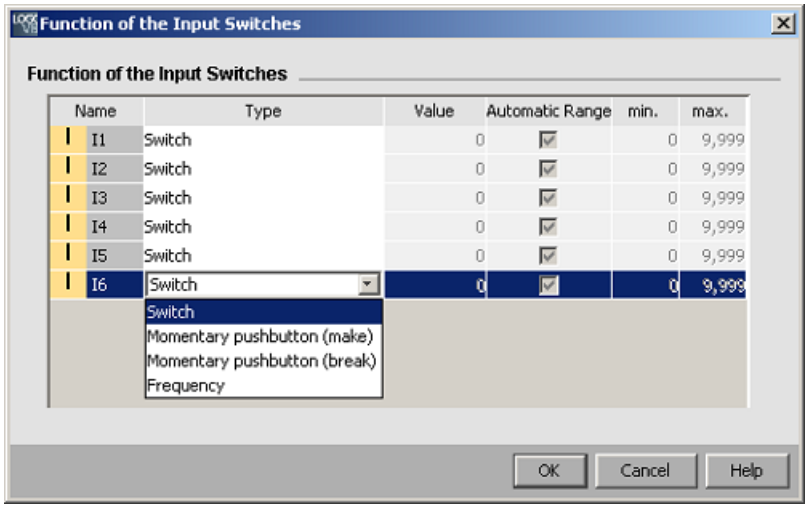
LOGO!Soft Comfort highlights the icon simulation mode. If you have configured an IP address for your circuit program, you can click the icon to simulate the circuit program in the network. You can watch VM (Variable Memory) values in the provided data table. To exit the simulation mode, click the SIM icon or any other icon of the programming toolbar. If you click another icon, you exit the simulation mode and open the tool mode of the icon that you clicked, for example selecting or inserting blocks.

At the start of the simulation mode, LOGO!Soft Comfort verifies the circuit program and displays the results in the Info Window (Page 90).

2.8.5.37 Tools -> Simulation Parameters

Select the **Tools** → **Simulation Parameters** command to configure the response of an input.

The dialog shows only the inputs actually used in your circuit program.



You have four options for the digital inputs:

- Switch
- Momentary pushbutton (make)

- Momentary pushbutton (break)
- Frequency

You have only one option for the analog inputs:

- Analog

Name column

"I" designates Digital inputs (Page 313).

"AI" designates Analog inputs (Page 318).

Switch

A switch latches when actuated and is released by actuating it once again.

Momentary pushbutton

A momentary pushbutton is only active while it is held down. The contact opens as soon as you release the button.

You can determine a make or break action for the pushbuttons.

Frequency

You can preset or change the frequency of an input while a simulation is running. The device frequency is in Hz. A frequency input is a special case, which is only used in conjunction with the threshold trigger SFB.

Analog

You can preset the value for the analog input (Page 318) or modify it while running in simulation mode. The units for the analog value corresponds with the default process variable. The range corresponds with the specified measurement range, provided you have selected the option of "Auto range". The value range corresponds in this case with the measurement range of the function connected to the input. The analog input represents a special case for analog SFBs.

Refer to the information in the "Analog value processing" section (Page 425) for help on analog block parameters.

Settings

When you save your circuit program, you also save the simulation settings. Thus, you do not need to enter the simulation parameters once again when you exit and reopen your circuit program.

While simulation mode is active, you can click a digital input in the list of input switches to change its settings. From the drop-down list select Switch, Momentary pushbutton (make), Momentary pushbutton (break) or Frequency. Use the OK button to enter your settings.

While simulation mode is active, you can also right-click a digital input in the circuit program and edit its block properties. In the Simulation tab of the block properties dialog, you can select the type of the input as described above.

Click "**OK**" to confirm your settings.

2.8.5.38 Tools -> Connect Modem

You can build network connections between LOGO!Soft Comfort and LOGO! devices to download and upload circuit programs or network projects by configuring their connected modems. LOGO!Soft Comfort supports 11-bit modems that use standard AT commands.

Select the **Tools** → **Connect Modem** menu command to start the process of configuring modems connected to your PC with LOGO!Soft Comfort. The LOGO! Base Module at the remote side is also connected with a modem and ready for network connection. LOGO!Soft Comfort displays a Modem Information dialog that provides an overview of the configuration process.

You must complete a series of dialogs to configure your modems. After you configure the modems and make the connections, you can download and upload circuit programs or network projects between LOGO!Soft Comfort and LOGO! Base Module across a telephone line connection over the modems.

The steps for connecting and configuring modems are listed below:

1. Select Modem (Page 185)
2. Select Remote Configuration (Page 185)
3. Configure Remote Modem Command (Page 185)
4. Configure Remote Modem (Page 186)
5. Select Local Configuration (Page 186)
6. Configure Local Modem Command (Page 186)
7. Configure Telephone Number (Page 186)

From the modem configuration dialogs, you can click "**Next**" to proceed through the dialogs, or click "**Previous**" to return to an earlier step.

Note

This menu command is valid only for LOGO! devices series 0BA6 or later.

2.8.5.39 Tools -> Connect Modem - Select Modem

From the Select modem dialog, you can select check boxes to configure the remote modem or the local modem. The remote modem is the one connected to the LOGO! Base Module and the local modem is the one connected to the computer with LOGO!Soft Comfort.

If you have previously configured the remote modem or the local modem from LOGO!Soft Comfort, the dialog displays the name of the modem as configured from LOGO!Soft Comfort. You can click "**Detail**" to display specific information about the LOGO!Soft Comfort configuration of a modem.

If you have configured the remote modem by some means other than LOGO!Soft Comfort, you can disregard the displayed settings. LOGO!Soft Comfort will use the configuration in the actual modem. If you have not yet configured the remote modem, or choose to change the existing configuration, then select the Remote modem check box.

For the local modem, LOGO!Soft Comfort will use the settings as displayed by the "**Detail**" button, or you can select the Local modem check box to edit the configuration.

If you need to configure or change the configuration of both modems, then select both check boxes.

If you have already configured both modems but need to set the telephone number, do not select the check boxes. When you click "**Next**", you will advance to the telephone number configuration (Page 186) dialog. Otherwise, when you click "**Next**", you will proceed to configuration of the selected modems.

2.8.5.40 Tools -> Connect Modem - Select Remote Configuration

From the Select remote configuration dialog, you select whether to edit or delete an existing configuration, if one exists, or to create a new configuration.

Click "**Next**" to continue with modem configuration.

2.8.5.41 Tools -> Connect Modem - Configure Remote Modem Command

From the Configure remote modem command dialog, you can use the name of the remote modem to access and configure a remote modem. You can select the check box to accept the default settings for the modem commands, or you can choose not to use the defaults and to edit the individual commands. The "Additional" field provides the opportunity to enter other modem commands. Separate each one with a blank if you add additional commands.

The commands are all standard commands. Refer to the documentation provided with your modem for specific command syntax.

Click "**Save Configuration**" to save this configuration for the remote modem.

2.8.5.42 Tools -> Connect Modem - Configure Remote Modem

The Configure remote modem dialog is the last dialog for you to complete remote modem configuration. After you ensure that the remote modem is connected to the LOGO! Base Module, follow these steps:

1. Select the "Done" check box.
2. Select the communications port to use.
3. Click "**Configure remote modem**".

LOGO!Soft Comfort will complete the modem configuration and display a status message.

2.8.5.43 Tools -> Connect Modem - Select Local Configuration

From the Select local configuration dialog, you select whether to edit or delete an existing configuration, if one exists, or to create a new configuration.

Click "**Next**" to continue with modem configuration.

2.8.5.44 Tools -> Connect Modem - Configure Local Modem Command

From the Configure local modem command dialog, you can use the name of the local modem to access and configure the local modem. You can select the check box to accept the default settings for the modem commands, or you can choose not to use the defaults and to edit the individual commands. The "Additional" field provides the opportunity to enter other modem commands. Separate each one with a blank if you add additional commands.

The commands are all standard commands. Refer to the documentation provided with your modem for specific command syntax.

Click "**Save Configuration**" to store this configuration to the local modem.

2.8.5.45 Tools -> Connect Modem - Configure Telephone number

From this dialog you can add and delete telephone numbers for the modem connection.

Click "**Add New**" to provide a name, telephone number, and description for a telephone connection. To add multiple telephone numbers, click "**Add New**" and enter additional telephone numbers as needed. To remove a telephone number from the list, select it and click "**Remove**".

From this dialog, you can dial one of the telephone numbers. To establish modem communication across one of the telephone connections, follow these steps:

1. Verify that the local modem is connected to your computer and that the remote modem is connected to LOGO!, and click the "**Done**" check box.
2. Select a telephone number from the list.
3. Click "**Dial**".

LOGO!Soft Comfort establishes the modem connection and displays a status message. If any error occurs, LOGO!Soft Comfort displays an error message. Check your connections and your configurations if you receive an error. Refer to the documentation provided with your modem for additional information.

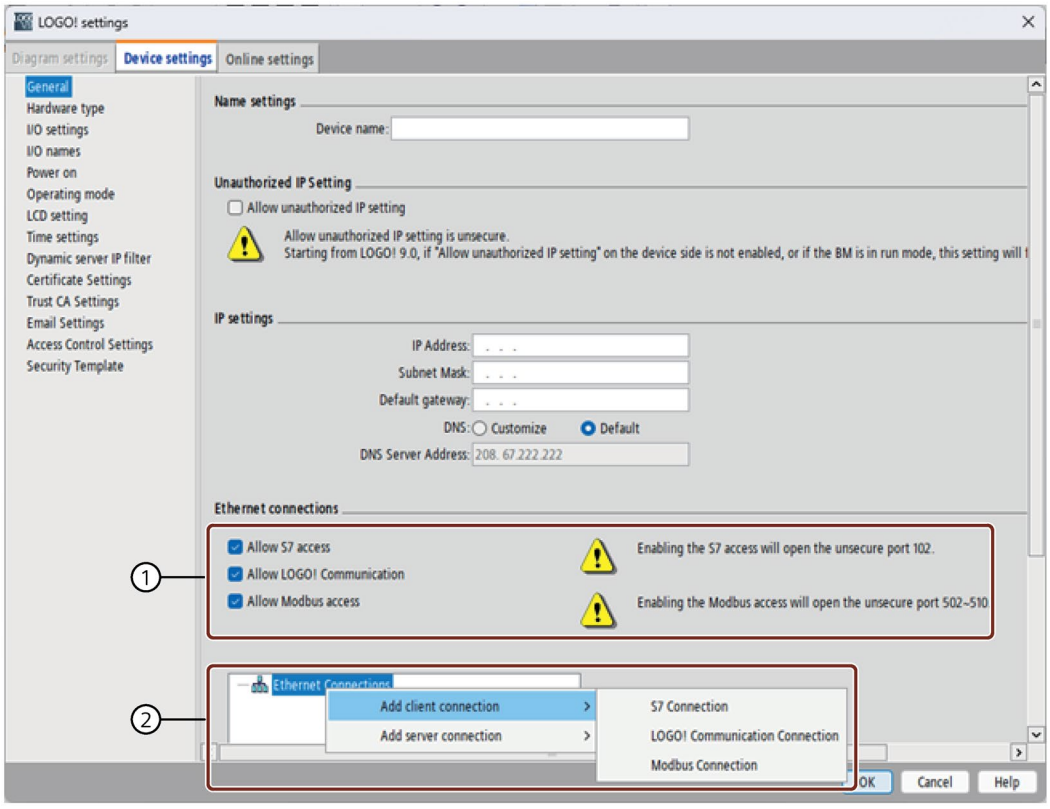
2.8.5.46 Tools -> Disconnect Modem

Use this command to disconnect an existing modem connection.

To configure modems, or to re-connect across configured modems, select the Tools → Connect Modem (Page 184) menu command.

2.8.5.47 Tools -> Ethernet Connections (0BA7 and later versions only)

Use this menu command to build Ethernet connections for the LOGO! Base Module.



① Here you select the Ethernet connection method.

You first enable the S7 access, LOGO! Communication or Modbus access before configuring the Ethernet connections.

② Here you define the Ethernet properties.

To add a client/server connection, you can right-click a connection item to enable the buttons:

Here you can define up to eight network connections, which are TCP/IP-based S7/Modbus communication connections to the following devices:

- Additional LOGO! devices
- SIMATIC S7 PLCs with Ethernet capability
- Modbus devices with Ethernet capability
- A maximum of one SIMATIC HMI (Operator Panel) that supports Ethernet communication with networked S7/Modbus devices
- CIM (Communicative Interface Module) devices with Ethernet capability

Note

LOGO! Communication

LOGO! Communication requirements:

- Devices support LOGO! Communication (LOGO! 9 and later versions, S7-compatible devices, CIM devices).
- The connected devices' certificates are trusted by each other.

To learn more about LOGO! certificate strategy, refer to the Security section in *LOGO! System Manual*. To learn more about how to configure certificate and manage trusted CA for LOGO!, refer to Certificate Settings (Page 144) and Trust CA Settings (Page 165).

Note

For detailed information about S7 communication configurations between the LOGO! Base Module, SIMATIC PLCs, HMIs and CIM devices, see FAQs under the Support selection at LOGO! Website (http://www.siemens.com/logo).

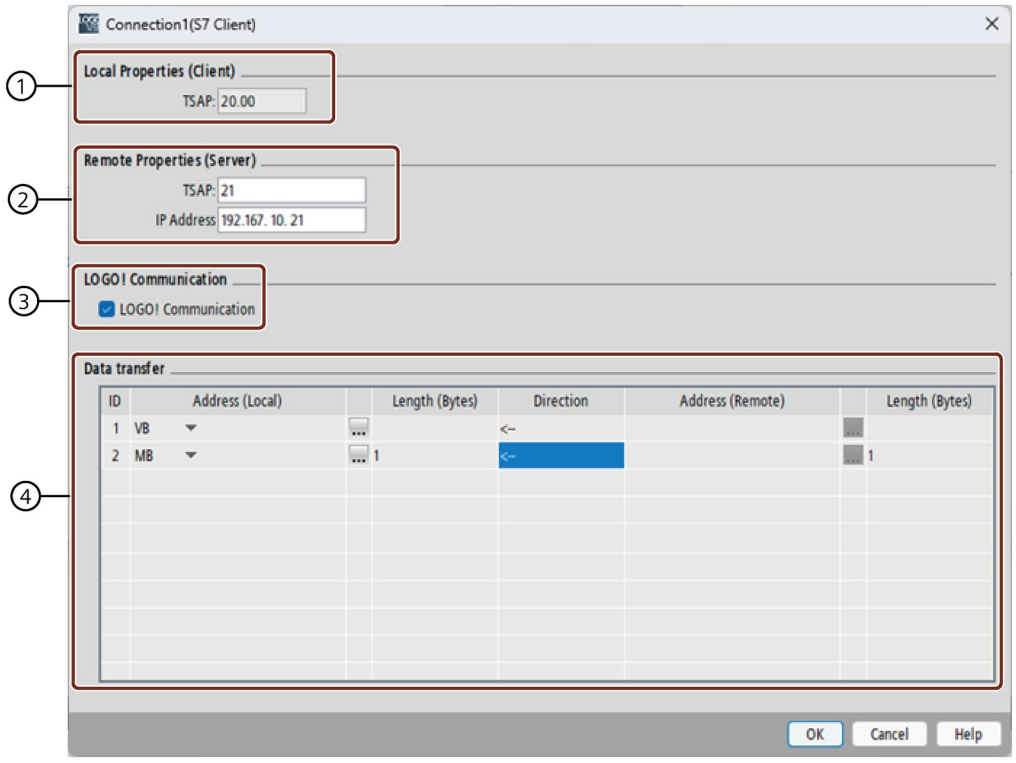
Configuring S7 client connections

Each S7 connection can be configured to be a client or a server, in which the local IP/local TSAP (Transmission Layer Service Access Point) and remote IP/remote TSAP are configured respectively. The server is the data source side in communication, it sends information that responds to the requests from the other side - the client.

To configure the client or server connections of each LOGO! connection, double-click the connection.

Right-click the desired connection and choose to add a client connection.

Double-click the connection item to configure the client connection.



① Here you define the properties of the Client.

TSAP is the Transmission Layer Service Access Point in TCP/IP communication.

The local TSAP of Client is automatically generated by LOGO!Soft Comfort.

② Here you define the properties of the Server.

The remote TSAP is the TSAP of the Server that you want to connect.

The remote IP address is the IP address of the Server that you want to connect.

③ Here you can select to enable LOGO! Communication. LOGO! Communication is only available between LOGO! 9.0 devices (and later versions).

④ Here you define the properties of the data transfer connection. (Read: Client <- Server, Write: Client -> Server)

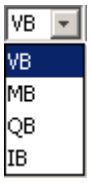
You can create a maximum of 32 data transfers in a Client connection.

In the read process, the local Base Module reads data from the remote server and stores it; in the write process, the local Base Module writes data to the remote server. You can store data either on the local Base Module or the remote Server by specifying the corresponding column. The maximum transfer data length is 212 bytes for every data transfer.

S7 Data transfer configuration

You can set the following values in the data transfer table in configuring client connections:

1. Click the following drop-down menu to choose the data value for transferring.



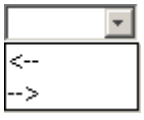
2. Input one address in the address field.
3. If you configured VM mapping, you can also click ... to display the VM mapping table as below:

In the VM mapping table, you can perform the following operations:

- Click a column to choose the desired address or click and drag down and up to choose multiple addresses.
- Click the mapping fields to switch to the parameter VM mapping dialog.
- Click and drag the black arrow at the bottom right corner to expand or shrink the table.

See Tools -> Parameter VM Mapping (0BA7 and later versions only) (Page 197) for more information about the VM mapping.

4. Click the empty drop-down menu to choose data transfer directions.



5. Input the other address.
6. To add or remove rows, right-click an existing row to enable the buttons.

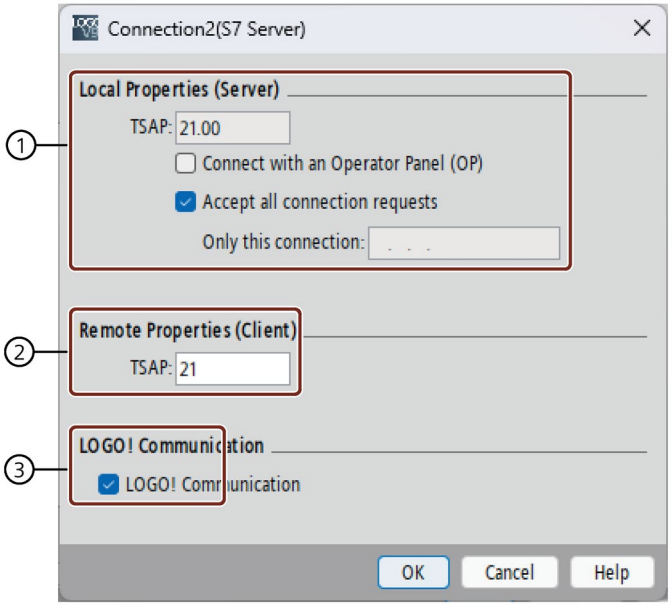
7. Save your changes.

Configuring S7 server connections

Double-click the connection item to configure the server connection.

Note

If the Server in this connection is a SIMATIC S7, you must configure the server connection on the added device.



① Here you define the properties of the Server.

TSAP: The range in LOGO! Base Module is 20.00 to FF.FF.

The local TSAP of Server is automatically generated by LOGO!Soft Comfort. If the Operator Panel (SIMATIC HMI) is the Client in this connection, select the "Connect with an Operator Panel (OP)" check box. LOGO!Soft Comfort then automatically changes the TSAP to 02.00.

If you select the "Accept all connections requests" check box, the Server responds to the requests from all Clients in the network.

The Server can accept a request only from one IP address. This address is the IP address of the client that you want to connect.

② Here you define the properties of the Client.

The remote TSAP is the TSAP of the Client that you want to connect.

③ Here you can select to enable LOGO! Communication. LOGO! Communication is only available between LOGO! 9.0 devices (and later versions).

Data transfer restrictions

The table below describes the range and local address restrictions for client connections.

Read/Write requests:

Local address (LOGO!)		**Remote address (S7 compatible device)**	
Address Type	Range	Address Type	Range
VB	0 to 850	VB	0 to 65535
VXB	0BA8 and later versions: 0 to 2047		
VRB	0BA8 and later versions: 0 to 5011		
MB	• LOGO! 9: 0 to 15 • 0BA8: 0 to 7 • 0BA7: 0 to 3	MB	0 to 65535
IB	• LOGO! 9: 0 to 7 • 0BA7 and 0BA8: 0 to 2	IB	0 to 65535
QB	• LOGO! 9: 0 to 7 • 0BA8: 0 to 2 • 0BA7: 0 to 1	QB	0 to 65535
		DB.DBB	DB[0,16000].DBB[0,65535]

Note

Address Type:

- VB: variable byte memory
- VXB/VRB: extended variable byte memory
- DB.DBB: data block byte memory
- MB: flag byte memory
- IB: input byte memory
- QB: output byte memory

Local address + Data length - 1 ≤ 850

Note

The values should follow the rule: Local address + Data length - 1 ≤ Max value of Local address type.

Configuring Modbus client connections (LOGO! 8.FS4 and later versions only)

Note

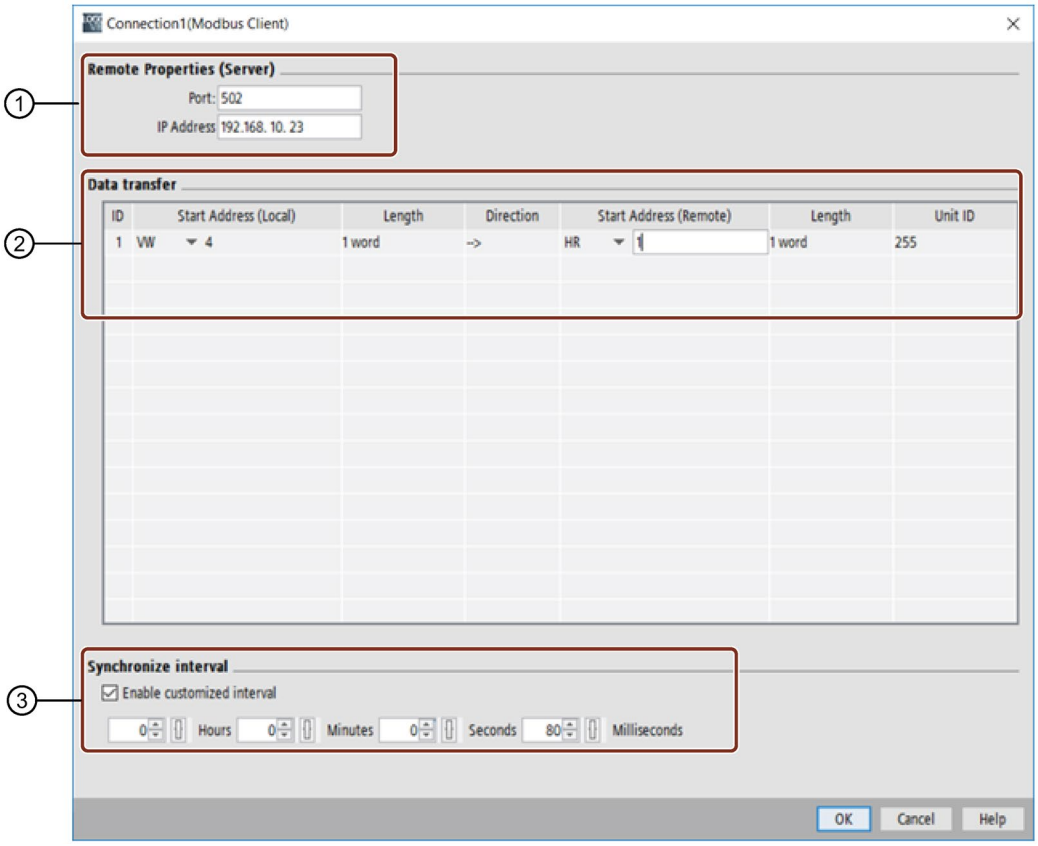
If you can connect a device to LOGO! 8.FS4 or later versions device with S7 or Modbus connection, Siemens recommends you connect the device with S7 connection.

Each Modbus connection can be configured as a client or a server, in which the local IP and remote IP are configured respectively. The server is the data source side in communication, it sends information that responds to the requests from the other side - the client.

To configure the client or server connections of each LOGO! connection, double-click the connection.

Right click the desired connection and choose to add a client connection.

Double-click the connection item to configure the client connection.



① Here you define the properties of the Server.
The remote IP address is the IP address of the Server or the gateway of the Server that you want to connect.

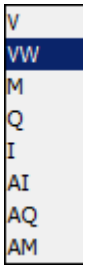
② Here you define the properties of the data transfer connection. (Read: Client <- Server, Write: Client -> Server)
The unit ID is the address of the Modbus RTU device.
You can create a maximum of 32 data transfers in a Client connection.
In the read process, the local Base Module reads data from the remote server and stores it; in the write process, the local Base Module writes data to the remote server. You can store data either on the local Base Module or the remote Server by specifying the corresponding column.

③ Here you define the time interval that LOGO! Base Module synchronizes the data with the server.
You can select the check box and input the specified time interval.

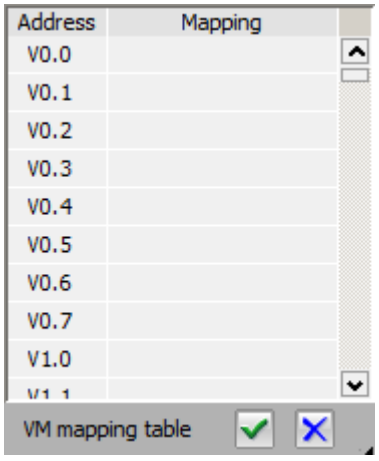
Modbus data transfer configuration

You can set the following values in the data transfer table in configuring client connections:

1. Click the following drop-down menu to choose the data value for transferring.



2. Input one address in the address field.
3. If you configured VM mapping, you can also click ... to display the VM mapping table as below:

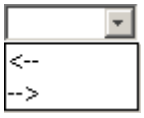


In the VM mapping table, you can perform the following operations:

- Click a column to choose the desired address or click and drag down and up to choose multiple addresses.
- Click the mapping fields to switch to the parameter VM mapping dialog.
- Click and drag the black arrow at the bottom right corner to expand or shrink the table.

See Tools -> Parameter VM Mapping (0BA7 and later versions only) (Page 197) for more information about the VM mapping.

4. Click the empty drop-down menu to choose data transfer directions.



5. Input the other address.
6. To add or remove rows, right-click an existing row to enable the buttons.

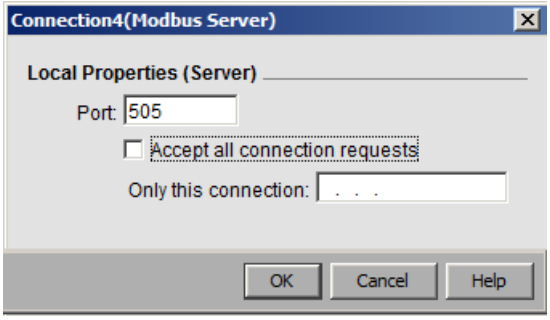
7. Save your changes.

Configuring Modbus server connections

Double-click the connection item to configure the server connection.

Note

If the Server in this connection is a SIMATIC Modbus or SIMATIC HMI, you must configure the server connection on the added device.



Here you define the properties of the Server.

- The port range on LOGO! BM is 502 to 510.
- If you select the "Accept all connections requests" check box, the Server responds to the requests from all Clients in the network.
- The Server can accept a request only from one IP address. This address is the IP address of the client that you want to connect.

Data transfer restrictions

The table below describes the range and local address restrictions for client connections.

Read/Write requests:

Local address (LOGO!)		**Remote address (Modbus compatible device)**	
Address Type	Range	Address Type	Range
I	• LOGO! 9: 1 - 64 bit • 0BA8: 1 - 24 bit	Discrete Input (DI)	1 to 65535 bit
Q	• LOGO! 9: 1 - 60 bit • 0BA8: 1 - 20 bit	Coil	
M	• LOGO! 9: 1 - 128 bit • 0BA8: 1 - 64 bit		
V	0.0 - 850.7 bit		
VX	LOGO! 8.4 and later versions: 0.0 - 2047.7		
VR	LOGO! 8.4 and later versions: 0.0 - 511.7		
AI	• LOGO! 9: 1 - 16 word • 0BA8: 1 - 8 word	Input Register (IR)	1 to 65535 word
VW	0 - 850 word	Holding Register (HR)	
VXW	LOGO! 8.4 and later versions: 0 - 2046		
VRW	LOGO! 8.4 and later versions: 0 - 510		
AQ	• LOGO! 9: 1 - 16 word • 0BA8: 1 - 8 word		
AM	• LOGO! 9: 1 - 128 word • 0BA8: 1 - 64 word		
FAM	LOGO! 9 and later versions: 2 - 64 word		

Note

Address Type:

- I: input
- AI: analog input
- Q: output
- M: M flag
- V: variable bit memory
- VX/VR: extended variable bit memory
- VW: variable word memory
- VXW/VRW: extended variable word memory
- AQ: analog output
- AM: analog M flag
- FAM: float analog M flag

Local address + Data length - 1 ≤ 850

Note

The values should follow the rule: Local address + Data length - 1 ≤ Max value of Local address type.

2.8.5.48 Tools -> Parameter VM Mapping (0BA7 and later versions only)

VM overview

LOGO! Base Module uses VM (Variable Memory) as a local data communication interface for data exchange by means of connections/data-transfer configuration.

You can use LOGO!Soft Comfort with the Ethernet connections menu command following instructions in the Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) section to construct the network topology.

LOGO!Soft Comfort performs data exchange process as follows:

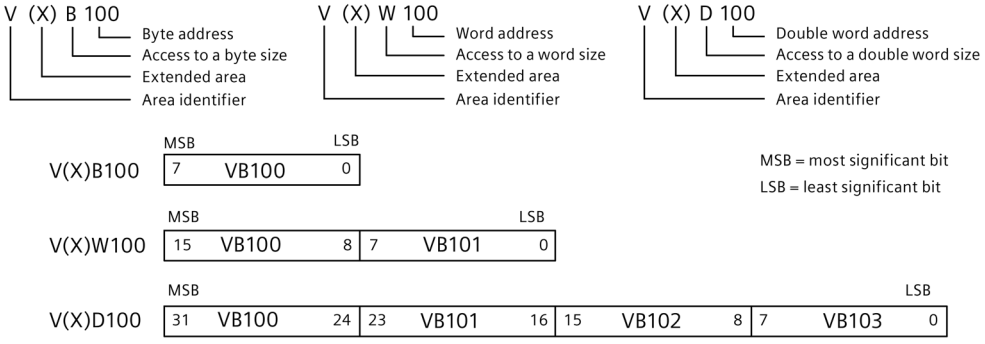
- The server stores the required data into the VM area specified by the data connection and data transfer. This is defined as a "share" action in the following section.
- The client unit reads the server's VM area and then updates the corresponding local VM area in its network process step.
- After the local update, the circuit program in the client can use the information in the local VM originated from the Server.

Note

LOGO! 8.FS4 and later versions devices support two types of connections, S7 and Modbus. In addition, LOGO! 9.0 and later versions devices support LOGO! Communication. LOGO! 0BA7 and LOGO! 0BA8 only support S7 connection.

Data type and VM address

The following illustrates VM addressing and data type usage:

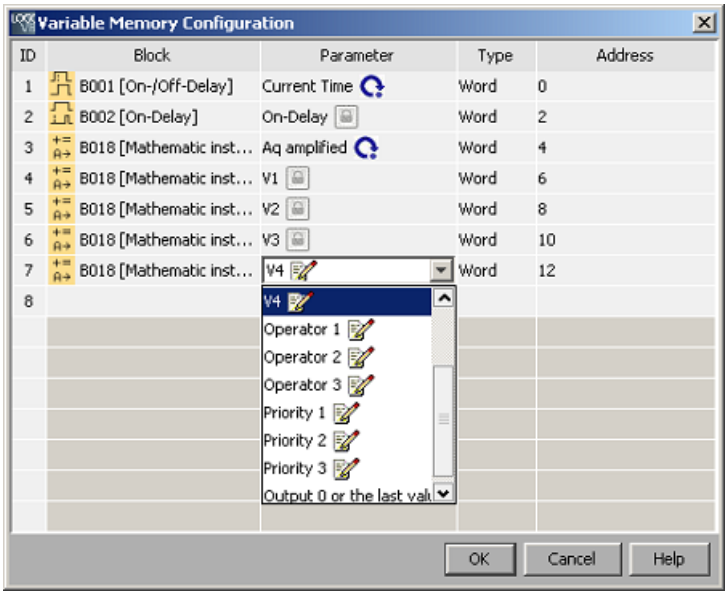


Creating a parameter VM mapping

When you change a parameter value in the local VM, the value in LOGO!Soft Comfort changes accordingly. In this way, LOGO!Soft Comfort synchronizes information with the local VM in real time.

LOGO!Soft Comfort synchronizes the parameter values of a block to the specified VM in each LOGO! cycle. After the synchronization, LOGO! Base Module can use the VM to communicate with other SIMATIC devices. You can map up to 64 parameters in VM for each LOGO! Base Module in the Variable Memory Configuration dialog. For LOGO! 8.4 and later versions Base Module, 2048 bytes of VX area is extended for block parameter VM mapping.

The following screen is an example of the configuration dialog of parameter VM mapping:



The Block column lists the parameters for SFBs in the current program. The Parameter column provides a select list of the parameters of the corresponding block. The Type column displays the data type of the selected parameter. The Address column is also configurable. You can use it to identify the VM address used to save a parameter value.

The icon next to a parameter name indicates the property of this parameter:

The parameter value is a setting value and is writable.

The parameter value is an actual value and is read-only.

Although the parameter value is an actual value, you can still change the value.

NOTE:

Only the **Counter** parameter of Up/Down counter has such a flag.

The parameter value is referenced from an actual value of another already-programmed function block.

Note that if no flag appears, then the parameter value is a system value and remains read-only.

Within the parameter VM mapping window, you can achieve the following tasks:

- Select multiple record lines by pressing the **Ctrl** key or **Shift** key and clicking the ID of the desired line.
- Insert a down line by pressing the **Enter** key on the last cell of the desired line.
- Insert an up line by clicking the ID of the desired line and pressing the **Insert** key, or right-clicking the desired line to add a new row.
- Delete a line by clicking the ID of the desired line and pressing the **Delete** key, or right-clicking the desired line to delete an existing row.

You cannot change the parameter type and must configure a unique address for each parameter. The range for a parameter address is from 0 to 850. If the value you input exceeds this range, inputs and outputs will be modified to certain VM addresses automatically.

The following table provides mappings between I/O and VM addresses for LOGO! 9:

Block Type	VM Address (From)	VM Address (To)	Range
I	1024	1031	8 bytes
	6024	6031	8 bytes
AI	1032	1063	32 bytes
	6040	6071	32 bytes
Q	1064	1071	8 bytes
	6104	6110.5	7.5 bytes
AQ	1072	1103	32 bytes
	6120	6151	32 bytes
M	1104	1117	14 bytes
	6184	6199	16 bytes
AM	1118	1245	128 bytes
	6216	6471	256 bytes
FAM	6728	6855	128 bytes
NI	1246	1261	16 bytes
	6984	7047	64 bytes
NAI	1262	1389	128 bytes
	7112	7367	128 bytes
NQ	1390	1405	16 bytes
	7624	7683	60 bytes
NAQ	1406	1469	64 bytes
	7752	8007	256 bytes
NFAI	8264	8327	64 bytes
NFAQ	8392	8455	64 bytes

The following table provides mappings between I/O and VM addresses for LOGO! 0BA8:

Block Type	VM Address (From)	VM Address (To)	Range
I	1024	1031	8 bytes
AI	1032	1063	32 bytes
Q	1064	1071	8 bytes
AQ	1072	1103	32 bytes
M	1104	1117	14 bytes
AM	1118	1245	128 bytes
NI	1246	1261	16 bytes
NAI	1262	1389	128 bytes
NQ	1390	1405	16 bytes
NAQ	1406	1469	64 bytes

The following table provides mappings between I/O and VM addresses for LOGO! 0BA7:

DI	VM Address	DQ	VM Address
I1	V923.0	Q1	V942.0
I2	V923.1	Q2	V942.1
I3	V923.2	Q3	V942.2
I4	V923.3	Q4	V942.3

I5	V923.4	Q5	V942.4
I6	V923.5	Q6	V942.5
I7	V923.6	Q7	V942.6
I8	V923.7	Q8	V942.7
I9	V924.0	Q9	V943.0
I10	V924.1	Q10	V943.1
I11	V924.2	Q11	V943.2
I12	V924.3	Q12	V943.3
I13	V924.4	Q13	V943.4
I14	V924.5	Q14	V943.5
I15	V924.6	Q15	V943.6
I16	V924.7	Q16	V943.7
I17	V925.0		
I18	V925.1		
I19	V925.2		
I20	V925.3		
I21	V925.4		
I22	V925.5		
I23	V925.6		
I24	V925.7		
AI	**VM Address**	**AQ**	**VM Address**
AI1	VW926	AQ1	VW944
AI2	VW928	AQ2	VW946
AI3	VW930		
AI4	VW932		
AI5	VW934		
AI6	VW936		
AI7	VW938		
AI8	VW940		
AM	**VM Address**	**M**	**VM Address**
AM1	VW952	M1	V948.0
AM2	VW954	M2	V948.1
AM3	VW956	M3	V948.2
AM4	VW958	M4	V948.3
AM5	VW960	M5	V948.4
AM6	VW962	M6	V948.5
AM7	VW964	M7	V948.6
AM8	VW966	M8	V948.7
AM9	VW968	M9	V949.0
AM10	VW970	M10	V949.1
AM11	VW972	M11	V949.2
AM12	VW974	M12	V949.3

AM13	VW976	M13	V949.4
AM14	VW978	M14	V949.5
AM15	VW980	M15	V949.6
AM16	VW982	M16	V949.7
		M17	V950.0
		M18	V950.1
		M19	V950.2
		M20	V950.3
		M21	V950.4
		M22	V950.5
		M23	V950.6
		M24	V950.7
		M25	V951.0
		M26	V951.1
		M27	V951.2

The following VM addresses are occupied for special purposes:

VM Address	Reserved for	Range
984	Diagnostic Bits Array	1 Byte
985	"Year" of Real Time Clock (RTC)	1 Byte
986	"Month" of RTC	1 Byte
987	"Day" of RTC	1 Byte
988	"Hour" of RTC	1 Byte
989	"Minute" of RTC	1 Byte
990	"Second" of RTC	1 Byte

The LOGO! Base Module can share the following data with S7/Modbus by VM address:

Data Type	Number	Memory Type
Digital input	64	Bit
Digital output	60	Bit
Digital flag	128	Bit
Analog input	16	Word
Analog output	16	Word
Analog flag	128	Word
Float analog flag	32	Word
Value parameter	**	**
Actual value	**	**

The length (Byte, Word, or DWord) indicates the number of bytes in the VM area required by the parameter.

LOGO! Base Module can also share the time and date information with SIEMENS SIMATIC S7/Modbus compatible devices, HMI devices and CIM devices using VM addresses from 991 to 1002.

LOGO!Soft Comfort links the block parameters that you specify in the Variable Memory Configuration dialog with a VM address.

Not all of the VM area is available for configuration. LOGO!Soft Comfort reserves some bytes of the VM area. You cannot specify more than 64 parameters. If you attempt to specify more than 64, LOGO!Soft Comfort displays a failed operation message.

After the data transfer from a LOGO! Base Module to LOGO!Soft Comfort, you can view only analog values within the range of -32768 to 32767 on LOGO!Soft Comfort. If an analog value exceeds the value range, then only the nearest upper limit (32767) or lower limit (-32768) can be displayed.

Parameter settings

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
On-Delay				
Current Time	VW	R		
On-Delay	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Remaining Time	VW	R		
On-Delay Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Off-Delay				
Current Time	VW	R		
On-Delay	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Remaining Time	VW	R		
On-Delay Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
On-/Off-Delay				
Current Time	VW	R		
On Time (TH)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Off Time (TL)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
On Time (TH) Remaining Time	VW	R		
Off Time (TL) Remaining Time	VW	R		
On Time (TH) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Off Time (TL) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Current Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Retentive On-Delay				
Current Time	VW	R		
On-Delay	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Remaining Time	VW	R		
On-Delay Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Wiping Relay (Pulse Output)				
Current Time	VW	R		
Off Time (TL)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Off Time (TL) Remaining Time	VW	R		
Off Time (TL) time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Edge Triggered Wiping Relay				
Current Time	VW	R		
Pulse Width (TH)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Interpulse Width (TL)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Pulse Width (TH) Remaining Time	VW	R		
Interpulse Width (TL) Remaining Time	VW	R		
Pulse Width (TH) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Interpulse Width (TL) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Current Time Base	VB	R	10 milliseconds	1
			Seconds	2
			Minutes	3
Asynchronous Pulse Generator				
Current Time	VW	R		
Pulse Width	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Interpulse Width	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Pulse Remaining Time	VW	R		
Interpulse Remaining Time	VW	R		
Pulse Width (TH) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Interpulse Width (TL) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Current Time Base	VB	R	10 milliseconds	1
			Seconds	2
			Minutes	3
Random Generator				
Current Time	VW	R		
Max. On Delay (TH)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Max. Off Delay (TL)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Max. On Delay (TH) Remaining Time	VW	R		
Max. Off Delay (TL) Remaining Time	VW	R		
Max. On Delay (TH) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Max. Off Delay (TL) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Current Time Base	VB	R	10 milliseconds	1
			Seconds	2
			Minutes	3
Stairway Lighting Switch				
Current Time	VW	R		
Off Delay	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Pre-Warning Time (T!)	VW	R		
Pre-Warning Period (T!L)	VW	R		
Off Delay Remaining	VW	R		
Pre-Warning Time (T!) Remaining	VW	R		
Pre-Warning Period (T!L) Remaining	VW	R		
Off Delay Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Multiple Function Switch				
Current Time	VW	R		

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Off Delay Time (T)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Permanent Light (TL)	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Pre-Warning Time (T!)	VW	R		
Pre-Warning Period (T!L)	VW	R		
Off Delay Time (T) Remaining	VW	R		
Permanent Light (TL) Remaining	VW	R		
Pre-Warning Time (T!) Remaining	VW	R		
Pre-Warning Period (T!L) Remaining	VW	R		
Off Delay Time (T) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Permanent Light (TL) Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Current Time Base	VB	R	10 milliseconds	1
			Seconds	2
			Minutes	3
Weekly Timer (When an entry box is set unavailable or a function is disabled, "0xFF" is displayed on an HMI or S7/Modbus PLC and "*" is displayed on a Base Module.)				
Week Day 1	VB	R/W	Sunday	Bit 0
			Monday	Bit 1
			Tuesday	Bit 2
			Wednesday	Bit 3
			Thursday	Bit 4
			Friday	Bit 5
			Saturday	Bit 6
				NOTE: If the related bit is 1, then the day is set.
On Time 1	VW	R/W	h:m	h:m
Off Time 1	VW	R/W	h:m	h:m
Week Day 2	VB	R/W	Sunday	Bit 0
			Monday	Bit 1
			Tuesday	Bit 2
			Wednesday	Bit 3
			Thursday	Bit 4
			Friday	Bit 5
			Saturday	Bit 6
				NOTE: If the related bit is 1, then the day is set.

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
On Time 2	VW	R/W	h:m	h:m
Off Time 2	VW	R/W	h:m	h:m
Week Day 3	VB	R/W	Sunday	Bit 0
			Monday	Bit 1
			Tuesday	Bit 2
			Wednesday	Bit 3
			Thursday	Bit 4
			Friday	Bit 5
			Saturday	Bit 6
				NOTE: If the related bit is 1, then the day is set.
On Time 3	VW	R/W	h:m	h:m
Off Time 3	VW	R/W	h:m	h:m
Pulsely	VB	R/W	Off	0
			On	1
Yearly Timer (When an entry box is set unavailable, "0xFF" is displayed on an HMI or S7/Modbus PLC and "-" is displayed on a Base Module.)				
On Time	VW	R/W	Month:Day	Month:Day
Off Time	VW	R/W	Month:Day	Month:Day
On Year	VB	R/W	Year	Year
Off Year	VB	R/W	Year	Year
Monthly	VB	R/W	No	0
			Yes	1
Yearly	VB	R/W	No	0
			Yes	1
Pulsely	VB	R/W	Off	0
			On	1
Astronomical Clock				
Longitude	VD	R/W		VBx+0
			W	1
			E	0
			°	VBx+1
			'	VBx+2
			"	VBx+3
Latitude	VD	R/W		VBx+0
			S	1
			N	0
			°	VBx+1
			'	VBx+2
			"	VBx+3
Time Zero (E+; W-)	VW	R/W		-11 to 12 Low byte bit 7 means sign, for example: 00000001 10000000 means -1.

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
SunRise Time	VW	R		h:m
SunSet Time	VW	R		h:m
Stop Watch				
Time Base	VB	R/W	10 milliseconds	0
			Seconds	1
			Minutes	2
			Hours	3
Current Time	VD	R		
Lap Time	VD	R		
Output Time	VW	R		
Up/Down Counter				
Counter	VD	R/W		0 to 999999
On Threshold	VD	R/W		0 to 999999
Off Threshold	VD	R/W		0 to 999999
start value	VD	R/W		0 to 999999
Hours Counter				
Maintenance Interval (MI)	VD	R/W		0 to 599999 (9999H 59M)
Time-to-Go (MN)	VD	R		
Total Time (OT)	VD	R		
Threshold Trigger				
Frequency	VW	R		
On Threshold	VW	R/W		0 to 9999
Off Threshold	VW	R/W		0 to 9999
Gate Time	VW	R		
Analog Threshold Trigger				
On	VW	R/W		-20000 to 20000
Off	VW	R/W		-20000 to 20000
Gain	VW	R/W		
Offset	VW	R/W		
Ax, Amplified	VW	R		
Analog Differential Trigger				
On	VW	R/W		-20000 to 20000
Differential	VW	R/W		-20000 to 20000
Gain	VW	R/W		
Offset	VW	R/W		
Ax, Amplified	VW	R		
Off	VW	R		
Analog Comparator				
On	VW	R/W		-20000 to 20000
Off	VW	R/W		-20000 to 20000
Gain	VW	R/W		
Offset	VW	R/W		
Ax, Amplified	VW	R		
Ay, Amplified	VW	R		

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Ax (Amplified)-Ay (Amplified)	VW	R		
Analog Watchdog				
Gain	VW	R/W		
Offset	VW	R/W		
Aen (Comparison Value)	VW	R		
Ax, Amplified	VW	R		
Differential (+)	VW	R/W		0 to 20000
Differential (-)	VW	R/W		0 to 20000
Analog Amplifier				
Analog Amplifier: Gain	VW	R/W		-1000 to 1000
Analog Amplifier: Offset	VW	R/W		-10000 to 10000
Analog Amplifier: Ax, Amplified	VW	R		
Analog Multiplexer				
AQ Amplified	VW	R		
V1 (S1=0; S2=0)	VW	R/W		-32768 to 32767
V2 (S1=0; S2=1)	VW	R/W		-32768 to 32767
V3 (S1=1; S2=0)	VW	R/W		-32768 to 32767
V4 (S1=1; S2=1)	VW	R/W		-32768 to 32767
PWM				
Min.	VW	R/W		-10000 to 20000
Max.	VW	R/W		-10000 to 20000
Gain	VW	R/W		-1000 to 1000
Offset	VW	R/W		-10000 to 10000
Ax, Amplified (Current Period)	VW	R		
T	VW	R/W	Unit: Seconds	Value range: 0 to 9999
			Unit: Minutes or Hours	Value range: 0 to 5999
Periodic Time Base	VB	R/W	10 milliseconds	1
			Seconds	2
			Minutes	3
Mathematic Instructions				
AQ Amplified	VW	R		
V1	VW	R/W		-32768 to 32767
V2	VW	R/W		-32768 to 32767
V3	VW	R/W		-32768 to 32767
V4	VW	R/W		-32768 to 32767
Operator 1	VB	R/W		VBx+0
			+	0
			-	1
			*	2
			/	3

Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Operator 2	VB	R/W		VBx+0
			+	0
			+	1
			*	2
			/	3
Operator 3	VB	R/W		VBx+0
			+	0
			-	1
			*	2
			/	3
Priority1	VB	R/W	L	0
			M	1
			H	2
Priority2	VB	R/W	L	0
			M	1
			H	2
Priority3	VB	R/W	L	0
			M	1
			H	2
Reset Mode	VB	R/W	Reset to zero	0
			Keep last value	1
Analog Ramp				
Gain	VW	R/W		
Offset	VW	R/W		
Current Level	VW	R		
Level 1 (L1)	VW	R/W		-10000 to 20000
Level 2 (L2)	VW	R/W		-10000 to 20000
Largest Output Value	VW	R		
Start/Stop Offset	VW	R/W		0 to 20000
Speed of Change	VW	R/W		1 to 10000
PI Controller				
Set Value (SP)	VW	R/W		-10000 to 20000
PV, Amplified	VW	R		
Aq	VW	R		
Kc	VW	R/W		0 to 9999
Integration Time (TI)	VW	R/W	Unit: Minutes	0 to 5999
Direction	VB	R/W	+	0
			-	1
Manual Output (Mq)	VW	R/W		0 to 1000
min	VW	R/W		-10000 to 20000
max	VW	R/W		-10000 to 20000
Gain	VW	R/W		-1000 to 1000
Offset	VW	R/W		-10000 to 10000

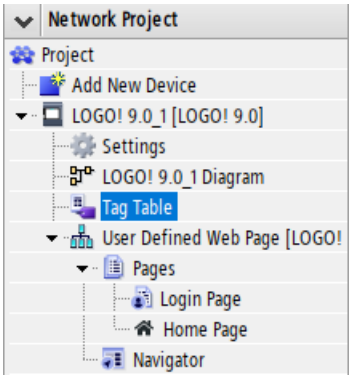
Function Block	Data type	Read/Write	Parameter settings in LOGO!Soft Comfort	Parameter settings on a partner device
Analog Filter				
Dialog Parameter Average Value Sample Number	VB	R/W		3 to 8
			8	3
			16	4
			32	5
			64	6
			128	7
			256	8
Ax	VW	R		
Aq	VW	R		
Max/Min				
Mode	VB	R/W		0, 1, 2 and other value
Ax	VW	R		
Minimum Value	VW	R		
Maximum Value	VW	R		
Aq	VW	R		
When reset=0, reset Min/Max	VB	R/W		0 or 1
Average Value				
Sample Time	VW	R/W	Unit: Seconds or Minutes	Value range: 0 to 59
			Unit: Hours	Value range: 0 to 23
			Unit: Days	Value range: 0 to 365
Number of Samples	VW	R/W	Unit: Seconds	Value range: 1 to St*100
			Unit: Days	Value range: 1 to 32767
			Unit: Hours	Value range: 1 to 32767
			Unit: Seconds and ≤ 5 Minutes	Value range: 1 to St*6000
			Unit: Seconds and ≥ 6 Minutes	Value range: 1 to 32767
Ax	VW	R		
Aq	VW	R		
Sample Time Time Base	VB	R/W	Seconds	1
			Minutes	2
			Hours	3
			Days	4
Float calculation instruction				
AQ Amplified	float VD	R		
V1	float VD	R/W		
V2	float VD	R/W		
V3	float VD	R/W		
V4	float VD	R/W		
Reset Mode	VB	R/W	Reset to zero	0
			Keep last value	1

2.8.5.49 Tools -> Tag Table (0BA7 and later versions only)

LOGO!Soft Comfort support tag table configurations for LOGO! 0BA7 and later versions devices. Use this command to configure the following items:

- Tag table
- Parameter VM mapping
- Cloud data transfer (only available for LOGO! 9 and later versions devices)

In a network project, when you add a LOGO! device (0BA7 and later versions), a tag table is created automatically under the device in the project tree.



Tag table

The tag table allows you to define tags that can be referenced in block parameters.

In an User Defined Web Page project, these defined tags can be used as the global variables for components. You can use variables and the binding data to configure components. When you configure a component that uses analog data, the component filters the variables from the Tag Table, and shows variables which match the component property in the **Variable Name** drop down list. To learn more about the web project, refer to User Defined Web Page (Page 531).

Add or delete tags

To add a tag in the table, click Add button. A tag with the default name "TagX" is generated. Then you can change the tag name, and configure the variable range, type, address and length. You can add up to 256 tags in the table.

To delete a tag in the table, select the tag then click Delete button.

Note

Tag name limit

- The tag name can contain upper-case or lower-case letters, numbers, special character underline (_), hyphen (-) or period (.).
- The tag name cannot exceed 30 characters in length.

Export or Import tags

To export the tag table, click Export button. Then you select the file path to save the .csv file.

Note

You cannot export empty tag table.

To import tags into the table, click Import button, then upload the .csv file from your local file system. You can use the exported tag table file as the template to fill in tag data.

When importing a .csv file, LOGO!Soft Comfort will check the imported tags. The import check window displays all the tags in the .csv file.

- Check the box "Only show conflicting or erroneous items" to filter out and only display the tags that cannot be imported directly.
- Select the action option.
- Import button is only available when all the conflict and error tags are properly handled. Click the button to starting importing.
- Click Cancel button to cancel importing the .csv file.

Check result	Meaning	Action option
None	No error for the tag. The tag can be imported.	• Import: import the tag. • Skip: cancel importing the tag.
Overwritable conflict	The imported tag is exactly the same as the tag in the tag table. The tag can be imported and will replace the tag in the tag table.	• Overwrite: import the tag and replace the one in the tag table. • Skip: cancel importing the tag.
Conflict	The tag has the same tag name as a tag in the tag table but has different variable address. The tag cannot be imported.	• Skip: cancel importing the tag.
Error	Error tag. For example, the tag name exceeds the limit; tag for invalid variable. The tag cannot be imported.	• Skip: cancel importing the tag.

Note

Tag number limit

The tag table supports 256 tags at most. If the total number of tags in the tag table and in the imported .csv file exceeds 256, the additional tags will be highlighted in the import check window. You need to select Skip action for these additional tags to cancel importing them.

Variables in tag table

The following table lists the variables that can be used to define tags in the tag table:

Variable type	Variable address range
I	• LOGO! 9: I1-I64 • 0BA8, 0BA7: I1-I24
IB	• LOGO! 9: IB0-IB7 • 0BA8, 0BA7: IB0-IB2
Q	• LOGO! 9: Q1-Q60 • 0BA8: Q1-Q20 • 0BA7: Q1-Q16
QB	• LOGO! 9: QB0-QB7 • 0BA8: QB0-QB2 • 0BA7: QB0-QB1
M	• LOGO! 9: M1-M128 • 0BA8: M1-M64 • 0BA7: M1-M27
MB	• LOGO! 9: MB0-MB15 • 0BA8: MB0-MB7 • 0BA7: MB0-MB3
AI	• LOGO! 9: AI1-AI16 • 0BA8, 0BA7: AI1-AI8
AQ	• LOGO! 9: AQ1-AQ16 • 0BA8: AQ1-AQ8 • 0BA7: AQ1-AQ2
AM	• LOGO! 9: AM1-AM128 • 0BA8: AM1-AM64 • 0BA7: AM1-AM16
FAM	• LOGO! 9: FAM1-FAM32
V	• LOGO! 9, 0BA8, 0BA7: V: 0-850, Bits: 0-7
VB	• LOGO! 9, 0BA8, 0BA7: VB0-VB850
VD	• LOGO! 9, 0BA8, 0BA7: VD0-VD847
VW	• LOGO! 9, 0BA8, 0BA7: VW0-VW849
Cursor Key	• LOGO! 9, 0BA8, 0BA7: C1-C4
Function Key	• LOGO! 9, 0BA8, 0BA7: F1-F4
Shift Register	• LOGO! 9, 0BA8, 0BA7: S1.1-S1.8,S2.1-S2.8, S3.1-S3.8,S4.1-S4.8
VX	• LOGO! 9, 0BA8 (8.4): VX: 0-2047, Bits: 0-7

Variable type	Variable address range
VXB	• LOGO! 9, 0BA8 (8.4): VXB0-VXB2047
VXD	• LOGO! 9, 0BA8 (8.4): VXD0-VXD2044
VXW	• LOGO! 9, 0BA8 (8.4): VXW0-VXW2046
VR	• LOGO! 9, 0BA8 (8.4): VR: 0-511, Bits: 0-7
VRB	• LOGO! 9, 0BA8 (8.4): VRB0-VRB511
VRD	• LOGO! 9, 0BA8 (8.4): VRD0-VRD508
VRW	• LOGO! 9, 0BA8 (8.4): VRW0-VRW510

Parameter VM mapping

Here you can create the parameter VM mapping for your diagram. When the parameter variable memory address matches the tag in the tag table, you can select to bind the parameter with the tag.

To learn more about parameter VM mapping, refer to Tools -> Parameter VM Mapping (0BA7 and later versions only) (Page 197).

Cloud data transfer (LOGO! 9 and later versions only)

Here you can configure the data to transfer with IoT Cloud. You can configure the data either manually or by referencing the tags in the tag table.

This cloud data transfer configuration is synchronized with the cloud data transfer settings in the LOGO! diagram settings (Page 66). To learn more about cloud data transfer settings, refer to Tools -> Transfer -> Cloud Settings -> Cloud Data Transfer Settings (0BA8 and later versions only) (Page 116).

LOGO! 9:
The cloud data transfer configuration table is only available in the tag table configurations menu for LOGO! 9 and later versions devices.

2.8.5.50 Tools -> Options

Here you can select various options for LOGO!Soft Comfort:

- General (Page 216)
- Preference (Page 217)
- Print (Page 217)
- Cut connections (Page 218)
- Simulation (Page 218)
- Colors (Page 219)
- UDF (Page 219)

- CSV Separator (Page 219)
- Certificate (Page 219)

2.8.5.51 Tools -> Options: General

Here you can define your default editor.

- Edit your circuit diagram always in the FBD Diagram Editor
- Edit your circuit diagram always in the LAD Editor

Here you can also define the user interface language.

- Display the user interface in Deutsch
- Display the user interface in English
- Display the user interface in Spain
- Display the user interface in French
- Display the user interface in Italian
- Display the user interface in Chinese

To set and apply a new language, you must close and restart LOGO!Soft Comfort.

Note

Change your operating system language prior to changing the language for LOGO!Soft Comfort.

Here you can define the zoom factor for the size of user interface text and icons.

- Set the size scale to 100%
- Set the size scale to 125%
- Set the size scale to 150%

Note

The zoom factor of network view or diagram editor is not changed after you set a new size scale of user interface text and icons.

Note

To ensure complete display of LOGO!Soft Comfort, you should use the recommended scale size and display resolution by your computer system.

To set and apply a new size scale, you must restart LOGO! Soft Comfort.

2.8.5.52 Tools -> Options: Preference

Here you can define your preferred display settings.

- Whether to display comments
- Whether to display connector names
- Whether to display parameters of a block
- Whether to use antialiasing in the drawing
- Whether to label marked lines
- Whether to save the software interface and working environment
- Whether to start from the diagram tab or project tab

Other possible settings:

- Antialiasing: With antialiasing, corners and edges appear softened.
- If you enable View > Select lines (Page 90) with **Label marked lines**, the marked lines are labeled as the following example:

B007 > B006/2 means that the connection runs from block 7 to block 6 at input(pin) 2. LOGO!Soft Comfort does not label connections if the target block to which the connection is running is in the immediate vicinity.

2.8.5.53 Tools -> Options: Print

Here you can determine the appearance of your printed circuit programs:

- Whether to print the comment you have entered in the comment tab under File → Properties: General (Page 68)
- Whether to print the Ethernet connections you have configured under Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187)
- Whether to print the parameter VM mapping you have configured under Tools -> Parameter VM Mapping (0BA7 and later versions only) (Page 197)
- Whether to print the connector names and parameters in a circuit diagram
- Whether to print the list of the parameters of all blocks, of all selected blocks, or only of the special timer functions
- Whether to print the list of connector names
- Whether to suppress empty page
- Inputting the desired zoom factors for the printing

2.8.5.54 Tools -> Options: Cut Connections

Here you can choose to cut connections via the Cut/Join (Page 48) either manually or automatically.

You can specify one or both of the following types of connections to be cut:

- Connections on import or on upload
- Connections routed across a block
- Connections exceeding a configurable length

In the radius text box you can choose either to input the radius points directly or to use the scroll bar.

After confirming these settings, LOGO!Soft Comfort will cut connections accordingly.

If you configured LOGO!Soft Comfort to cut connections during importing or uploading, the software cuts connections according in the following cases:

- When you upload (transfer) a circuit program from LOGO! to LOGO!Soft Comfort
- When you import (open) a circuit program created with LOGO!Soft Standard or LOGO!Soft Comfort

2.8.5.55 Tools -> Options: Simulation

Here you can configure the simulation parameters and its displayed status:

- For starting a simulation:
  - You can choose whether to start the simulation automatically when you switch to simulation mode. Otherwise, you must press the green arrow icon to start simulation from simulation mode.
  - You can choose whether to automatically simulate network communication when the IP address is accessible. Otherwise, you must press the icon to start simulation in network.
  - You can specify whether to reset the status of inputs and outputs at the start of simulation.
- For interface display:
  - You can also specify whether to switch the display of signal states and process variables on or off in simulation mode. Switching it off improves the performance of your simulation because when you disable the display of signal states and process variables, there is no need for LOGO!Soft Comfort to calculate these values continuously.
  - In addition, you can specify whether to display a separate simulation window for text messages on the LOGO! TD/LOGO! TDE. If selected, simulation mode shows active message texts for the LOGO! Base Module and the LOGO! TD/LOGO! TDE in separate windows.
  - You can specify whether to show the elapsed time for simulation in standard 12 hour format.

2.8.5.56 Tools -> Options: Colors

Here you can define the following elements of the color settings:

- Desktop color
- Colors of signal lines carrying a logical "1" or "0" signal in simulation mode
- Color setting for UDF block frame in circuit program
- Colors for each of the four maximum possible block inputs and for the block output.
- Background color of function blocks.
- Background color of special flags.
- Color of parameter box lines connecting parameter boxes from each other.
- Color of connecting line between float analog function block and integer analog function block (LOGO! 9 and later versions only).

You can reset color on the chosen field by choosing different color panels from Swatches, HSV, HSL, RGB, CMYK and Standard.

The preview area shows your color selection.

2.8.5.57 Tools -> Options: UDF (0BA7 and later versions only)

Use this command to configure the UDF library.

A UDF library can contain two types of elements: a single UDF (.lma) file and a folder with multiple UDF files.

You can add or remove UDF files or folders in the dialog.

UDFs added to the UDF library appear immediately in the block tree, and are available for use in the circuit program.

2.8.5.58 Tools -> Options: CSV Separator

Use this command to choose whether to separate items in the CSV-format log file by semicolons or by commas.

2.8.5.59 Tools -> Options: Security

Certificate

Here you can change the option of whether to trust LOGO! 8.3 product root CA. If you don't trust LOGO! 8.3 product root CA, you will fail to establish communication between LOGO!Soft Comfort and LOGO! 8.3 Base Module.

User Information Management (LOGO! 9 and later versions only)

When connecting LOGO!Soft Comfort (V9.0 or later versions) to LOGO! 9 (or later versions), you are required to log in as an authenticated user by entering the correct user name and password. You can choose to save the login information so that you won't need to enter user name and password again when connecting.

Here you can click the button to delete the saved user login information. Then you need to enter the correct user name and password when connecting.

To learn more about the user management, refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109).

LOGO! 9 only:
This option is available only for LOGO! 9 and later versions.

Security Configuration Wizard

Here you can select to enable or disable the Security Configuration Wizard. When the Security Configuration Wizard is enabled, every time you create a new diagram for LOGO! 9 devices, the Security Configuration Wizard appears to guide you through all the security related configurations. The Security Configuration Wizard is enabled by default.

When using the Security Configuration Wizard, you can choose to configure the security settings step by step, or use an existing template. Refer to Configuring security settings (LOGO! 9 and later versions only) (Page 226) for detailed operation.

LOGO! 9 only:
This option is available only for LOGO! 9 and later versions.

2.8.6 Window menu

From the Window menu, you can arrange your circuit program windows on the desktop. You can duplicate existing circuit programs and split the windows to obtain a clearer overview of large programs. The following window options are available:

- Undo Split (Page 221)
- Split into two Windows (Page 221)
- Split into three Windows (Page 221)
- Selection list (Page 221)

2.8.6.1 Window -> Undo Split

You can use this menu command to undo all splits of a circuit program window.

2.8.6.2 Window -> Split into two windows

LOGO!Soft Comfort allows you to split the diagram editor window into two windows.

You can drag one diagram to the other window in order to view different areas of this diagram. You can then use the scroll bars to view or modify the elements not displayed in either window.

You can also copy one diagram to the other window to compare two circuit programs or to modify the pasted diagram.

The split, of course, affects only the window, but not your circuit program. These changes, take effect throughout the circuit program because only the window is split, but not the circuit program.

In project mode, every time you add a LOGO! Base Module in the network view, LOGO!Soft Comfort creates a corresponding program at the same time in the diagram editor frame. You can edit one window at a time. Move your mouse in the desired window frame and click the left mouse button on that window to switch highlight to it before operations. You can also click the device in the network view when working in project mode.

Note

Bilateral programming

LOGO!Soft Comfort supports network programming between two split windows. For more information on two-side programming or namely bilateral programming, see Two-side programming (Page 256).

Note

If you accidentally close a diagram in project mode, you can double-click the device in the network view frame to show the diagram again.

2.8.6.3 Window -> Split into three windows

LOGO!Soft Comfort also supports to split diagram editor window into three windows.

The items to note are the same as Window -> Split into two windows (Page 221), see that section for more information.

2.8.6.4 Window -> Selection list

The selection list at the end of the Window menu shows you all the windows you have opened on the programming interface. You can use this selection list to quickly switch between windows.

2.8.7 Help menu

This menu provides you with help and information on LOGO!Soft Comfort.

- Contents (Page 222)
- Context-sensitive Help (Page 223)
- Update Center (Page 223)
- Update Cloud (Page 224)
- About (Page 224)

2.8.7.1 Help -> Contents

The Online Help

The online help quickly and reliably provides you with information about program and network configuration, tools and the creation of circuit programs and network projects with LOGO!Soft Comfort.

Topics of the Online Help

The User interface (Page 57) section describes the user interface with its toolbars and the LOGO!Soft Comfort menus in detail.

Refer to the Tutorial (Page 225) for a quick and easy introduction to the basics of operating LOGO!Soft Comfort, its circuit programming features and its new project networking features.

Towards the end of this section you will find an extensive Practical example (Page 289) that takes you through all the steps of circuit program and network project creation.

The Sample applications (Page 303) section introduces a few applications for LOGO!.

The Reference material (Page 312) chapter contains the following subsections:

- The Constants and connectors (Page 312) , Basic functions (only the FBD Editor) (Page 335) and Special functions (Page 340) subsections provide you with information about the various elements of a circuit program.
- The Circuit programs (Page 516) subsection provides information on memory requirements, circuit program limits for LOGO!, and additional information about blocks.
- The Network projects (Page 530) subsection gives an overview of the network project.
- The Data Log profile (Page 497) subsection gives information about the Data Log.
- The UDF (Page 500) subsection provides information on the UDF (User Defined Function block).

The Tips and Tricks (Page 594) section includes information that supports your daily tasks with LOGO!Soft Comfort.

The online help includes an **index** as well as a **full text search** feature for keyword and terminology based searches.

Help for blocks

If you double-click a block in the circuit program, you receive a window with parameters and settings for the block. If you then click the Help button in this window you receive the Help for this block in its own window.

Alternatively, you can right-click a block in the circuit program and select **Help** from the shortcut menu.

2.8.7.2 Help -> Context-sensitive help

→ Help **Context-sensitive help**

To display help on an object, first click the context-sensitive help icon (see above) and then the object.

Result: A window opens with information on this object.

You can also right-click objects on the programming interface and select **Help** from the shortcut menu to display a corresponding help topic.

The standard toolbar (Page 42) also contains an icon for this menu command.

2.8.7.3 Help -> Update Center

Note: This function is disabled in current release. You can download the upgrade packages manually from Siemens (www.siemens.com).

Update Center

The Update Center helps you to install additional languages, program add-ons, service packs and new versions for your LOGO!Soft Comfort.

If you update the software to a higher version (for example, from Version 8.0 to Version 8.1), you can upgrade from either the Update Center or a USB Stick or a DVD-ROM.

How to use the Update Center

Follow these steps to perform an update/upgrade:

1. Select whether you want to update/upgrade LOGO!Soft Comfort via the Internet or using your local file system (USB Stick, DVD-ROM, floppy or hard disk drive).
2. If you choose to update/upgrade LOGO!Soft Comfort from your local file system, then you are prompted to enter the folder path in which you save the updates/upgrades.
   If you update/upgrade LOGO!Soft Comfort from the Internet, then the correct Internet address is already preset in the Settings Internet Update. If you are not connected directly to the Internet, then you must specify a proxy server. Consult your network administrator in this regard. An Internet connection is then created.

3. You are then shown all the updates/upgrades available for your software version. Select the desired updates/upgrades. If you are updating LOGO!Soft Comfort from the Internet, then your selected updates/upgrades will be downloaded and installed.
4. If you are updating/upgrading LOGO!Soft Comfort via the Internet, you are prompted to manually close the Internet connection when you have completed these actions.

LOGO!Soft Comfort is closed automatically when the update/upgrade is completed. The functionality of the installed update/upgrade is available to you after you restart LOGO!Soft Comfort.

Update Center

When installing an upgrade/update, if you receive the error message **Does not agree with magic number**, this means the upgrade/update file **Setup.exe** has not been executed fully.

In this case, download the upgrade/update file from the Internet again and ensure the file is transferred completely.

2.8.7.4 Help -> Update Cloud

Siemens will release Cloud related updates after Cloud service platforms' corresponding updates. In this case, you only need to update Cloud instead of updating LOGO!Soft Comfort.

How to use the Update Cloud

Follow these steps to update Cloud:

1. Download the Cloud update package from Siemens Web (https://www.siemens.com/global/en/products/automation/systems/industrial/plc/logo/logo-software.html), and save the file in your local file system.
2. Unzip the downloaded package.
3. Click **Help -> Update Cloud**. The window displays the current Cloud version information, then click **Next**.
4. In this window, click the folder icon to select the root directory of the unzipped cloud update package file. LOGO!Soft Comfort verifies the update package and displays if the update package file or the version is valid.
5. Click **Next** to start the update. After the update, the window displays the update result.
6. Click **Finish** to close the window. LOGO!Soft Comfort reminds you in a window that the update will not take effect until you restart the program.

2.8.7.5 Help -> About

The **General** tab displays the version number and the release version of your LOGO!Soft Comfort software.

The **System** tab provides you with information on the version of the Java Runtime environment used, the program paths, the installed operating system and on the memory used.

Tutorial 3

3.1 Prerequisites for working with the tutorial

To use this tutorial, you must be familiar with PC operation and you must know how to create a function block diagram. To download your circuit programs, you also need a PC cable, SD card or Ethernet cable for connecting the PC interface to your LOGO! device.

3.2 Getting started with program creation

You are going to learn the basics of working with LOGO!Soft Comfort by creating a simple circuit program and simulating it on your PC. Towards the end of this chapter, you will find a few sample applications (Page 289) for LOGO!Soft Comfort, and information on how to prepare, transfer and archive your application.

If necessary, review the elements of the user interface (Page 35) before beginning the tutorial.

Factory door (Page 305)

Air-conditioning system (Page 303)

Heating control (Page 306)

Fill station (Page 309)

3.2.1 Creating a circuit program

Developing a circuit program

Perform these tasks to develop a circuit program:

1. Create a new circuit program (Page 226)
2. Configure security settings (Page 226)
3. Select blocks (Page 228)
4. Place the blocks (Page 229)
5. Configure and comment the blocks (Page 230)
6. Connect the blocks (Page 230)
7. Optimize the circuit program (Page 236)
8. Save the circuit program (Page 241)

Note that not all blocks are available (Page 233) under all circumstances.

Configure security settings:
Using the security configuration wizard to configure security settings is only available for LOGO! 9 and later versions.

3.2.1.1 Creating a new circuit program

After you start LOGO!Soft Comfort, you can begin to create a new circuit program.

To create a new circuit program, select the **File -> New** menu command or click the **New** button in the standard toolbar.

→ File → new (Page 58)

LOGO!Soft Comfort opens the FBD Editor (or the default editor specified under Tools/Options/Standard Editor), and then you can create the new circuit program in a new window on the programming interface.

Click the small arrow on the right side of the **File** → **new** icon to open the LAD, FBD or UDF Editor.

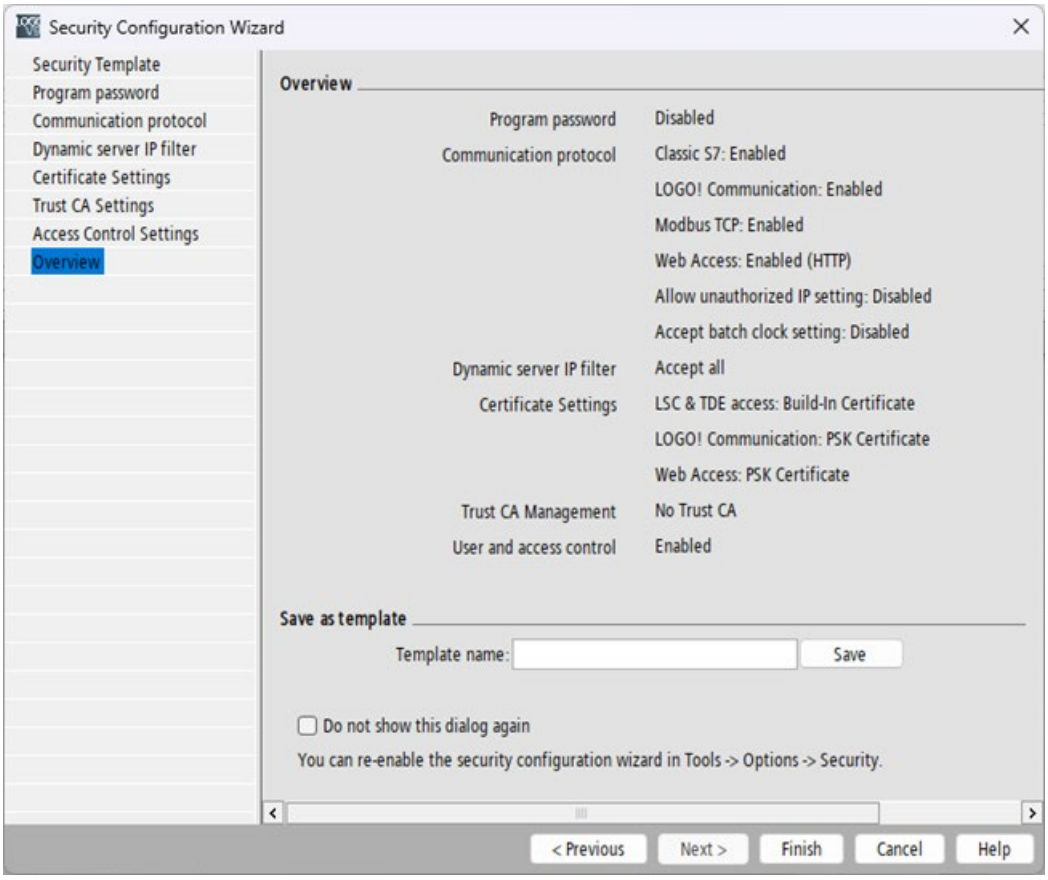
3.2.1.2 Configuring security settings (LOGO! 9 and later versions only)

If the security configuration wizard is enabled, when you create a new diagram for LOGO! 9 (and later versions), or when you switch the hardware type to LOGO! 9 (and later versions), the Security Configuration Wizard appears to guide you through all the security related configurations.

Note

If you close the wizard to cancel or discard all the security configurations, you cannot re-open the wizard for the created diagram.

Using Security Configuration Wizard



The Security Configuration Wizard provides the following optional security configurations:

- Security template

  In this wizard page, you can choose to use an existing template. If there is no existing template, you can start creating one.

  To use an existing template, click the Template field and then select one in the drop-down list. Click Apply. If you want to use part of the template, check the corresponding box of the template items.

  Click Next button to go to the next configuration item.

- Program password

  In this wizard page, you can choose to enable or disable the program password. To set the program password, refer to File -> Properties - Program password (Page 71).

- Communication protocol

  Here you choose to enable ethernet connections: S7 access, LOGO! Communication and Modbus access, web server access, unauthorized IP setting, batch clock setting.

  Refer to Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) to learn more about ethernet connections.

- Dynamic server IP filter

  Here you can configure to access the access request from all IP or specific IP. Refer to Tools -> Transfer -> Dynamic Server IP Filter (0BA8 and later versions only) (Page 154) to learn the detailed configuration.

- Certificate settings

  Here you can configure the certificate strategy. Refer to Tools -> Transfer -> Certificate Settings (Page 144) to learn the detailed configuration.

- Trust CA settings

  Here you can manage all the trust CA certificates. Refer to LOGO! settings -> Online settings -> Trust CA settings (LOGO! 9 and later versions only) (Page 165) to learn the detailed configuration.

- Access control settings

  Here you can configure the user management. Refer to Tools -> Transfer -> Access control (LOGO! 9 and later versions only) (Page 109) to learn the detailed configuration.

- Overview

  Here the wizard displays the overview of the configurations you have done. Click Previous button or the item in the navigation menu to reach to the specific wizard page, then you can view or change the configuration.

  To save above settings as a security configuration template, you need to name the template, then click Save.

  Here you can choose to disable the Security Configuration Wizard by checking the box "Do not show this dialog again". You can also enable or disable the Security Configuration Wizard in the menu command Tools -> Options: Security (Page 219).

  You can also manage the security configuration templates in the Device settings through menu command File -> Properties - Template (Page 77).

Click Finish button to complete the security configuration and close the wizard. Then the LOGO! settings (Page 66) window appears automatically for further device configuration. You can either continue to configure the device or close the window.

3.2.1.3 Selecting blocks

Your first programming step is to select the blocks for your circuit program. Determine the order in which you want to insert the I/O and the standard/SFB blocks.

Under Co in the programming toolbar, you find the constants and terminals, that is, a collection of I/O and constant signals. Under GF, you find the basic logic functions of Boolean algebra: standard digital logic blocks. Under SF you can find the special functions. You can also access the respective function groups via the function keys.

Co or [F6] → Constants/connectors (Page 312)

SF or [F8] → SFBs (Page 340)

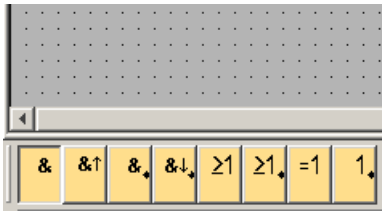
Only in the FBD and UDF Editors:
GF or [F7] → Basic functions (Page 335)

A quick and easy way of selecting blocks and placing them into your circuit program (Page 594)

3.2.1.4 Placing blocks

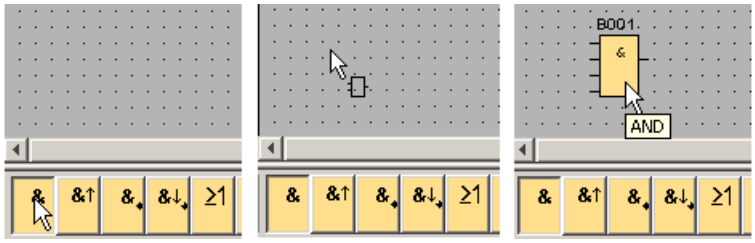
Click the icon group that contains the required block or, as an alternative, click the function key (Page 39). The programming interface displays all blocks belonging to the selected Basic function group.

Example for the FBD Editor:



You can insert the selected function on your programming interface by clicking the programming interface. You can select other functions with the mouse before you place them.

Example for the FBD Editor:



There is no need to align the blocks right away. A precise alignment of the blocks at this time does not make sense, until you have interconnected them and entered the comments in your circuit program.

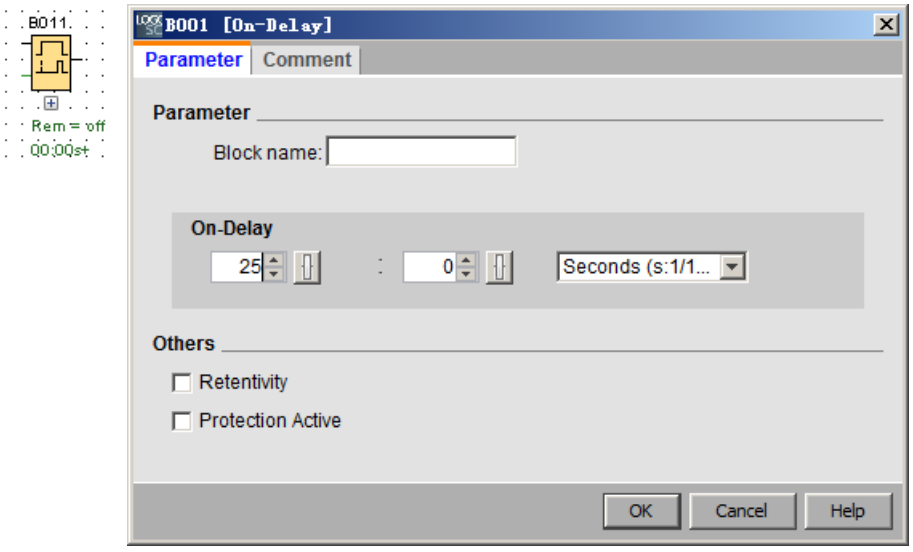
Information on block numbering is found here (Page 529).

How to quickly and easily select blocks and place them into your circuit program (Page 594)

3.2.1.5 Editing blocks

Shortcut menus

Right-click an object opens a shortcut menu that offers you various object editing options. The editing options depend on the selected object:



Objects consist of not only blocks and connecting lines, but also the programming interface and toolbars.

You can also call Help -> Context-sensitive help (Page 223) on the selected object in the shortcut menu.

Configuring blocks

Double-click a block to configure block properties. The properties dialog includes a Comment tab as well as various parameter tabs for the SFBs (Page 340), and for some of the basic functions (Page 335) and constants and connectors (Page 312). You specify here the values and settings for your blocks. You can click the **Help** button to get help on the parameters of the selected block.

You can recognize special functions by the green lettering below the block on the programming interface.

3.2.1.6 Connecting blocks

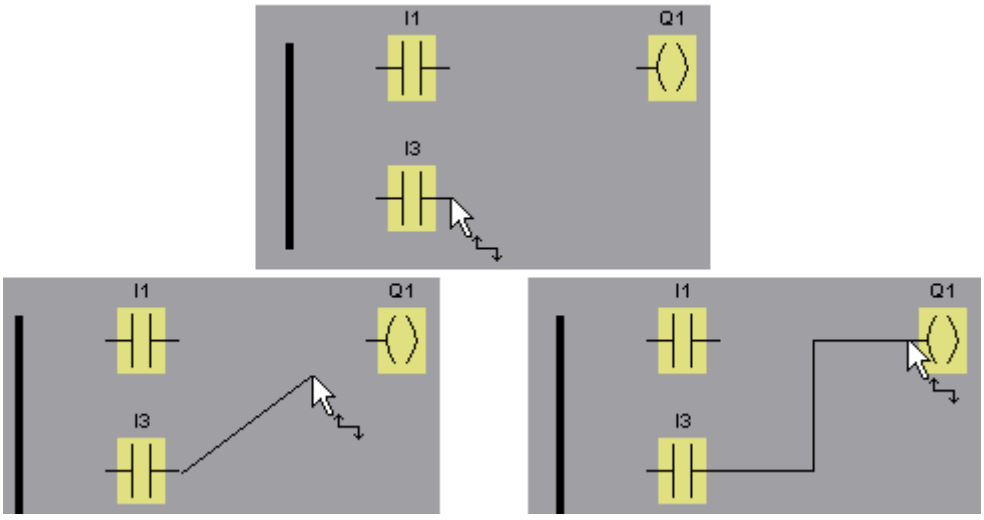
To complete the circuit program, you must interconnect the blocks. In the programming toolbar (Page 45), select the block connection icon.

Example for FBD:

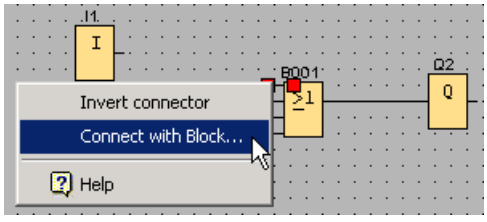
→ Connector (Page 47)

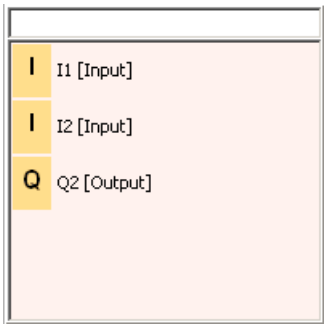
Click the connector of one block and drag the mouse to a connector of another block to make a connection between the two blocks. LOGO!Soft Comfort connects the two terminals.

Example for LAD:



LOGO!Soft Comfort offers you a further option of connecting blocks when you right-click the input or output of a block. In the shortcut menu, click the **Connect with block** menu command to display a selection list that contains all blocks available for your connection. Click the relevant target block. LOGO!Soft Comfort then draws the connecting line. This method is especially useful for connecting a source to a target block over a greater distance on the programming interface.



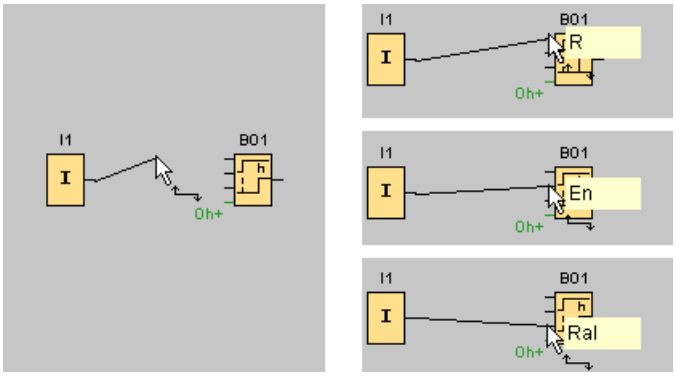


Note on the LAD Editor:
Do not forget to connect the I/O to the bus bar on the left edge of the editor window.

Tips on connecting blocks

When you connect an input to an output, or vice versa, LOGO!Soft Comfort displays a tooltip that shows the connection. Release the mouse button to snap the line onto the indicated input.

You can refer to the short information (tooltips) in LOGO!Soft Comfort for additional help on circuit programming. Hover over a block to see the name of the block. Hover over a block input to see the name of the input.



LOGO!Soft Comfort displays a blue frame around the mouse pointer when it can connect to an block input (pin)

Rules for connecting blocks

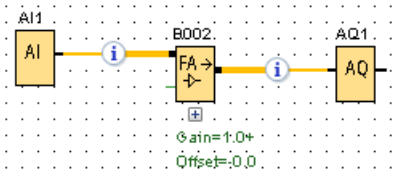
The following rules apply to the connection of blocks:

- You can connect a single input to multiple outputs.
- You cannot connect multiple inputs to a single output.
- You cannot interconnect I/O in the same path of a circuit program. Recursion is not permitted. Interconnect a flag (Page 316) or output (Page 314) if necessary.
- SFBs (Page 340) also have green "connectors". These do not represent connecting pins, but are used instead for assigning the parameter settings.
- Analog I/O cannot be connected to digital I/O.

Connecting blocks in different data type (LOGO! 9 and later versions)

For LOGO! 9 and later versions BM, float data type is supported. When you configure the data type of an analog block as Float (32-bit) data type, you will notice that the input/output connector line is thicker than the line of the block in integer data type.

LOGO!Soft Comfort supports to connect blocks in different data types, that is, connecting an analog block in integer data type to an analog block in float data type, or vice versa. In this case, LOGO!Soft Comfort generates the connecting line in yellow by default, and there is a reminder mark ⓘ placing on the line between the two blocks.



When you connect an integer output to a float input, LOGO!Soft Comfort automatically converts the integer data into float data in 32-bit; when you connect a float output to an

integer input, LOGO!Soft Comfort automatically cuts off the numbers after the decimal point and converts the float data into receivable integer data in 16-bit.

If you hover your mouse cursor above the reminder mark , you can see the reminder that the value accuracy will be lost for different data type connection.

Multiple connections

You can connect I/O to existing connections.

A quick and easy way of connecting blocks in large circuit programs (Page 596)

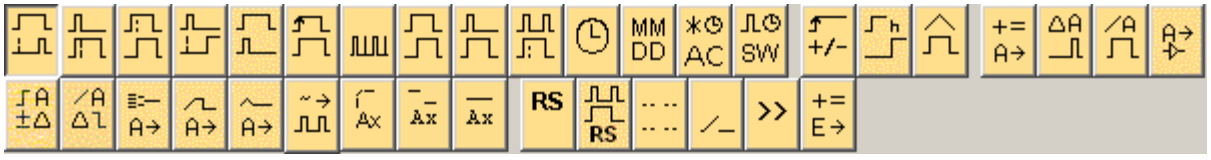
3.2.1.7 Availability of blocks

Hardware defaults

The memory space (Page 527) and the device series (Page 517) of your LOGO! determines:

- How many blocks you can use in the circuit program
- Which blocks are available to create your circuit program

After you have created a circuit program, you can call the Tools → Determine LOGO! (Page 175) menu command or press the function key (Page 39) [F2] to display an Info Window that shows you which LOGO! devices are available for executing your circuit program.



The blocks which are not available for your selected LOGO! are not displayed.

Optimizing the circuit program

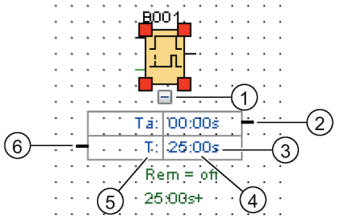
Should you determine in the course of creating your circuit program that a LOGO! device is unable to handle your circuit program, you should first make use of all the functional resources offered to you by the LOGO! device. You could, for instance, replace memory intensive blocks (Page 520) with a structure consisting of several blocks, which altogether require less memory space.

If the various optimization attempts are unsuccessful, then you can use an additional LOGO!, or optimize/simplify the functionality of your application.

3.2.1.8 Parameter box overview

Click the small box below the block to open the parameter box. Not all blocks have parameter boxes.

A parameter box describes each parameter in one line including its name, value and unit.



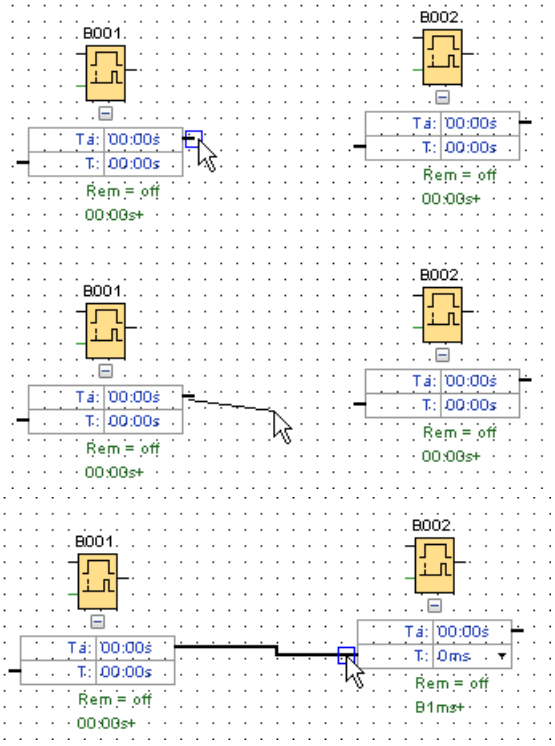
① show/hide button
② output connector
③ unit
④ parameter value
⑤ parameter name
⑥ input connector

For information on using a parameter box, see Editing a parameter box (Page 234).

3.2.1.9 Editing a parameter box

To create, cut, or delete a connection line, follow these steps:

1. Click the connector of one parameter box and drag the mouse to a connector of another parameter box to make a connection between the two parameter boxes.



2. You can cut and rejoin the reference line. For information on cutting the reference line, see Cut/Join (Page 48).

3. You can delete the reference line. Deleting a connection line means deleting their reference relationship. For information on deleting a reference line, see Edit → Delete (Page 81).
4. You can hide or show a parameter box line. For information on hiding/showing a parameter box, see shown/hidden parameter box line (Page 51).

Customized reference line color

You can define the reference line color in color option dialog. On how to set the color of reference line, see section Tools -> Options: Colors (Page 219) for more information. After you select a color, LOGO!Soft Comfort uses that color for all reference lines.

Tips on connecting parameter boxes

After you connect a line from an output connecter to an input connecter, or vice versa, a pop-up tooltip opens to show the connection. Release the mouse button to snap the line onto the indicated input.

You can refer to the short information (tooltips) in LOGO!Soft Comfort for additional help on circuit programming. Hover over a block to see the name of the block. Hover over a block input to see the name of the input.

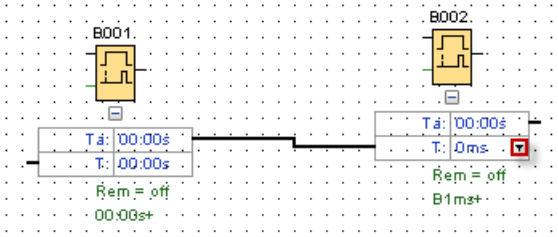
Rules for connecting parameter boxes

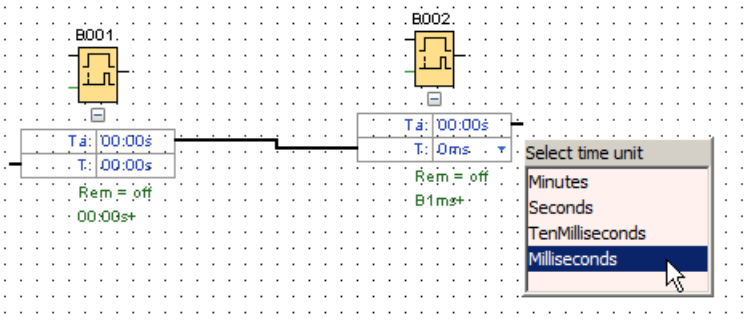
The following rules apply to the connection of blocks:

- You can connect a single input to multiple outputs.
- You cannot connect multiple inputs to a single output.

To change a time unit

When the time-type parameters refer to another parameter, you can change the units of the parameter by left clicking the small arrow and selecting the unit you want in the drop down list.





3.2.2 Editing the layout

The circuit program is ready for use after you have inserted and connected the blocks. To optimize the appearance of your layout, you can reposition the blocks and lines.

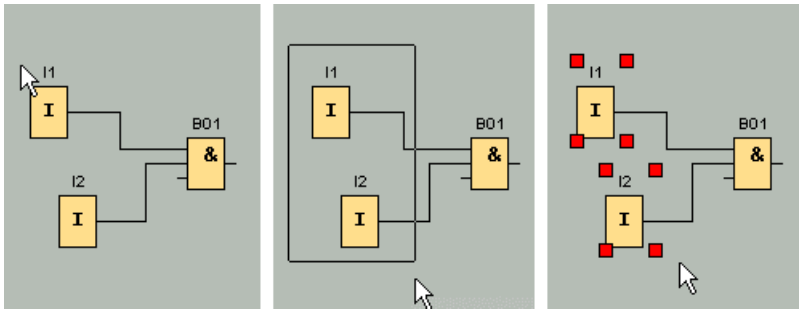
3.2.2.1 Selecting objects

Before you can move or align objects you must first select them. Click the selection tool in the programming toolbar or press the [ESC] key to activate the selection tool.

or **[ESC]** → Selection (Page 47)

You select single blocks or connecting lines with a simple mouse click. To select groups of blocks or connecting lines, you "capture" them with the mouse. To "capture" objects, keep the left mouse button pressed and draw a frame around them and then release the mouse button. LOGO!Soft Comfort highlights the "captured" blocks by small red squares at the corners of the selected fields.

Sample for the FBD Editor:



In addition to the selection of single objects by a simple mouse click or highlighting object groups by "capturing", there is a further selection option: Under "optional selection", mark the objects one after the other by holding down the [Ctrl] key while you select the objects. To remove an object from the selection, hold down the [Ctrl] key and click a selected object once again.

3.2.2.2 Editing selected objects

You can delete single or grouped objects with the [Del] key, or move them with drag and drop or use the keyboard. The cursor keys allow fine positioning in very small steps. However, do not set the snap function in the Format → Grid menu when doing so. You can also cut, copy and paste selected objects by means of the relevant toolbar icons.

→ Cut a Selected Object (Page 81)

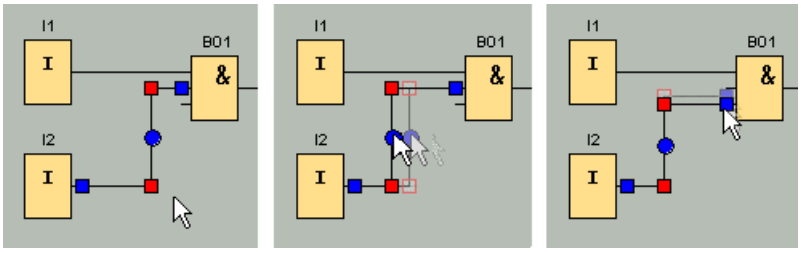
→ Copy a Selected Object (Page 81)

→ Paste a Selected Object (Page 81)

Editing selected connecting lines

LOGO!Soft Comfort indicates a selected connecting line by round and square blue handles. You can use the round handles to move the lines at a right angle into the direction in which they extend. You can use the square handles to reassign the beginning or end of a line. Move the lines by dragging the round handles.

Example for the FBD Editor:



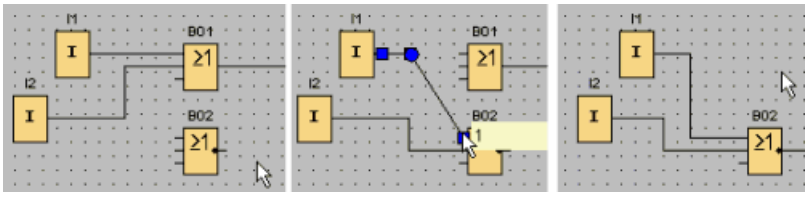
If you do not connect a line to a suitable target connector, LOGO!Soft Comfort reconnects it to its initial position after you "release" the mouse button.

3.2.2.3 Replacing blocks

To replace a block in your circuit program with another function block, follow these steps:

1. Insert the new block above or below the block you want to replace.
2. Rewire the connecting lines of the old block to the new one as described under "Editing selected connecting lines" in Editing selected objects (Page 237).
3. After having rewired all the connecting lines, you can delete the old block and move the new block into this position.

Example for the FBD Editor:



By keeping this block replacement order, you can maintain your connecting lines. If you first delete the old block, you also delete its connections, which means you have to recreate all connections.

In a LOGO! 0BA7 and LOGO! 0BA8 Base Module, you can directly replace an old block by dragging the new block from the block tree to the old block figure with the left mouse key pressed.

3.2.2.4 Cutting connections

It may turn out to be difficult to interpret the layout of a large circuit, especially if it contains many line crossings. You can clean up your connection layout, using the "Cut/Join" tool of the programming toolbar.

→ Cut/Join (Page 48)

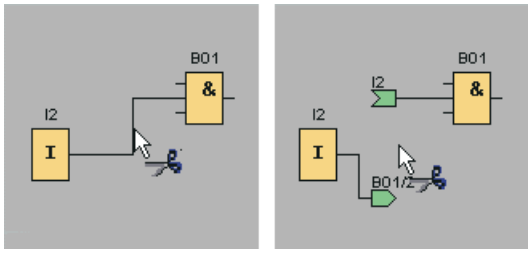
Click a connection after you have called this tool. The selected connecting line is graphically split. However, the link between the blocks remains active.

The open ends of the cut connection are now shown with arrowhead icons, which indicate the direction of the signal flow. Above the icons, you can now see the cross-references, including the page number of the circuit program, the block name and the number of the block terminal that is connected to the open link.

Right-click the line connecting the two blocks you want to cut, then select the cut command.

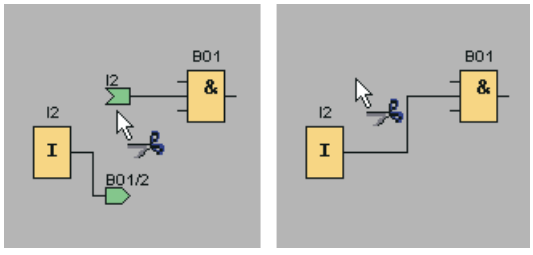
You can also cut a group of connections, using the Edit → Cut Connections (Page 81) menu command. Before you cut any connections, you can also set the cutting criteria, for example, cut all connections routed through blocks.

Example for the FBD Editor:



The connection is closed again by clicking on its open end while the Cut/Join tool is active. Optionally, you can close the connection by right-clicking on an open end and calling the **Join** menu command.

Example for the FBD Editor:



You should not use this tool to edit smaller circuit programs. In most cases you can optimize the layout by repositioning the icons.

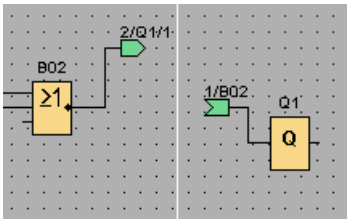
Applications and advantages

Large and complex circuit layouts may contain numerous line crossings, thus making it more or less difficult to interpret the circuit. In such cases, the Cut/Join button is a highly effective means of clearing up the circuit layout.

You can quickly jump to the partner connector by right-clicking the open end of a cut connection. This opens a shortcut menu, in which you can select the **Go To Partner** menu command to jump to the partner end of the cut connection.

Another advantage of the Cut/Join tool is its utilization for circuits extending across more than one printable page, that is, across a page break. The connecting lines of two circuit blocks which are shown on different pages are cut without cross-reference. However, if you cut such connections using the Cut/Join tool you generate a cross-reference pointing to the source or the connection target.

Example for the FBD Editor:



3.2.3 Documentation and saving

3.2.3.1 Documentation of the circuit program

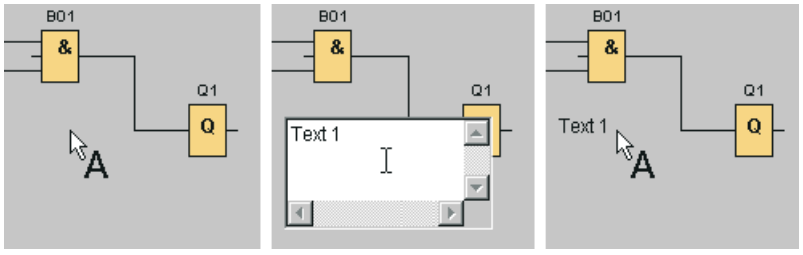
Labels

You can create block-independent and associated labels using the text tool of the programming toolbar. To do so, click the text tool.

A → Text tool (Page 48)

When this icon is active, open a text input box by clicking a free area of the programming interface or a block. After you have entered the label text, simply click anywhere outside the label window or press the [ESC] key. The window is closed and the label text is displayed in the diagram. That label can now be selected, moved or aligned.

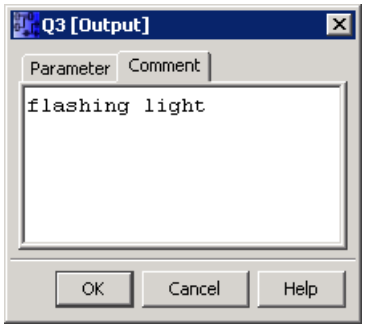
Example for the FBD Editor:

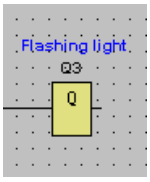


Block independent and associated text

Click a free area of the programming interface to create a block independent label. A label can be edited by calling the text tool and then clicking on the relevant label.

By clicking a block with the text tool, you create an associated label, namely the block comment. You can also input and edit this comment in the comments tab of the block properties dialog. The block comment can be used, for example, to name a block or to describe the task of the block within your circuit.





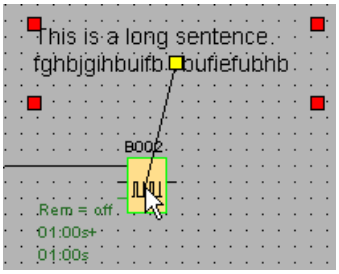
If you select a block with an associated label, the text is not marked. However, when you move the block, you also move the label. When you copy or cut the block, only the block itself is copied to the clipboard. A cut operation deletes the associated label. However, the associated label can be selected and moved, copied, cut or pasted individually. An associated label that is pasted from the clipboard is no longer associated with the block.

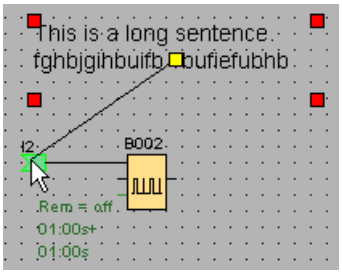
In Edit → Input/output Names (Page 85) you can assign block numbers and connector names to the I/O.

Comment linking and connector comments

Text comments can be linked to function blocks or to cut connectors.

To link the text and the function blocks, left-click the yellow cubic in the center of the text when the text is selected and move the pointer to the block you want link to with the left mouse button pressed. When a function block or a cut connector is linked to a comment, its frame color is green.





A linked comment moves consistently with the figure to which it is attached. You can adjust the relative position of the comment to the figure, as you do a block comment.

3.2.3.2 Opening and saving a circuit program

Opening a circuit program

You can always click the File open icon to open a circuit program for further editing.

→ File Open (Page 58)

Saving a circuit program

Click the File save icon in the standard toolbar to save the circuit program.

→ File Save (Page 61)

The circuit program/project is saved under the name it was opened with, while older versions are overwritten. When you initially save a file, you are prompted to specify a program path and name.

3.3 Simulation of a circuit program

3.3.1 Starting the simulation

Use the Tools → Simulation (Page 182) menu command or the simulation icon in the programming toolbar to place your circuit program in simulation mode.

At the start of simulation, LOGO!Soft Comfort verifies the circuit program and shows any existing errors in the Info Window, which you can view by calling the View → Info Window (Page 90) menu command or by pressing the function key (Page 39) [F4]. You can also use the function key [F2] in the Info Window to display the LOGO! modules capable of running your program.

In simulation mode, you have the simulation toolbar and status window (Page 43) available for performing the simulation and for observing and controlling the behavior of your circuit program.

Note

You can simultaneously simulate only three of your circuit programs. A warning dialog reminds you when you try to simulate the fourth one.

3.3.2 Layout of inputs

LOGO!Soft Comfort displays inputs as key or switch icons, with the name below the icon. An open input represents an inactive switch. When you click the icon, LOGO!Soft Comfort switch it on and indicates that with red.

→ Icon for pushbutton I1, not actuated → open input

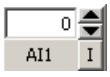
→ Icon for pushbutton I1, actuated → closed input

→ Icon for pushbutton I2, not actuated → open input

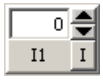
→ Icon for pushbutton I2, actuated → closed input

Layout of analog and frequency inputs

You can set the analog voltage or frequency values for analog and frequency inputs by means of a slide resistor. Click the relevant block to display and operate this slider directly in the diagram. If you want to specify a more precise value, enter it directly or set it directly via the up/down keys beside the input window.



→ Display for analog input block



→ Frequency input

Input functions

You set the response of your inputs for simulation purposes with the Tools → Simulation Parameters (Page 182) menu command.

3.3.3 Layout of the outputs

In simulation mode, LOGO!Soft Comfort displays the outputs Q (Page 314) and the flag M (Page 316) as outputs.

LOGO!Soft Comfort indicates the status of an output or flag by a light or dark bulb icon. LOGO!Soft Comfort displays the name of the output in your circuit program below this icon.

→ Status display of output Q1 → Output switched off

→ Status display of output Q1 → Output switched on

The icon only indicates the status of an output. You cannot turn the output on or off by clicking the icon.

3.3.4 Set output

In simulation mode, you can set a block output by right-clicking the digital output of the block. With this command, you can set the output irrespective of the current status of the block. The output remains set until you enable it again or you end the simulation.

This way you can use a simulation to check how a circuit program will react to certain states.

3.3.5 Power failure

The user can simulate a power failure by clicking the **Power** icon to interrupt the power supply to all inputs.

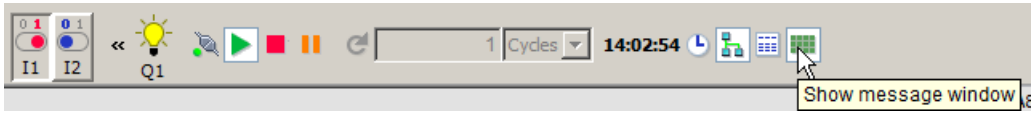
→ Power icon, not actuated

→ Power icon, actuated → Simulated power failure

You can use this function to test the reaction of the circuit to power failure and restart, as well as its retentivity. In contrast to the start of simulation, retentivity is relevant for the "Power failure" function. The start of a simulation is equivalent to the "Load Program" function in LOGO!. LOGO!Soft Comfort resets all values, including the retentive values.

3.3.6 Layout of message

After you start simulation, the simulation toolbar contains a toggle button that shows the message window.

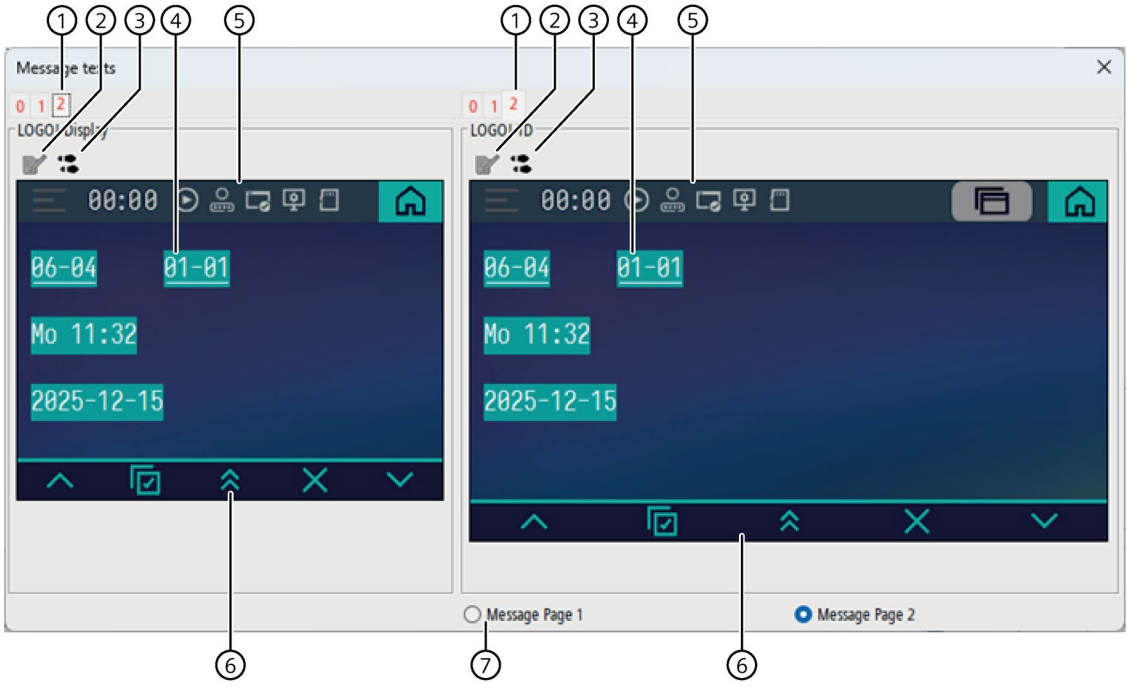


If you right-click the entry in the message, you can see from which block the entry in the message originates. You can also select this block in the circuit program (**Go to Block**) and call up the properties of this block (**Block Properties**).

For LOGO! 9 and LOGO! 9 TDE devices, when you configure a LCD Message (Page 449) function block to display message pages, simulation mode shows message pages on the device screen.

When you configure a LOGO! 0BA6 or 0BA7 message text (Page 464), or a LOGO! 0BA8 message text (Page 458), you specify whether to display the message text on one destination (the LOGO! onboard display or LOGO! TD) or on both. If you specify to display a message text on one destination, simulation mode shows active message texts for that destination in one window. If you select to display on both destinations, simulation mode shows active message texts for the LOGO! onboard display and the LOGO! TD in separate windows. If you use LOGO! 0BA5 message texts (Page 476) in your circuit program, the message text destination can only be the LOGO! onboard display.

Message simulation (LOGO! 9 and later versions)



① The priority of displaying message pages configured in the LCD Message FB.

② Click the icon to enter manual mode, where you can change the value of certain message widget displaying on the device screen.

LSC simulator provides you two ways to enter the manual mode:

- Select the message widget whose value you want to change, then click the write-value icon
- Double-click the message widget whose value you want to change

③ **Go to Block** symbol.

Click the icon to find the LCD Message function block where the displayed message page is configured. The LCD Message block will be selected in the circuit diagram.

④ Message widget.

To see the detailed information of the message widget, hover your mouse over the widget, then a tooltip will display the detailed information of the widget.

If the widget is a reference parameter, you can see the icon before the reference value.

The editable widget is displayed with the underline. Double-click the editable widget to modify the value.

Refer to LCD message (LOGO! 9 and later versions) (Page 449) to learn more about the LCD message block and message widgets.

⑤ The status bar that is simulated from the actual screen of LOGO! BM/TDE. Unlike the actual status bar on the LOGO! BM, the simulated status bar is not functional.

To learn more about the device screen, refer to *LOGO! System Manual*.

⑥ The toolbar that is simulated from the actual screen of LOGO! BM/TDE. Unlike the actual toolbar on the LOGO! BM, the simulated toolbar is not functional.

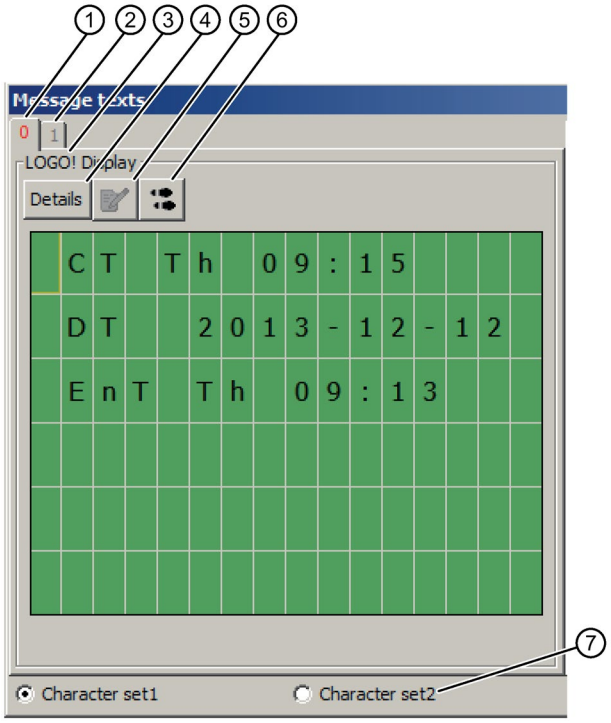
To learn more about the device screen, refer to *LOGO! System Manual*.

⑦ Options to change the displayed message page. These options only work when M27 flag (Page 316) is not configured in the circuit diagram to determine the message page display.

Message texts simulation (0AB6 to 0BA8 devices)

Standard View

The following display shows you the standard view with the message destination on the LOGO! display only:



① Tab of the displayed message text stating the priority.

② Tab of another message text.

③ Name of the message destination. It can be "LOGO! onboard display" or "LOGO! TD", depending on your setting.

④ **Details** button
If you click this button, the view changes and you receive more detailed information in the Detail View (see below).

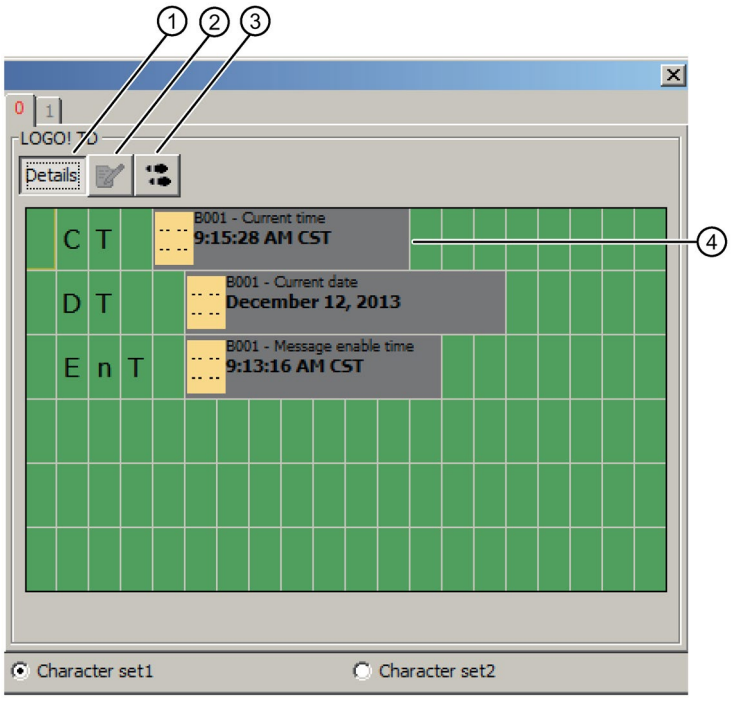
⑤ **Enter value manually** symbol
Before you can use this function you must first click a changeable entry in the message text. If you then click this button, you can manually change the current value.
Alternatively you can also double-click an entry to manually change it.

⑥ **Go to Block** symbol
If you click this button, the special function belonging to the message text is selected in the circuit program.

⑦ Options for different character sets, when the circuit program does not use M27 (Page 316) to determine the character set selection.

Detail View

The following display shows you the detail view with the message destination on the LOGO! TD only:



① **Details** button
If you click this button, you return to the standard view (see above).

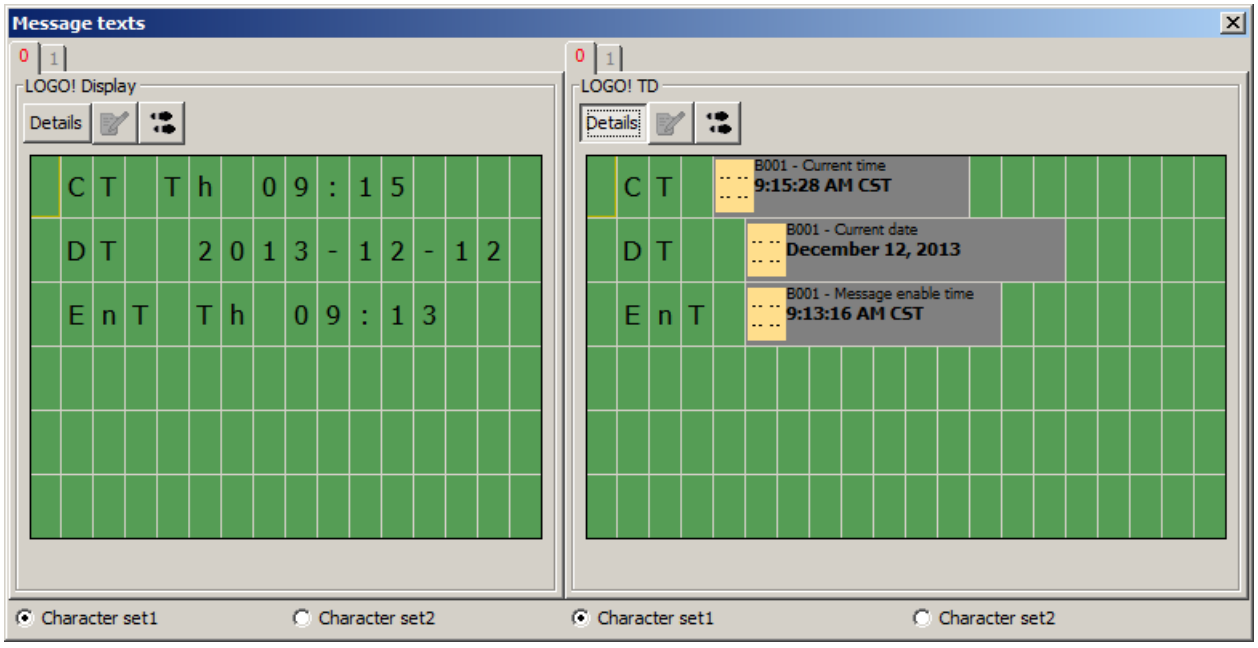
② **Enter value manually** symbol
Before you can use this function you must first click a changeable entry in the message text.
If you then click this button, you can manually change the current value.
Alternatively you can also double-click an entry to manually change it.

③ **Go to Block** symbol
If you click this button, the special function belonging to the message text is selected in the circuit program.

④ Entry in message text with information regarding the block from which the entry originated.

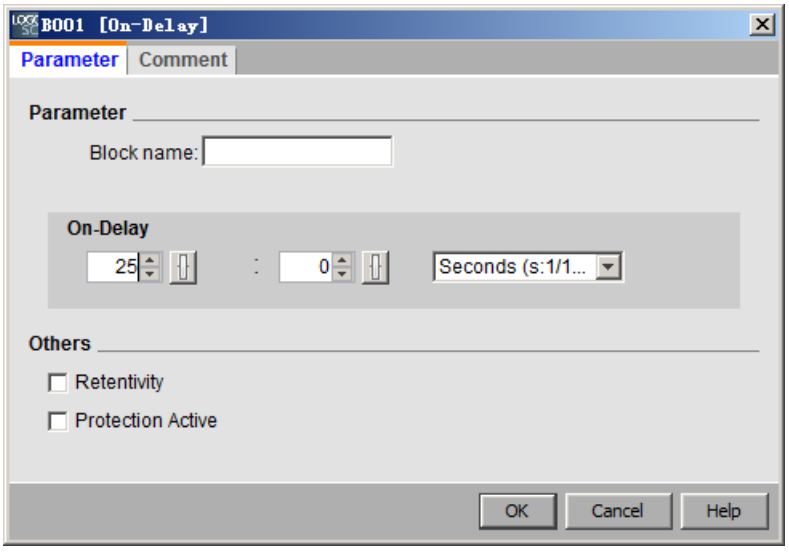
View for separate LOGO! onboard display and LOGO! TD message text displays

If you select the option "Show message text for the LOGO! TD in a separate window" from the Tools -> Options: Simulation (Page 218) dialog and specify that the message destination is on both the LOGO! onboard display and the LOGO! TD, simulation mode shows active message texts for both modules in separate windows.



3.3.7 Parameter assignment in simulation mode

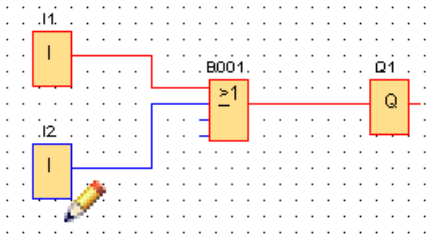
You can double-click a block during simulation to open the block properties dialog. Here, as in programming mode, you can modify comments or parameters.



Simulation mode shows you the actual parameter values. This analysis option allows you to test the reaction of your circuit program. You can open several parameter assignment windows concurrently in simulation mode.

3.3.8 Alternative operation

You can click directly the inputs to switch them on or off.

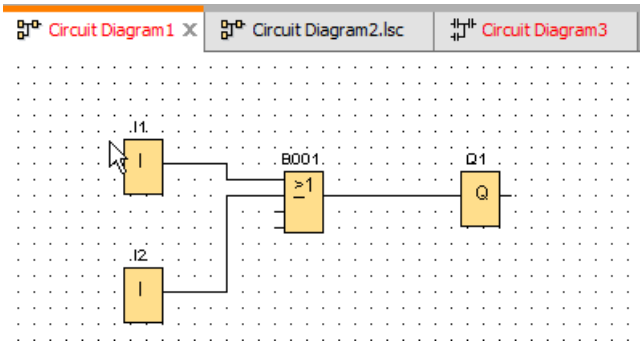


3.3.9 Controlling the simulation time

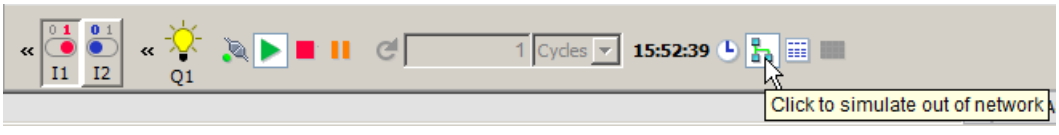
The simulation mode of LOGO!Soft Comfort allows you to test your circuit program on a timed basis, or over a specific number of cycles. You can even modify the time of day to test timer operations in your circuit program. See the time control (Page 43) section in the simulation toolbar topic for more information on the capabilities you have in simulation mode.

3.3.10 Simulating network communication (0BA7 and later versions only)

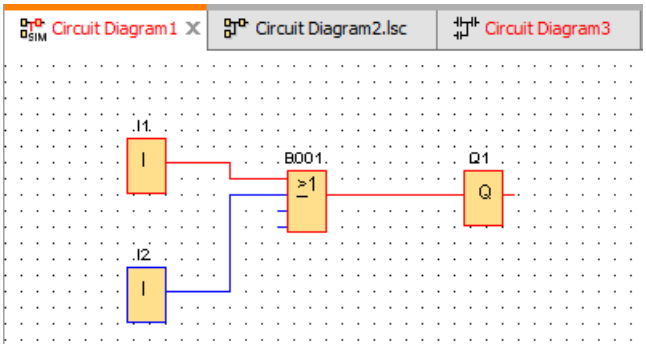
In simulation mode, LOGO!Soft Comfort creates a virtual network simulation group in the background to support network simulation. You can put one or more circuit programs into this group. You can create only one simulation group at a time and the IP address of each circuit program in a group must be unique. The following figure shows three circuit programs in a simulation group.



After you start simulation, the simulation toolbar contains a toggle button, which is available only after you configure the Ethernet connection information.



If you click the network simulation button, LOGO!Soft Comfort displays the circuit programs in the simulation group. The following figure shows a circuit program that is being simulated.



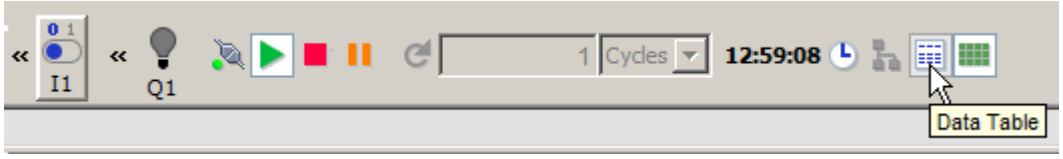
You can remove a diagram from the simulation group by clicking the button "Simulate out of network". After you remove it, LOGO!Soft Comfort continues to simulate the circuit program but without communication to the other circuit programs.

0BA0 : 0BA9

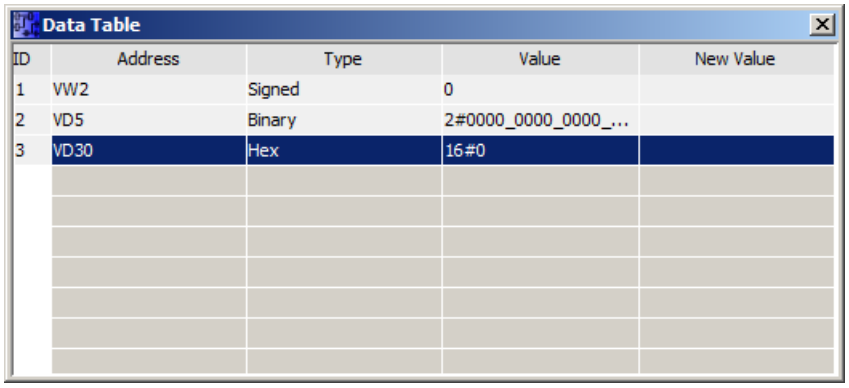
For circuit programs without the network feature, simulation is the same as in LOGO! 0BA6.

3.3.11 Data table (0BA7 and later versions only)

You can watch Variable Mapping (VM) values in the Data Table. The simulation toolbar contains a toggle button for opening or closing the display of the Data Table.



In the Data Table, you can enter VM addresses and choose the corresponding data types. LOGO!Soft Comfort displays the current values for the VM addresses that you provide. You can add new rows by right-clicking an existing row, or pressing the Enter key on the last cell of an existing row. You can enter new values in the New Value column for an existing VM address.



The table below shows the valid address types and memory ranges:

Address Type	Range
Bit	x.0 to x.7
VB	0 to 850
VW	0 to 849
VD	0 to 847
IB	0 to 2
QB	0 to 2
MB	0 to 7

For simulation, the values of the Data Table will be updated each cycle. For online test, the values are updated after each communication.

3.4 Getting started with project creation

You can learn the basics of working with LOGO!Soft Comfort by creating a simple circuit project and simulating it on your PC. The online help also includes a few sample applications (Page 303) for LOGO!Soft Comfort, and information on how to prepare, transfer and archive your application.

If necessary, review the elements of the user interface (Page 35) before beginning the tutorial.

3.4.1 Creating a Network project

3.4.1.1 Creating a new circuit project

After you have started LOGO!Soft Comfort, you can start to create a new circuit project.

To create a new project, click the **File** → **new** or click the **New** button in the standard toolbar in project mode.

→ File → new (Page 58)

Note

When you create a new project, the current project will be closed. If you haven't saved the current project, LOGO!Soft Comfort prompt you to save it.

3.4.1.2 Creating a circuit project

Developing a circuit project

Perform these tasks to develop a circuit program:

1. Create a new project (Page 251).
2. Add a new device (Page 252)
3. Create a circuit program for the device (Page 225)
4. Save the project (Page 256)

3.4.1.3 Adding a new device

After you create a new project, you can start to design your network and add devices.

1. Double-click **Add new device** in the Network project tree.
2. Select Device in the Device list.
3. Set the IP address, subnet mask and the Gateway for the device in the configuration dialog. You can also change the device name in this window.

   To set the security configurations, for LOGO! 9.0 (or later versions) and LOGO! 9 TDE, you can select to use an existing security configuration template. For LOGO! 9.0 (or later versions) device, if not using a template, the Security Configuration Wizard (if not disabled) will appear to guide your through all the security related configurations. Refer to Configuring security settings (LOGO! 9 and later versions only) (Page 226) to learn the detailed information.

Alternatively, you can click the **Add new device** button in Networking toolbar (Page 54)to add a new device.

Note

When you add a new device in the Network view of project mode, LOGO!Soft Comfort automatically creates a new circuit program and displays it in the diagram editor. See "Creating a new circuit program (Page 226)", for more information.

3.4.1.4 Devices

Local PC

You use the local PC to create, edit, and configure the project and circuit program. For how to configure the local PC, see Configuring PC settings (Page 258).

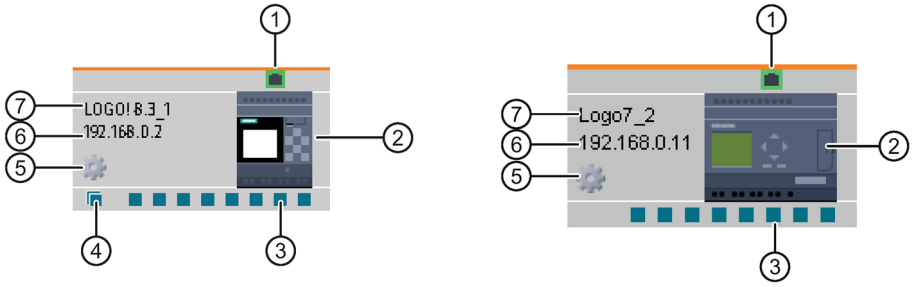
When you add a new device, LOGO!Soft Comfort generates an Ethernet connection between the device and the local PC. You cannot modify the Ethernet connection line in the Network view.

LOGO! device

In the network view, you can add the following types of LOGO! device:

- LOGO! 9.0
- LOGO! 9.0 Slave
- LOGO! 8.4
- LOGO! 8.4 Slave
- LOGO! 8.3
- LOGO! 8.3 Slave
- LOGO! 0BA7
- LOGO! 0BA7 Slave
- LOGO! 8 (0BA8.Standard)
- LOGO! 8 (0BA8.Standard) Slave
- LOGO! 8.1 & 8.2 (LOGO! 8.FS4)
- LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave

The following display shows you the standard view of device models for LOGO! 8.4, LOGO! 8.3, LOGO! 0BA7, LOGO! 8 (0BA8.Standard) and LOGO! 8.1 & 8.2 (LOGO! 8.FS4).



①	Ethernet port	This port shows the Ethernet port to other devices.
②	Device image	Device image
③	Normal connector	You can create Ethernet connections between devices by connecting the normal connectors through drag-and-drop operation. For how to connect the normal connector, refer to Configuring Ethernet connection, LOGO! to LOGO!. (Page 269) Note: You can only connect a normal connector to a connector of another device. You cannot connect different connectors in one device to each other.
④	Dynamic connector	You can connect a dynamic connector with a maximum of eight normal device connectors. When you create a connection between a dynamic connector and a normal connector of another device, LOGO!Soft Comfort automatically creates a client connection in the connect device. Note: 0BA8 devices and later version devices have dynamic connector. A dynamic connector cannot be connected with other dynamic connectors.
⑤	Property icon	You can open the device property panel by left-clicking the property icon.

⑥	Device IP	When you connect a device in diagram mode, you must assign the IP address for a device before creating an Ethernet connection to or from the device. In network project mode, LOGO!Soft Comfort assigns a default IP address (for example, 192.168.1.1) when you add a new device to a project.
⑦	Device name	Note: LOGO!Soft Comfort displays the device name, or the first 11 characters of the device name.

Note

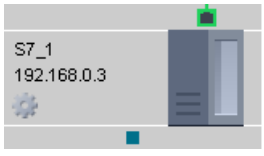
You can only connect Modbus devices to LOGO! 8.FS4 and later version devices.

LOGO! slave

In LOGO!Soft Comfort, you can only connect a LOGO! slave to a LOGO! device and you cannot create connection by dragging and dropping. You can only create the connection by connecting network blocks. For how to connect LOGO! devices, refer to Configuring Ethernet connection, LOGO! to LOGO! slave (Page 280).

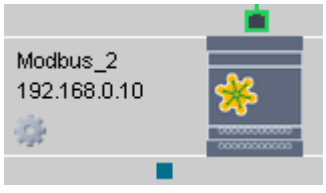
S7 compatible device

In LOGO!Soft Comfort, you can only connect S7 devices to LOGO! devices, but not HMI, TDE, CIM or LOGO! slave. S7 devices has only one connector in LOGO!Soft Comfort, but you can create multiple connections between S7 device and LOGO! devices (up to 100). For how to connect S7, refer to Configuring Ethernet connection, LOGO! to S7 (Page 269).



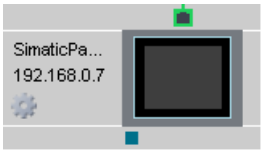
Modbus compatible device

In LOGO!Soft Comfort, you can only connect Modbus devices to LOGO! 8.FS4 and later versions devices. Modbus device has only one connector in LOGO!Soft Comfort, but you can create multiple connections between Modbus device and LOGO! devices (up to 100). For how to connect Modbus devices, refer to Configuring Ethernet connection, LOGO! to Modbus compatible devices (LOGO! 8.FS4 and later versions only) (Page 270).



HMI

In LOGO!Soft Comfort, you can only connect HMI to a LOGO! device. For how to connect HMI, refer to Configuring Ethernet connection, LOGO! to HMI (Page 272).

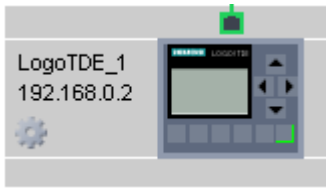


LOGO! 9 TDE (LOGO!Soft Comfort V9.0 and later versions)

You can connect LOGO! 9 TDE to a LOGO! 9 (or later versions) BM for both online mode and offline mode. For detailed information, refer to Configuring LOGO! TDE offline settings (Page 259) and Configuring LOGO! TDE online settings (Page 261).

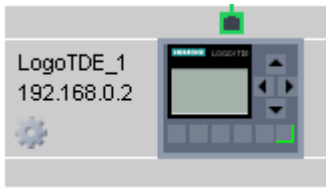
LOGO! TDE 6ED1055-4MH08-0BA0 (LOGO!Soft Comfort V8.2 and later versions)

In LOGO!Soft Comfort, you can connect LOGO! TDE 6ED1055-4MH08-0BA0 to a LOGO! device for both online mode and offline mode. For detailed information, refer to Configuring LOGO! TDE offline settings (Page 259) and Configuring LOGO! TDE online settings (Page 261).



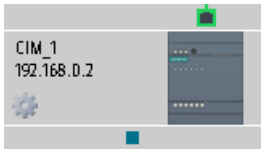
LOGO! TDE (prior to LOGO!Soft Comfort V8.2)

You can reserve an IP address for you LOGO! TDE in LOGO!Soft Comfort.



CIM Device

In LOGO!Soft Comfort, you can only connect CIM device to a LOGO! device. For how to connect CIM, refer to Configuring Ethernet connection, LOGO! to CIM devices (Page 273).



3.4.1.5 Opening and saving a circuit project

Saving a project

Click the save icon in the standard toolbar to save the project.

→File Save (Page 61)

LOGO!Soft Comfort saves the project under the name it was opened with and overwrites the older versions. When you initially save a project, LOGO!Soft Comfort prompts you to specify a program path and name.

Saving a circuit program of a device

Right click the device, and select **Export** in the shortcut menu to save the circuit program.

Opening a project

You can click the File open icon to open a circuit project for further editing.

→File Open (Page 58)

Importing a circuit program to a project

Right-click any blank space in the network view, and select **Import...** in the shortcut menu to import the circuit program.

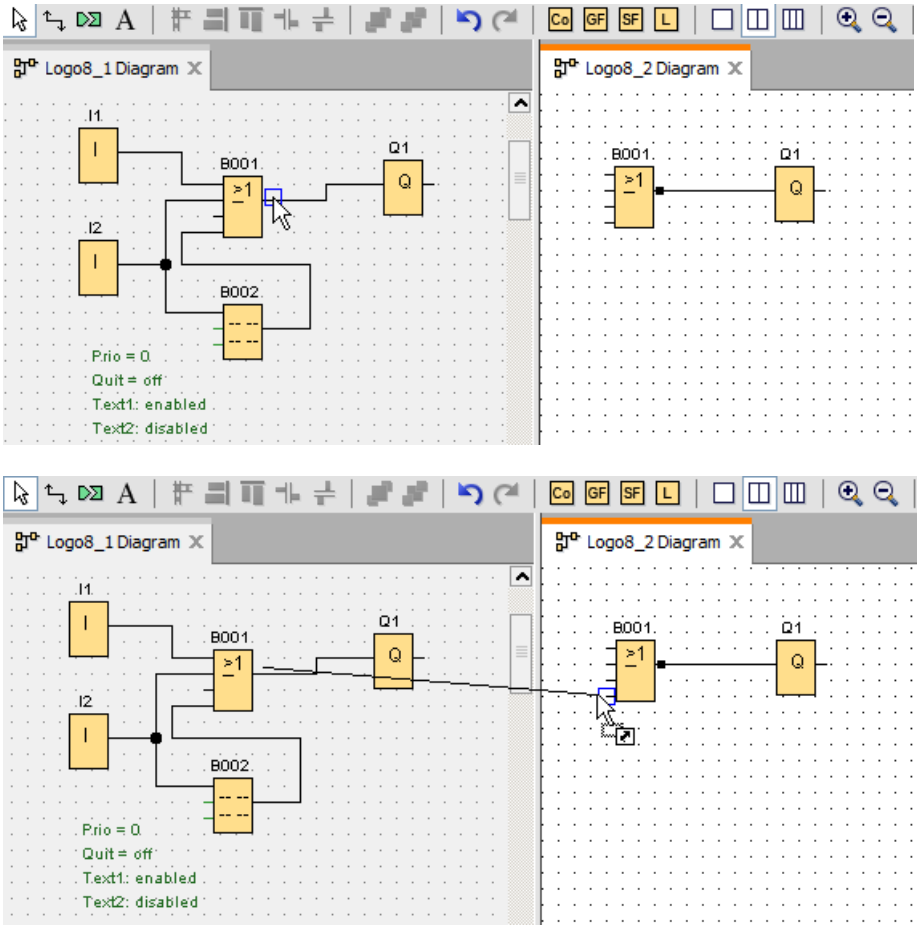
3.4.1.6 Two-side programming

Project mode supports network programming between two diagrams. You can easily create the network connection and data transfer by drag and drop.

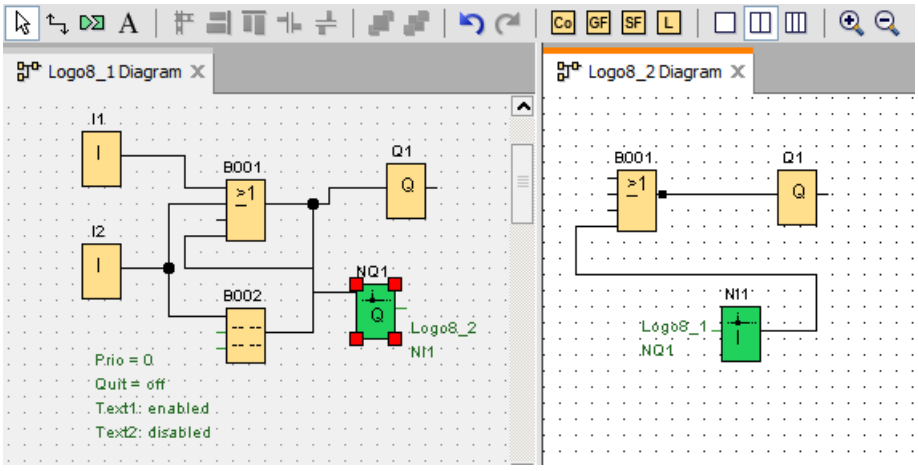
You can only use two-side programming between 0BA8 or later versions devices in project mode.

Transferring block data between two diagrams by two-side programming

Position the mouse pointer on the output connector of a function block. Press the left mouse button and hold it. Move the pointer from the source connector to the target input connector. Release the mouse button. LOGO!Soft Comfort connects the two terminals.

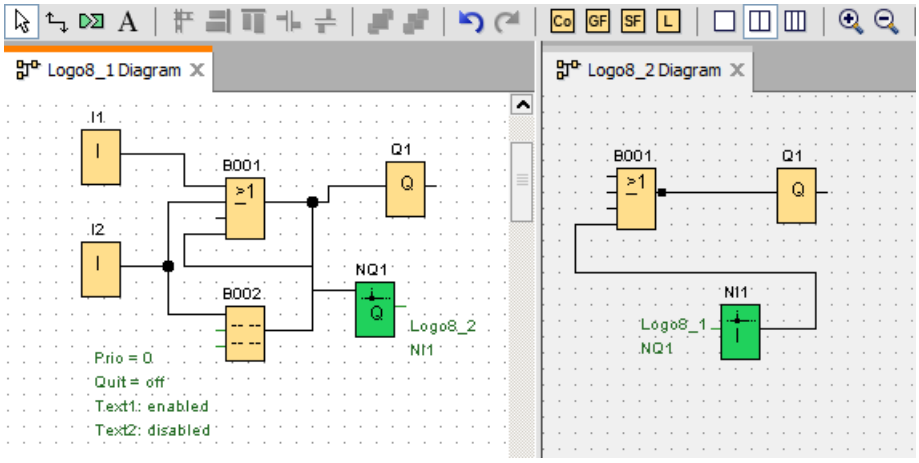


When you connect two function blocks in two separate circuit diagrams, LOGO!Soft Comfort creates a pair of network function blocks, including the Ethernet connection and data transfer mechanism. The green color indicates that the LOGO! device of the two circuits are connected in LOGO!Soft Comfort. The network function block turns to red if its LOGO! device loses the connection to the other LOGO! device in LOGO!Soft Comfort.



An alternative way to set up the connection

1. Insert a pair of network blocks (for example, NI/NQ) in the two diagrams.
2. Connect the NI to the block from which you want to get remote value.
3. Connect NQ to the block to which you want to transfer data.
4. Connect the NI and NQ.



3.4.2 Device setting configuration

3.4.2.1 Configuring PC settings

The local PC running LOGO!Soft Comfort is the local device for the network configuration.

When you add new devices, LOGO!Soft Comfort connects them automatically to the local PC in the network view.

You can then configure the PC settings by clicking the icon on the local PC image in the network view.

You can select the network interface that connects the local PC to the LOGO! Base Module from this dialog.

3.4.2.2 Configuring LOGO! offline settings

After configuring the local PC settings, you can then configure device offline settings by clicking the icon on the device image in network view.

You can refer to the File -> Properties (Page 66) for detailed information.

3.4.2.3 Configuring LOGO! online settings

After connecting your device to the local PC, you are then able to configure the device online settings by clicking the icon on the device image in network view frame.

You can refer to File -> Properties (Page 66) for detailed information.

3.4.2.4 Configuring LOGO! TDE offline settings

In **Network view** panel, after adding new device (Page 252), you can click the icon on the device image, and then the **LOGO! TDE settings** dialog shows**.**

LOGO! 9 TDE

In the **LOGO! TDE settings** dialog, you can configure LOGO! 9 TDE for the following offline settings:

- **General**

  In this tab, you can set the name and IP for your device.

- **LCD Message**

  In this tab, you can select the message page displaying on LOGO! TDE. There are three options for General settings and you can select the option by clicking the radio button:

  - Message Page 1: select to display message page 1 on the connected TDE.
  - Message Page 2: select to display message page 2 on the connected TDE.
  - Follow BM's Setting: select this option to follow the message page display settings of the BM. To learn the detailed information of BM message display settings, refer to File -> Message text Settings (LOGO! 9 and later versions) (Page 64).

  You can also set the filter time. The filter time determines the frequency at which the LOGO! TDE refreshes the analog values in the message page. The setting value ranges from 100 ms to 1000 ms.

- **BM List**

  You can add 6 BMs in the list at most. You can change the BM list through the menu Add BM on the TDE device.

- **LCD setting**

  In this tab, you can set the LCD display brightness and configure the screen saver for the TDE device. These settings are also available through the menu Setup -> LCD on the TDE device.

  Note
  LCD lifetime

  High brightness and continuous displaying lead to a shorter lifetime for the LCD. To protect the LCD, it is recommended that you set a low display brightness and enable the screen saver.

- **TDE power-on screen**

  In this tab, you can set a power-on screen for LOGO! 9 TDE. LOGO! 9 TDE supports background image or color setting, and text setting for the power-on screen.

- **Certificate Settings**

  Here you can configure the certificate strategy for the TDE communication with LOGO!Soft Comfort. If you choose the PSK certificate or external certificate, you need to use the PSK password to generate the PSK certificate, or import the external certificate.

- **Trust CA Settings**

  Here you can manage the trusted CA certificates.

- **Access Control Settings**

  In this tab, you can enable or disable the UMAC access for TDE.

- **Template**

To make all the configuration in offline settings take effect, you need to download the configuration to the TDE. While in online settings (Page 261), changes and configuration take effect immediately.

LOGO! TDE 6ED1055-4MH08-0BA0

In the **LOGO! TDE settings** dialog, you can configure LOGO! TDE 6ED1055-4MH08-0BA0 for the following offline settings:

- **General**

  In this tab, you can set the name and IP for your device. You can set the Device name to the LOGO! TDE, and then input the IP address, subnet mask and Default gateway to assign an IP to the LOGO! TDE.

- **Host IP**

  In this tab, you can enter the Host IP address or select the IP address from address book by clicking the **Address book** button.

- **Message text**

  In this tab, you can configure message text settings in LOGO! TDE. There are three options for General settings and you can click the radio button to select the option:

  - Character Set 1: This specifies the primary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.
  - Character Set 2: This specifies the secondary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.
  - Follow BM's Setting: This option can lead you to follow the BM's setting. For detailed information on Message text setting in BM, refer to File -> Message Text Settings (0BA8 and earlier versions) (Page 65).

- **TDE power-on screen (offline)**

  In this tab, you can configure a power-on screen for LOGO! TDE in the following two ways:

  - To follow the BM's setting, click the check box next to **Use BM's setting.**
  - To customize TDE power-on screen, select a character set and then use the keyboard to type characters into the **Content** area. The power-on screen can only contain simple text strings

3.4.2.5 Configuring LOGO! TDE online settings

LOGO! TDE Settings dialog is composed of Online setting tab and Offline setting tab. You can configure LOGO! TDE online setting on the Online setting tab.

There are two methods to enter the online setting tab:

- Method 1: After configuring the TDE device (Page 155), the communication between the LOGO! TDE and LOGO!Soft Comfort is established successfully, and then **LOGO! TDE Settings** dialog automatically appears. The Online setting tab is editable and the Offline setting tab is not accessible.
- Method 2: In **Network view** panel, after adding new device (Page 252), you can click the icon on the device image, and then the **LOGO! TDE settings** dialog shows**.**

LOGO! 9 TDE

In the **LOGO! TDE settings** dialog, you can configure LOGO! 9 TDE for the following online settings:

- **Connect to TDE**

  In this tab, you can transfer data between a LOGO! TDE and LOGO!Soft Comfort after configuring the communication interface successfully.

- **Show FW version**

  In this tab, you can identify the firmware version of LOGO! TDE.

- **Assign IP address**

  In this tab, you can change the IP address, subnet mask and default gateway of the LOGO! TDE in the New IP settings, and click the **Assign IP address** button to implement change. You can also assign a device name for the TDE.

- **Assign Message text**

  In this tab, you can select the message page displaying on LOGO! TDE. There are three options for General settings and you can select the option by clicking the radio button:

  – Message Page 1: select to display message page 1 on the connected TDE.

  – Message Page 2: select to display message page 2 on the connected TDE.

  – Follow BM's Setting: select this option to follow the message page display settings of the BM. To learn the detailed information of BM message display settings, refer to File -> Message text Settings (LOGO! 9 and later versions) (Page 64).

  You can also set the filter time. The filter time determines the frequency at which the LOGO! TDE refreshes the analog values in the message page. The setting value ranges from 100 ms to 1000 ms.

- **BM List**

  You can add 6 BMs in the list at most. You can also change the BM list through the menu Add BM on the TDE device.

- **LCD setting**

  In this tab, you can set the LCD display brightness and configure the screen saver for the TDE device. These settings are also available through the menu Setup -> LCD on the TDE device.

  Note

  LCD lifetime

  High brightness and continuous displaying lead to a shorter lifetime for the LCD. To protect the LCD, it is recommended that you set a low display brightness and enable the screen saver.

- **TDE power-on screen**

  In this tab, you can set a power-on screen for LOGO! 9 TDE. LOGO! 9 TDE supports background image or color setting, and text setting for the power-on screen.

- **Access control settings**

  In this tab, you can enable or disable the UMAC access for TDE. Here you can also change password of the LOGO! TDE Admin, or log out the Admin.

  Note

  LOGO! TDE has only one user: Admin. LOGO! TDE Admin is not LOGO! BM Admin.

  When you power-on the LOGO! TDE for the first time or after the device factory reset, you are required to set the TDE Admin password.

  You can also change the TDE Admin password through the TDE menu command. Refer to *LOGO! System Manual* for more information.

- **Certificate Settings**

  Here you can configure the certificate strategy for the TDE communication with LOGO!Soft Comfort. If you choose the PSK certificate or external certificate, you need to use the PSK password to generate the PSK certificate, or import the external certificate.

- **Trust CA Settings**

  When choosing external certificate for security communication with LOGO! BM (LOGO! 9 and later versions), you need to manage the trust CA and certificate here.

- **Factory Reset**

  You can also reset the TDE device to factory setting through the menu Setup -> Factory Reset on the TDE device.

- **Firmware Upgrade**

  In this tab, you can check the current firmware version of the TDE and upgrade the firmware. TDE shares the same firmware upgrade file with LOGO! BM (LOGO! 9 and later versions). To learn detailed information about firmware upgrade, refer to LOGO! settings -> Online settings -> Firmware Upgrade (LOGO! 9 and later versions only) (Page 174).

LOGO! TDE 6ED1055-4MH08-0BA0

In the **LOGO! TDE settings** dialog, you can configure LOGO! TDE 6ED1055-4MH08-0BA0 for the following online settings:

- **Connect to TDE**

  In this tab, you can transfer data between a LOGO! TDE and LOGO!Soft Comfort after configuring the communication interface successfully.

- **Show FW version**

  In this tab, you can identify the firmware version of LOGO! TDE.

- **Assign IP address**

  In this tab, you can change the IP address, subnet mask and default gateway of the LOGO! TDE in the New IP settings, and click the **Assign IP address** button to implement change.

- **Assign Host IP**

  In this tab, you can assign the Host IP address to LOGO! TDE, enter the Host IP address or select the IP address from Address book, and then click **Apply** button.

- **Assign Message text**

  In this tab, you can assign message text settings in LOGO! TDE. There are three options for General settings, you can click the radio button to select the option:

  – Character Set 1: This specifies the primary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.

  – Character Set 2: This specifies the secondary character set for message texts. Message texts are composed of characters from either Character Set 1 or Character Set 2. Either character set can be the default for configuring message texts.

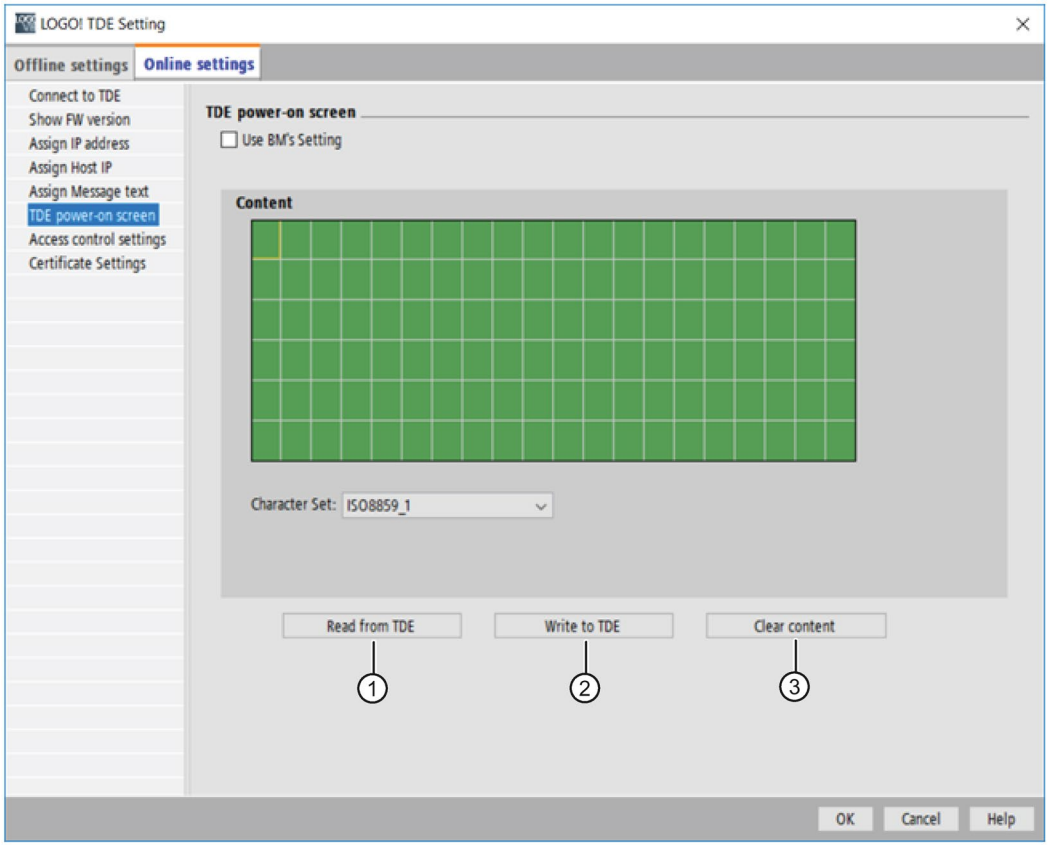
  – Follow BM's Setting: This option can lead you to follow the BM's setting. For detailed information on Message text setting in BM, refer to File -> Message Text Settings (0BA8 and earlier versions) (Page 65).

- **TDE power-on screen**

  In this tab, you can configure a power-on screen for LOGO! TDE in the following two ways:

  – To follow the BM's setting, click the checkbox next to **Use BM's setting.**

  – To customize TDE power-on screen, select a character set and then use the keyboard to type characters into the **Content** area. The power-on screen can only contain simple text strings.



Click "①" to read the previously-configured power-on screen that is stored in the memory of LOGO! TDE.

Click "②" to write the currently-configured screen to LOGO! TDE memory. LOGO! TDE updates the power-on screen that is stored in memory.

Click "③" to switch back to empty screen.

- **Access control settings**

  In this tab, you can enable LSC access and change the password:

  To enable LSC access, select the **Allow remote access** checkbox.

  To protect the remote access with password, select the **Enable password protection for remote access** checkbox and set a new password.

- **Certificate Settings**

  In this tab, you can check the expiration date information of LOGO! root certificate and product certificate.

3.4.2.6 Configuring settings for other standard devices

If you have added SIMATIC HMI devices, SIMATIC S7 devices, Modbus devices, a LOGO! TDE, a CIM device, or other devices in the network view, you can then edit the device name, IP address, subnet mask, and gateway for those devices. You can also browse files on your computer and import a project file with the settings for HMI and S7 devices.

3.4.2.7 Detecting device online status

After you configure the online and offline settings, you can go online and view online status for the devices.

Push the devices online to start scanning for any connected LOGO! Base Modules.

LOGO!Soft Comfort detects all the devices in the project as accessible, inaccessible and unknown devices, see "Going online (0BA8 and later versions only) (Page 55)" for more information.

See "Configuring settings for unknown devices (Page 266)" for more information about configuring unknown devices.

After the your device is found, you can stop displaying the online status for all devices. See "Going offline (0BA8 and later versions only) (Page 56)" for more information.

3.4.2.8 Configuring settings for unknown devices

You can configure the device name, IP address, subnet mask, and gateway of an unknown device to define it on the network.

Note

On normal occasions, you are able to delete the connection line between local PC and its connected device in the network view by choosing it and clicking the ✕ button on the standard tool bar. But when deleting the unknown devices and their connection lines, you will need to disconnect them physically with the local PC, instead of deleting from the network view.

Uploading the added devices

To upload the added device to a project, right-click the device in the network view and select **Upload** from the shortcut menu. If no previous settings, the uploaded device can use the IP address, subnet mask, and gateway you defined in the step above. After completion, the device is displayed as an identified LOGO! Base Module.

Note

If the IP address of the uploaded device conflicts with the existing device, a warning message of IP address conflict pops out and then you need to reset its IP address according to "Configuring LOGO! online settings (Page 259)"

3.4.3 Create Ethernet connection

LOGO!Soft Comfort supports to create Ethernet connections in network view frame. You can connect the device in your project through the following ways:

- Create Ethernet connection by drag-and-drop (Page 267)
- Create Ethernet connection, LOGO! to non-project devices (Page 283)
- Create Ethernet connection by two sides programing (0BA8 and later version devices only) (Page 282)

For more information, you can refer to Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187).

Cross-LAN connection

LOGO!Soft Comfort allows to add devices with different LAN settings to the same network project.

Make sure the router on both sides can communicate with each other, for information on how to create cross-LAN connections, see section Create Ethernet connection, LOGO! to non-project devices (Page 283) .

Note

Siemens recommend you don't add cross-LAN connections in a project. If you attempt to connect devices outside the LAN, the connections you add may be inapplicable.

Enabling the defined TSAP on the target device

LOGO! Base Module, HMI, S7 compatible device and CIM device use the TSAP (Transportation Service Access Point) as an identified label of the access point to any other devices.

The TSAP for the LOGO! physical connectors is from 20.00 to 27.00.

The TSAP for the LOGO! dynamic connector is from 00.01 to 18.FF.

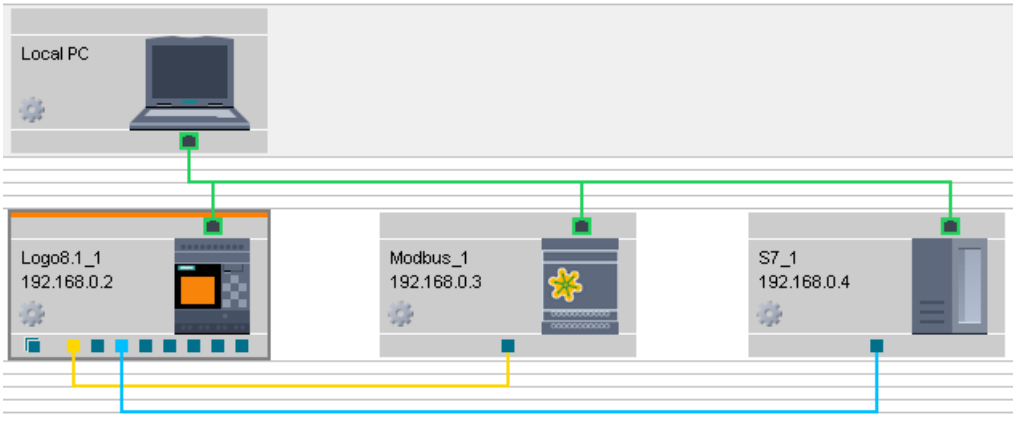
You need to make sure the same TSAP is enabled on the target device in order to build data communication successfully.

3.4.3.1 Create Ethernet connection by drag-and-drop

LOGO!Soft Comfort enables you to create Ethernet connections by dragging and dropping in network view.

Simply click a connector of the source LOGO! Base Module, drag to the desired connector on the target device, and release the left button.

Result: LOGO!Soft Comfort creates a pair of Ethernet connection between the two devices, and connects the two connectors with a line.



LOGO!Soft Comfort sets different connection lines with different color.

Connection lines	Connection line color
PC to devices	green
LOGO! to LOGO! LOGO! to S7 compatible devices LOGO! to HMI LOGO! to CIM devices	blue
LOGO! to Modbus compatible device	yellow

LOGO!Soft Comfort automatically identifies the server and client according to your operations.

- If you connect a normal connector to a dynamic connector, the LOGO! device using the dynamic connector is the server.
- If you connect two normal connectors, the start end is the client.

Note

HMI can only work as a client.

Note

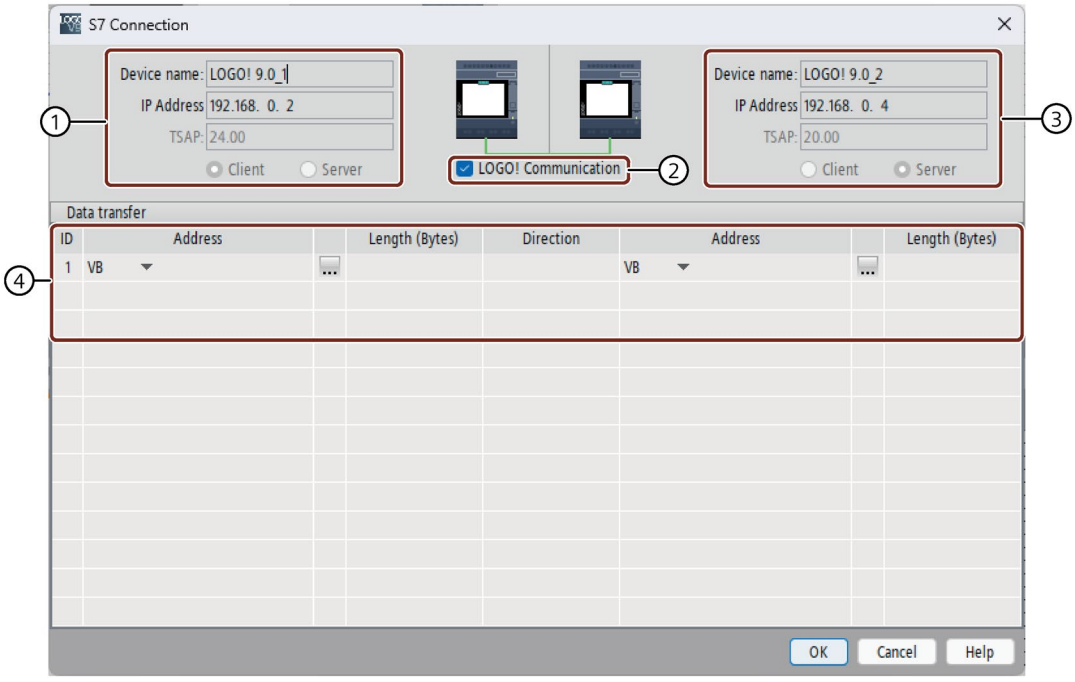
CIM device can only work as a server.

Note

When LOGO! BM works as a Modbus TCP server through a dynamic connector, LOGO! BM uses the port 510.

Configuring Ethernet connection, LOGO! to LOGO!

Double-click the connection line to configure the connection settings:



① **Starting point (Client)**:
All the fields are read-only.

② **LOGO! Communication**:
Select to enable or disable LOGO! Communication.
For LOGO! BM, LOGO! communication is only available for LOGO! 9.0 and later versions devices.

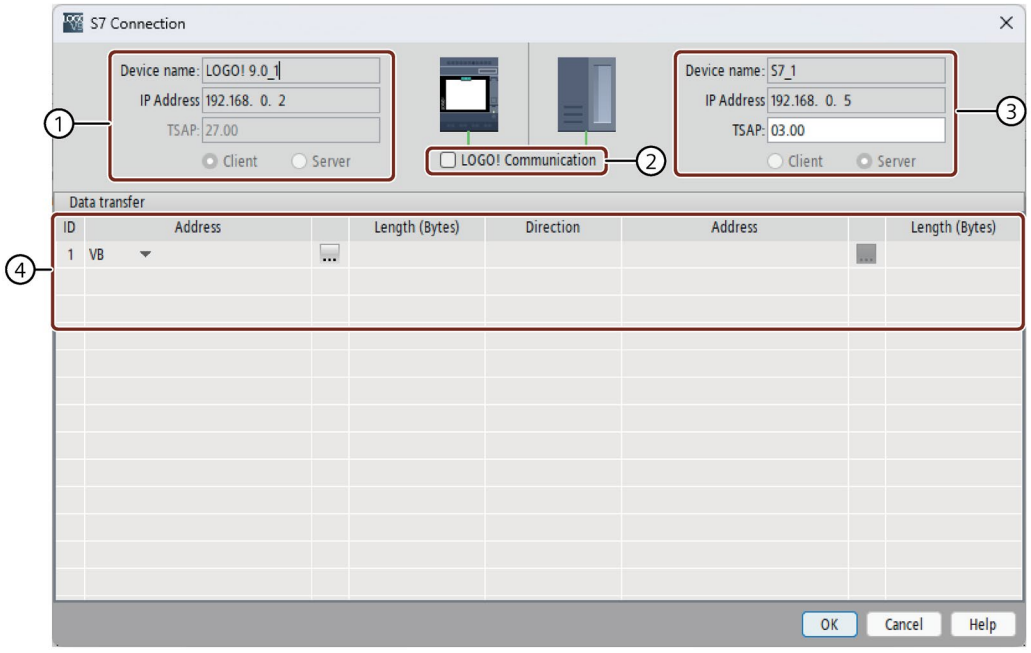
② **End point (Server)**:
All the fields are read-only.

④ **Data transfer table**
See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Configuring Ethernet connection, LOGO! to S7 devices

LOGO!Soft Comfort supports the creation and configuration of Ethernet connections between LOGO! Base Modules and S7 compatible devices.

Double-click the connection line to configure the connection settings:



① **LOGO! Base Module**:
All the fields are read-only.

② **LOGO! Communication**:
Select to enable or disable LOGO! Communication.
For LOGO! BM, LOGO! communication is only available for LOGO! 9.0 and later versions devices.

③ **S7 Device**:
Except for TASP, all the fields are read-only.

④ **Data transfer table**
See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

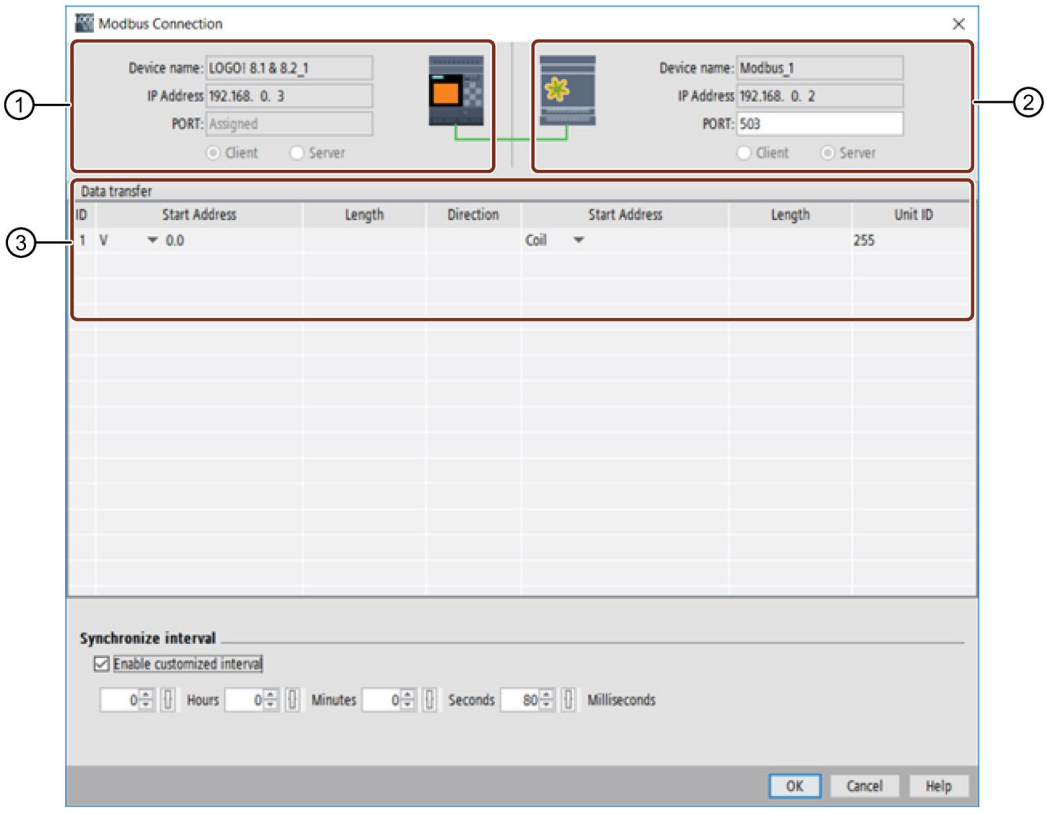
Note

If you connect the dynamic connector with an S7 compatible device, LOGO!Soft Comfort disables the server/client check boxes. The LOGO! Base Module with the dynamic connector is always the server in this connection.

Configuring Ethernet connection, LOGO! to Modbus compatible devices (LOGO! 8.FS4 and later versions only)

LOGO!Soft Comfort supports the creation and configuration of Ethernet connections between LOGO! Base Modules and Modbus compatible devices.

Double-click the connection line to configure the connection settings:



① **LOGO! Base Module**:

The LOGO Base Module is the client by default, you can set it as the client or the server here.

② **Modbus Device**:

The Modbus device is the server by default, you can set it as the server or the client here.

③ **Data transfer table**

See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Note

When your device supports both S7 and Modbus connection, Siemens recommends you connect your device to LOGO! with S7 connection.

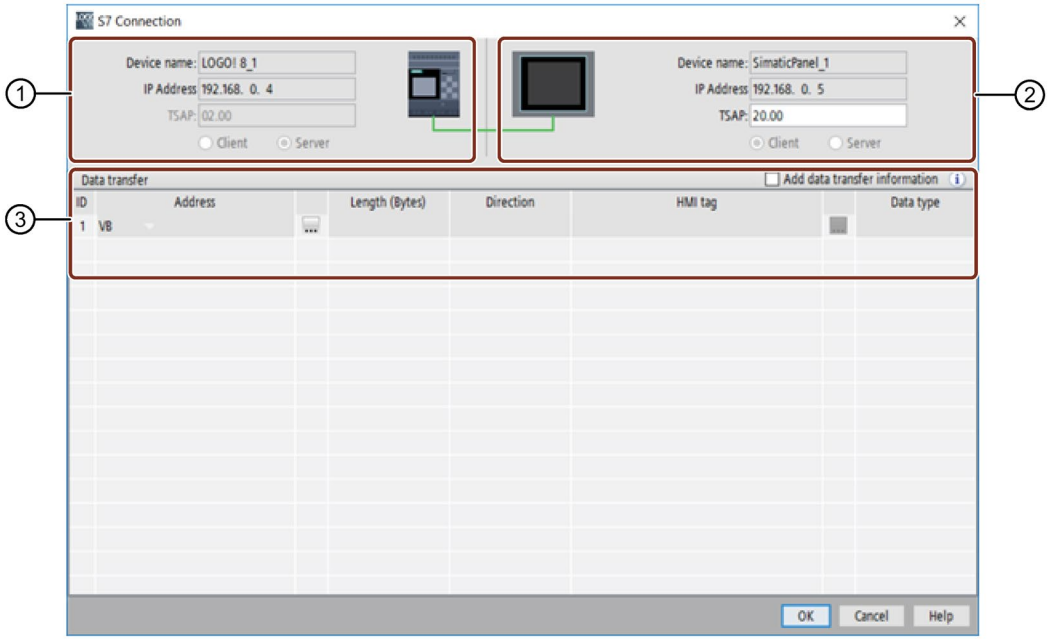
Note

If you connect the dynamic connector with an Modbus compatible device, LOGO!Soft Comfort disables the server/client check boxes. The LOGO! Base Module with the dynamic connector is always the server in this connection.

Configuring Ethernet connection, LOGO! to HMI devices

When you need to connect a Siemens HMI (SIMATIC Panel) device to a LOGO! Base module, you can only connect them through drag-and-drop.

Double-click the connection line to configure the connection settings:



① **LOGO! Base Module**:

All the fields are read-only.

The LOGO! Base Module is always the server.

② **HMI**:

You can set the TSAP address here. Or it shows the TSAP of the starting point of your connection.

③ **Data transfer table**

Select the "Add data transfer information" check box to activate the data transfer table.

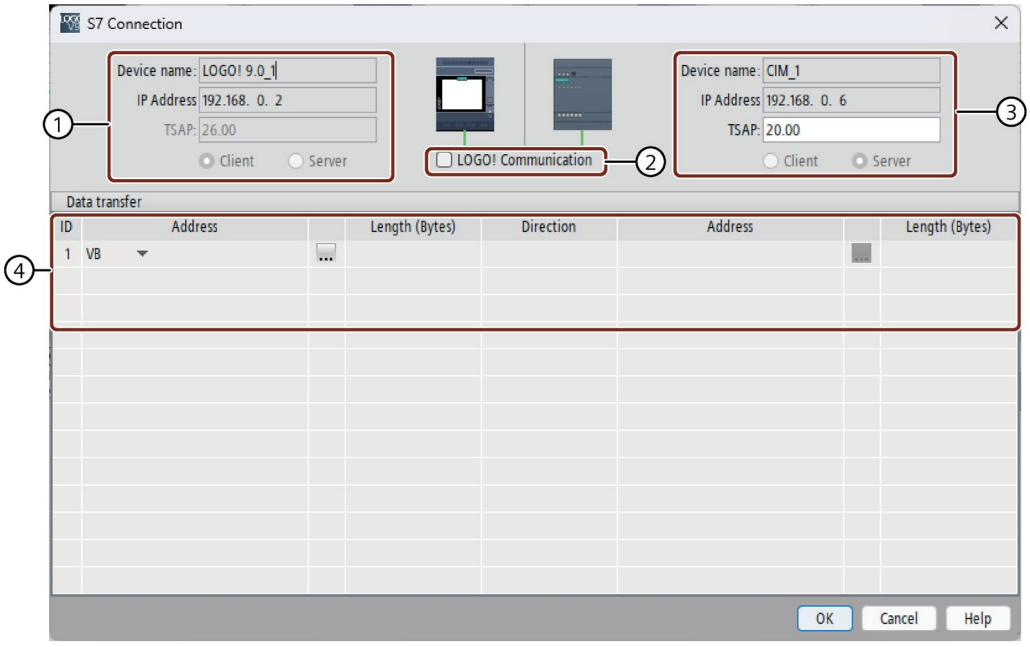
See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Note

The LOGO! Base Module is always the server in a connection between a LOGO! Base Module and an HMI device. A LOGO! device can only connect to one HMI.

Configuring Ethernet connection, LOGO! to CIM devices

LOGO!Soft Comfort supports the creation and configuration of Ethernet connections between LOGO! Base Modules and CIM device.
Double-click the connection line to configure the connection settings:



① **LOGO! Base Module:**

All the fields are read-only.

The LOGO! Base Module is always the client.

② **LOGO! Communication**:

Select to enable or disable LOGO! Communication.

For LOGO! BM, LOGO! communication is only available for LOGO! 9.0 and later versions devices.

③ **CIM device:**

You can set the TASP address here. Or it shows the TSAP of the starting point of your connection.

④ **Data transfer table:**

See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Note

The CIM device is always the server in a connection between a LOGO! Base Module and a CIM device.

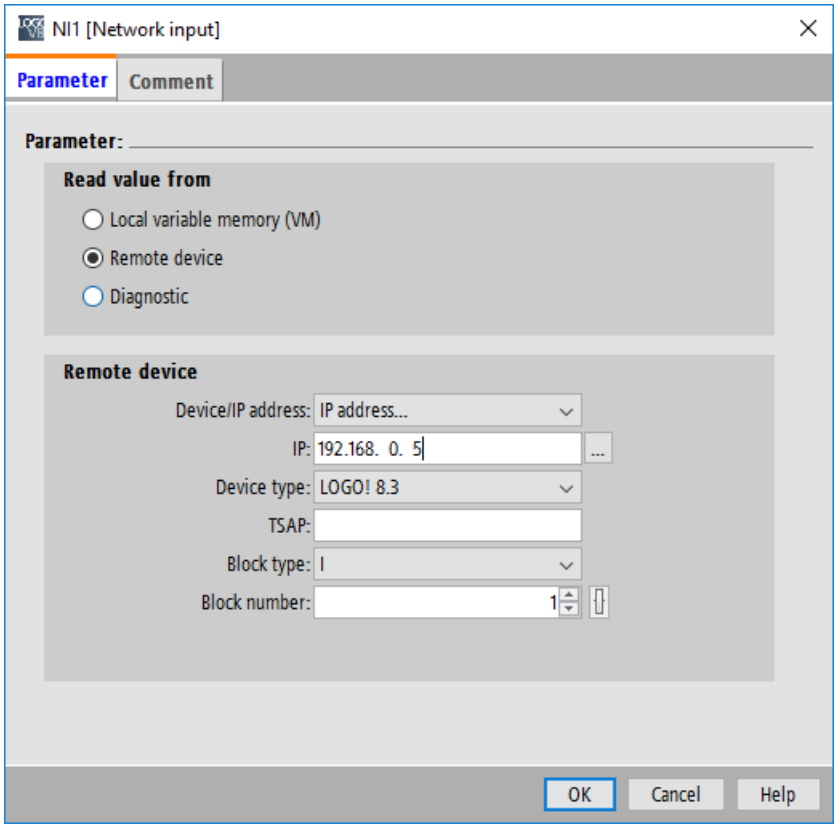
3.4.3.2 Create Ethernet connection by network block

LOGO!Soft comfort supports connecting LOGO! Base Module to S7 compatible devices, Modbus compatible devices, or LOGO! and LOGO! slave devices through network blocks.

Creating remote connections

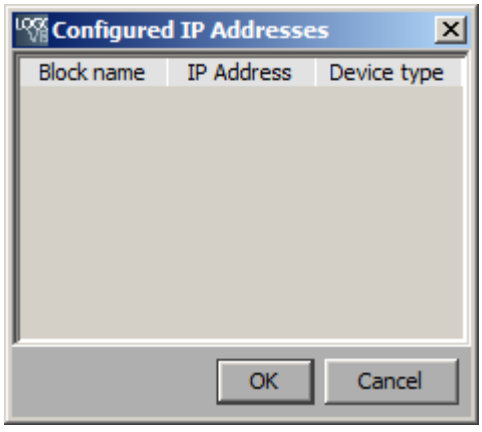
If you add network blocks to communicate with other devices, you can configure connections as follows:

1. Right click the function block and set the block properties of this block.



The configure items are different for different device type, for example you need to input the port and Unit ID for connecting a Modbus-compatible device.

2. Define the device to connect as a remote device.
3. Choose the device name and IP address of the target device.
   Alternatively, you can also browse for a device configured previously.



LOGO!Soft Comfort supports to configure your local device to the following remote devices on the listed block types and their value range.

For NI and NAI:

Function Block	Local Device	Remote Device	Block Type and Value Range
NI	LOGO! 9.0 & 8.4	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7] / VX: [0, 2047].[0, 7] / VR: [0, 511].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7] / VX: [0, 2047].[0, 7] / VR: [0, 511].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	I: [1, 24] / Q: [1, 16] / M: [1, 27] / V: [0, 850].[0, 7]
		Modbus Compatible device	Coil: [1, 65535] / DI: [1. 65535]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	I: [1, 64] / Q: [1, 60]
		LOGO! 8.4 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.3 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 0BA7 Slave	I: [1, 24] / Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 8.3, 8.2 & 8.1 (LOGO! 8.FS4)	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	I: [1, 24] / Q: [1, 16] / M: [1, 27] / V: [0, 850].[0, 7]
		Modbus Compatible device	Coil: [1, 65535] / DI: [1. 65535]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	I: [1, 64] / Q: [1, 60]
		LOGO! 8.4 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.3 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 0BA7 Slave	I: [1, 24] / Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 8 (0BA8.Standard)	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]

Function Block	Local Device	Remote Device	Block Type and Value Range
		LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	I: [1, 24] / Q: [1, 16] / M: [1, 27] / V: [0, 850].[0, 7]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	I: [1, 64] / Q: [1, 60]
		LOGO! 8.4 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.3 Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	I: [1, 24] / Q: [1, 20]
		LOGO! 0BA7 Slave	I: [1, 24] / Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 0BA7	LOGO! 0BA7 Slave	I: [1, 24] / Q: [1, 16]
NAI	LOGO! 9.0 & 8.4	LOGO! 9.0	V: [0, 849] / VX: [0, 2046] / VR: [0, 510]
		LOGO! 8.4	V: [0, 849] / VX: [0, 2046] / VR: [0, 510]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		Modbus Compatible device	IR: [1, 65535] / HR: [1, 65535]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AI: [1, 16] / AQ: [1, 16]
		LOGO! 8.4 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.3 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 0BA7 Slave	AI: [1, 8] / AQ: [1, 2]
		CIM Devices	V: [0, 65534]
	LOGO! 8.3, 8.2 & 8.1 (LOGO! 8.FS4)	LOGO! 9.0	V: [0, 849]
		LOGO! 8.4	V: [0, 849]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		Modbus Compatible device	IR: [1, 65535] / HR: [1, 65535]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AI: [1, 16] / AQ: [1, 16]
		LOGO! 8.4 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.3 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 0BA7 Slave	AI: [1, 8] / AQ: [1, 2]

Function Block	Local Device	Remote Device	Block Type and Value Range
		CIM Devices	V: [0, 65534]
	LOGO! 8 (0BA8.Standard)	LOGO! 9.0	V: [0, 849]
		LOGO! 8.4	V: [0, 849]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AI: [1, 16] / AQ: [1, 16]
		LOGO! 8.4 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.3 Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AI: [1, 8] / AQ: [1, 8]
		LOGO! 0BA7 Slave	AI: [1, 8] / AQ: [1, 2]
		CIM Devices	V: [0, 65534]
	LOGO! 0BA7	LOGO! 0BA7 Slave	AI: [1, 8] / AQ: [1, 2]

For NQ and NAQ:

Function Block	Local Device	Remote Device	Block Type and Value Range
NQ	LOGO! 9.0 & 8.4	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7] / VX: [0, 2047].[0, 7] / VR: [0, 511].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7] / VX: [0, 2047].[0, 7] / VR: [0, 511].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	V: [0, 850].[0, 7]
		Modbus Compatible device	Coil: [1. 65535]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	Q: [1, 60]
		LOGO! 8.4 Slave	Q: [1, 20]
		LOGO! 8.3 Slave	Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	Q: [1, 20]
		LOGO! 0BA7 Slave	Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 8.3, 8.2	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]

Function Block	Local Device	Remote Device	Block Type and Value Range
	& 8.1 (LOGO! 8.FS4)	LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	V: [0, 850].[0, 7]
		Modbus Compatible device	Coil: [1. 65535]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	Q: [1, 60]
		LOGO! 8.4 Slave	Q: [1, 20]
		LOGO! 8.3 Slave	Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	Q: [1, 20]
		LOGO! 0BA7 Slave	Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 8 (0BA8.Standard)	LOGO! 9.0	I: [1, 64] / Q: [1, 60] / M: [1, 128] / V: [0, 850].[0, 7]
		LOGO! 8.4	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.3	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 8 (0BA8.Standard)	I: [1, 24] / Q: [1, 20] / M: [1, 64] / V: [0, 850].[0, 7]
		LOGO! 0BA7	V: [0, 850].[0, 7]
		S7 Compatible device	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7] / DB: [0, 16000].[0, 65535].[0, 7]
		LOGO! 9.0 Slave	Q: [1, 60]
		LOGO! 8.4 Slave	Q: [1, 20]
		LOGO! 8.3 Slave	Q: [1, 20]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	Q: [1, 20]
		LOGO! 8 (0BA8.Standard) Slave	Q: [1, 20]
		LOGO! 0BA7 Slave	Q: [1, 16]
		CIM Devices	I: [0, 65535].[0, 7] / Q: [0, 65535].[0, 7] / M: [0, 65535].[0, 7] / V: [0, 65535].[0, 7]
	LOGO! 0BA7	LOGO! 0BA7 Slave	Q: [1, 16]
NAQ	LOGO! 9.0 & 8.4	LOGO! 9.0	V: [0, 849] / VX: [0, 2046] / VR: [0, 510]
		LOGO! 8.4	V: [0, 849] / VX: [0, 2046] / VR: [0, 510]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		Modbus Compatible device	HR: [1, 65535]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AQ: [1, 16]
		LOGO! 8.4 Slave	AQ: [1, 8]
		LOGO! 8.3 Slave	AQ: [1, 8]

Function Block	Local Device	Remote Device	Block Type and Value Range
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AQ: [1, 8]
		LOGO! 0BA7 Slave	AQ: [1, 2]
		CIM Devices	V: [0, 65534]
	LOGO! 8.3, 8.2 & 8.1 (LOGO! 8.FS4)	LOGO! 9.0	V: [0, 849]
		LOGO! 8.4	V: [0, 849]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		Modbus Compatible device	HR: [1, 65535]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AQ: [1,16]
		LOGO! 8.4 Slave	AQ: [1, 8]
		LOGO! 8.3 Slave	AQ: [1, 8]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AQ: [1, 8]
		LOGO! 0BA7 Slave	AQ: [1, 2]
		CIM Devices	V: [0, 65534]
	LOGO! 8 (0BA8.Standard)	LOGO! 9.0	V: [0, 849]
		LOGO! 8.4	V: [0, 849]
		LOGO! 8.3	V: [0, 849]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	V: [0, 849]
		LOGO! 8 (0BA8.Standard)	V: [0, 849]
		LOGO! 0BA7	V: [0, 849]
		S7 Compatible device	I: [0, 65534] / Q: [0, 65534] / M: [0, 65534] / V: [0, 65534] / DB: [0, 16000].[0, 65534]
		LOGO! 9.0 Slave	AQ: [1, 16]
		LOGO! 8.4 Slave	AQ: [1, 8]
		LOGO! 8.3 Slave	AQ: [1, 8]
		LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AQ: [1, 8]
		LOGO! 8 (0BA8.Standard) Slave	AQ: [1, 8]
		LOGO! 0BA7 Slave	AQ: [1, 2]
		CIM Devices	V: [0, 65534]
	LOGO! 0BA7	LOGO! 0BA7 Slave	AQ: [1, 2]

Configuring remote connections

Follow the same approach to configure remote connections as that in section Configuring Ethernet connection, LOGO! to LOGO! (Page 269). Note that LOGO!Soft Comfort allows you to switch to the diagram of the connected device simply by clicking on the values (NI1/NQ1...) in the connection dialog. This operation is only available for network blocks.

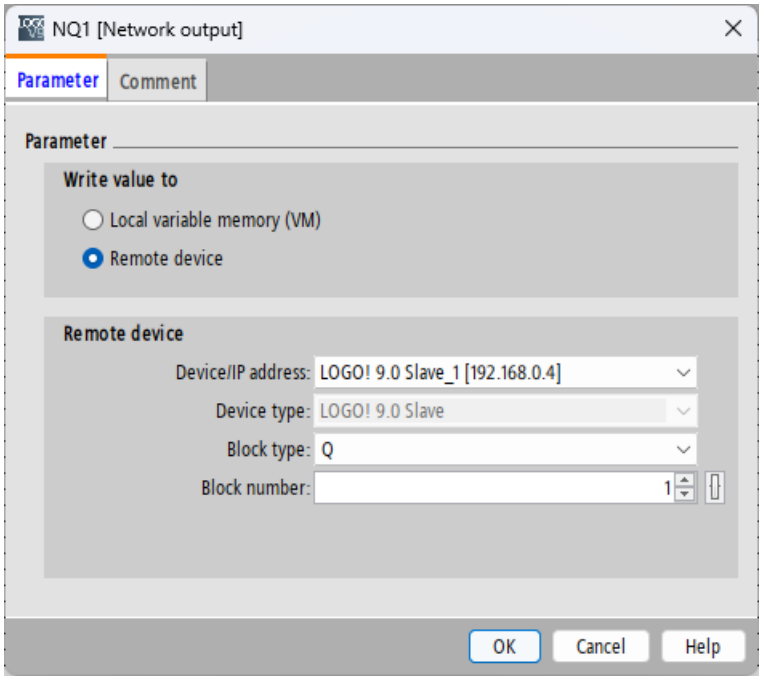
Configuring Ethernet connection, LOGO! to LOGO! slave

LOGO!Soft Comfort supports the connection of a LOGO! Base Module to a LOGO! slave only through network blocks.

Add LOGO! device and LOGO! Slave devices in the network project.

Follow the same steps as Create Ethernet connection by network block (Page 273).

Select the LOGO! Slave device's IP address in the dropdown list of Device/IP address in the Remote device configuration area. The Device type automatically changes to LOGO! Slave.



Note

You can only create connections between a LOGO! Base Module and a LOGO! slave device using network function blocks (NI/NQ/NAI/NAQ). Drag-and-drop operations are not available in this case.

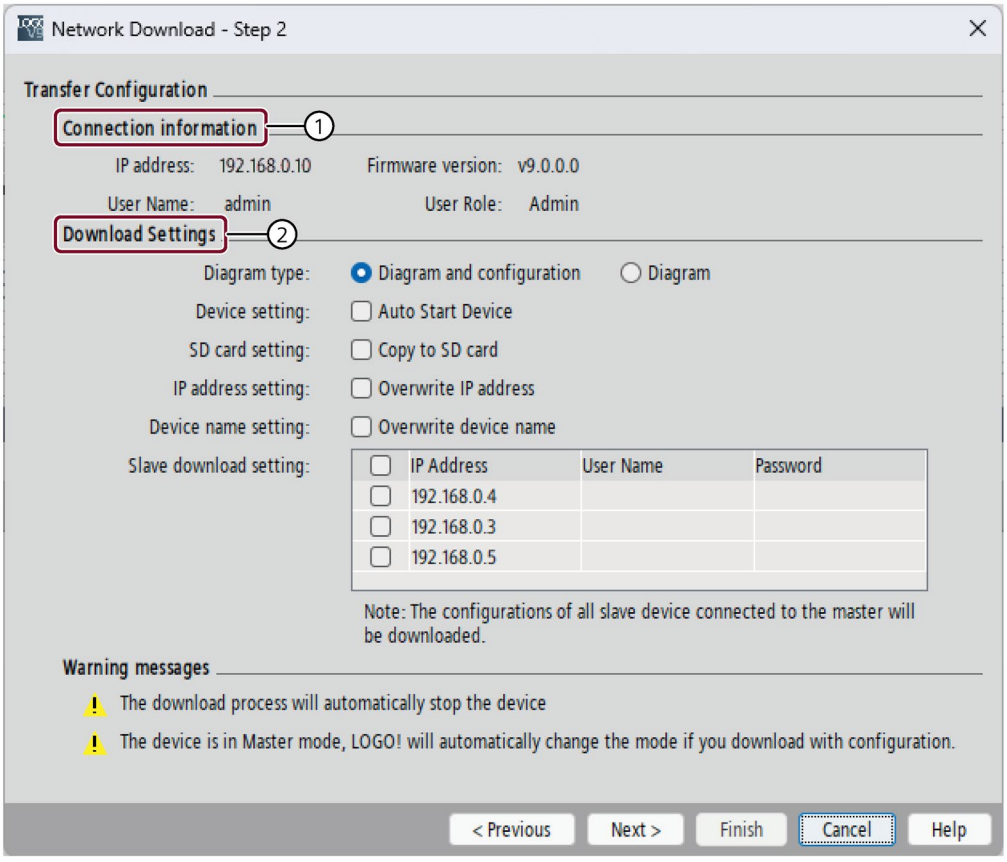
Note

LOGO! 9 devices support 64 NIs and 60 NQs separately. LOGO! 0BA8 devices support 24 NIs and 20 NQs separately. But no matter NI or NQ, you can have maximum 32 data connections in total.

Downloading network project to LOGO! BM

When you download the network project to LOGO! BM, LOGO!Soft Comfort requires that you confirm the connection interface for each communication attempt. See "Tools -> Transfer (Page 92)" for complete information.

After the connection setup, you can configure the transfer details before you download the network project to the LOGO! BM.



① Shows the IP address and FW version of the LOGO! BM

② Items to configure before the download:

- Diagram type: select whether to download the circuit diagram and BM device configuration or only the circuit diagram.
- Device setting: If you select to enable Auto Start Device, the LOGO! BM will start running the diagram automatically after the successful download.
- SD card setting: If you select to enable Copy to SD card, the LOGO! BM will copy the download to the SD card.
- IP address setting: If you select to enable Overwrite IP address, the LOGO! BM's IP address will be overwritten by the configuration after the successful download.
- Slave download setting: Select the LOGO! slave devices configured to be included in the project.

The device configuration for each selected slave devices is downloaded to each slave device. After the download, the selected slave devices will automatically change to slave mode, instead of you manually changing the mode on the device.

You can also download the slave device configuration to the device separately by clicking Download in the shortcut menu. The slave device automatically change to slave mode after the download.

0BA0 - 0BA8:

For LOGO! 0BA0 - 0BA8 devices, you need to manually change the slave devices to slave mode.

The following table lists the operating state of LOGO! 9 devices in master or slave mode after power off/on:

Device mode	LOGO! BM with LCD	LOGO! BM without LCD
Master mode	• with diagram: STOP • without diagram: last operating mode	• with diagram: RUN • without diagram: STOP
Slave mode	RUN Note: you can change it to STOP state and change other configuration through the menu on device screen.	RUN Note: you can change it to STOP state and change other configuration through the menu on the connected TDE screen or through LSC.

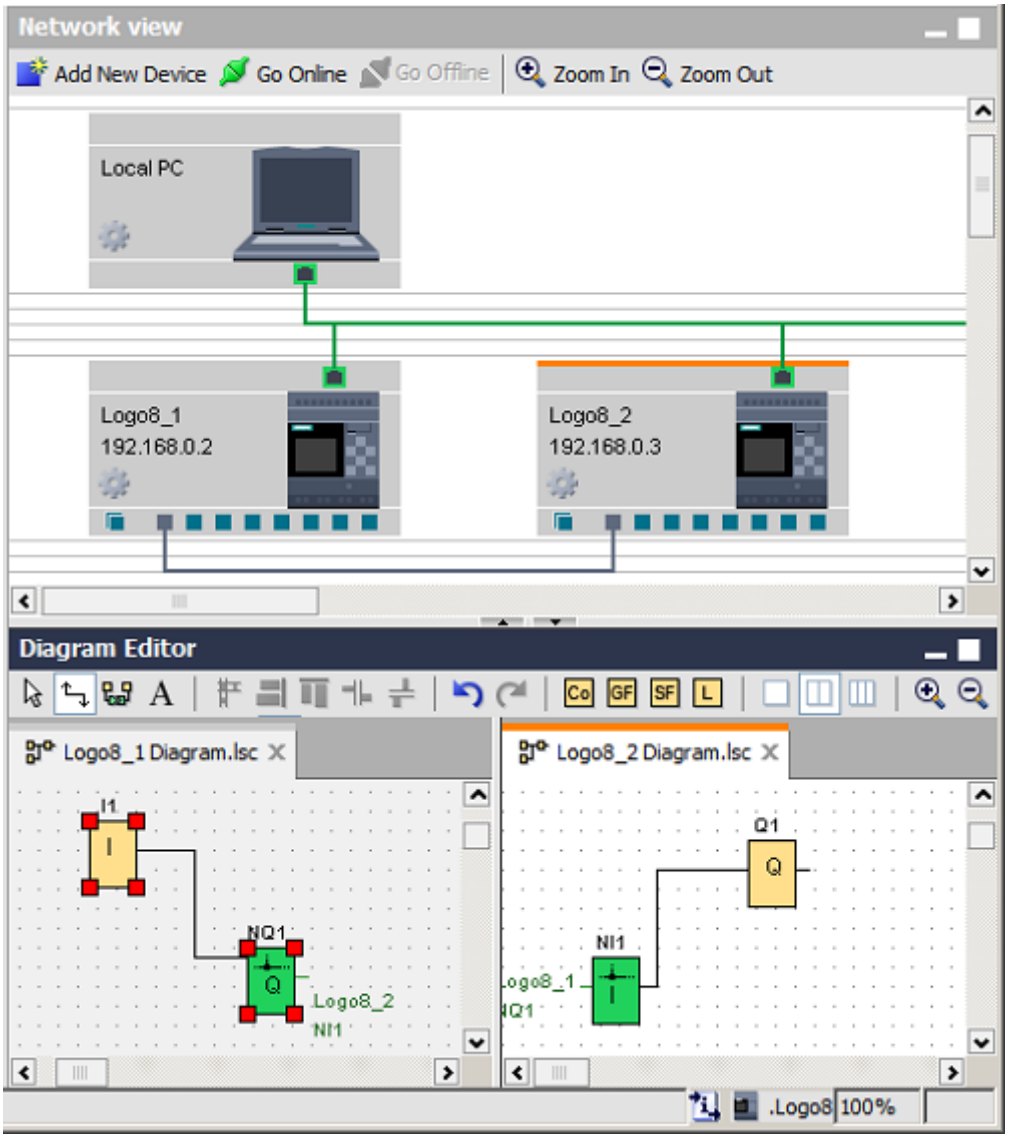
3.4.3.3 Create Ethernet connection by two sides programing (0BA8 and later version devices only)

LOGO!Soft Comfort also supports the creation of Ethernet connections between two LOGO! Base module through two-side programing.

To connect two LOGO! Base module, simply click a connector of the source block, drag to the desired connector on the target block, and release the left button.

Results:

- LOGO!Soft Comfort connects the two connectors with a gray line, indicating that the line is read-only.
- LOGO!Soft Comfort adds a green NQ function block to the source LOGO! diagram, and a green NI function block to the target LOGO! diagram.



You need to know the following during your operations:

- LOGO!Soft Comfort creates connection lines in order from left to right.
- You can only change the server/client status, data transfer address, and direction by adding and configuring the related function block.
- You can only remove the connection line by deleting the added NI and NQ blocks. You cannot click ✕ on the standard toolbar to remove these blocks.
- Once you remove one of the two automatically-added green function blocks, the other changes to red, warning that the connection is not complete.

3.4.3.4 Create Ethernet connection, LOGO! to non-project devices

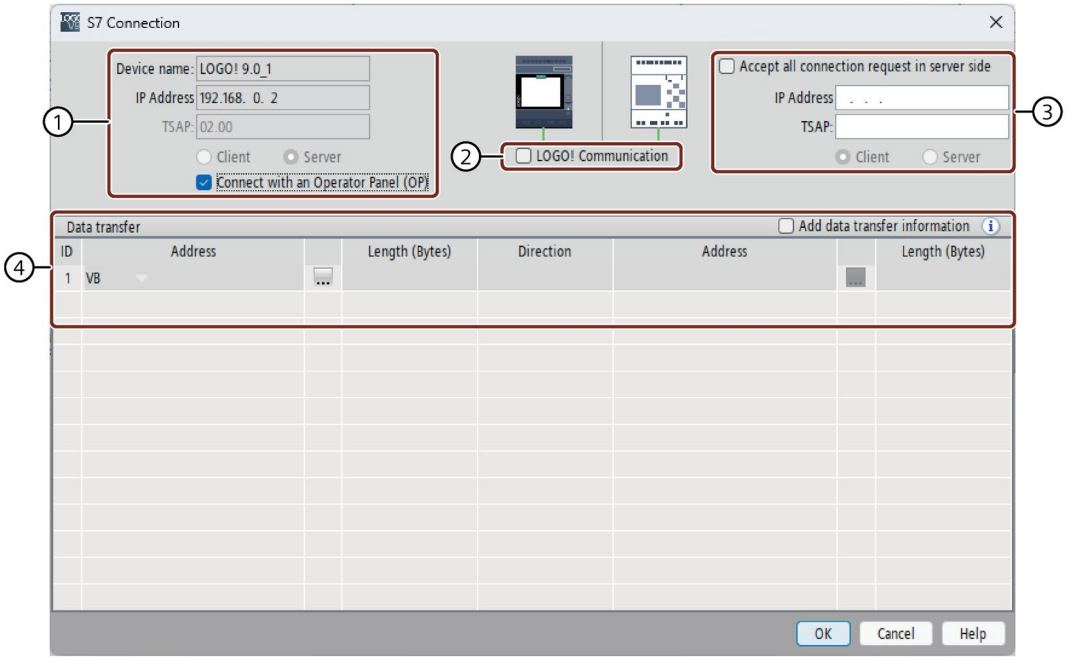
LOGO!Soft Comfort supports the creation and configuration of Ethernet connections between LOGO! Base Modules and devices outside of the current project.

Create a connection to remote device

1. Right-click the LOGO! Base Module or its connector.
2. Choose to add a server connection or a client connection.
3. Choose to add a S7 connection, LOGO! Communication connection or a Modbus connection.

Adding server connection

Follow the steps below to configure the server connection.



① **LOGO! Base Module**:

Here you can set if you are trying to connect to an operator panel like SIMATIC Panel.

② **LOGO! Communication**:

Select to enable or disable LOGO! Communication.

For LOGO! BM, LOGO! Communication is only available for LOGO! 9.0 and later versions devices.

③ **Non-project Device**:

Here you can set whether to allow access from all requests, or enter the IP address and TSAP port to enable connection to the non-project device.

You must allow access from all requests if you are trying to connect to devices outside of the LAN (Local Area Network).

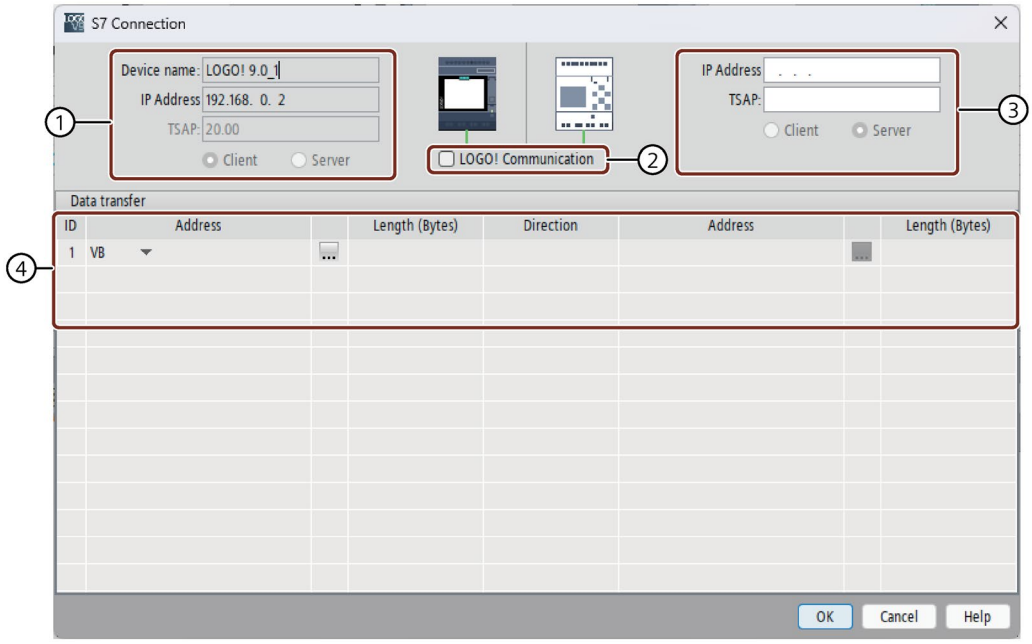
④ **Data transfer table**

Use the check box to activate the data transfer table.

See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Adding client connection

Follow the steps below to configure the client connection.



① **LOGO! Base Module**:
All the fields are read-only.

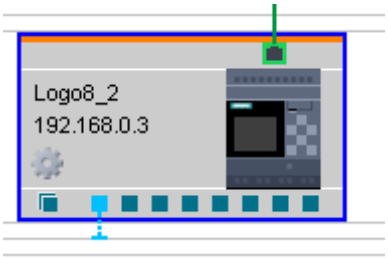
② **LOGO! Communication**:
Select to enable or disable LOGO! Communication.
For LOGO! BM, LOGO! Communication is only available for LOGO! 9.0 and later versions devices.

③ **Non-project Device**:
Enter the IP address and TSAP port to enable connection to the non-project device.

④ **Data transfer table**
See Tools -> Ethernet Connections (0BA7 and later versions only) (Page 187) for more information about data transfer configurations.

Connection result

LOGO!Soft Comfort displays the connection as a terminal in the network view.



Note

- If you choose the LOGO! Base Module when creating connections, the terminal automatically uses the available connector in the left-to-right order.
- If you choose a specific connector, the terminal uses the connector that you selected.

3.4.4 Import or export a device

3.4.4.1 Export a device

You can export a device with all function block information and device configurations in a project. The exported device could be opened in diagram mode or imported to other projects.

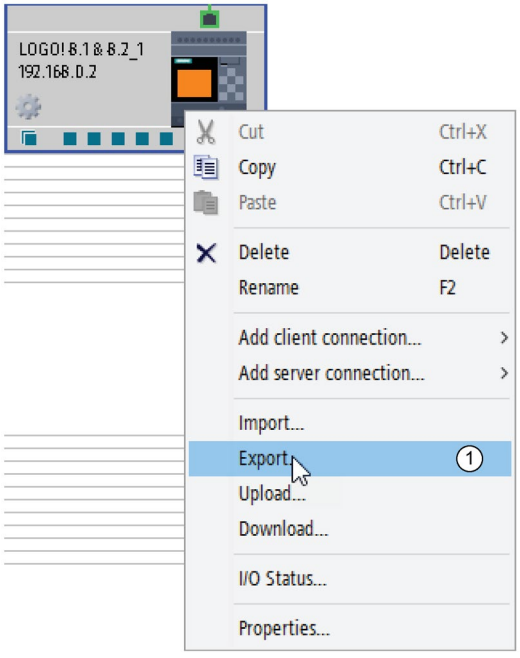
The remote device names configured in function blocks **NI/NQ/NAI/NAQ/NFAI/NFAQ** are converted to IP after the exporting.

The device file is saved as **lsc** file.

Export a device from a project

To export a device from your project, follow the steps below.

1. Right-click the device, then click ①.



2. Browse to the folder you want to save the device file, then click **Save**.

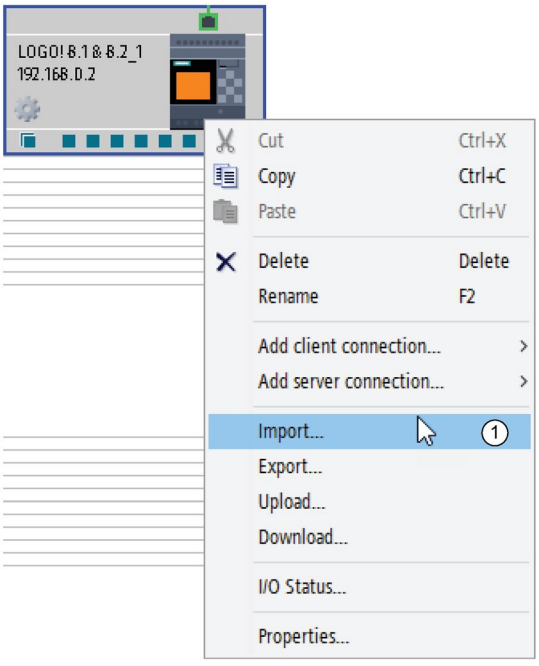
3.4.4.2 Import a device

You can import a circuit program and its device configurations to a network view.

Import a circuit program to a LOGO! device

Follow the below steps to import a circuit to your project.

1. Right-click a device in the network view, then click ①.



2. Select the circuit program you want to import in your computer.

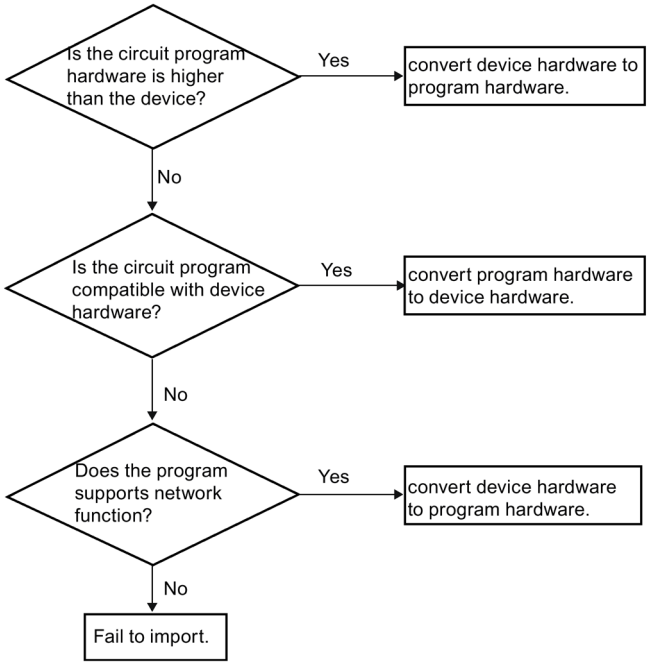
Note

You can only import your circuit program to a device of LOGO! 0BA7 and later versions.

Note

The importing circuit program replaces the former circuit program saved in the LOGO! device.

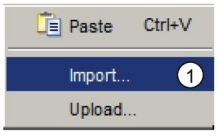
When you import a circuit program to a device which has a different hardware version from it, LOGO!Soft Comfort will synchronize their hardware version according to their own status. For those circuit programs which don't support network functions, you cannot import them to a device. See the following flowchart for the detailed information.



Create a new LOGO! 8.1 & 8.2 (LOGO! 8.FS4) device by importing a circuit program

You can create a new LOGO! 8.1 & 8.2 (LOGO! 8.FS4) by either of the following methods.

- Import in Network view
  - Right click any blank area in the network view, then click ①.



  - Select the circuit program you want to import in your computer.
- Drag and drop a circuit program to the network project tree.

Recover network connection

During the importing, LSC checks the IP address of the importing device. If the IP address is existed in the current network project, LSC prompts you that the IP address and network configuration need to be updated. After you click **Yes**, LSC assigns a new IP address to the importing device.

LSC reconnects the connectors when their following configuration matches:

- Client and Server.
- IP address
- TSAP

For more information on the network setting, refer to Create Ethernet connection (Page 266).

Note

When a device's dynamic port is fully occupied, the connection to this dynamic port cannot be recovered any more.

3.5 Practical example

3.5.1 Practical example: Introduction

This practical sample application (Page 289) for a service water pump offers new users a step-by-step introduction. You learn here how to apply the functions that you have learned, based on a practical example.

Further samples of circuit programs are found in the Sample Applications section (Page 303).

3.5.2 The task

In addition to the drinking water supply, rainwater takes an increasing part in domestic water supply systems, thus saving money and helping to protect the environment. For example, rainwater can be used for the following needs:

- Washing clothes
- Watering the garden
- Watering indoor plants
- Washing the car
- Flushing the toilet

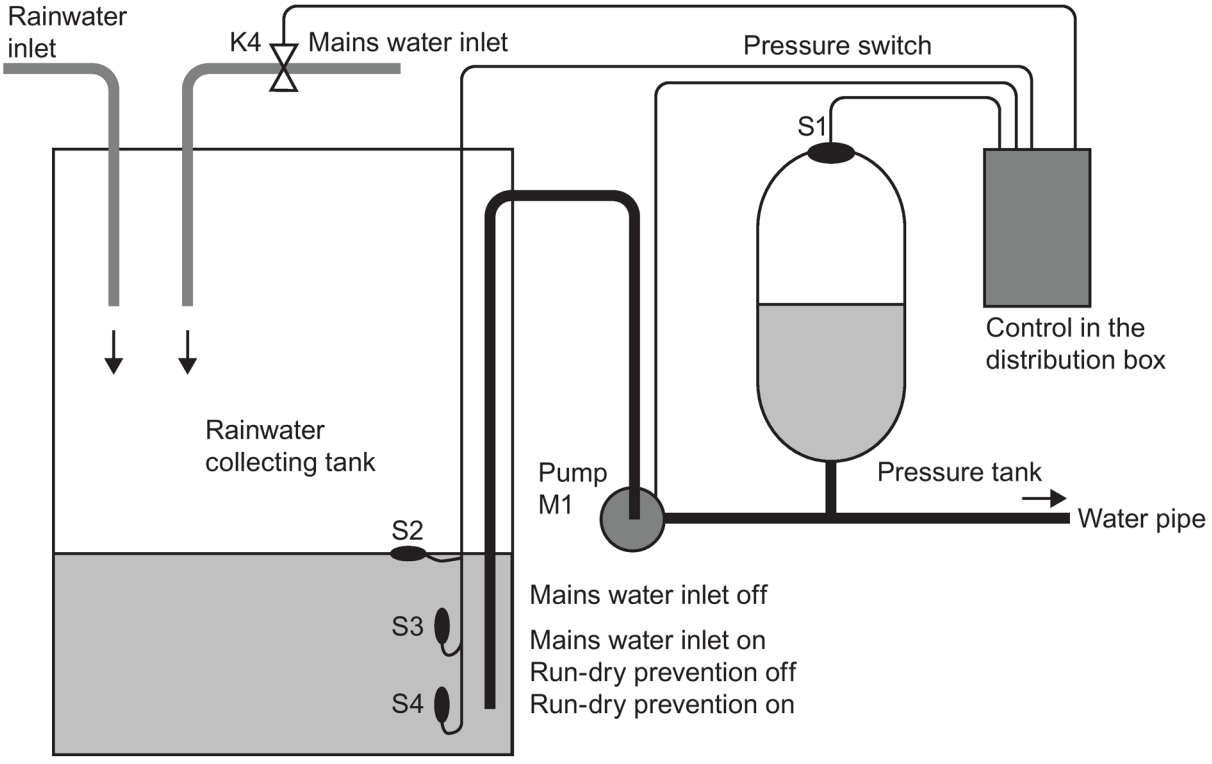
Rainwater can be collected in a suitable system to be used instead of drinking water.

Description of the system

The rainwater is collected in a reservoir. From the reservoir, it is pumped into a respective water supply system. From there it can be tapped in the same way as drinking water. The system functions can be upheld by supplying drinking water if the reservoir runs out of service water. Service water may include water for various services - washing, bathing, cooking, watering plants, etc.

The goal of this task is to create a control circuit that satisfies the requirements for such an installation.

The sketch below illustrates how such a service water system works:

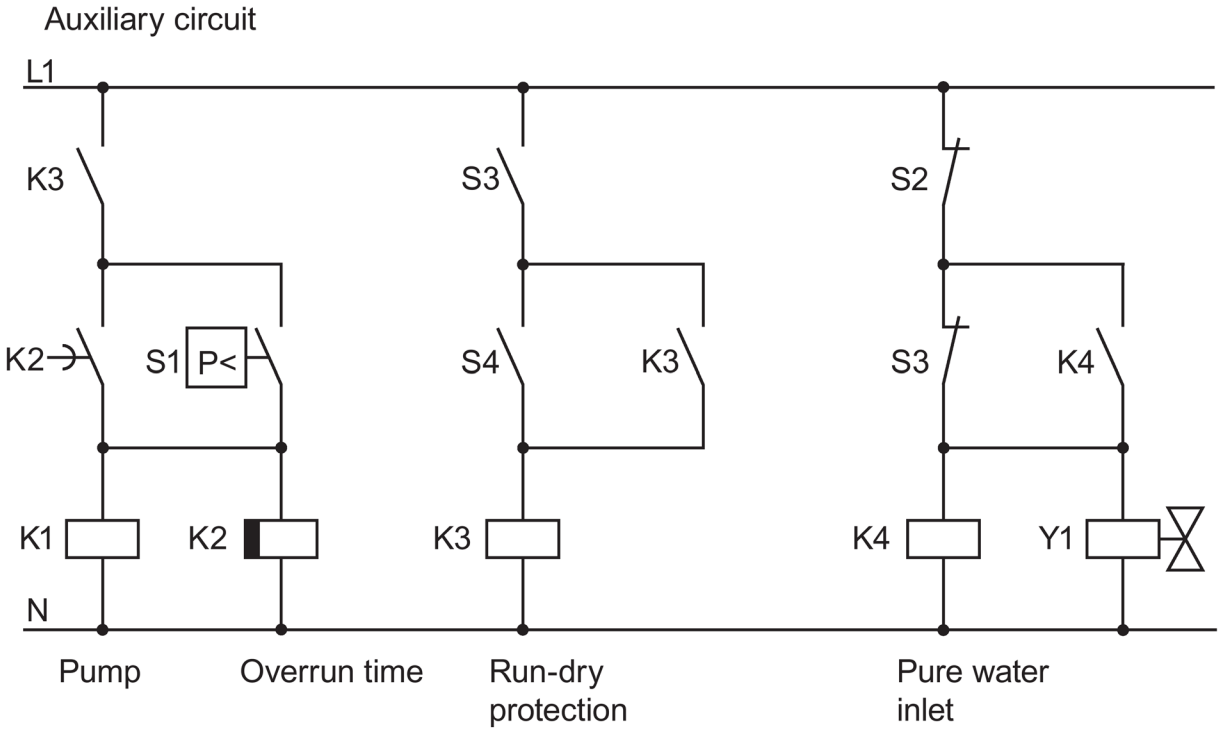


Requirements of the control system

- Service water must be available at all times. An emergency control system must change over to drinking water supply, for example, if service water runs low.
- The ingress of service water into the drinking water network must be prevented when switching over to drinking water supply.
- The pump must be disabled if the service water reservoir runs low of water (dry-run protection).

3.5.3 Layout of the solution

The pump and a solenoid valve are controlled by a pressure switch and three float switches, which are installed in the service water reservoir. The pump must be switched on if the pressure in the reservoir drops below minimum. When the operating pressure is reached, the pump is switched off again after a tracking time of a few seconds. The tracking time prevents pump oscillation if water is tapped over an extended period.

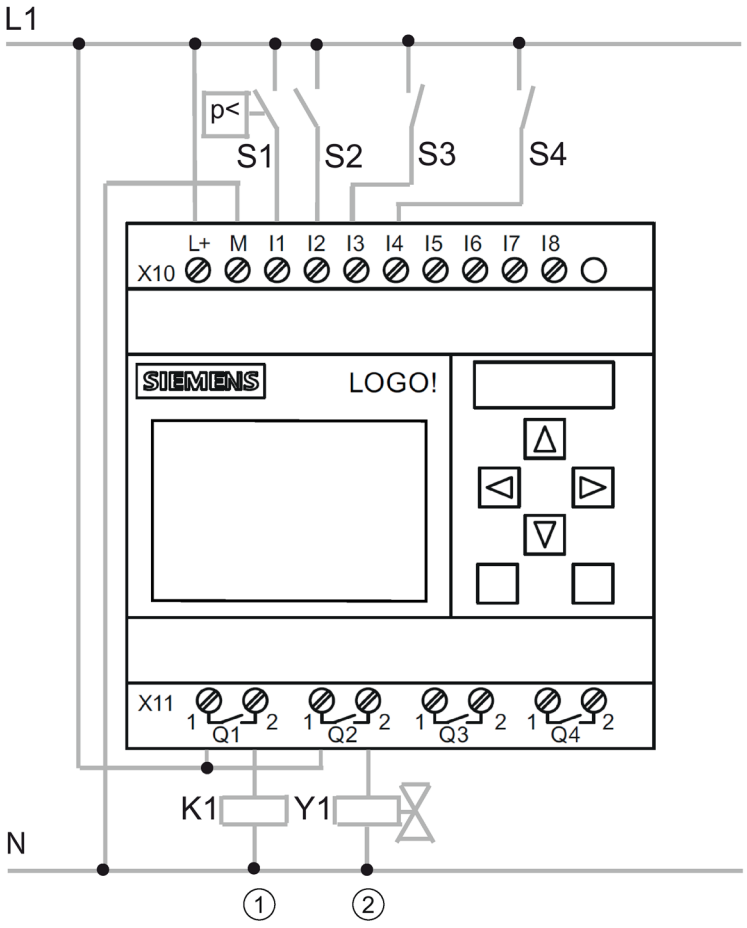


3.5.4 Solution with LOGO!

Connecting field devices

In addition to the LOGO! device, all you need is the pressure switch and the float switches to control the pump. If you are using a 3-phase AC motor, a contactor relay is required for switching the pump. In systems with single-phase AC pumps, you must install a contactor relay if the current of the AC pump exceeds the switching capacity of the output relay Q1. A solenoid valve can usually be controlled directly, due to its low power consumption.

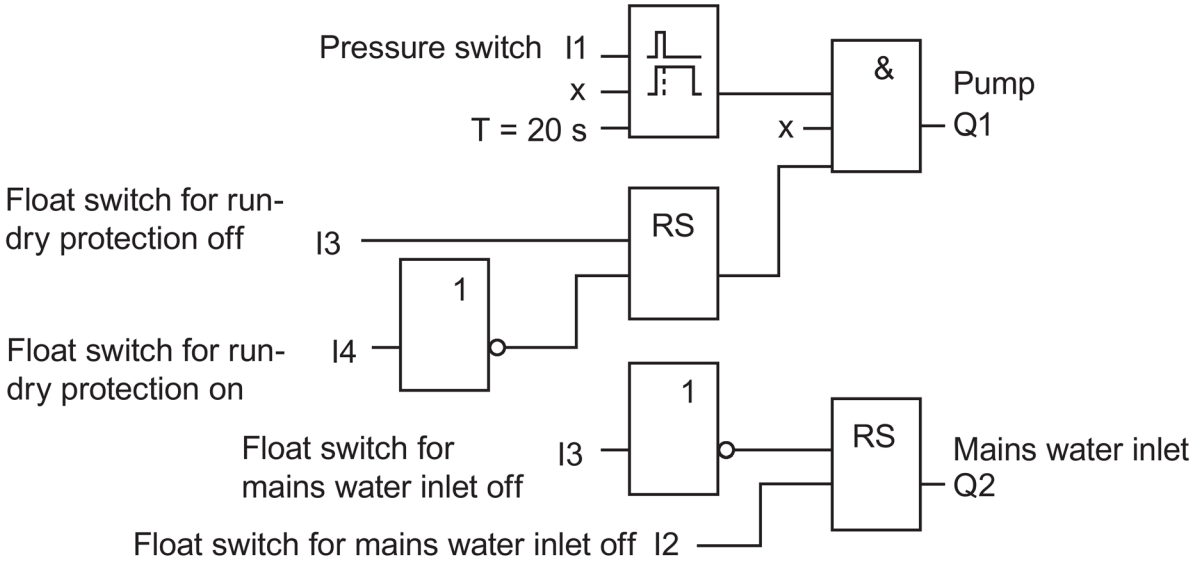
Connection diagram



① Pump
② Mains water inlet

Block diagram

The block diagram shows you how to interconnect the pump controls and the solenoid valve. The layout corresponds with the structure of the circuit program.



Options

For specific applications, you also have the choice of integrating additional functions which could otherwise only be realized with additional switchgear:

- Enabling the pump at specific times, for example, only during the summer months or at a specific time-of-day
- Indication of an imminent or existing shortage of water
- System error messages

3.5.5 Input of project data

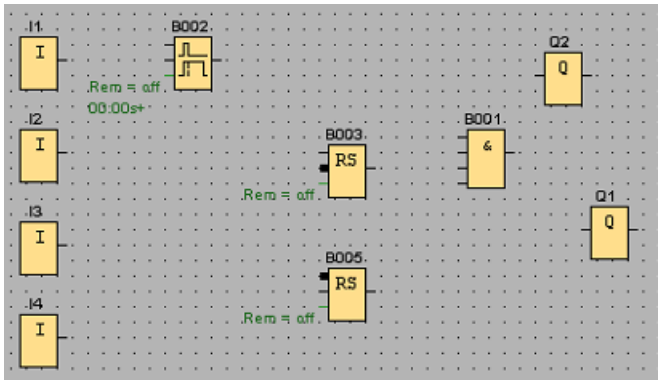
After you have planned your project, you can start to create it in LOGO!Soft Comfort. If you do not want to start programming right away, you can first input your project data in the Properties dialog (Page 68).

When working through the following steps, remember to save your circuit program at regular intervals. You might want to open a revised version at a later time to test out other options.

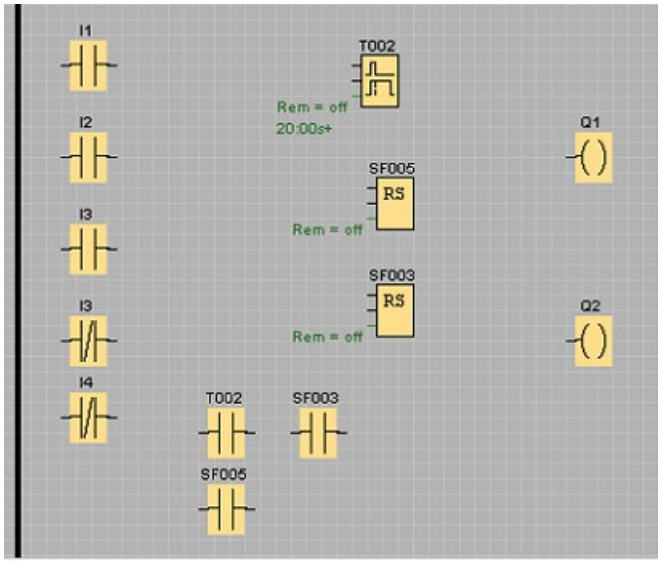
3.5.6 Placing blocks

In the next step, place the required blocks into the programming interface. Note that in addition to the standard and special functions, you also require I/O blocks. At this stage of progress it is sufficient for you to place the blocks roughly into position that seems appropriate to you for connecting them later. You can carry out fine positioning after making all of the connections.

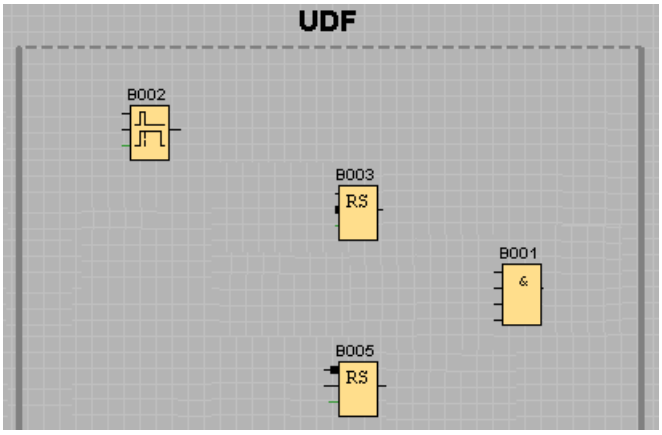
FBD Editor:



LAD Editor:



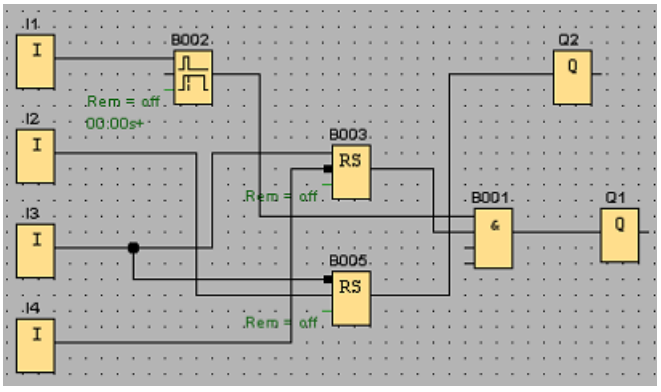
UDF Editor:



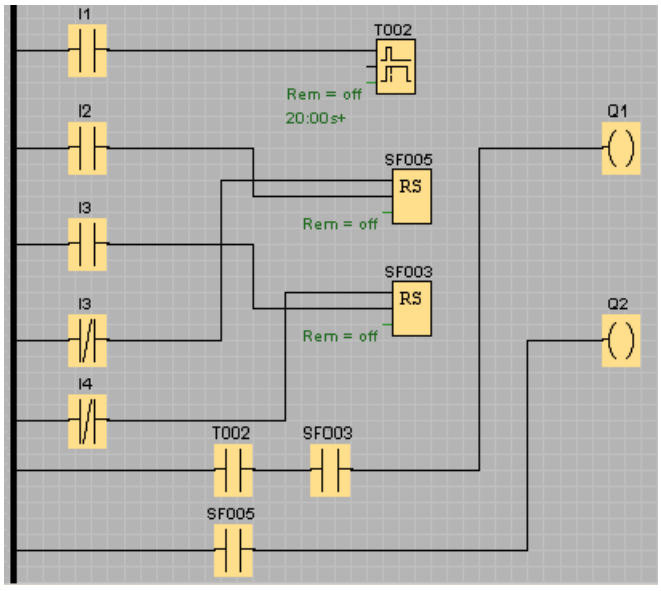
3.5.7 Connecting blocks

Connect the blocks as you have planned previously. Connect them by drawing the connecting line, starting at the output of a source block and ending at the input of the target block. This has the advantage that you are shown the name of the connector when you interconnect the input, which is particularly advantageous for the various connectors of SFBs.

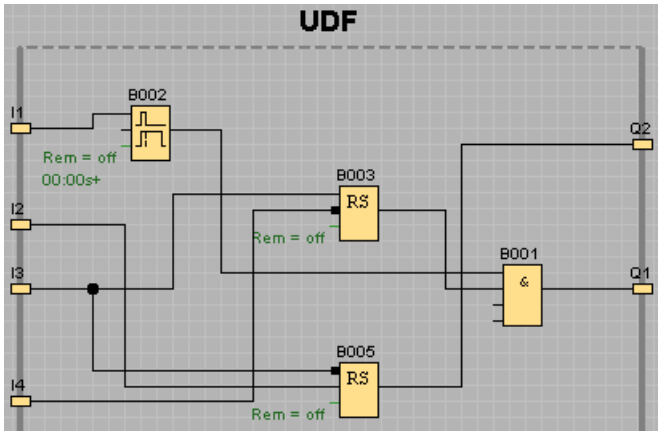
FBD Editor:



LAD Editor:



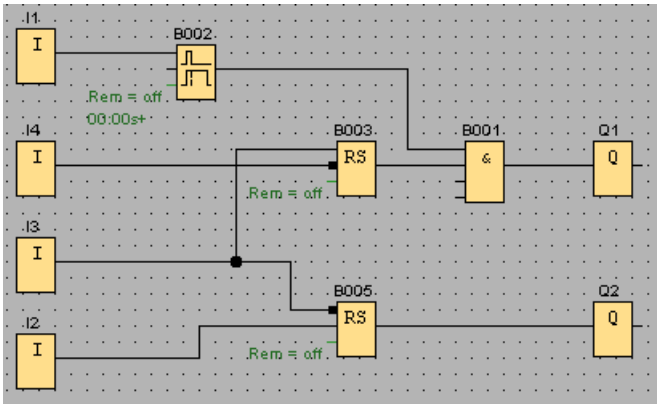
UDF Editor



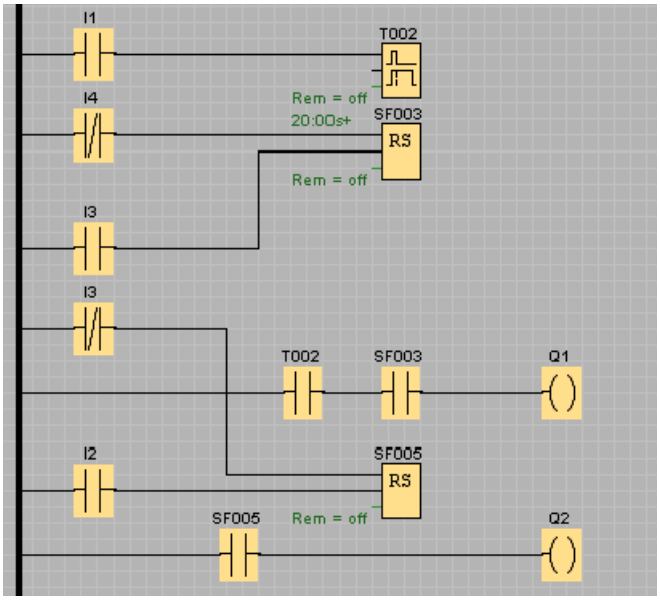
3.5.8 Cleaning up the programming interface

Some of the connecting lines might be routed across blocks, which can make the layout of the circuit program hard to read. To "tidy up" the programming interface, select the connecting lines and blocks where required and move or align them until you have optimized the circuit program layout as far as possible.

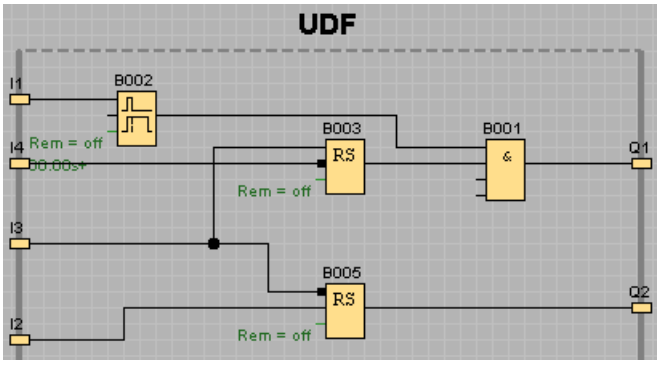
FBD Editor:



LAD Editor:



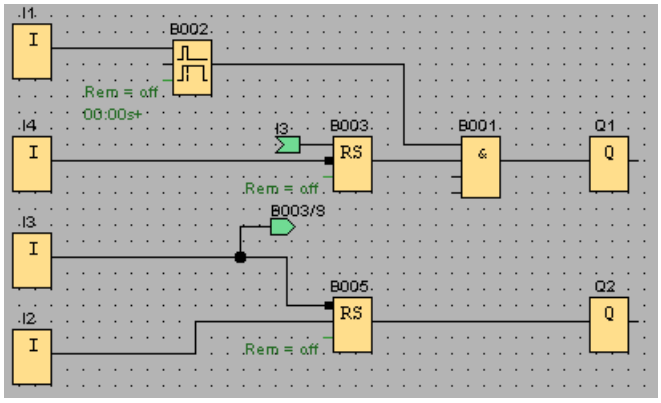
UDF Editor



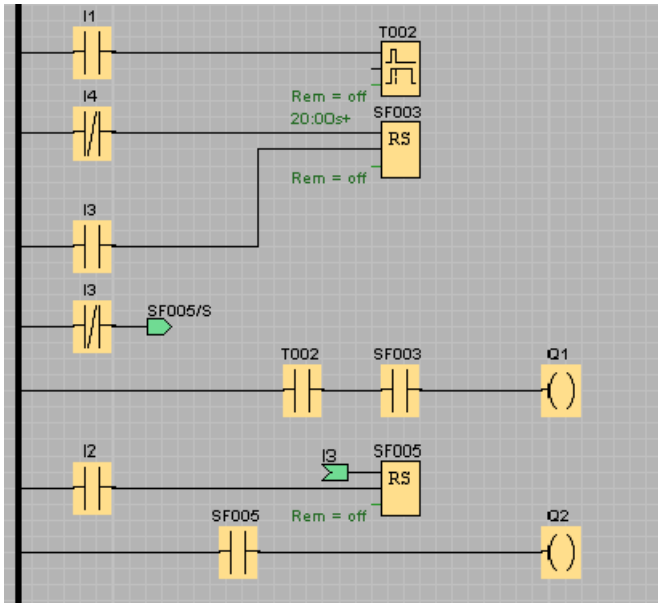
3.5.9 Optimizing the view

You can cut unwanted though unavoidable line crossings using the Cut/Join tool (Page 48) to improve the appearance.

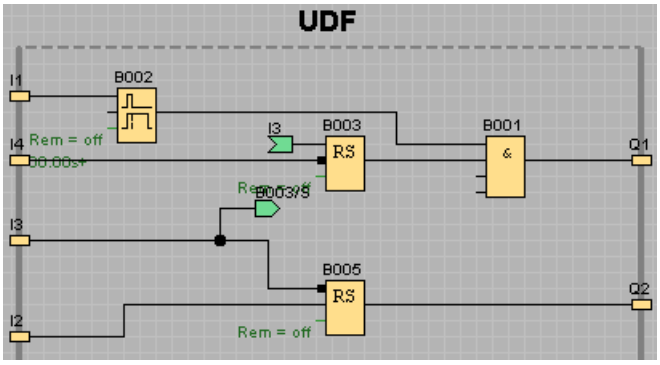
FBD Editor:



LAD Editor:



UDF Editor



Note that UDF blocks do not support inputs, outputs, analog inputs, analog outputs, M8, M25, M26, M27, shift registers, the data log or message text function blocks.

You have now completed your circuit program. Verify all connections once again and configure the block parameters to suit your requirements.

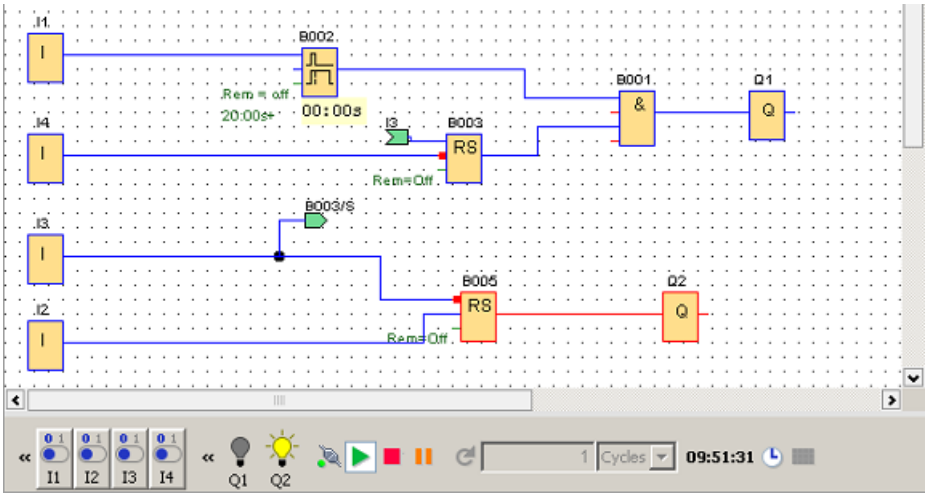
3.5.10 Testing the circuit program

Place your circuit program in simulation mode (Page 182) and verify that your program is error-free.

Although you now know that you can run your circuit program in LOGO!, you still need to make sure your circuit program operates as planned. You may also want to modify certain parameters. You can try out different input values, test the reaction of the system to power failure and compare your calculations or expectations with the simulated reaction of the outputs. The simulation toolbar and status window (Page 43) provide the tools you need for these tasks.

The float and pressure switches have a momentary action. If, however, you wish to simulate your circuit for testing purposes, simply change the input function from momentary action to switching action.

Example for the FBD Editor:



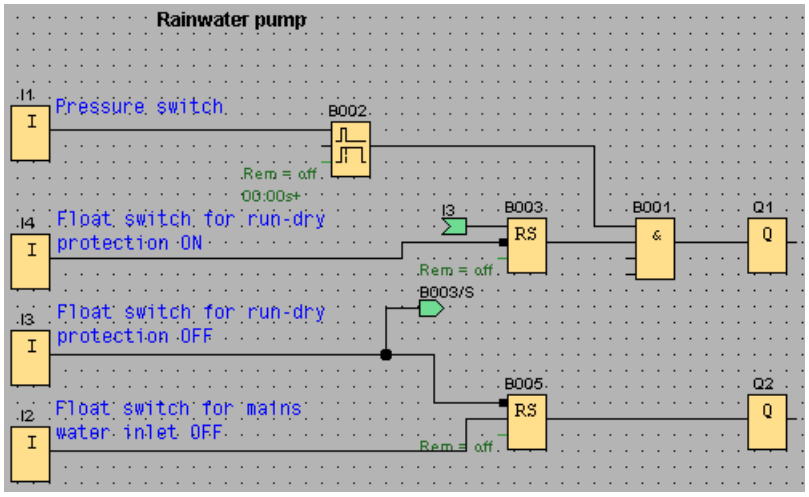
When you have made all corrections and everything runs as expected, you can start to document your circuit program.

3.5.11 Circuit program documentation

Program comments

You can now start to add comments to your program using the Text tool (Page 48). Describe the I/O to make your circuit program easy to understand. You do not have to display the connector names on-screen. You should nevertheless assign names to the connectors, because you may want to print out a connection list at a later time. From the comment tab of the File → Properties dialog (Page 66) , you can add a comment to your circuit program, which you can include when you print the circuit program.

Example for the FBD Editor:



Saving the file to a storage medium

Before you transfer your circuit program, you should save it once again. Choose the relevant command from the menu and enter a program name and path.

Printing the circuit program

Use the File → Print (Page 63) command to print a copy of your circuit program. From this dialog you specify the print format and the details to be included or omitted.

3.5.12 Transferring the circuit program

Password protection

To protect your process solution and prevent unauthorized access to your circuit program, you can assign a password before you transfer it to LOGO!.

To assign this password, use the Parameter tab of the File → Properties (Page 66) menu command dialog. Enter your password and confirm it with OK.

Password protection is used when you transfer the circuit program to LOGO! and is activated when LOGO! exits transfer mode.

The password protects your circuit program in LOGO!. Editing values and parameters, or viewing the circuit program in LOGO!, or uploading the circuit program from LOGO! to the PC is now only possible after you have entered the password.

Transferring the circuit program

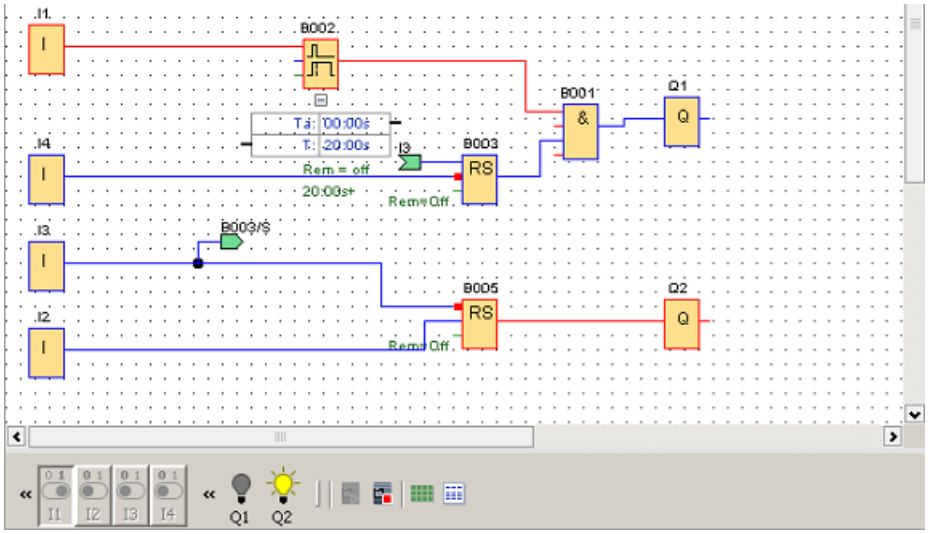
Finally, transfer your circuit program to a suitable LOGO! version and then connect the module. Connect LOGO! with the consumer devices in your project.

You have created the circuit program under LOGO!Soft Comfort within a very short time and, compared with conventional methods, you have saved yourself a considerable amount of time and effort.

3.5.13 Performing an online test of the circuit program

After you are satisfied with your program simulation and have downloaded it to LOGO! Base Module, you can also perform an online test of the circuit program. An online test is similar to simulation in that you can view inputs and outputs and block parameters. It differs, however, in that you are testing the program running in the LOGO! Base Module with "live" inputs rather than testing the program on the PC with simulated inputs.

The following example shows an online test of the practical example circuit program. In this example, input I1 was turned on and then turned off. The off-delay timer began counting when I1 was turned off:



	Synchronize message text
	Data Table

See the topic Simulating network communication (0BA7 and later versions only) (Page 249) for prerequisite conditions for an online test.

During an online test, you can modify a parameter of a function block with the LOGO!Soft Comfort. After your modification, the LOGO! Base Module then synchronizes the modified parameter. You can also modify the parameter in the LOGO! Base Module, and the LOGO!Soft comfort synchronizes the modified parameter.

Note

If the LOGO! Base Module is still in "Set Param" mode, it can not synchronize your modification in the LOGO!Soft Comfort.

Sample applications

4

Introduction

To give you an impression of the versatility of LOGO!, LOGO!Soft Comfort includes a small collection of applications, in addition to the service water pump application shown in the tutorial.

This online help briefly describes the tasks and presents the relevant solutions with LOGO!Soft Comfort. You can find these circuit programs, as well as many others, on your LOGO!Soft Comfort USB Stick in the ..\Samples folder. You will also find there documentation for the various samples.

Additional sample programs are also available on the Internet at LOGO! sample programs website (http://www.siemens.com/logo-application-examples).

Note

LOGO! sample applications are available and free of charge to our customers. We provide the sample applications without guarantee, and they are intended for general information about the possible fields of application for LOGO! Base Modules and LOGO!Soft Comfort software. Custom solutions may be different.

The user operates the system at his own responsibility. We also refer to local standards and system-related installation regulations.

This section presents the following sample applications:

- Air-conditioning system (Page 303)
- Factory door (Page 305)
- Heating control (Page 306)
- Fill station (Page 309)

Note the service water pump example (Page 289).

4.1 Air-conditioning system

Requirements for an air-conditioning system

An air-conditioning system supplies fresh air into a room and exhausts the contaminated air. Let us look at the following sample system:

- A room contains an extractor fan and a fresh-air fan.
- Each fan under monitoring by means of a flow sensor.
- The pressure in the room may rise above the atmospheric pressure.

- The fresh-air fan may only be switched on if the flow sensor signals the safe operational state of the extractor fan.
- A warning lamp indicates failure of one of the fans.

Standard solution

The fans are under monitoring by means of flow sensors. If the sensors registered no air flow after a short delay time has expired, the system is switched off and an error message is generated, which can be acknowledged by pressing the off button.

Fan monitoring requires an analyzer circuit with several switching devices, in addition to the flow sensors. A single LOGO! device can replace this analyzer circuit.

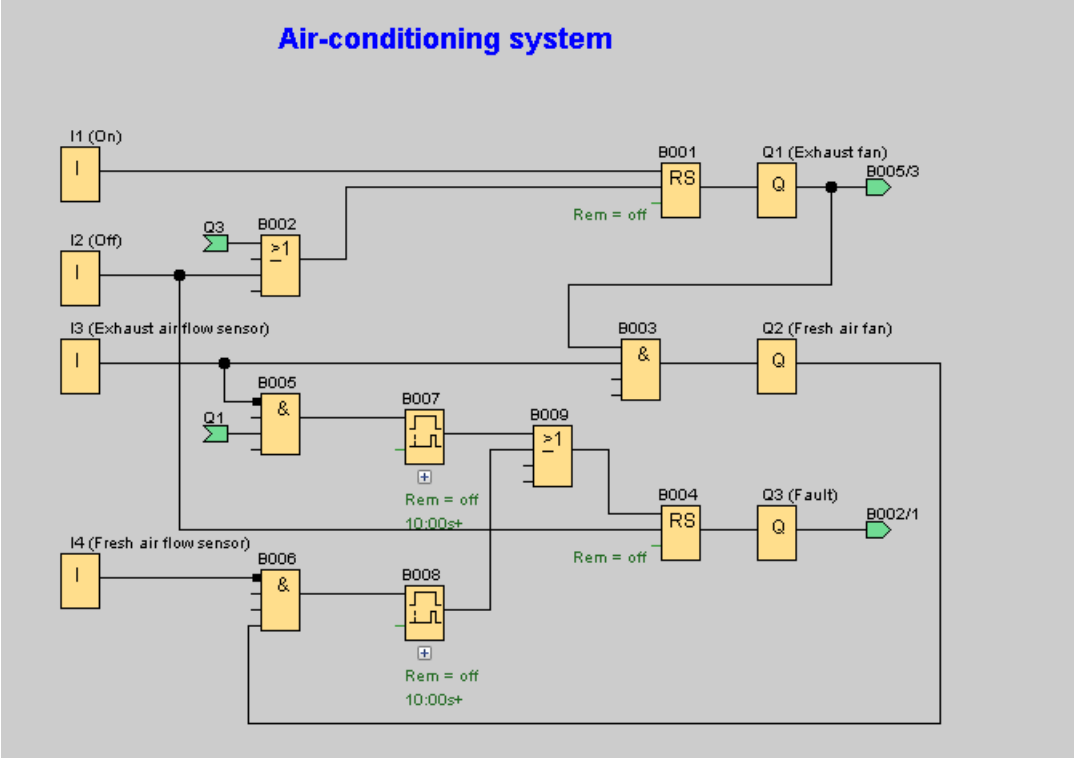
LOGO!Soft Comfort solution

The use of LOGO! reduces the amount of switchgear. Thus, you save installation time and space in the control cabinet. You may even be able to use as a smaller control cabinet.

With LOGO! you can also switch off the fans sequentially after the system is switched off.

The circuit in LOGO!Soft Comfort

The system is switched on and off at the inputs I1 and I2. The fans are connected to outputs Q1 and Q2, the flow sensors are connected to the inputs I3 and I4. Blocks B007 and B008 are used to set the watchdog times after which the flow sensors should send a signal to the fault output Q3.



You can invert output Q3 to use output messages at Q4. Relay Q4 only drops out if main power is lost or if there is a fault in the system. The output can then be used for a remote message.

4.2 Factory door

Requirements for a gate control system

In many cases a factory entrance is closed with roll gates. Those gates are only opened when vehicles need to enter or leave the factory grounds. The gate is controlled by a gatekeeper.

- The sliding gate is opened and closed by means of a pushbutton control in the gatehouse. The gatekeeper can monitor the gate operation.
- The roll gate is normally fully opened or it is closed. However, gate movements can always be interrupted.
- A flashing light is activated five seconds before the gate moves and while the gate is in motion.
- A safety pressure strip ensures that people are not injured and that no objects are trapped and damaged when the gate is closing.

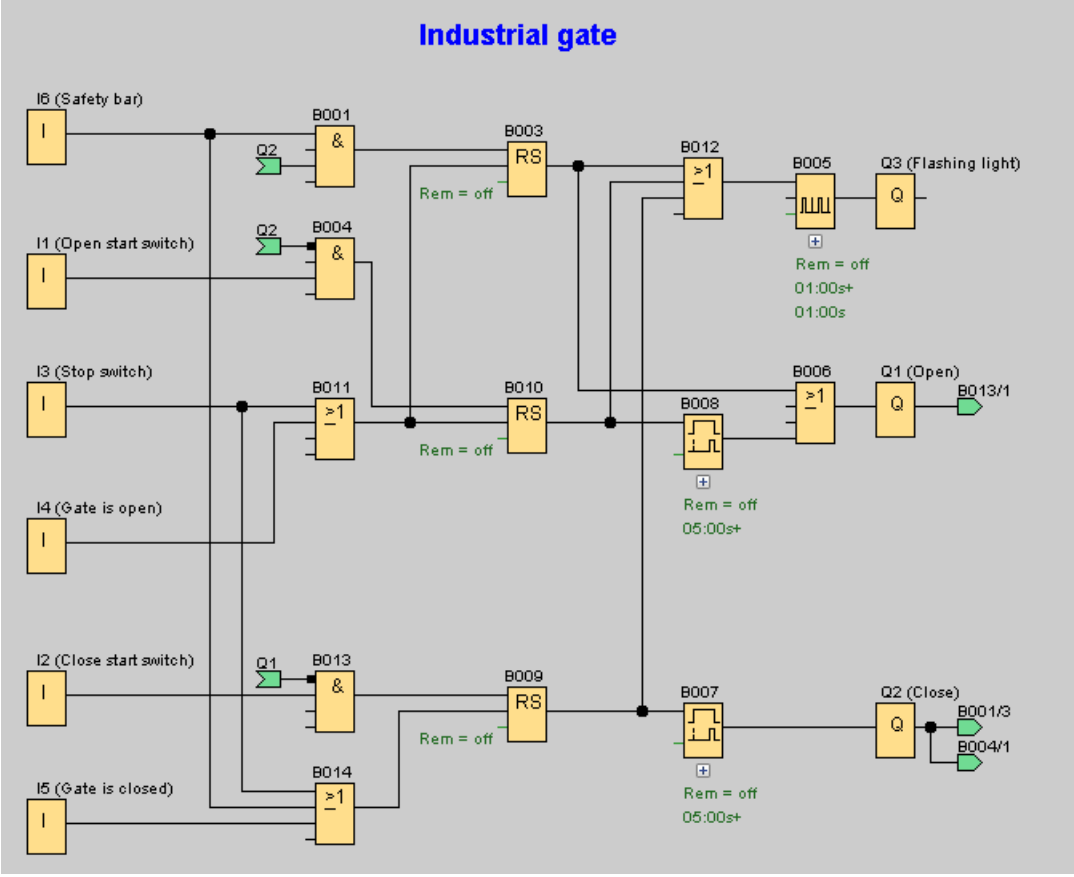
Standard solution

There are many different control systems for operating automatic gates. The OPEN and CLOSE buttons initiate gate movements in the relevant direction, provided it is not already moving in the opposite direction. Movement of the gate is terminated either by means of the STOP button or the relevant limit switch.

LOGO!Soft Comfort solution

A LOGO! circuit provides a further feature compared to standard controls: The actuation of a safety bar interrupts the closing motion of the gate. Five seconds before the gate opens or closes, a flashing light is activated and signals the start of the movement. It continues flashing until the gate has stopped.

In contrast to standard solutions, LOGO! offers an easy and economic means of modifying the control system.



4.3 Heating control

Requirements of the heating control

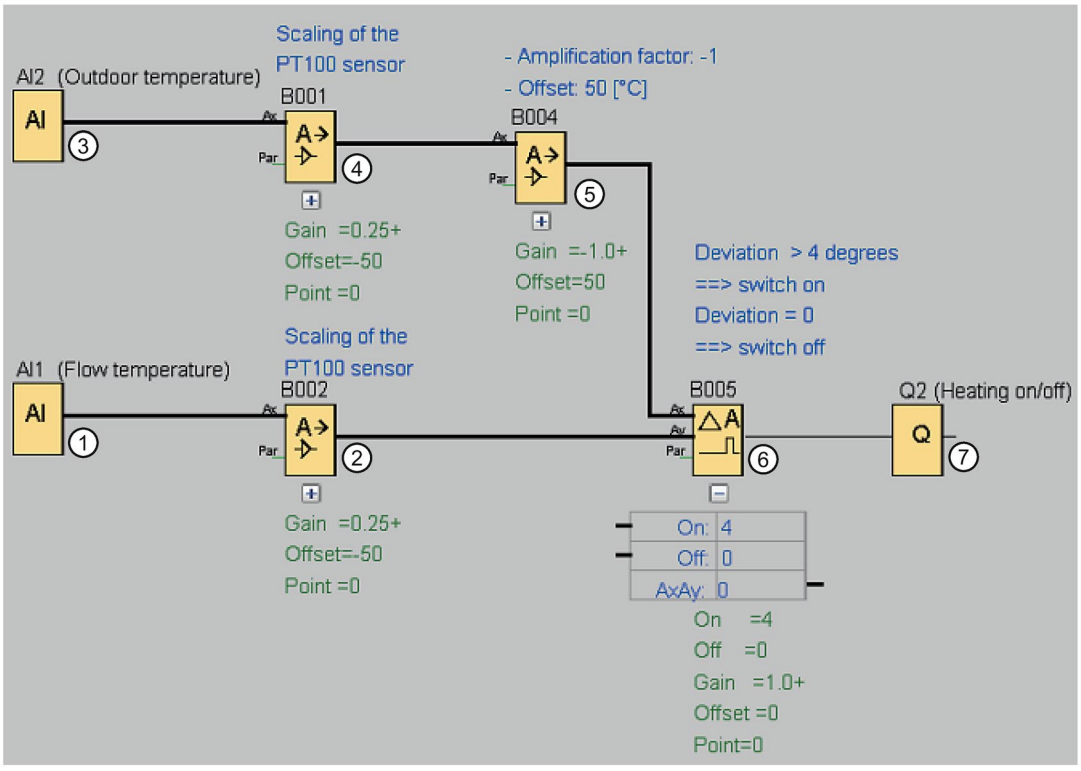
This example illustrates a heating control where the flow temperature of the heating is to be controlled at an inverse proportion to the outdoor temperature. This means that the lower the outdoor temperature, the greater the flow temperature.

PT100 sensors measure the outdoor and flow temperatures.

With an outdoor temperature of 0 °C, the flow temperature should be 50 °C (**x**).

If the outdoor temperature drops by more than 4 °C, the heating should switch on.

LOGO!Soft Comfort Solution



① A PT100 sensor is connected to AI1 which measures the flow temperature.

② The parameters for the analog amplifier are as follows:

- Sensor: PT100
- The PT100 sensors stipulate the measuring range and parameters.
- Unit: Celsius
- Resolution: x 1

The amplifier causes the actual temperature that the sensor has measured to be issued as the output.

③ A PT100 sensor is connected to AI2 which measures the outdoor temperature.

④ The parameters for the analog amplifier are as follows:

- Sensor: PT100
- The PT100 sensors stipulate the measuring range and parameters.
- Unit: Celsius
- Resolution: x 1

The amplifier causes the actual temperature that the sensor has measured to be issued as the output.

⑤ The parameters for the analog amplifier are as follows:

- Sensor: No sensor
- Gain: -1 (changes the sign of the value of the analog amplifier output from B001)
- Offset: 50

The parameters of the amplifier at B004 cause the difference of the compared temperatures of the comparator at B005 to be 0 if the sum of both temperatures is 50.

⑥ The parameters for the analog comparator are as follows:

- Sensor: No sensor
- Gain: 1
- Offset: 0
- On Threshold value: 4
- Off Threshold value: 0

The analog comparator switches on the output Q2 if the difference between the flow temperature and the standardized outdoor temperature exceeds 4 °C.

If the difference falls below 0 °C, the analog comparator switches the output Q2 off again.

⑦ Output Q2 switches the heating on and off.

Mode of operation

The outdoor temperature drops, which causes the value issued to the analog amplifier at B004 to increase to the same extent. The difference at the analog comparator between the flow and the outdoor temperature increases accordingly.

If the difference exceeds 4 °C the heating switches on.

By switching on the heating, the flow temperature increases. Because of this, the difference at the analog comparator between the flow and the outdoor temperature decreases (provided the outdoor temperature drops more slowly than the flow temperature increases).

If the difference falls below 0 °C, the heating switches off.

Changing parameters

The Offset parameter at the analog amplifier at B004 depends on your desired flow temperature at 0 °C outdoor temperature. Furthermore, the switch-on threshold and the switch-off threshold of the heating can change by means of the On and Off threshold values of the analog comparator at B005.

Try it out!

The example can be found as a circuit program on the LOGO!Soft Comfort DVD-ROM or LOGO! USB Stick. Load the circuit program in LOGO!Soft Comfort and try out the instructions above in simulation mode.

4.4 Fill station

Requirements for a fill station

A box shall be filled with two different items, up to a specified total for each item. When all items are in the box, it will be transported to the packaging station. A conveyor belt transports the items of both types to the box. (This example does not show the filling conveyor belt.) This circuit program for this example uses two up/down counters to count the items of each type, a mathematic instruction to sum the total number of items, and message texts to be displayed on the LOGO! onboard display and LOGO! TD (Text Display) that show the number of items of each type and the total number counted so far.

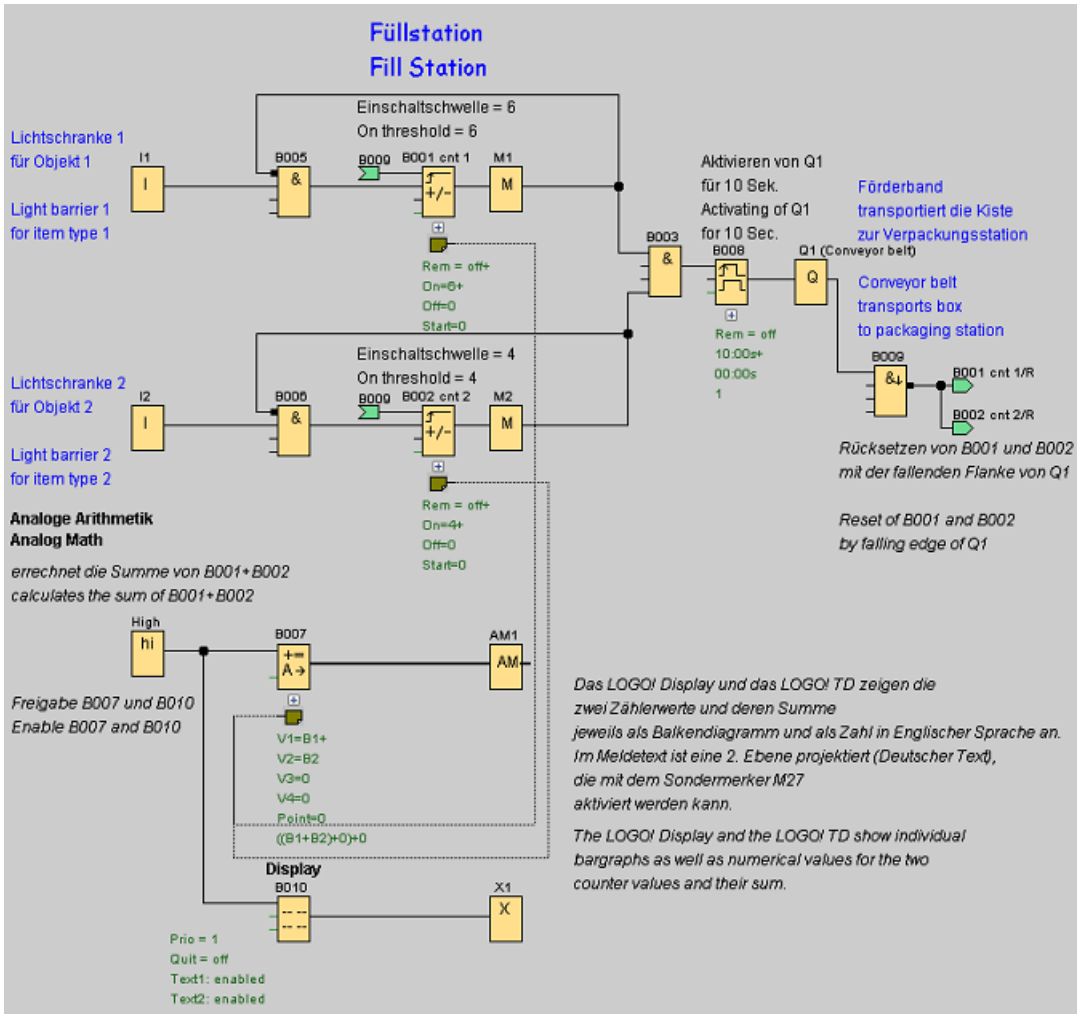
This process is described below:

- To fill the box, each item is transported by a conveyor belt to the box (not part of this example).
- The sequence in which the items fall into the box is random.
- Each item that falls into the box is counted by a sensor.
- The connected LOGO! TD as well as the LOGO! onboard display must display how many items of each kind have been counted, how many total items are in the box.

The circuit program in LOGO!Soft Comfort

Light barriers are connected to the two digital inputs I1 and I2 sensors that detect when an item falls into the box. The two counters (B001 and B002) count each item for the two specific types of items as they fall into the box. The on-threshold of each counter specifies the maximum number possible for each item type. When the box is full, a conveyor belt activates for ten seconds to transport the filled box to the packaging station and to transport an empty box to the fill station.

The circuit program uses a message text function block (Page 464) to display on the LOGO! TD and LOGO! onboard display how many total items and how many of each type have been counted. The message text uses the "ticking" feature to alternate between displaying bar graphs of the counted items and displaying a text summary of the counts.


Füllstation
Fill Station
Einschaltschwelle = 6
On threshold = 6
Lichtschranke 1
für Objekt 1
Light barrier 1
for item type 1
I1
B005
B000
B001 cnt 1
M1
Rem = off+
On=6+
Off=0
Start=0
Aktivieren von Q1
für 10 Sek.
Activating of Q1
for 10 Sec.
B003
B008
Q1 (Conveyor belt)
Förderband
transportiert die Kiste
zur Verpackungsstation
Conveyor belt
transports box
to packaging station
Rem = off
10:00s+
00:00s
1
Einschaltschwelle = 4
On threshold = 4
Lichtschranke 2
für Objekt 2
Light barrier 2
for item type 2
I2
B006
B002 cnt 2
M2
Rem = off+
On=4+
Off=0
Start=0
B009
B001 cnt 1/R
B002 cnt 2/R
Rücksetzen von B001 und B002
mit der fallenden Flanke von Q1
Reset of B001 and B002
by falling edge of Q1
Analoge Arithmetik
Analog Math
errechnet die Summe von B001+B002
calculates the sum of B001+B002
High
B007
AM1
Freigabe B007 und B010
Enable B007 and B010
V1=B1+
V2=B2
V3=0
V4=0
Point=0
((B1+B2)+0)+0
Display
B010
X1
Prio = 1
Quit = off
Text1: enabled
Text2: enabled
Das LOGO! Display und das LOGO! TD zeigen die
zwei Zählerwerte und deren Summe
jeweils als Balkendiagramm und als Zahl in Englischer Sprache an.
Im Meldetext ist eine 2. Ebene projektiert (Deutscher Text),
die mit dem Sondermerker M27
aktiviert werden kann.
The LOGO! Display and the LOGO! TD show individual
bargraphs as well as numerical values for the two
counter values and their sum.

Parameters of the function blocks

Note the following parameter usage:

- The on-thresholds of counters B001 and B002 define the maximum number of items of each item type to be put in the box.
- The pulse width (TH) of the edge-triggered wiping relay defines the duration of the movement of the conveyor belt.
- The mathematic instruction function block B007 that calculates the total is programmed as follows:
  - Value 1 is a reference parameter to the current value of counter B001.
  - Value 2 is a reference parameter to the current value of counter B002.
  - Operator 1 is "+" to sum the two counters.
  - Priority 1 is high. (This is the only operation in the function block, so the priority in this case is irrelevant).
  - The remaining operands and operators are set to "+ 0" and do not affect the output of the equation.

Message texts

Message text block B010 displays a message text whose four lines all tick "line by line", such that two screen forms display in alternation. The first shows bar graph representations of the counted items (B001 and B002 current values) and a bar graph for the summed total items as calculated by B007. The second screen form shows the same values numerically and with text descriptions.

The message text function block is configured with two character sets enabled. The message text for character set 1 is configured with English text and the message text for character set 2 is configured with German text. You use the File → Message Text Settings (Page 65) to select the two character sets. In this case you would select the same character set for both English and German characters. When LOGO! is in run mode, the current character set selection for message texts determines which message will display.

Reference material

5

5.1 Constants and connectors

Co

You must select this tool if you want to place input blocks, output blocks, flags or constants (high, low) on the programming interface. You can select the specific type of block to insert from an additional toolbar that pops up when you select this tool.

Display in the FBD Editor	Display in the LAD Editor	Display in the UDF Editor
I — Inputs (Page 313)	Make contact (Page 332)	lo hi — Permanent logical levels (Page 315)
C — Cursor keys (Page 313)	Break contact (Page 332)	X — Open connectors (Page 315)
F — LOGO! TD/LOGO! TDE function keys (Page 314)	Analog contact (Page 332)	M AM FAM — Flags (Page 316)
S — Shift register bits (Page 315)	Float contact (Page 333)	
lo hi — Permanent logical levels (Page 315)	Relay coil (Page 333)	
Q — Outputs (Page 314)	Inverted output (Page 333)	
X — Open connectors (Page 315)	Analog outputs (Page 333)	
M AM FAM — Flags (Page 316)	Float output (Page 334)	
AI — Analog inputs (Page 318)	Network inputs (0BA7 and later versions only) (Page 334)	
AQ — Analog outputs (Page 319)	Network analog inputs (0BA7 and later versions only) (Page 334)	
I — Network inputs (0BA7 and later versions only) (Page 319)	Network outputs (0BA7 and later versions only) (Page 334)	
AI — Network analog inputs (0BA7 and later versions only) (Page 323)	Network analog outputs (0BA7 and later versions only) (Page 334)	

FAI	Network float analog inputs (LOGO! 9 and later version only) (Page 325)
Q	Network outputs (0BA7 and later versions only) (Page 326)
AQ	Network analog outputs (0BA7 and later versions only) (Page 328)
FAQ	Network float analog outputs (LOGO! 9 and later version only) (Page 330)
FAI	Network float analog input (LOGO! 9 and later versions only) (Page 334)
FAQ	Network float analog output (LOGO! 9 and later versions only) (Page 334)

The number of available icons depends on the LOGO! version you have selected.

5.1.1 FBD and UDF

5.1.1.1 Inputs

Input blocks represent the input terminals of LOGO!. LOGO! 9 provides up to 64 digital inputs; LOGO! 0BA8 provides up to 24 digital inputs.

In your block configuration, you can assign an input block a new input terminal, if this terminal is not already used in the circuit program.

Overview (Page 312)

This block is not available in the UDF Editor.

5.1.1.2 Cursor keys

Up to four cursor keys are available to you. You can program cursor keys for the circuit program in the same ways as other inputs. Cursor keys can save switches and inputs, and allow operator control of the circuit program.

For LOGO! 9 and later versions BM and TDE, you can find the virtual cursor keys in the toolbar on the BM or TDE. Refer to LOGO! System Manual to learn more about it.

For LOGO! 0BA8 and earlier versions BM and TDE, the four physical cursor keys on the LOGO! TDE are the same cursor key inputs on the LOGO! Base Module. Pressing ESC and any of the cursor keys, for example, on either the LOGO! TDE or LOGO! activates a single input for a cursor key.

Overview (Page 312)

This block is not available in the UDF Editor.

5.1.1.3 LOGO! TD/LOGO! TDE function keys

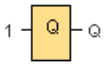
LOGO!Soft Comfort provides you four function keys that you can use as digital inputs in your circuit program. You program the function keys in the same way as other inputs in your circuit program. Function keys can save switches and inputs, and allow operator control of the circuit program.

For LOGO! 9 TDE, you can find four virtual function keys and four virtual cursor keys in the toolbar on the TDE.

Overview (Page 312)

This block is not available in the UDF Editor.

5.1.1.4 Outputs



Output blocks represent the output terminals of LOGO!. LOGO! 9 provides up to 60 digital outputs; LOGO! 0BA8 provides up to 20 digital outputs.

In your block configuration, you can assign an output block a new terminal, provided this terminal is not already used in your circuit program.

The output always carries the signal of the previous program cycle. This value does not change within the current program cycle.

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This block is not available in the UDF Editor.

5.1.1.5 Permanent logical levels

Set the block input to logical **hi** (hi = high) to set it permanently to logical "H" state.

Set the block input to logical **lo** (lo = low) to set it permanently to logical "L" state.

Overview (Page 312)

This block is available in both FBD and UDF Editors.

5.1.1.6 Shift register bits

The LOGO! devices provide eight shift register bits SX.1 to SX.8 (X value range: 1 to 4), which are assigned the read-only attribute in the circuit program. The content of shift register bits can only be modified by means of the shift register special function.

The LOGO! 0BA7, 0BA8 and LOGO! 9 devices provide a maximum of 32 shift registers bits S1.1 to S4.8.

Overview (Page 312)

This block is not available in the UDF Editor.

5.1.1.7 Open connectors

Interconnect the output of an unused block (for example, message texts) with this block. LOGO! 9 supports up to 128 open connectors; LOGO! 0BA7 and 0BA8 support up to 64 open connectors; LOGO! 0BA6 supports up to 16 open connectors.

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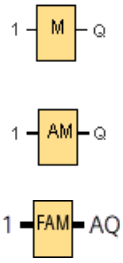
This block is available in both FBD and UDF Editors.

5.1.1.8 Flags



Flag blocks output their input signal. LOGO! 9 provides 128 digital flags M1 to M128, 128 analog flags AM1 to AM128, and 32 float analog flags FAM1 to FAM32.

- **0BA8:** 64 digital flags M1 to M64; 64 analog flags AM1 to AM64
- **0BA7:** 27 digital flags M1 to M27; 16 analog flags AM1 to AM16
- **0BA6:** 27 digital flags M1 to M27; six analog flags AM1 to AM6
- **0BA4, 0BA5:** 24 digital flags M1to M24; six analog flags AM1 to AM6
- **0BA3, 0BA2:** eight digital flags M1 to M8
- **0BA1:** four digital flags M1 to M4
- **0BA0:** zero flag

In your block configuration, you can assign a new number to the flag, provided this flag number does not already exist in your circuit program.

The output always carries the signal of the previous program cycle. This value does not change within the current program cycle.

The following special flags have different background colors:

- M8 (displays blue in LOGO!Soft Comfort) = Initialization Flag
- M25 (display white in LOGO!Soft Comfort)
  - 0BA8 and earlier versions: LOGO! displays white backlight
- M26 (display white in LOGO!Soft Comfort)
  - 0BA8 and earlier versions: LOGO! TD display white backlight
- M27 (displays green in LOGO!Soft Comfort)
  - LOGO! 9 and later versions: Message Page Flag
  - 0BA8 and earlier versions: Message Character Set Flag
- M28 (displays amber in LOGO!Soft Comfort)
  - LOGO! 9 and later versions: LOGO! displays amber backlight on the status bar
  - 0BA8 and earlier versions: LOGO! displays amber backlight
- M29 (displays red in LOGO!Soft Comfort)
  - LOGO! 9 and later versions: LOGO! displays red backlight on the status bar
  - 0BA8 and earlier versions: LOGO! displays red backlight

- M30 (displays amber in LOGO!Soft Comfort)
  - LOGO! 9 and later versions: LOGO! TDE displays amber backlight on the status bar
  - 0BA8 and earlier versions: LOGO! TDE displays amber backlight
- M31 (displays red in LOGO!Soft Comfort)
  - LOGO! 9 and later versions: LOGO! TDE displays red backlight on the status bar
  - 0BA8 and earlier versions: LOGO! TDE displays red backlight

Besides, flag blocks which are configured as email sending trigger event (Page 76) display green backlight.

Startup flag: M8

The M8 flag is set in the first cycle of the user program and can thus be used in your circuit program as a startup flag. It is reset after the first program execution cycle.

In the subsequent cycles, the M8 flag reacts in the same way as the M1 to M64 flags.

Backlight flags

For LOGO! 0BA8 and earlier versions, Flags M25, M28 and M29 control the backlight of the LOGO! onboard display. Flags M26, M30 and M31 control the backlight of the LOGO! TDE.

For LOGO! 9 and later versions, Flags M28 and M29 control the backlight of the LOGO! screen status bar. Flags M30 and M31 control the backlight of the LOGO! TDE screen status bar.

You can use the outputs of timers, message texts, or other function blocks to activate the backlight flags. To enable multiple conditions to control the backlight of the devices, you can use multiple function blocks in parallel or in sequence.

Message page flag: M27 (LOGO! 9 and later versions)

In the circuit program, you can use M27 to determine to display Message Page 1 or Message page 2.

When M27=0 (low), then LOGO! only displays message page 1; when M27=1 (high), then LOGO! only displays message page 2.

To make M27 flag control the message page display, you need to select "User M27 to change the message page" in the Message text settings. Refer to File -> Message text Settings (LOGO! 9 and later versions) (Page 64) for detailed information.

Message text character set flag: M27 (0BA8 and previous versions)

The M27 flag, if used, determines whether the message texts of the primary character set or the secondary character set will display. You select the two character sets from either LOGO! or the File → Message Text Settings (Page 65) menu command of LOGO!Soft Comfort. Then when you configure message texts (Page 464) , you select whether a particular message text consists of characters from the primary character set (Character Set 1) or the secondary character set (Character Set 2).

In the circuit program, you can use M27 to enable the message texts of either the primary or secondary character set and to disable the message texts of the other. When M27=0 (low), then LOGO! only displays the message texts from the primary character set; when M27=1 (high), then LOGO! only displays the message texts from the secondary character set.

Analog flags: AM1 to AM128

The analog flags can be used as markers for analog inputs or analog instruction blocks. The analog flag merely accepts an analog value as input and outputs that value.

Float analog flags: FAM1 to FAM32

The float analog flags can be used as markers for float analog inputs or float analog instruction blocks. The float analog flag merely accepts a float analog value as input and outputs that value.

M8, M25, M26, M27, M28, M29, M30 and M31 are not available in the UDF Editor.

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5.1.1.9 Analog inputs

The LOGO! 12/24RC, LOGO! 12/24RCo, LOGO! 24, LOGO! 24o, LOGO! 24C, LOGO! 24Co and LOGO! 12/24RCE, as well as the expansion modules LOGO! AM2 12/24 process analog signals. In your block configuration, you can assign a new input terminal to an input block, provided this terminal is not already used in the circuit program.

LOGO! 9 supports up to 16 analog inputs; LOGO! 0BA8 supports up to 8 analog inputs.

Some of the input terminals of the LOGO! 0BA6 versions 12/24RC, 12/24RCo, 24/24o, 24C and 24Co have a dual definition: they can be used as either digital inputs or analog inputs. See the *LOGO! Manual* or product information for specific information about specific modules. Circuit programs written for these modules for the LOGO! 0BA5 release and earlier can run on LOGO! 0BA6 modules without modification. New circuit programs can make use of the new input features, which provide additional fast-speed counters and analog capability.

For help on analog block parameters, refer to information on analog value processing (Page 425).

The block input number is not determined by the hardware structure in systems operating with devices of the 0BA0 to 0BA2 series.

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This block is not available in the UDF Editor.

5.1.1.10 Analog outputs

LOGO! 9 supports up to 16 analog outputs; LOGO! 0BA8 supports up to 8 analog outputs. You can only set an analog value at the analog output, that is, a function with an analog output, analog flag AM or float analog flag FAM.

If you connect a special function (that has an analog output) to a **real** analog output, then note that the analog output can only process values from 0 to 1000.

You can configure the behavior of analog outputs for LOGO! 0BA5 and higher versions in STOP mode. Analog outputs can retain their last values when LOGO! goes to STOP mode. Alternatively, you can configure specific values to be set for AQ1 to AQ16 (AQ1 to AQ8 for 0BA8, AQ1 and AQ2 for 0BA7 and previous versions devices) when LOGO! goes to STOP mode.

You can also set the analog output value range. You have two choices:

- Normal (0 V to 10 V or 0 mA to 20 mA)
- 4 mA to 20 mA

0BA0 to 0BA5: You cannot configure the behavior of AQ1 and AQ2 on transition to STOP mode for LOGO! modules prior to the 0BA5 device series.

Overview (Page 312)

This block is not available in the UDF Editor.

5.1.1.11 Network inputs (0BA7 and later versions only)

You can connect a network input to a block input. LOGO! 9 supports up to 512 network inputs; LOGO! 0BA8 supports up to 64 network inputs.

Network inputs can read values from the following types:

- VM

  When reading values from VM, the address range is as follows:

  – VB: 0.0 to 850.7

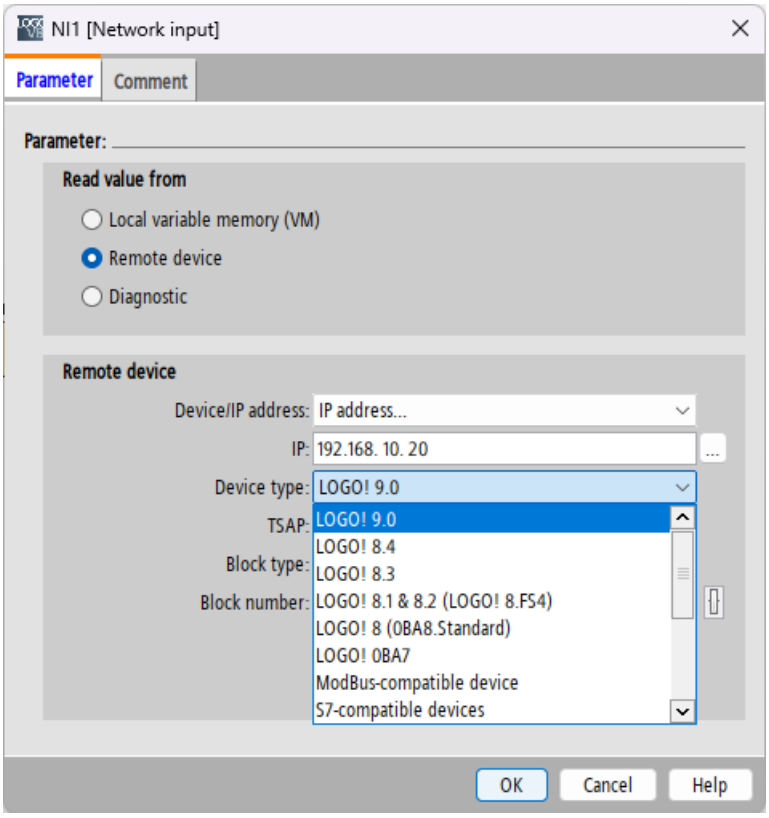
  – VXB: 0.0 to 2047.7

  – VRB: 0.0 to 511.7

- Remote device

  When reading values from a remote device, you must enter its IP address or select from the existing device types.

  – Remote device types for LOGO! 9.0/LOGO! 8.4/LOGO! 8.3/LOGO! 8.1 & 8.2 (LOGO! 8.FS4)



Available device types and their block types are as follows:

Device type	Block type
LOGO! 9.0	I1 to I64, Q1 to Q60, M1 to M128, and VB0.0 to VB850.7, VXB0.0 to VXB2047.7, VRB0.0 to VRB511.7
LOGO! 8.4	I1 to I24, Q1 to Q20, M1 to M64, and VB0.0 to VB850.7, VXB0.0 to VXB2047.7, VRB0.0 to VRB511.7
LOGO! 8.3	I1 to I24, Q1 to Q20, M1 to M64, and VB0.0 to VB850.7
LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	I1 to I24, Q1 to Q20, M1 to M64, and VB0.0 to VB850.7

LOGO! 8 (0BA8.Standard)	I1 to I24, Q1 to Q20, M1 to M64, and VB0.0 to VB850.7
LOGO! 0BA7	I1 to I24, Q1 to Q16, M1 to M27, and VB0.0 to VB850.7
ModBus-compatible devices	Coil1 to Coil65535, DI1 to DI65535
S7-compatible devices	IB0.0 to IB65535.7, QB0.0 to QB65535.7, MB0.0 to MB65535.7, VB0.0 to VB65535.7, DB0.DBB0.0 to DB16000.DBB65535.7
LOGO! 9.0 Slave	I1 to I64 and Q1 to Q60
LOGO! 8.4 Slave	I1 to I24 and Q1 to Q20
LOGO! 8.3 Slave	I1 to I24 and Q1 to Q20
LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	I1 to I24 and Q1 to Q20
LOGO! 8 (0BA8.Standard) Slave	I1 to I24 and Q1 to Q20
LOGO! 0BA7 Slave	I1 to I24 and Q1 to Q16
CIM Device	IB0.0 to IB65535.7, QB0.0 to QB65535.7, MB0.0 to MB65535.7, VB0.0 to VB65535.7

  - Remote device types for LOGO! 8 (0BA8.Standard)

    LOGO! 8 (0BA8.Standard) device cannot read values from Modbus-compatible device. Except Modbus-compatible device, all the other device types and their block types are available for LOGO! 8 (0BA8.Standard).

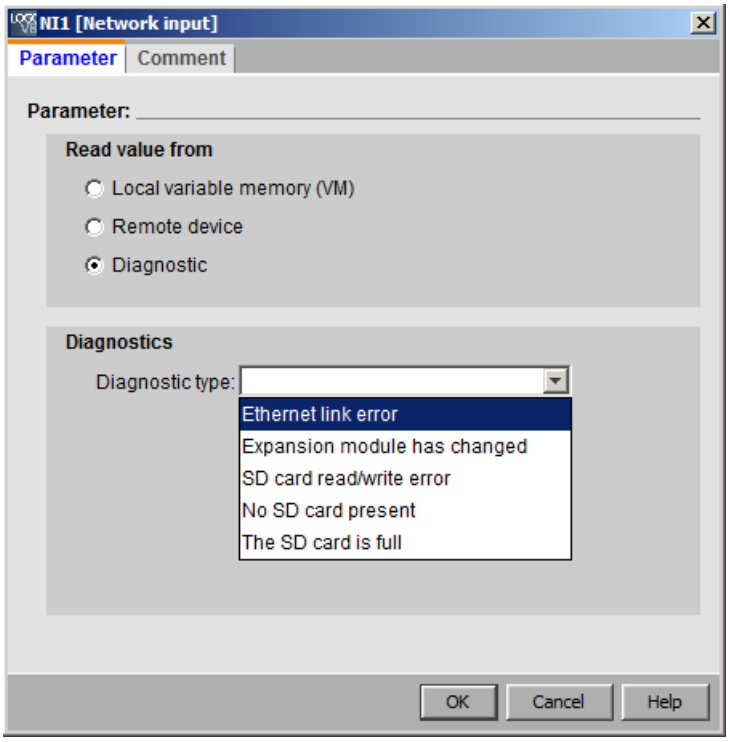
  - Remote device types for LOGO! 0BA7

    For LOGO! 0BA7, network inputs can only read values from LOGO! 0BA7 Slave. The block type is the input or output of the slave. Network inputs can read values from I1 to I24 or Q1 to Q16 of a slave Base Module.

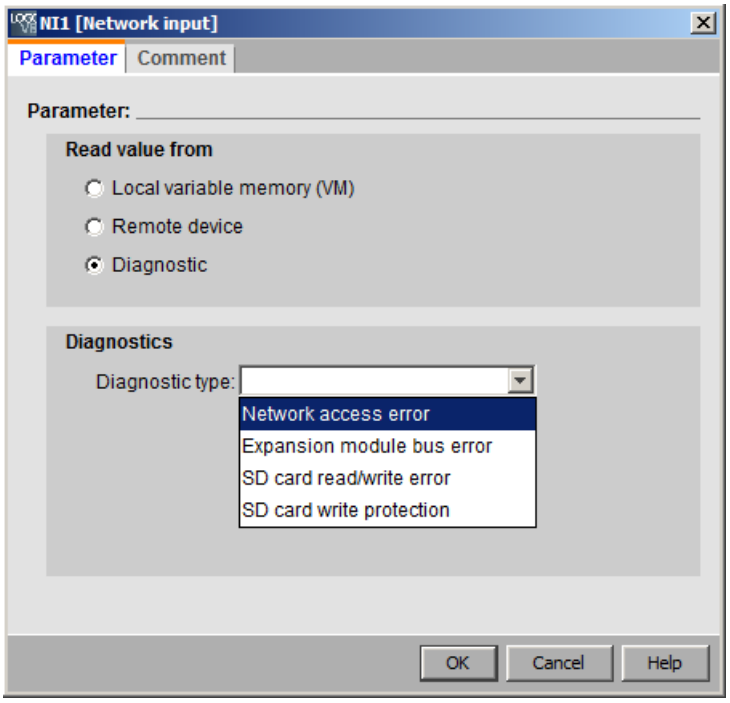
- Diagnostics

  When reading values from the diagnostic information, you need to select a diagnostic type first, as shown in the following figures. The diagnostic types correspond to the bits in the VM area. Each of the bits is set to 1 or 0, which respectively indicates that an error of this type exists or not.

  - LOGO!Soft Comfort V8.0 and later versions device diagnostic type



– LOGO! 0BA7 diagnostic type



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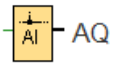
Network inputs are inactive in the UDF Editor.

5.1.1.12 Network analog inputs (0BA7 and later versions only)



You can connect a network analog input to a block input. LOGO! 9 supports up 128 network analog inputs; LOGO! 0BA8 supports up to 32 network analog inputs.

Network analog inputs can read values from the following types:

- VM

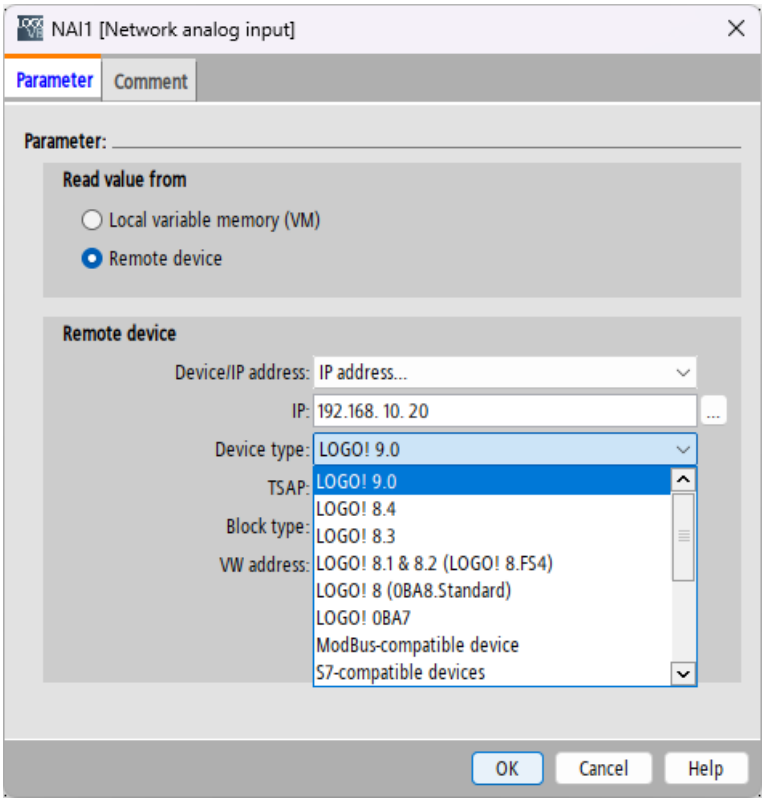
  When reading values from VM, the address range is as follows:

  - VM: 0 to 849
  - VXM: 0 to 2046
  - VRM: 0 to 510

- Remote device

  When reading values from a remote device, you must enter its IP address or select from the existing device types.

  - Remote device types for LOGO! 9.0/LOGO! 8.4/LOGO! 8.3/LOGO! 8.1 & 8.2 (LOGO! 8.FS4)



Available remote device types and their block types are as below:

Device type	Block type
LOGO! 9.0	VW0 to VW849, VXW0 to VXW2046, VRW0 to VRW510
LOGO! 8.4	VW0 to VW849, VXW0 to VXW2046, VRW0 to VRW510
LOGO! 8.3	VW0 to VW849
LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	VW0 to VW849
LOGO! 8 (0BA8.Standard)	VW0 to VW849
LOGO! 0BA7	VW0 to VW849
ModBus-compatible devices	IR1 to IR65535, HR1 to HR65535
S7-compatible devices	IW0 to IW65534, QW0 to QW65534, MW0 to MW65534, VW0 to VW65534, DB0 to DB16000, and .DBW0 to .DBW65534
LOGO! 9.0 Slave	AI1 to AI16 and AQ1 to AQ16
LOGO! 8.4 Slave	AI1 to AI8 and AQ1 to AQ8
LOGO! 8.3 Slave	AI1 to AI8 and AQ1 to AQ8
LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AI1 to AI8 and AQ1 to AQ8
LOGO! 8 (0BA8.Standard) Slave	AI1 to AI8 and AQ1 to AQ8
LOGO! 0BA7 Slave	AI1 to AI8 and AQ1 to AQ2
CIM Device	VW0 to VW65534

– Remote device types for LOGO! 8 (0BA8.Standard)

LOGO! 8 (0BA8.Standard) device cannot read values from Modbus-compatible device. Except Modbus-compatible device, all the other device types and their block types are available for LOGO! 8 (0BA8.Standard).

– Remote device types for LOGO! 0BA7

  For LOGO! 0BA7, network analog inputs can only read values from LOGO! 0BA7 Slave. If you read a value from a slave Base Module, you must enter the slave IP address or select the existing LOGO! 0BA7 Slave in the project. Network analog inputs can read values from AI1 to AI8 or AQ1 to AQ2 of a slave Base Module.

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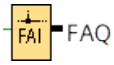
Network analog inputs are inactive in the UDF Editor.

5.1.1.13 Network float analog input (LOGO! 9 and later versions only)



You can connect a network float analog input to a float block input. LOGO! 9 supports up 16 network float analog inputs.

Network analog inputs can read values from the following types:

- VM

  When reading values from VM, the address range is as follows:

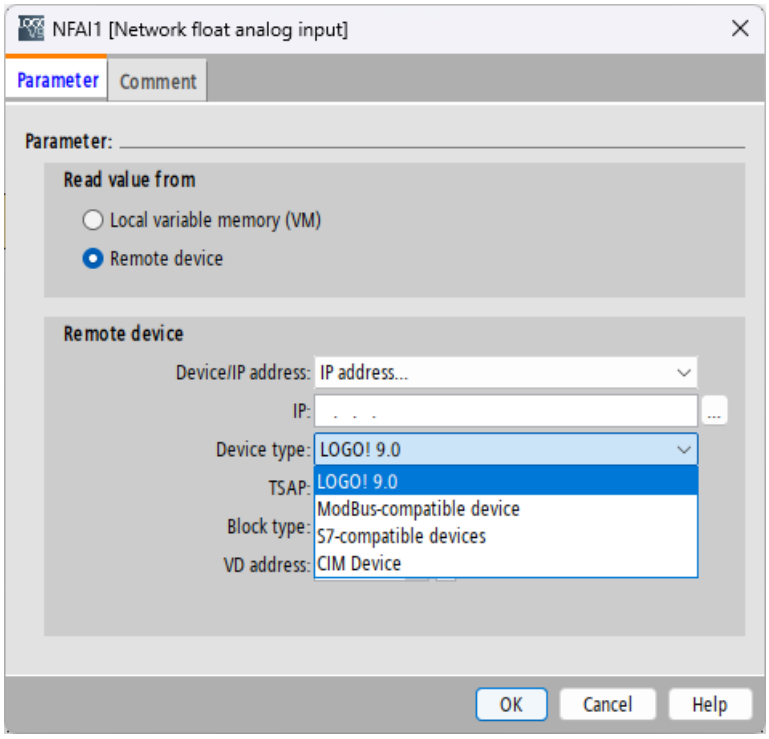
  – VD: 0 to 847

  – VXD: 0 to 2044

  – VRD: 0 to 508

- Remote device

  When reading values from a remote device, you must enter its IP address or select from the existing device types.



Available remote device types and their block types are as follows:

Device type	Block type
LOGO! 9.0	VD0 to VD847, VXD0 to VXD2044, VRD0 to VRD508
ModBus-compatible devices	IR1 to IR65535, HR1 to HR65535
S7-compatible devic-es	ID0 to ID65534, QD0 to QD65534, MD0 to MD65534, VD0 to VD65534, DB0 to DB16000, and .DBD0 to .DBD65534
CIM Device	VD0 to VD65534

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Network float analog inputs are inactive in the UDF Editor.

0BA0 - 0BA8:
The network float analog input function block did not exist prior to LOGO! 9.

5.1.1.14 Network outputs (0BA7 and later versions only)

When the LOGO! 0BA7 Base Module (or later version BM) is in slave mode, you can configure a network output on the master to control a digital output on the remote device. LOGO! 9 supports up to 480 network outputs; LOGO! 0BA8 supports up to 64 network outputs.

Network outputs can write values to the following types:

- VM

  When writing values to VM, the address range is as follows:

  – VB: 0.0 to 850.7

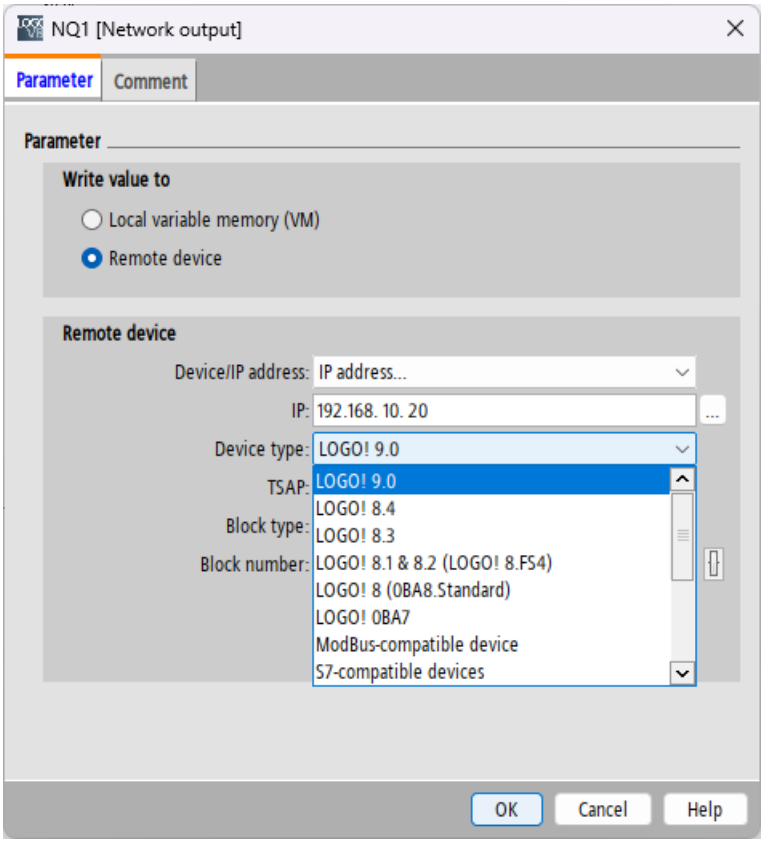
  – VXB: 0.0 to 2047.7

  – VRB: 0.0 to 511.7

- Remote device

  When writing values to a remote device, you must first enter the device IP address or select the existing device.

  – Remote device types for LOGO! 9.0/ LOGO! 8.4/LOGO! 8.3/LOGO! 8.1 & 8.2 (LOGO! 8.FS4)



Available device types and their block types are as follows:

Device type	Block type
LOGO! 9.0	I1 to I64, Q1 to Q60, M1 to M128, and VB0.0 to VB850.7, VXB0.0 to VXB2047.7, VRB0.0 to VRB511.7
LOGO! 8.4	I1 to I24, Q1 to Q20, M1 to M64, and VB0.0 to VB850.7, VXB0.0 to VXB2047.7, VRB0.0 to VRB511.7
LOGO! 8.3	I1 to I24, Q1 to Q20, M1 to M64 and VB0.0 to VB 850.7
LOGO! 8.1 & 8.2 (8.FS4)	I1 to I24, Q1 to Q20, M1 to M64 and VB0.0 to VB 850.7

LOGO! 8 (0BA8.Standard)	I1 to I24, Q1 to Q20, M1 to M64 and VB0.0 to VB 850.7
LOGO! 0BA7	VB0 to VB850
ModBus-compatible devices	Coil1 to Coil65535
S7-compatible devices	IB0.0 to IB65535.7, QB0.0 to QB65535.7, MB0.0 to MB65535.7, VB0.0 to VB65535.7, DB0.DBB0.0 to DB16000.DBB65535.7
LOGO! 9.0 Slave	Q1 to Q60
LOGO! 8.4 Slave	Q1 to Q20
LOGO! 8.3 Slave	Q1 to Q20
LOGO! 8.1 & 8.2 (8.FS4) Slave	Q1 to Q20
LOGO! 8 (0BA8.Standard) Slave	Q1 to Q20
LOGO! 0BA7 Slave	Q1 to Q16
CIM Device	IB0.0 to IB65535.7, QB0.0 to QB65535.7, MB0.0 to MB65535.7, VB0.0 to VB65535.7

- Remote device types for LOGO! 8 (0BA8.Standard)

  LOGO! 8 (0BA8.Standard) device cannot read values from Modbus-compatible device. Except Modbus-compatible device, all the other device types and their block types are available for LOGO! 8 (0BA8.Standard).

- Remote device types for LOGO! 0BA7

  For LOGO! 0BA7, network outputs can only write values to LOGO! 0BA7 Slave. If you write a value to a slave Base Module, you must enter the slave IP address or select the existing LOGO! 0BA7 Slave. The block number is from Q1 to Q16.

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Network outputs are inactive in the UDF Editor.

5.1.1.15 Network analog outputs (0BA7 and later versions only)

When the LOGO! 0BA7 Base Module (or later version BM) is in slave mode, you can configure a network analog output on the master to control an analog output on the slave. LOGO! 9 supports up to 128 network analog outputs; LOGO! 0BA8 supports up to 16 network analog outputs.

For LOGO! 8 (0BA8.Standard) and later version devices, network analog outputs can write values to the following types:

- VM

  When writing values to VM, the address range is as follows:

  – VW: 0 to 849

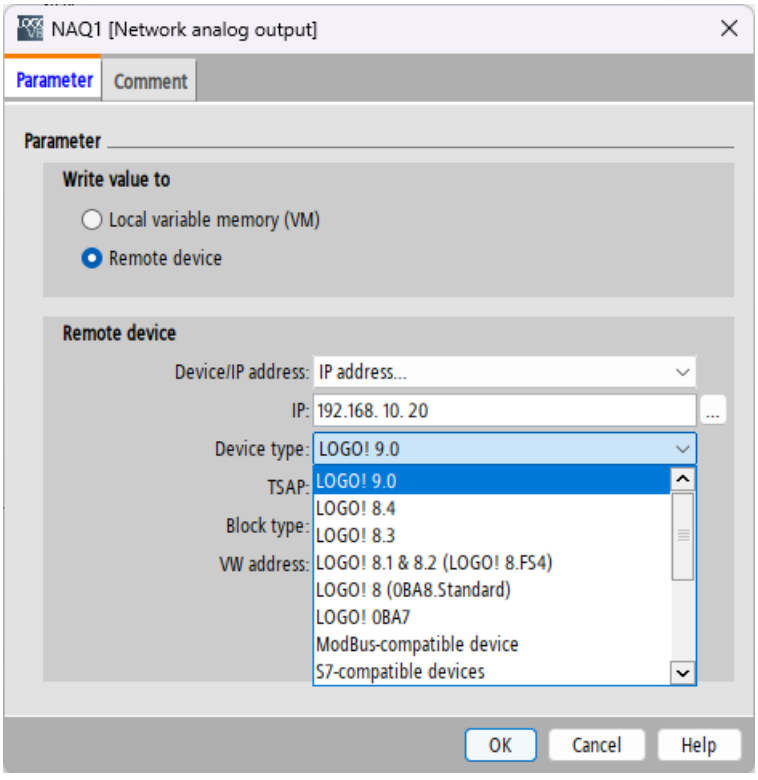
  – VXW: 0 to 2046

  – VRW: 0 to 510

- Remote device

  When writing values to a remote device, you must first enter the device IP address or select the existing device.

  – Remote device types for LOGO! 9.0/LOGO! 8.4/LOGO! 8.3/LOGO! 8.1 & 8.2 (LOGO! 8.FS4)



Available device types and their block types are as follows:

Device type	Block type
LOGO! 9.0	VW0 to VW849, VXW0 to VXW2046, VRW0 to VRW510
LOGO! 8.4	VW0 to VW849, VXW0 to VXW2046, VRW0 to VRW510
LOGO! 8.3	VW0 to VW849
LOGO! 8.1 & 8.2 (LOGO! 8.FS4)	VW0 to VW849
LOGO! 8 (0BA8.Standard)	VW0 to VW849
LOGO! 0BA7	VW0 to VW849

ModBus-compatible device	HR1 to HR65535
S7-compatible devices	IW0 to IW65534, QW0 to QW65534, MW0 to MW65534, VW0 to VW65534, DB0 to DB16000 and .DBW0 to .DBW65534
LOGO! 9.0 Slave	AQ1 to AQ16
LOGO! 8.4 Slave	AQ1 to AQ8
LOGO! 8.3 Slave	AQ1 to AQ8
LOGO! 8.1 & 8.2 (LOGO! 8.FS4) Slave	AQ1 to AQ8
LOGO! 8 (0BA8.Standard) Slave	AQ1 to AQ8
LOGO! 0BA7 Slave	AQ1 to AQ2
CIM Device	VW0 to VW65534

- Remote device types for LOGO! 8 (0BA8.Standard)

  LOGO! 8 (0BA8.Standard) device cannot read values from Modbus-compatible device. Except Modbus-compatible device, all the other device types and their block types are available for LOGO! 8 (0BA8.Standard).

- LOGO! 0BA7

  For LOGO! 0BA7, network analog outputs can only write values to LOGO! 0BA7 Slave. If you write a value to a slave Base Module, you must enter the slave IP address or select the existing LOGO! 0BA7 Slave. The block number is from AQ1 to AQ2.

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Network analog outputs are inactive in the UDF Editor.

5.1.1.16 Network float analog output (LOGO! 9 and later versions only)

When the LOGO! 9 Base Module (or later version BM) is in slave mode, you can configure a network float analog output on the master to control a float analog output on the slave. LOGO! 9 supports up to 16 network float analog outputs.

Network float analog outputs can write values to the following types:

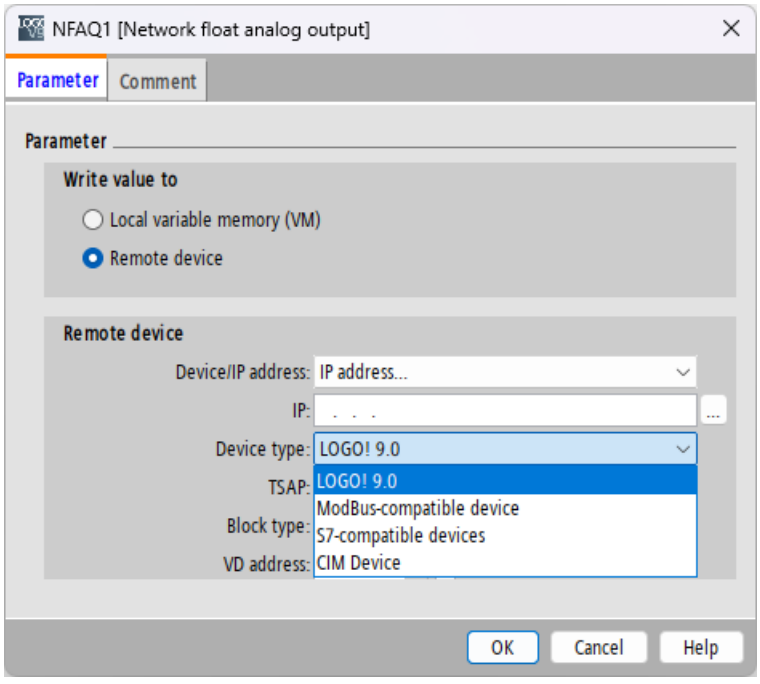
- VM

  When writing values to VM, the address range is as follows:

  - VD: 0 to 847
  - VXD: 0 to 2044
  - VRD: 0 to 508

- Remote device

  When writing values to a remote device, you must first enter the device IP address or select the existing device.



  Available device types and their block types are as follows:

Device type	Block type
LOGO! 9.0	VD0 to VD847, VXD0 to VXD2044, VRD0 to VRD508
ModBus-compatible device	HR1 to HR65535
S7-compatible devices	ID0 to ID65534, QD0 to QD65534, MD0 to MD65534, VD0 to VD65534, DB0 to DB16000 and .DBD0 to .DBD65534
CIM Device	VD0 to VD65534

Overview (Page 312)

Network float analog outputs are inactive in the UDF Editor.

0BA0 - 0BA8:
The network float analog output function block did not exist prior to 0AB9.

5.1.2 LAD

5.1.2.1 Make contact

Make contacts, as well as break contacts (Page 332), analog contacts (Page 332) and float contacts (Page 333) represent the input terminals of a LOGO! module.

When you place a contact in your circuit program, LOGO!Soft Comfort displays a relevant dialog. In this dialog, you can specify the type of input according to the LOGO! in use. The cursor keys are also available as inputs as are the LOGO! TDE function keys if you have a LOGO! TDE module. You can also select a fixed logical level for the input.

To change an input in your LAD circuit program, double-click the corresponding block to open the relevant dialog.

Overview (Page 312)

5.1.2.2 Break contact

Break contacts, as well as make contacts (Page 332), analog contacts (Page 332) and float contacts (Page 333) represent the input terminals of a LOGO! module.

When you place the contact in your circuit program, LOGO!Soft Comfort displays a relevant dialog. In this dialog you can specify the type of input according to your LOGO!. The cursor keys are also available as inputs as are the LOGO! TDE function keys if you have a LOGO! TDE module. You can also select a fixed logical level for the input.

To change an input in your LAD circuit program, double-click the corresponding block to open a dialog in which you can make your changes.

Overview (Page 312)

5.1.2.3 Analog contact

Analog contacts, as well as break contacts (Page 332), make contacts (Page 332) and float contacts (Page 333) represent the input terminals of a LOGO! device.

When you place a contact in your circuit program, LOGO!Soft Comfort displays a relevant dialog. In this dialog you can specify the type of input according to your LOGO! device.

To change an input in your LAD circuit program, double-click the corresponding block in your circuit program to open a dialog in which you can make your changes.

Overview (Page 312)

5.1.2.4 Float contact (LOGO! 9 and later versions only)

Float contacts, as well as make contacts (Page 332), break contacts (Page 332) and analog contacts (Page 332) represent the input terminals of a LOGO! module.

When you place a contact in your circuit program, LOGO!Soft Comfort displays a relevant dialog. In this dialog, you can specify the type of input according to the LOGO! in use.

To change an input in your LAD circuit program, double-click the corresponding block to open the relevant dialog.

Note

Float contacts can only be used with float function blocks and float analog flags. If you change the data type from float into integer for the float function block, the float contact will not automatically convert into the analog contact. To download and run the LAD circuit diagram successfully, you need to change the float contact to an analog contact. Vise versa.

Overview (Page 312)

5.1.2.5 Relay coil

Relay coils represent the output terminals like inverted outputs (Page 333), analog outputs (Page 333) and float outputs (Page 334) on a LOGO!.

To change an output in your LAD circuit program, double-click the corresponding block to open a dialog in which you can assign various functions to the output.

Overview (Page 312)

5.1.2.6 Inverted output

Inverted outputs, as well as relay coils (Page 333), analog outputs (Page 333) and float outputs (Page 334) represent the output terminals of a LOGO! device.

To change an output in your LAD circuit program, double-click the corresponding block to open a dialog in which you can assign various functions to the output.

Overview (Page 312)

5.1.2.7 Analog output

Analog outputs represent the output terminals like relay coils (Page 333), inverted outputs (Page 333) and float outputs (Page 334) on a LOGO!.

To change an output in your LAD circuit program, double-click the corresponding block to open a dialog in which you can assign various functions to the output.

If you connect a special function that has an analog output to a **real** analog output, then note that the analog output can only process values from 0 to 1000, 0 to 4095 or 0 to 10000 (depending on the analog resolution you set in the I/O settings (Page 69)).

Overview (Page 312)

5.1.2.8 Float output (LOGO! 9 and later versions only)

Float outputs represent the output terminals like relay coils (Page 333), inverted output (Page 333)s and analog outputs (Page 333) on a LOGO!.

To change an output in your LAD circuit program, double-click the corresponding block to open a dialog in which you can assign various functions to the output.

Overview (Page 312)

5.1.2.9 Network inputs (0BA7 and later versions only)

Refer to Network inputs (0BA7 and later versions only) (Page 319) in the FBD Editor.

5.1.2.10 Network analog inputs (0BA7 and later versions only)

Refer to Network analog inputs (0BA7 and later versions only) (Page 323) in the FBD Editor.

5.1.2.11 Network outputs (0BA7 and later versions only)

Refer to Network outputs (0BA7 and later versions only) (Page 326) in the FBD Editor.

5.1.2.12 Network analog outputs (0BA7 and later versions only)

Refer to Network analog outputs (0BA7 and later versions only) (Page 328) in the FBD Editor.

5.1.2.13 Network float analog input (LOGO! 9 and later versions only)

Refer to Network float analog input (LOGO! 9 and later versions only) (Page 325) in the FBD Editor.

5.1.2.14 Network float analog output (LOGO! 9 and later versions only)

Refer to Network float analog output (LOGO! 9 and later versions only) (Page 330) in the FBD Editor.

5.2 Basic functions (FBD and UDF Editors)

Select this tool if you want to place standard Boolean logic blocks on the programming interface. LOGO!Soft Comfort then displays a toolbar with all of the Boolean logic blocks:

AND (Page 335)

OR (Page 338)

AND with edge evaluation (Page 336)

NOR (Page 338)

NAND (Page 337)

XOR (Page 339)

NAND with edge evaluation (Page 337)

NOT (Page 340)

Select the block that you need to place it on the programming interface.

Inverting the inputs

You can invert individual inputs:

- A logical "1" at a specific input is inverted to logical "0" in the circuit program.
- A logical "0" is inverted to logical "1" in the circuit program.

To invert an input, right-click the input and select the **invert** command from the shortcut menu.

You cannot invert the inputs of output blocks.

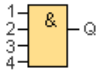
0BA0-0BA3:
To invert an input, use the basic function NOT (Page 340).

Timing diagrams

Each timing diagram of the basic functions displays three inputs to make evaluation easier for you.

0BA0-0BA3:
The basic functions have three inputs.

5.2.1 AND



The output of an AND function is only 1 if **all** inputs are 1, that is, when they are closed.

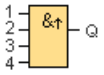
A block input that is not used (x) is assigned: x = 1.

AND function logic table

Input 1	Input 2	Input 3	Input 4	Output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

Overview (Page 335)

5.2.2 AND with edge evaluation

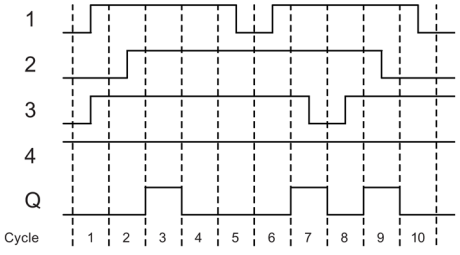


The output of an AND function with edge evaluation is only 1 if **all** inputs are 1 and **at least one** input was 0 during the last cycle.

The output is set to 1 for the duration of one cycle and must be reset to 0 for the duration of the next cycle before it can be set to 1 again.

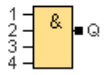
A block input that is not used (x) is assigned: x = 1.

Timing diagram of an AND with edge evaluation:



Overview (Page 335)

5.2.3 NAND



The output of an NAND function is only 0 if **all** inputs are 1, i.e. when they are closed.

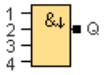
A block input that is not used (x) is assigned: x = 1.

NAND function logic table

Input 1	Input 2	Input 3	Input 4	Output
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

Overview (Page 335)

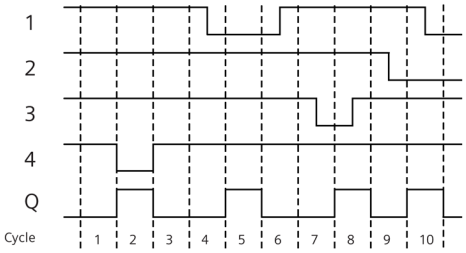
5.2.4 NAND with edge evaluation



The output is set to 1 for the duration of one cycle and must be reset to 0 at least for the duration of the next cycle before it can be set to 1 again.

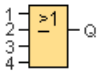
A block input that is not used (x) is assigned: x = 1.

Timing diagram of a NAND with edge evaluation



Overview (Page 335)

5.2.5 OR



The output of an OR function is 1 if **at least one** input is 1 (closed).

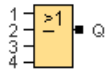
A block input that is not used (x) is assigned: x = 0.

OR function logic table

Input 1	Input 2	Input 3	Input 4	Output
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Overview (Page 335)

5.2.6 NOR



The output of an NOR (NOT OR) function is only 1 if **all** inputs are 0 (open). When one of the inputs is on (logical 1 state), the output is off.

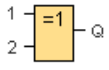
A block input that is not used (x) is assigned: x = 0.

NOR function logic table

Input 1	Input 2	Input 3	Input 4	Output
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

Overview (Page 335)

5.2.7 XOR



The output of an XOR (exclusive OR) function is 1 if the signal status of the inputs is **different**.

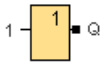
A block input that is not used (x) is assigned: x = 0.

XOR function logic table

Input 1	Input 2	Output
0	0	0
0	1	1
1	0	1
1	1	0

Overview (Page 335)

5.2.8 NOT



The output of an NOT function is 1 if the input is 0. The NOT block inverts the input status.

Advantage of the NOT, for example: LOGO! no longer requires break contacts. You simply use a make contact and convert it into a break contact with the help of the NOT function.

NOT function logic table

Input 1	Output
0	1
1	0

Overview (Page 335)

5.3 Special functions

Select this tool if you want to place additional retentive or time-related function blocks on the programming interface. LOGO!Soft Comfort then displays a toolbar of special function icons:

Timers

On-delay (Page 346)

Off-delay (Page 348)

On-/Off-delay (Page 350)

Retentive on-delay (Page 352)

Wiping relay (pulse output) (Page 354)

Edge triggered wiping relay (Page 355)

Symmetrical pulse generator (0BA3 only) (Page 357)

Asynchronous pulse generator (Page 358)

Analog

Analog threshold trigger (Page 387)

Analog differential trigger (Page 391)

Analog comparator (Page 394)

Analog watchdog (Page 399)

Analog amplifier (Page 402)

Analog multiplexer (Page 404)

Pulse Width Modulator (PWM) (Page 407)

Mathematic instruction (Page 411)

Random generator (Page 360)

Stairway lighting switch (Page 362)

Multiple function switch (Page 364)

Weekly timer (Page 367)

Yearly timer (Page 370)

Astronomical clock (0BA7 and later versions only) (Page 373)

Stopwatch (0BA7 and later versions only) (Page 376)

Counter

Up/Down counter (Page 378)

Hours counter (Page 381)

Threshold trigger (Page 385)

PI controller (Page 439)

Analog ramp (Page 443)

Analog filter (0BA7 and later versions only) (Page 414)

Max/Min (0BA7 and later versions only) (Page 416)

Average value (0BA7 and later versions only) (Page 421)

Float calculation instruction (LOGO! 9 and later versions) (Page 423)

Miscellaneous

Latching relay (Page 447)

Pulse relay (Page 448)

LCD message (LOGO! 9 and later versions) (Page 449)

Message text (LOGO! 0BA4 and LOGO! 0BA5) (Page 476), Message text (LOGO! 0BA6 and LOGO! 0BA7) (Page 464), Message text (LOGO! 0BA8) (Page 458)

Softkey (Page 481)

Shift register (0BA4 to 0BA6) (Page 486) , Shift register (0BA7 to 0BA8) (Page 484)

Mathematic instruction error detection (Page 487)

Float/Integer converter (LOGO! 8.FS4 and later versions only) (Page 489)

Integer/Float converter (LOGO! 8.FS4 and later versions only) (Page 492)

The **LAD Editor** offers you the following additional functions:
AND with edge evaluation (Page 336)
NAND with edge evaluation (Page 337)

FBD and UDF Editors: description of the blocks of special functions
The description of the blocks of special functions in the circuit program begins with timer blocks ("T"), with counter blocks ("C") and with the remaining blocks ("SF").

The LOGO! version you have selected determines these characteristics of your circuit program:

- Available blocks
- Parameters that you can set

This topic also describes the following tasks or characteristics of the special functions:

- Inverting inputs
- Block configuration
- Reference parameters
- Protection
- Retentivity

Inverting inputs

You can invert individual inputs:

- You can invert a logical "1" at a specific input to logical "0" in the circuit program.
- You can invert a logical "0" to logical "1" in the circuit program.

To do so, right-click the input and select the **invert** command from the shortcut menu.

You cannot invert the inputs of output blocks.

Note

- Unused logical inputs default to logical "0".
- You cannot invert the inputs of a UDF block.

0BA0-0BA3:
To invert an input, use the basic function NOT (Page 340)

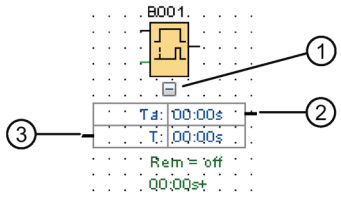
Block configuration

The block properties dialog provides you with an easy means of setting the various block parameters.

Reference functionality

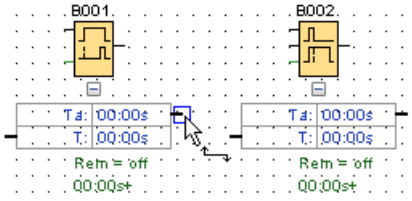
You can also assign parameters to blocks with the value from other blocks. Such parameters are reference parameters.

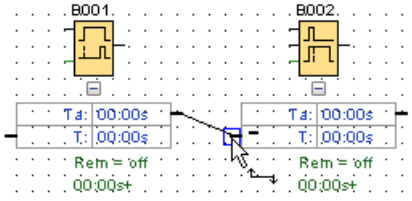
The parameter box displays the block's parameters in a table. You can reference any parameter in the parameter box to the parameter of another function. You can use the show/hide button to change the visibility of the parameter box.



① Show/hide button
② Output connector
③ Input connector

Each parameter has an input connector and/or an output connector. You can simply use drag and drop to create a reference line between the parameter connector of one function and the parameter connector of another function. Note that you cannot connect output parameters to other output parameters.





The reference line between two parameters indicates their reference relation. You can delete the reference line to remove the reference.

LAD Editor/0BA4-0BA7:

The parameter box is not available in the LAD Editor or for 0BA4-0BA7 devices.

Follow the below steps to create a reference:

1. Click the "Reference" button next to a parameter in the block properties window.
2. LOGO!Soft Comfort displays all the blocks available for providing the reference parameter.
3. Select the block you want to refer to.

For example, if you click the "Reference" button for the Off-Delay parameter of an Off-Delay timer, you can then choose a specific block to reuse the time value of that timer.

A quick way of changing block parameters (Page 597)

LOGO! 0BA7 and LOGO! 0BA8 devices provide a timer reference function. With this function, you can take the current time (Ta) of a timer as the reference value (C) in other function blocks. The calculation of the reference value (C) follows the formula as shown below:

Current time (Ta)	Time base	Reference value (C)
A : B	Hours (h : m)	C = A × 60 + B
A : B	Minutes (m : s)	C = A × 60 + B
A : B	Seconds (s: 1/100s)	C = A × 100 + B

Protection

If a **Protection Active** check box exists for the protection of a block parameter, you can enable or lock the display and editing of this parameter in LOGO! configuration mode.

Retentivity

The switching state and counter values of SFBs can be retentive. This means that the current data values are retained, for example after a power failure, so that the function is resumed at the break position after power on. Hence, a timer is not reset, but instead the time-to-go expires.

You must set the retentivity to enable this feature for the relevant function. There are two possible settings:

- On: Current data values are retained.
- Off: Current data values are not retained (default).

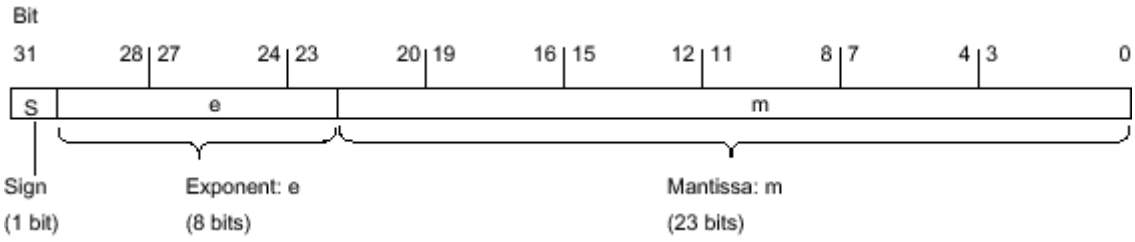
The Hours counter (Page 381) is an exception, because it is always retentive.

Floating-point numbers description

Floating-point numbers have a length of 32 bits, and consist of the following three components:

- Sign: determined by the signal state of bit 31. The bit 31 assume the value "0" (positive) or "1" (negative).
- 8-bit exponents to basis 2: the exponent is increased by a constant (base, +127), so that it has a value range of 0 to 255.
- 23-bit mantissa: only the fraction part of the mantissa is shown. The integer part of the mantissa is always 1 with normalized floating-point numbers and is not stored.

The following figure shows the structure of floating-point numbers:



Note

With floating-point numbers, only the precision defined by the IEEE754 standard is stored. Additionally specified decimals are rounded off according to IEEE754.

The number of decimal places may decrease for frequently nested arithmetic calculations.

If more decimal places are specified than can be stored by the data type, the number is rounded to the value corresponding to the precision allowed by this value range.

The following table shows the properties of floating-point numbers:

Length (bit)	Format	Value range	Examples of value input
32	Floating-point numbers according to IEEE754	-3.402823e+38 to -1.175495e-38 ±0.0	1.0e-5
	Floating-point numbers	+1.175495e-38 to +3.402823e+38	1.0

Note

LOGO! 0BA8 and earlier versions only provide integer analog function blocks. You can use Float/Integer convertor (Page 489) FB or Integer/Float convertor (Page 492) FB to convert the integer and float data. These two blocks can only be used with the integer function blocks, and support single-precision floating-point number and double-precision floating-point number.

LOGO! 9 and later versions provide float analog function blocks. Float analog blocks only support single-precision floating-point number.

Floating-point numbers display

LOGO! supports the processing of floating-point numbers that comply with the IEEE754 standard.

This following table lists the display rules for floating-point numbers in LOGO!.

Value	Display
Invalid value	NaN
Positive infinity	+INF
Negative infinity	-INF
Valid value	• Display with seven significant digits (including both integer and decimal parts). • The display format supports scientific notation.

To learn more about the floating-point numbers format and display, refer to the IEEE754 standard.

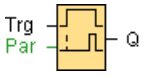
Note

Float analog function blocks

The output value of the float analog function blocks are floating-point numbers as shown in above table. When errors occur in the float blocks, the output value (usually AQ) will be kept as the value from the last cycle, and the float block parameters are unreliable.

5.3.1 Timers

5.3.1.1 On-delay



Short description

The output does not switch on until a configured delay time has expired.

Connection	Description
Trg input	The Trg (Trigger) input triggers the on-delay time.
Parameter	**T:** represents the on-delay time after which the output is switched on (output signal transition 0 to 1). **Retentivity** on = the status is retentive in memory.
Output **Q**	**Q** switches on after a specified time T has expired, provided Trg is still set.

Parameter T

The actual value of another already-programmed function can provide the time in parameter T:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

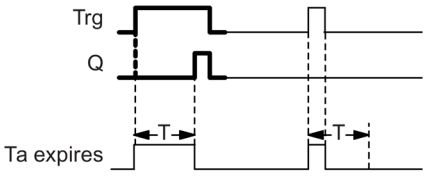
For the **LOGO! 9** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You can select the required function by the block number.

For information on the validity and accuracy of the time base, refer to the *LOGO! manual*.

Timing diagram



The bold section of the timing diagram is also shown in the on-delay icon.

Description of the function

The 0 to 1 transition at input Trg triggers the time Ta (the current time in LOGO!).

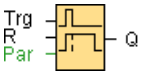
If the status at input Trg stays 1 at least for the duration of the configured time T, the output is set to 1 when this time has expired (the on signal of the output follows the on signal of the input with delay).

The time is reset if the status at input Trg changes to 0 again before the time T has expired.

The output is reset to 0 when input Trg is 0.

Special functions (Page 340)

5.3.1.2 Off-delay



Short description

The output with off-delay resets after a defined time has expired.

Connection	Description
Input **Trg**	Start the off-delay time with a negative edge (1 to 0 transition) at input **Trg** (Trigger).
Input **R**	Reset the off-delay time and set the output to 0 via the **R** (Reset) input. Reset has priority over **Trg**.
Parameter	**T:** The output is switched off on expiration of the delay time **T** (output signal transition 1 to 0). **Retentivity** on = the status is retentive in memory.
Output **Q**	**Q** switches on for the duration of the time **T** after a trigger at input **Trg**.

Parameter T

The actual value of another already-programmed function provides the time set in parameter T:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq

- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

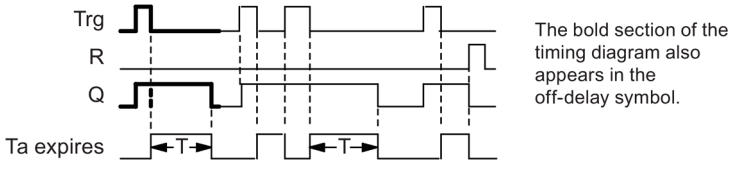
For the **LOGO! 9** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

For information on the validity and accuracy of the time base, refer to the *LOGO! Manual*.

Timing diagram



Description of the function

A 0 to 1 transition at input Trg sets output Q to 1 instantaneously.

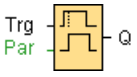
At the 1 to 0 transition at input Trg, LOGO! retriggers the current time T, and the output remains set. LOGO! resets the output Q to 0 when T_a reaches the value specified in T (T_a=T) (off delay).

A one-shot at input Trg retriggers the time Ta.

You can reset the time Ta and the output via the input R (Reset) before the time Ta has expired.

Special functions (Page 340)

5.3.1.3 On-/Off-delay



Short description

The on-/off- delay function block can set an output after a configured on-delay time and then reset it again upon expiration of a second configured time.

Connection	Description
Input **Trg**	You trigger the on-delay with a positive edge (0 to 1 transition) at input **Trg** (Trigger). You trigger the off-delay with a negative edge (1 to 0 transition).
Parameter	**T_H** is the on-delay time for the output (output signal transition 0 to 1). **T_L** is the off-delay time for the output (output signal transition 1 to 0). **Retentivity** on = the status is retentive in memory
Output **Q**	**Q** switches on upon expiration of a configured time **T_H** if **Trg** is still set. It switches off again upon expiration of the time **T_L** and if **Trg** has not been set again.

Parameters T_H and T_L

The actual value of another already-programmed function can provide the on-delay time and off-delay time set in parameter T_H and T_L:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

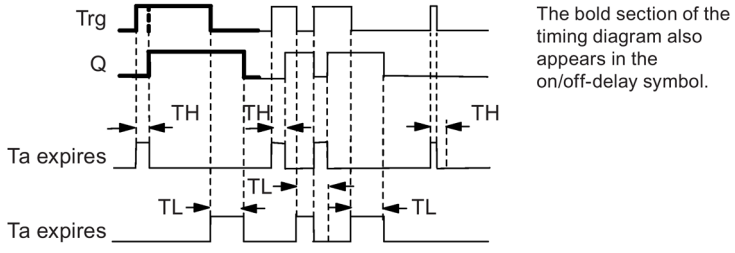
For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

For information on the validity and accuracy of the time base, refer to the *LOGO! Manual*.

Timing diagram



Description of the function

A 0 to 1 transition at input Trg triggers the time T_H.

If the status at input Trg is 1 for at least the duration of the configured time T_H, LOGO! sets the output to logical 1 upon expiration of this time (output is on-delayed to the input signal).

The time T_H resets if the status at input Trg resets to 0 before this time has expired.

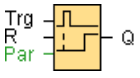
The 1 to 0 transition at the output triggers the time T_L is triggered.

If the status at input Trg remains 0 at least for the duration of a configured time T_L, the output resets to 0 upon expiration of this time (output is off delayed to the input signal).

The time T_L resets if the status at input Trg returns to 1 before this time has expired.

Special functions (Page 340)

5.3.1.4 Retentive on-delay



Short description

A one-shot at the input triggers a configurable time. LOGO! sets the output upon expiration of this time.

Connection	Description
Input **Trg**	Trigger the on-delay time via the **Trg** (Trigger) input.
Input **R**	Reset the on-delay time and reset the output to 0 via input **R** (Reset). Reset takes priority over **Trg**.
Parameter	**T** is the on-delay time for the output (output signal transition 0 to 1).
Output **Q**	**Q** switches on upon expiration of the time **T**.

Parameter T

The value of another already-programmed function can provide the time in parameter T:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta

- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

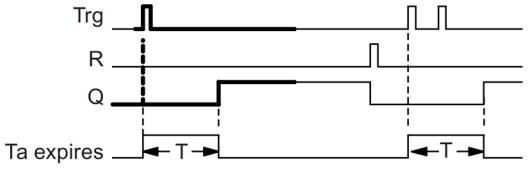
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the **LOGO! 9** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



The bold section of the timing diagram is also shown in the symbol of the retentive on-delay.

Description of the function

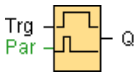
A 0 to 1 signal transition at input Trg triggers the current time Ta. LOGO! sets the output Q to 1 when Ta reaches the time T. A further pulse at input Trg does not affect Ta.

The output and the time Ta reset to 0 only with a 1 signal at input R.

If you do not set the retentivity, output Q and the expired time reset after a power failure.

Special functions (Page 340)

5.3.1.5 Wiping relay (pulse output)



Short description

An input signal generates an output signal of a configurable length.

Connection

Connection	Description
Input **Trg**	You trigger the time for the wiping relay with a signal at input **Trg** (Trigger).
Parameter	**T** represents the time after which the output resets (output signal transition 1 to 0). **Retentivity** on = the status is retentive in memory.
Output **Q**	A pulse at **Trg** sets **Q**. The output stays set until the time **T** has expired and if **Trg** = 1 for the duration of this time. A 1 to 0 transition at **Trg** prior to the expiration of **T** also resets the output to 0.

Parameter T

The actual value of another already-programmed function can provide the off time T:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta

- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

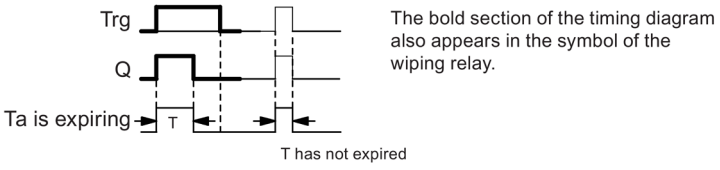
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



Description of the function

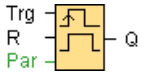
The input signal Trg = 1 sets the output Q to 1. The signal also triggers the time Ta, while the output remains set.

When Ta reaches the value defined at T (Ta=T), the output Q resets to 0 state (pulse output).

If the signal at input Trg changes from 1 to 0 before this time has expired, the output immediately resets from 1 to 0.

Special functions (Page 340)

5.3.1.6 Edge triggered wiping relay



Short description

An input pulse generates a preset number of output pulses with a defined pulse/pause ratio (retriggerable), after a configured delay time has expired.

Connection	Description
Input **Trg**	You trigger the times for the Edge-triggered wiping relay with a signal at input **Trg** (Trigger).
Input **R**	The output and the current time **Ta** resets to 0 with a signal at input **R**.
Parameter	**T_H, T_L:** The pulse width **T_H** and the interpulse width **T_L** are adjustable. **N** determines the number of pulse/pause cycles **T_L/T_H**: Value range: 1 to 9. **Retentivity** on = the status is retentive in memory.
Output **Q**	Output Q sets when the time **T_L** has expired and resets when **T_H** has expired.

0BA2, 0BA3:
Only the parameter T_H exists. T_H represents the off-delay time for the output. Input R is not available.

Parameters T_H and T_L

The actual value of another already-programmed function can provide the pulse width T_H and the interpulse width T_L:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta

- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

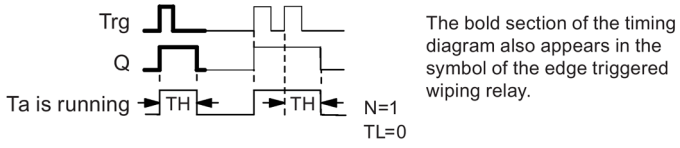
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



Description of the function

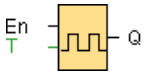
The change at input Trg to 1 triggers the time T_L (time low). After the time T_L has expired, LOGO! sets the output Q to 1 for the duration of the time T_H (time high).

If LOGO! retriggers the input Trg prior to the expiration of the preset time ($T_L + T_H$), the time Ta resets and the pulse/pause period is restarted.

Special functions (Page 340)

5.3.1.7 Symmetrical pulse generator (0BA3 only)

The symmetrical pulse generator is only available for devices of the series 0BA3.
LOGO! devices of the current series use an asynchronous pulse generator (Page 358) instead of the symmetrical pulse generator.

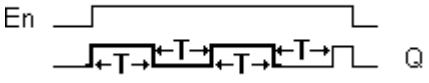


Short description

The function outputs a pulse signal with a configurable period.

Connection	Description
Input **En**	You enable (En=1) or disable (En=0) the pulse generator with the signal at input **En** (Enable).
Parameter	**T** is the on or off time of the output.
Output **Q**	**Q** is toggled periodically on and off with the pulse time **T**.

Timing diagram

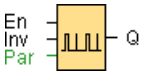


Description of function

You define the length of the on and off times at the parameter T. The **En** input enables the pulse generator. The pulse generator sets the output to 1 for the duration of the time T, then to 0 for the duration of the time T and so forth, until input En = 0.

Always specify a time T of 0.1 s. A time T is not defined for T = 0.05 s and T = 0.00 s.

5.3.1.8 Asynchronous pulse generator



Description of function

The pulse shape at the output can be modified by a configurable pulse/pause ratio.

Connection	Description
Input **En**	You enable/disable the asynchronous pulse generator with the signal at input **En**.
Input **Inv**	The Inv input can be used to invert the output signal of the active asynchronous pulse generator.
Parameter	**T_H**, **T_L**: You can customize the pulse width (**T_H**) and the interpulse width (**T_L**).
Output **Q**	**Q** is toggled on and off cyclically with the pulse/pause times **T_H** and **T_L**.

Parameters T_H and T_L

The pulse width T_H and the interpulse width T_L can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax

- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

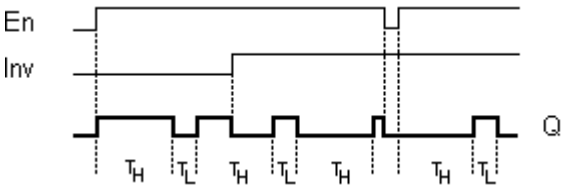
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



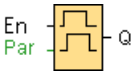
Description of the function

You can set the pulse/pause ratio at the TH (Time High) and TL (Time Low) parameters.

The INV input can be used to invert the output signal. The input block INV only inverts the output signal if the block is enabled with EN.

Special functions (Page 340)

5.3.1.9 Random generator



Short description

The output of a random generator is toggled within a configurable time.

Connection	Description
Input **En**	The positive edge (0 to 1 transition) at the enable input **En** (Enable) triggers the on-delay for the random generator. The negative edge (1 to 0 transition) triggers the off-delay for the random generator.
Parameter	**T_H:** The on-delay is determined at random and lies between 0 s and **T_H**. **T_L:** The off-delay is determined at random and lies between 0 s and **T_L**.
Output **Q**	**Q** is set on expiration of the on-delay if En is still set. It is reset when the off-delay time has expired and if En has not been set again.

Parameters T_H and T_L

The on-delay time T_H and the off-delay time T_L can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq

- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

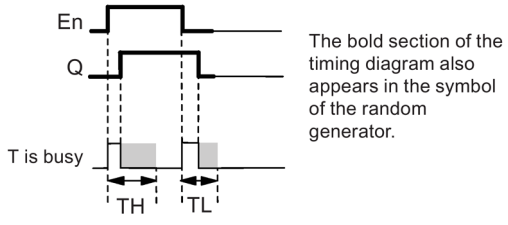
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



Description of the function

With the 0 to 1 transition at input En, a random time (on-delay time) between 0 s and T_H is set and triggered. If the status at input En is 1 for at least the duration of the on-delay, the output is set to 1 when this on-delay time has expired.

The time is reset if the status at input En is reset to 0 before the on-delay time has expired.

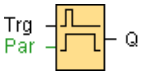
When input En is reset 0, a random time (off-delay time) between 0 s and T_L is set and triggered.

If the status at input En is 0 at least for the duration of the off-delay time, the output Q is reset to 0 when the off-delay time has expired.

The time is reset if the status at input En returns to 1 before the on-delay time has expired.

Special functions (Page 340)

5.3.1.10 Stairway lighting switch



Short description

The edge of an input pulse triggers a configurable time. The output is reset when this time has expired. An off warning can be output prior to the expiration of this time.

Connection	Description
Input **Trg**	You trigger the time (off-delay) for the stairway switch with a signal at input **Trg** (Trigger).
Parameter	**T** : The output is reset (1 to 0 transition) when the off-delay time **T** has expired. $T_!$: determines the triggering time for the prewarning. $T_{!L}$: determines the length of the prewarning time. **Retentivity** on = the status is retentive in memory.
Output **Q**	**Q** is reset after the time **T** has expired. A warning signal can be output before this time has expired.

Parameters T, $T_!$ and $T_{!L}$

The off-delay time T, the prewarning time $T_!$ and the prewarning period $T_{!L}$ can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq

- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

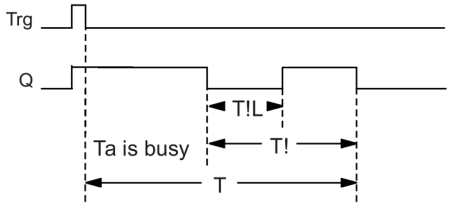
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

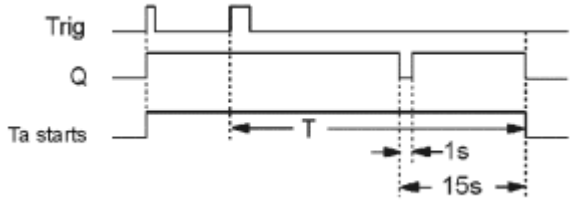
- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



The prewarning time is set to 15 s. The $T_!$ and $T_{!L}$ parameters thus become obsolete.



Changing the time base

You can change the prewarning time base and the period.

Time base T	Prewarning time	Prewarning period
Seconds *	990 ms	500 ms
Minutes	15 s	1 s
Hours	15 min	1 min

* makes sense only for programs with a cycle time of < 25 ms

Description of the function

Output Q is set to 1 with a 0 to 1 signal transition at input Trg. The 1 to 0 transition at input Trg triggers the current time and output Q remains set.

Output Q is reset to 0 when Ta reaches the time T. Before the off delay time (T - $T_!$) has expired, you can output a prewarning that resets Q for the duration of the off prewarning time $T_{!L}$.

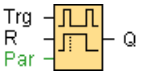
Ta is retriggered (optional) at the next high/low transition at input Trg and if Ta is expiring.

Scan cycle time

For information on how to determine the scan cycle time of a LOGO!, refer to the appendix of the *LOGO! Manual*.

Special functions (Page 340)

5.3.1.11 Multiple function switch



Short description

Switch with two different functions:

- Pulse switch with off delay
- Switch (continuous light)

Connection	Description
Input **Trg**	A signal at input **Trg** (Trigger) sets output **Q** (permanent light) or resets **Q** with an off-delay. When active, output **Q** can be reset with a signal at input **Trg**.
Input **R**	A signal at input **R** resets the current time **Ta** and resets the output.
Parameter	**T :** determines the off-delay time. The output is reset (1 to 0 transition) when the time **T** expires. **T_L :** determines the period during which the input must be set in order to enable the permanent light function. **$T_!$:** determines the on delay for the prewarning time. **$T_{!L}$:** determines the length of the prewarning time period. **Retentivity** on = the status is retentive in memory.
Output **Q**	Output **Q** is set with a signal at input **Trg**, and it is reset again after a configured time has expired and depending on the pulse width at input **Trg**, or it is reset with another signal at input **Trg**.

Parameters T, T_L, $T_!$ and $T_{!L}$

The off-delay time T, the permanent light time T_L, the on-delay prewarning time $T_!$, and the prewarning time period $T_{!L}$ can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq

- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

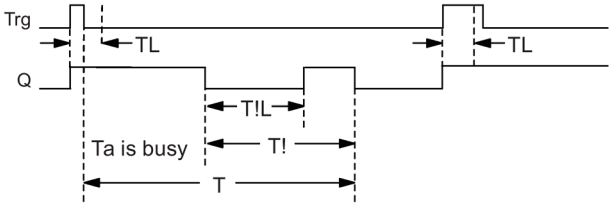
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

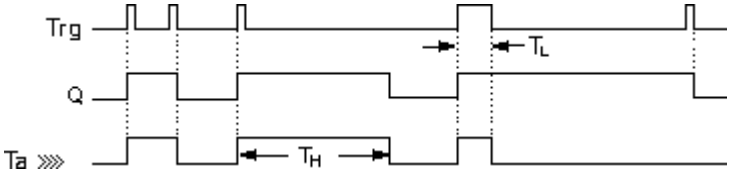
- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



0BA2, 0BA3:
Only the T_L and T parameters exist.
The output is reset when T has expired.
T_L determines the period during which the input must be set in order to enable the permanent light function.
Input R is not available to the user.



Description of the function

Output Q is set to 1 with a 0 to 1 signal transition at Trg.

If output Q = 0, and input Trg is set hi for at least the duration of T_L, the permanent lighting function is enabled and output Q is set accordingly.

The off-delay time T is triggered when the status at input Trg changes to 0 before the time T_L has expired.

Output Q is reset when the Ta = T.

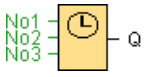
You can output an off-warning signal prior to the expiration of the off-delay time (T - T!) that resets Q for the duration of the off prewarning time T!L. A subsequent signal at input Trg always resets T and output Q.

Caution

The time base for T, T! and T!L must be identical.

Special functions (Page 340)

5.3.1.12 Weekly timer



Caution

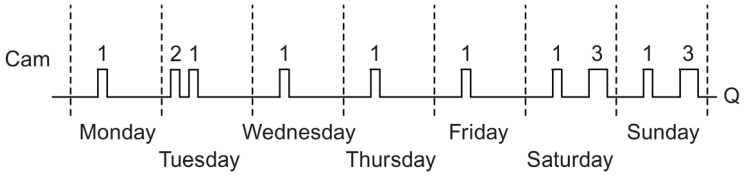
Your LOGO! must be equipped with an internal real-time clock if you are going to use this SFB.

Short description

The output is controlled by means of a configurable on/off date. The function supports any combination of weekdays.

Connection	Description
Parameters **No1, No2, No3**	At the **No1, No2, No3** (Cam) parameters you set the on- and off-time triggers for each cam of the weekly timer. For each Cam you specify the day of the week and the time of day for the on- and off-times.
Par	You specify whether the timer pulses on for one cycle when activated and is then reset. The pulse parameter applies to all three cams.
Output **Q**	**Q** is set when the configured cam is actuated.

Timing diagram (three practical examples)



Cam 1:	Daily:	06:30 h to 8:00 h
Cam 2:	Tuesday:	03:10 h to 04:15 h
Cam 3:	Saturday and Sunday:	16:30 h to 23:10 h

Description of the function

Each weekly timer is equipped with three cams. You can configure a time hysteresis for each individual cam. At the cams you set the on- and off-hysteresis. The weekly timer sets the output at a certain time, provided it is not already set.

The weekly timer resets the output at the off-time if you configured an off-time, or at the end of the cycle if you specified a pulse output. A conflict is generated in the weekly timer when the on-time and the off-time at another cam are identical. In this case, cam 3 takes priority over cam 2, while cam 2 takes priority over cam 1.

The switching status of the weekly timer is determined by the status at the No1, No2 and No3 cams.

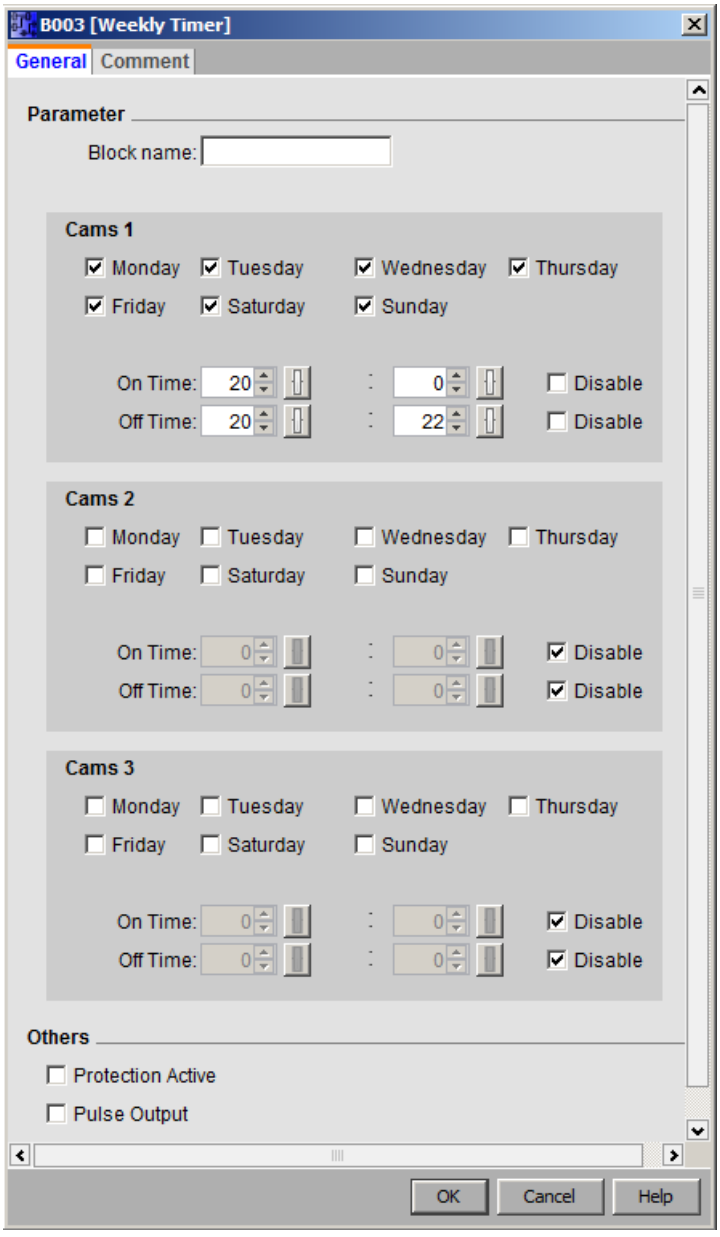
On-times

The on-time is any time between 00:00 h and 23:59 h. You can also configure the on-time to be a pulse signal. The timer block will be activated at the specified time for one cycle and then the output is reset. The off-time is disabled in this case as it is not applicable.

Special characteristics to note when configuring

The block properties window offers a tab for each one of the three cams. Here you can set the day of the week for each cam. Each tab offers you in addition an option of defining the on- and off-times for each cam in hour and minute units. Hence, the shortest switching cycle is one minute. Also on each tab you have the option of specifying a pulse output for the cam.

You can disable the on- and off-times individually. You can achieve switching cycles extending across more than one day, for example, by setting the on-time for cam 1 to Monday 7:00 h and the off-time of cam 2 to Wednesday 13:07 h, while disabling the on time for cam 2.



0BA0 : 0BA9

The **Pulse** setting is available only as of the 0BA6 device series.

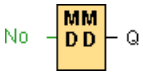
Backup of the real-time clock

The internal real-time clock of LOGO! is buffered against power failure. The buffering time is influenced by the surrounding temperature, and is typically 20 days (for LOGO! 0BA7 devices) or 80 hours (for LOGO! 0BA6 devices) at a surrounding temperature of 25 °C.

The LOGO! 0BA6 devices and higher support the option of a battery card or a combined program module (memory) and battery card. The real-time clock is buffered for several years with either of these cards.

Special functions (Page 340)

5.3.1.13 Yearly timer



Short description

The output is controlled by means of a configurable on/off date. You can configure the timer to activate on a yearly, monthly, or user-defined time basis. With any mode, you can also configure the timer to pulse the output during the defined time period. The time period is configurable within the date range of January 1, 2000 to December 31, 2099.

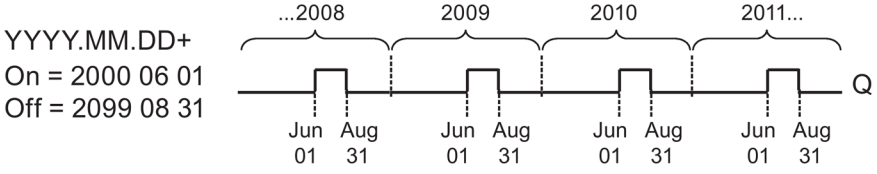
Note

To use this function block, you must use a LOGO! with an internal real-time clock.

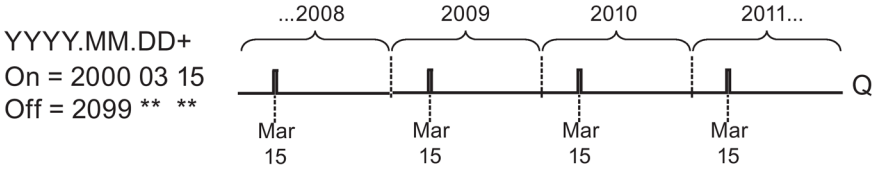
Connection	Description
Parameter	At the **No** (cam) parameter, you configure the timer mode, the on-/off-times for the timer, and whether the output is a pulse output.
Output **Q**	Q is set on when the configured cam is switched on.

Timing diagrams

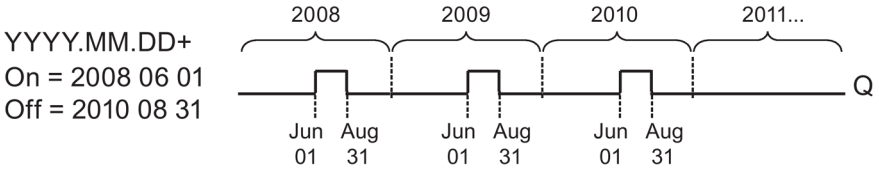
Example 1: Yearly selected, On Time = 2000.06.01, Off Time = 2099.08.31, Every year on June 1 the timer output switches on and remains on until August 31.



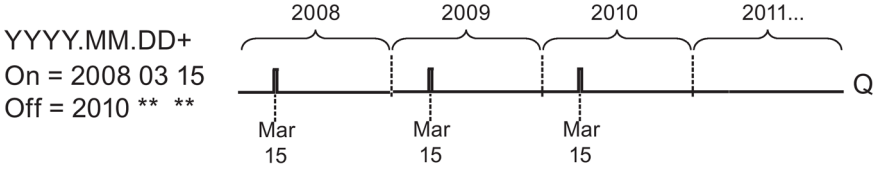
Example 2: Yearly selected, **Pulse Output** selected, On Time = 2000.03.15, Off Time = 2099.**.**. Every year on March 15, the timer switches on for one cycle.



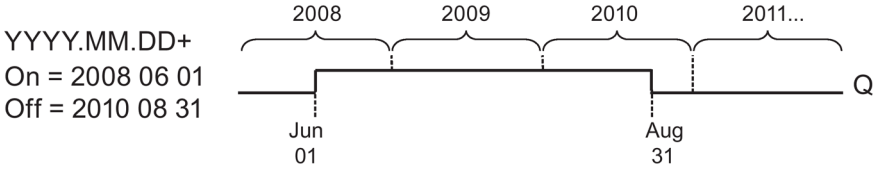
Example 3: Yearly selected, On Time = 2008.06.01, Off Time = 2010.08.31. On June 1 of 2008, 2009, and 2010, the timer output switches on and remains on until August 31.



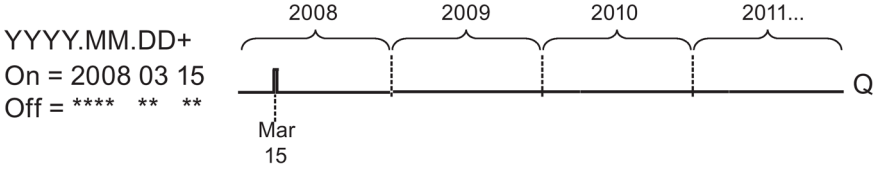
Example 4: Yearly selected, **Pulse Output** selected, On Time = 2008.03.15, Off Time = 2010.**.**. On March 15 of 2008, 2009, and 2010, the timer output switches on for one cycle.



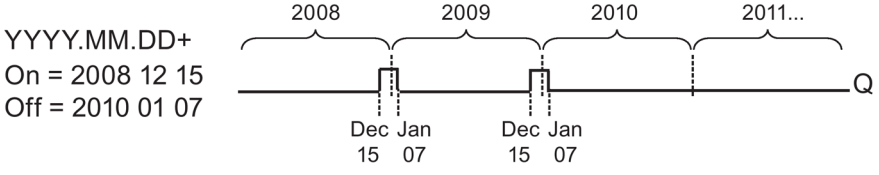
Example 5: Monthly not selected, **Yearly** not selected, On Time = 2008.06.01, Off Time = 2010.08.31. On June 1, 2008 the timer output switches on and remains on until August 31, 2010.



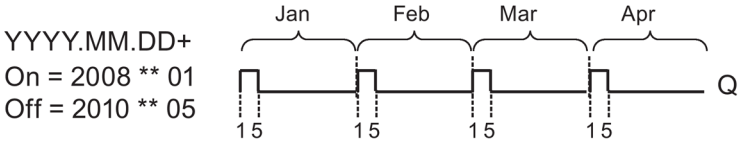
Example 6: Monthly not selected, **Yearly** not selected, **Pulse Output** selected, On Time = 2008.03.15, Off Time = ****.**.**. On March 15, 2008 the timer switches on for one cycle. Because the timer does not have a monthly action or yearly action, the timer output pulses only one time at the specified On Time.



Example 7: Yearly selected, On Time = 2008.12.15, Off Time =2010. 01.07. On December 15 of 2008 and 2009, the timer output switches on and remains on until January 7 of the following year. When the timer output turns off on January 7, 2010 it does NOT turn on again the following December 15.



Example 8: Monthly selected, On Time = 2008.**.01, Off Time = 2010.**.05. Starting in 2008, on the first day of each month the timer output switches on and switches off on the fifth day of the month. The timer continues in this pattern through the last month of 2010.



Description of the function

The yearly timer sets and resets the output at specific on and off dates. Sets and resets are executed at 00:00. If your application requires a different time, use a weekly timer together with a yearly timer in your circuit program.

The On Time specifies the month and day when the timer is set. The Off Time identifies the month and day on which the output is reset again. For the on and off times, note the order of the fields: The first field defines the year, the second the month and the third the day.

When you select the **Monthly** check box, the timer output switches on each month at the specified day of the start time and remains on until the specified day of the Off Time. The On Year specifies the initial year in which the timer is activated. The Off Year defines the last year in which the timer turns off. The maximum year is 2099.

If you select the **Yearly** check box, the timer output switches on each year at the specified month and day of the start time and remains on until the specified month and day of the Off Time. The On Year specifies the initial year in which the timer is activated. The Off Year defines the last year in which the timer turns off. The maximum year is 2099.

If you select the **Pulse Output** check box, the timer output switches on at the specified On Time for one cycle and then the timer output is reset. You can choose to pulse a timer on a monthly or yearly basis, or just a single time.

If you select none of the Monthly, Yearly, or Pulse check boxes, you can define a specific time period with the On Time and Off Time. It can span any time period that you choose.

For a process action that is to be switched on and off at multiple but irregular times during the year, you can define multiple yearly timers with the outputs connected by an **OR** function block.

The **Yearly** and **Pulse Output** settings are available only as of the 0BA6 device series
The **Monthly** setting is available only as of the 0BA4 device series.

Backup of the real-time clock

The internal real-time clock of LOGO! is buffered against power failure. The buffering time is influenced by the surrounding temperature, and is typically 20 days (for LOGO! 0BA7 and later version devices) or 80 hours (for LOGO! 0BA6 devices) at a surrounding temperature of 25°C. If you are using the optional LOGO! Battery card, or combined LOGO! Memory/Battery card, LOGO! can retain the clock time for up to two years.

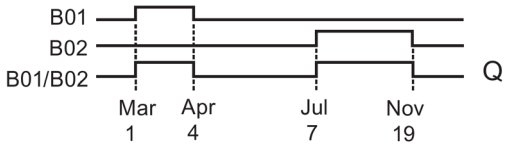
Special characteristics to note when configuring

You can numerically enter values for the month and day fields. Enter values within the logical range of month values and day values; otherwise LOGO!Soft Comfort returns an error message.

The **calendar** icon offers you an easy way of setting the date. It opens a window where you can set the days and months by clicking the relevant buttons on a calendar page.

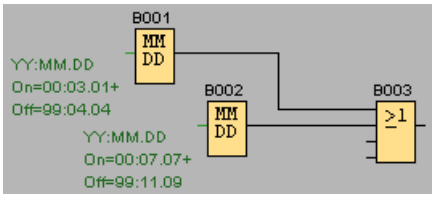
Sample configuration

The output of a LOGO! is to be switched on annually, from the 1st of March to the 4th of April and from the 7th of July to the 19th of November. This requires two blocks for configuring the specific On Times. The outputs are then linked via an OR block.



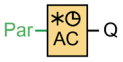
Place two yearly timer switch SFBs on your programming interface. Configure the On Time for the first yearly timer to 03.01 and the Off Time to 04.04. Configure the On Time for the second yearly timer to 07.07 and the Off Time to 11.19.

Create a logical link of the blocks with a standard OR block. The OR output is 1 if at least one of the yearly timer switches is set.



Special functions (Page 340)

5.3.1.14 Astronomical clock (0BA7 and later versions only)

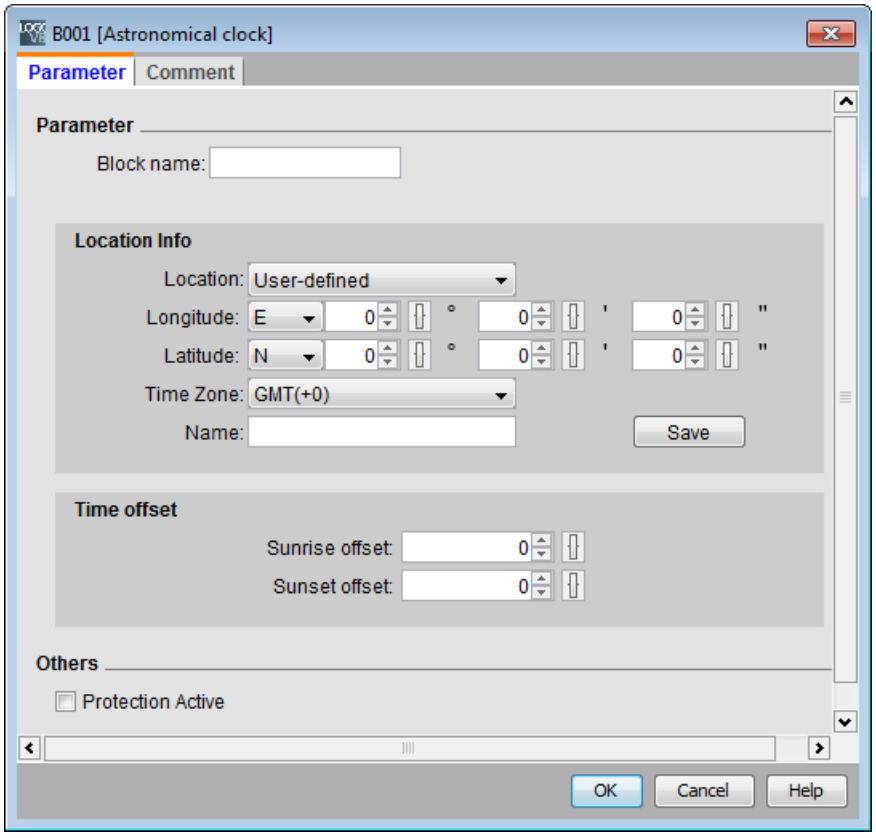


Short description

The astronomical clock SFB is used to set an output high between sunrise and sunset based on the local time at the geographical location of the LOGO! 0BA7 or 0BA8 devices. The output status of this function block also depends on the configuration of summer time/winter time conversion.

Connection	Description
Parameter	The location info including longitude, latitude, time zone, and **TR** (sunrise time)/**TS** (sunset time) offsets.
Output **Q**	**Q** is set to hi when sunrise time is reached. It holds this state until sunset time is reached.

Parameters



In the astronomical clock dialog, you can select the location of the LOGO! device from one of the following pre-defined time zone locations:

- Beijing
- Berlin
- London
- Rome
- Moscow
- Tokyo
- Washington
- Ankara

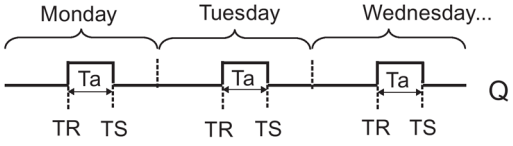
- Madrid
- Amsterdam

If you select one of these locations, LOGO!Soft Comfort uses the latitude, longitude, and time zone of your selection.

Alternatively, you can configure a specific latitude, longitude, and time zone for your location, and provide a name for this custom location.

Based on the location and time zone, LOGO! calculates the absolute sunrise and sunset time for the current day. The block also takes summer time/winter time into consideration, if it is configured on the computer where LOGO!Soft Comfort is installed. To do such configuration, you should select check box of "Automatically adjust clock for daylight for saving changes" in the "Date and Time Properties" dialog.

Timing diagram

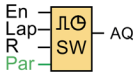


Description of function

The function calculates the value at the input and sets or resets **Q** depending on the sunrise time and sunset time at the configured location and time zone of the module.

Special functions (Page 340)

5.3.1.15 Stopwatch (0BA7 and later versions only)



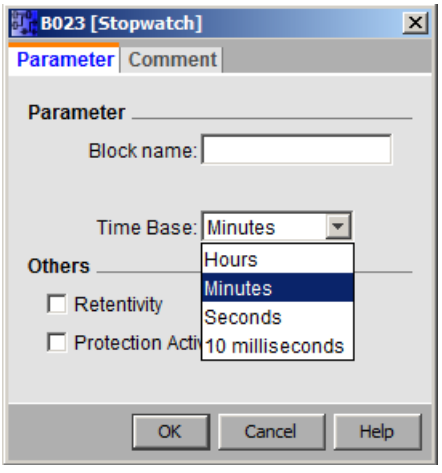
Short description

The stopwatch records the time elapsed since it was enabled.

Connection	Description
Input **En**	En (Enable) is the monitoring input. LOGO! sets the current elapsed time to 0 and begins counting elapsed time when En transitions from 0 to 1. When En transitions from 1 to 0, the elapsed time is frozen.
Input **Lap**	A positive edge (0 to 1 transition) at input **Lap** pauses the stopwatch, and sets output to lap time. A negative edge (1 to 0 transition) at input **Lap** resumes the stopwatch, and set the output to current elapsed time.
Input **R**	A signal at input **R** (Reset) clears the current elapsed time and lap time.
Parameter	Time base for elapsed time, which you can set to hours, minutes, seconds, or 1/100ths of seconds.
Output **AQ**	The output **AQ** outputs value of the current elapsed time when it is a negative edge (1 to 0 transition) at the input **Lap**, and outputs value of the Lap time when it is a positive edge (0 to 1 transition) at the input **Lap**. A positive edge (0 to 1 transition) resets the value at output AQ to 0.

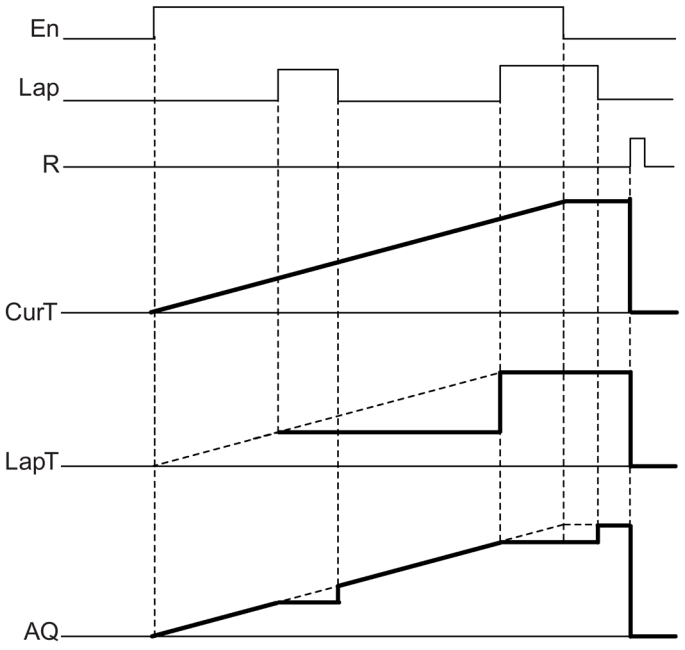
Parameters Time base

You can configure the time base for the analog output:



The time base for the elapsed time can be in hours, minutes, seconds, or 1/100ths of seconds (units of 10 milliseconds). The smallest time base, and therefore the resolution, is 10 milliseconds, or 1/100ths of seconds.

Timing diagram



Description of the function

When En = 1, the current time increases.

When En = 0, the current time counting pauses.

When En = 1 and Lap = 0, the output AQ outputs the value of the current elapsed time.

When En = 1 and Lap = 1, the current time continue increasing, but the output AQ outputs the value of the Lap time.

When En = 0 and Lap =1, the output AQ outputs the value of the Lap time.

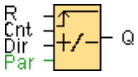
When En = 0 and Lap = 0, the output AQ outputs the value of the latest current time.

When R = 1, both the current time and the Lap time are reset.

Special functions (Page 340)

5.3.2 Counters

5.3.2.1 Up/Down counter



Short description

An input pulse increments or decrements an internal value, depending on the parameter setting. The output is set or reset when a configured threshold is reached. The direction of count can be changed with a signal at input Dir.

Connection	Description
Input **R**	You reset the output and the internal counter value to the start value (StartVal) with a signal at input **R** (Reset)
Input **Cnt**	This function counts the 0 to 1 transitions at input **Cnt**. It does not count 1 to 0 transitions. • Use the inputs I3, I4, I5, and I6 for high-frequency counts (LOGO! 12/24RCE/RCEo, LOGO! 24CE/24CEo): max. 5 kHz, if the fast input is directly connected to the Up/Down counter function block • Use any other input or circuit element for low-frequency counts (typically 4 Hz).
Input **Dir**	Input **Dir** (Direction) determines the direction of count: Dir = 0: Up Dir = 1: Down
Parameter	**On**: On threshold / Value range: 0 to 999999 **Off**: Off threshold / Value range 0 to 999999 **Start Value**: Initial value from which to begin counting either down or up. **Retentivity** on = the status is retentive in memory.
Output **Q**	**Q** is set and reset according to the actual value at Cnt and the set thresholds.

Parameters On and Off

The on threshold On and the off threshold Off can be provided by the value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

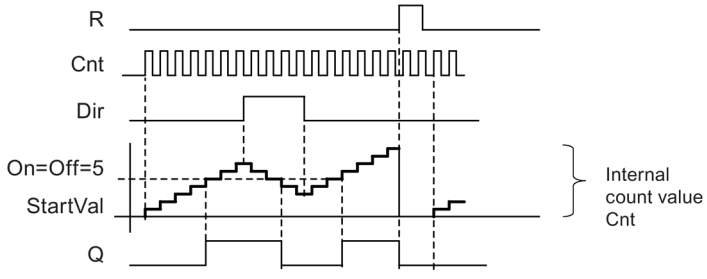
For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

For information on the validity and accuracy of the time base, refer to the *LOGO! Manual*.

Timing diagram



Description of the function

The function increments (Dir = 0) or decrements (Dir = 1) the internal counter by one count with every positive edge at input Cnt.

You can reset the internal counter value to the start value with a signal at the reset input R. As long as R=1, the output Q is 0 and the pulses at input Cnt are not counted.

Output Q is set and reset according to the actual value at Cnt and the set thresholds. See the following rules for calculation.

Calculation rule

- If the on threshold ≥ off threshold, then:
  Q = 1, if Cnt ≥ On
  Q = 0, if Cnt < Off.
- If the on threshold < off threshold, then:
  Q = 1, if On ≤ Cnt < Off.

0BA0-0BA5:
The Start Value parameter does not exist. The counter always counts up or down from 0.
0BA0-0BA3:
The off parameter does not exist. The calculation rule is therefore void.

Caution

The function polls the limit value of the counter once in each cycle.

Thus, if the pulses at the fast inputs I3, I4, I5, or I6 are faster than the scan cycle time, the SFB might not switch until the specified limit has been exceeded.

Example: Up to 100 pulses per cycle can be counted; 900 pulses have been counted so far. On = 950; Off = 10000. The output is set in the next cycle, after the value has reached 1000.

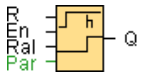
The output would not be set at all if the value Off = 980

Scan cycle time

For information on how to determine the scan cycle time of a LOGO!, refer to the appendix in the LOGO! Manual.

Special functions (Page 340)

5.3.2.2 Hours counter



Short description

A configured time is triggered with a signal at the monitoring input. The output is set when this time has expired.

Connection	Description
Input **R**	A positive edge (0 to 1 transition) at input **R** resets output **Q** and sets a configured value MI at the counter for the duration of the time-to-go (MN).
Input **En**	**En** is the monitoring input. LOGO! scans the On Time of this input.
Input **Ral**	A positive edge at input Ral (Reset all) resets the hours counter (OT) and the output, and sets the time-to-go value (MN) to the configured maintenance interval (MI): • Output Q = 0 • The measured operating hours OT = 0 • The time-to-go of the maintenance interval MN = MI.
Parameter	**MI**: Maintenance interval to be specified in units of hours and minutes Range of values: 0000 h to 9999 h, 0 m to 59 m **OT:** Accumulated total operating time. An offset start time can be specified in hours and minutes. Range of values: 00000 h to 99999 h, 0 m to 59 m **Q → 0**: • **When "R" is selected:** Q = 1, if MN = 0; Q = 0, if R = 1 or Ral = 1 • **When "R+En" is selected**: Q = 1, if MN = 0; Q = 0, if R = 1 or Ral = 1 or En = 0.
Output **Q**	The output is set when the time-to-go MN = 0. The output is reset: • **When "Q → 0:R+En",** if R = 1 or Ral = 1 or En = 0 • **When "Q → 0:R**", if R = 1 or Ral = 1.

Parameter MI

The maintenance interval MI can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq

- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

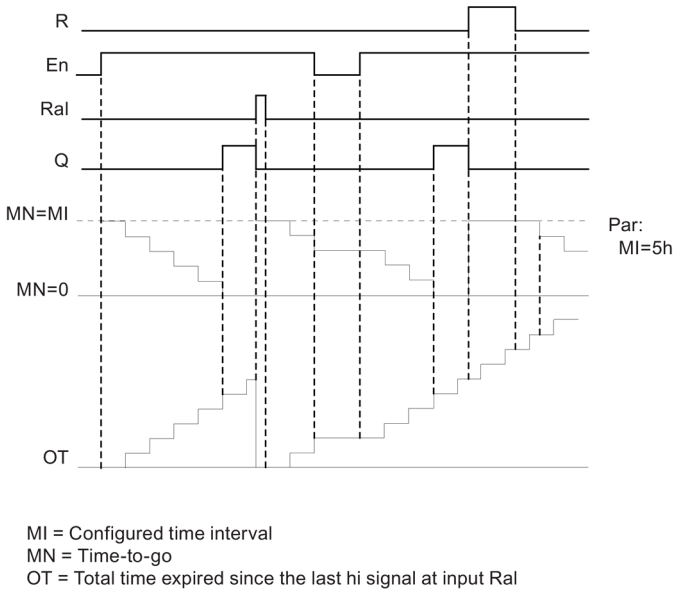
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



MI = Configured time interval
MN = Time-to-go
OT = Total time expired since the last hi signal at input Ral

These values are always retentive.

Description of the function

The hours counter monitors input En. As long as the status at this input is 1, LOGO! calculates the expired time and the time-to-go MN. LOGO! displays these times when set to configuration mode. The output is set to 1 when the time-to-go is equal to zero.

You reset output Q and the time-to-go counter to the specified value MI with a signal at input R. The operation hour counter OT remains unaffected.

You reset output Q and the time-to-go counter to the specified value MI with a signal at input Ral. The operation hour counter OT is reset to 0.

Depending on your configuration of the Q parameter, the output is either reset with a reset signal at input R or Ral ("Q → R"), or when the reset signal is 1 or the En signal is 0 ("Q → R+En").

Viewing the MI, MN and OT values

In LOGO!Soft Comfort you can fetch the hours counter via the Tools -> Transfer -> Hours Counter (Page 151) menu command.

Limit value of OT

The value of the operating hours in OT is retained when you reset the hours counter with a signal at input R. The hours counter OT will be reset to zero with a transition from 0 to 1 at Ral. The hours counter OT continues the count as long as En = 1, irrespective of the status at the reset input R. The counter limit of OT is 99999 h. The hours counter stops when it reaches this value.

In programming mode, you can set the initial value of OT. MN is calculated according to the following formula when reset input R is never enabled: MN = MI - (OT % MI). The % operator provides an integer division remainder.

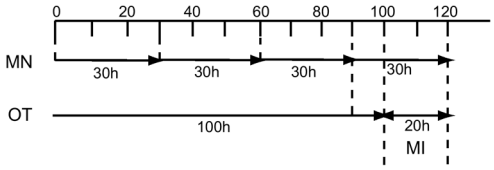
Example:

MI = 30h, OT = 100h

MN = 30 - (100 % 30)

MN = 30 -10

MN = 20h



In runtime mode, the value OT cannot be preset. If the value for MI is changed, there would be no calculation for the MN. MN would take on the value of MI.

Parameter preset

In LOGO!Soft Comfort, you can define MI and an OT start value.

You determine that Q does not depend on En by selecting the corresponding check box.

Retentivity with the hours counter

The hours counter in the LOGO! is retentive.

If the values of the hours counter are lost after a power failure, then select the respective block in your circuit program. Right-click the hours counter and select **Block Properties > Parameter**. The option **Retentivity** must be activated and unchangeable (grayed out).

If the **Retentivity** option is not available, then delete the block and insert a new special function **hours counter** at the same position.

0BA0-0BA5:
The maintenance interval (MI) and the start time for the operating time (OT) were in units of hours.

Value reset

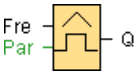
If you download a circuit program that contains an hours counter function from LOGO!Soft Comfort to a LOGO! 0BA7 or LOGO! 0BA8 Base Module, LOGO!Soft Comfort prompts you whether to continue or not. If you continue with the download, the hours counter value is reset.

Note

If you copy a circuit program that contains an hours counter function from an SD card to a LOGO! Base Module, the hours counter value is reset with no notification.

Special functions (Page 340)

5.3.2.3 Threshold trigger



Short description

The output is switched on and off depending on two configurable frequencies.

Connection	Description
Input **Fre**	The function counts 0 to 1 transitions at input **Fre**. Transitions from 1 to 0 are not counted. • Use the inputs I3, I4, I5, and I6 for high-frequency counts (LOGO! 12/24RCE/RCEo, LOGO! 24CE/24CEo): max 5kHz, if the fast input is directly connected to the threshold trigger function block • Use any other input or circuit element for low frequencies (typical 4 Hz).
Parameter	**On:** On threshold Range of values: 0000 to 9999 **Off:** Off threshold Range of values: 0000 to 9999 **G_T:** Time interval or gate time during which the input pulses are measured. Range of values: 00:00 s to 99:99 s
Output **Q**	**Q** is set or reset according to the threshold values.

Parameter G_T

The gate time G_T can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

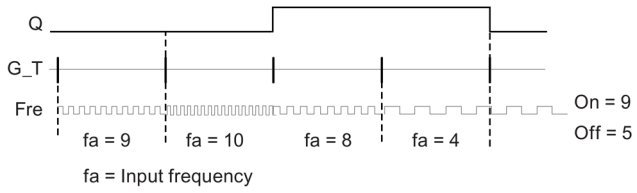
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Timing diagram



Description of the function

The trigger measures the signals at input Fre. The pulses are captured during a configurable period G_T.

Q is set or reset according to the set thresholds. See the following calculation rule.

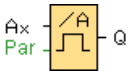
Calculation rule

- If the threshold (On) ≥ threshold (Off), then:
  Q = 1, if fa > On
  Q = 0, if fa ≤ Off.
- If the threshold (On) < threshold (Off), then Q = 1, if
  On ≤ fa < Off.

Special functions (Page 340)

5.3.3 Analog

5.3.3.1 Analog threshold trigger



Short description

The output is set or reset depending on two configurable thresholds (hysteresis).

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description		
Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1 2]		
Parameter	Range of values	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	On (On threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Off (Off threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p (Number of decimals)	0, 1, 2, 3	/

Output **Q**	**Q** is set or reset depending on the set thresholds.

[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data.

[2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data.

[3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value).

[4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).

Parameters On and Off

The On and Off parameters can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

0BA4:

A: Gain
Range of values 0.00 to 10.00

0BA2, 0BA3:

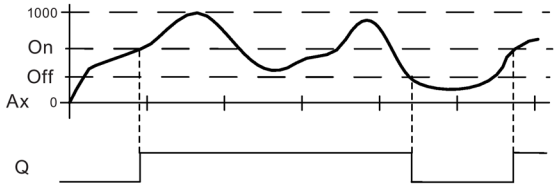
These parameters apply:
G: **G**ain in [%]
Range of values 0% to 1000%
O: Offset
Range of values -999 to 999
On: On threshold
Range of values 0 to 9999
Off: Off threshold
Range of values 0 to 9999

Parameter p (number of decimals)

Parameter p applies only to the display of On, Off and Ax values in a message text.

Parameter p does not apply to the comparison of On and Off values. (The compare function ignores the decimal point.)

Timing diagram



Description of the function

The function reads the value of the signal at the analog input Ax.

This value is multiplied by the value of parameter A (gain). Parameter B (offset) is added to the product, hence

(Ax * Gain) + Offset = Actual value Ax.

Output Q is set or reset depending on the set threshold values. See the following calculation rule.

0BA2, 0BA3:
The **function** is as follows:
The offset parameter is added to the read analog value. The sum is multiplied by the value of the gain parameter.
Value = (AI+offset)*gain
Output Q is set to 1 if the calculated value exceeds the on threshold (TH high).
Q is reset to 0 when the value reaches or drops below the off threshold (TH low).

Calculation rule

- If threshold (On) ≥ threshold (Off), then:
  Q = 1, if the actual value Ax > On
  Q = 0, if the actual value Ax ≤ Off.
- If threshold (On) < threshold (Off), then Q = 1, if
  On ≤ the actual value Ax < Off.

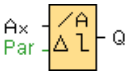
Particular characteristics to be noted when configuring

Refer to the help on analog block parameters in the Analog value processing (Page 425) section.

Note

The decimal point setting must be identical in the minimum and maximum range.

5.3.3.2 Analog differential trigger



Short description

The output is set and reset depending on a configurable threshold and a differential value.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	**Description**		
Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1] [2]		
Parameter	Range of values	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	On (On/Off threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Δ (Differential value for calculating the off parameter)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p (Number of decimals)	0, 1, 2, 3	/

Output **Q**	**Q** is set or reset, depending on the threshold and difference values.

[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data.

[2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data.

[3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value).

[4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).

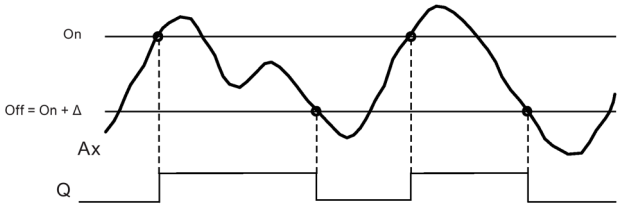
0BA4:
A: Gain
Range of values: 0.00 to 10.00

Parameter p (number of decimals)

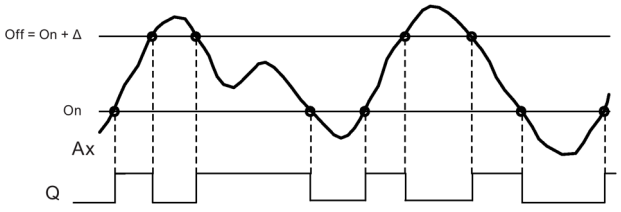
Parameter p applies only to the display of On, Off and Ax values in a message text.

Parameter p does not apply to the comparison of On and Off values. (The compare function ignores the decimal point.)

Timing diagram A: Function with negative difference Delta



Timing diagram B: Function with positive difference Delta



Description of the function

The function fetches the analog signal at input Ax.

Ax is multiplied by the value of the A (gain) parameter, and the value at parameter B (offset) is added to product, i.e.

(Ax * gain) + offset = actual value of Ax.

Output Q is set or reset, depending on the set (On) threshold and difference value (Delta). The function automatically calculates the Off parameter: Off = On + Delta, whereby Delta may be positive or negative. See the calculation rule below.

Calculation rule

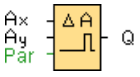
- When you set a negative differential value Delta, the On threshold ≥ Off threshold, and:
  Q = 1, if the actual value Ax > On
  Q = 0, if the actual value Ax ≤ Off.
  See the timing diagram A.
- When you set a positive differential value Delta, the On threshold < the Off threshold, and
  Q = 1, if:
  On ≤ the actual value Ax < Off.
  See the timing diagram B.

Particular characteristics to be noted when configuring

Refer to the help on analog block parameters in the Information on analog value processing (Page 425) section.

Special functions (Page 340)

5.3.3.3 Analog comparator



Short description

The output is set and reset depending on the difference Ax – Ay and on two configurable thresholds.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description		
Inputs **Ax**, **Ay**	Inputs **Ax**, **Ay** are two analog signals (integer or float) from the followings: • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1 2]		
Parameter	Range of values	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	On (On threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Off (Off threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p (Number of decimals)	0, 1, 2, 3	/

Output **Q**	**Q** is set or reset depending on the set thresholds.
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data.	
[2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data.	
[3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value).	
[4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).	

0BA4:
A: Gain
Range of values: 0.00 to 10.00
0BA0-0BA3:
The following parameters apply:
G : Gain in [%]
Range of values: 0% to 1000%
O : Offset
Range of values: -999 to 999
delta : Threshold
Q is set to 1 when the difference Ax-Ay exceeds the threshold.

Parameters On and Off

The on threshold On and the off threshold Off can be provided by the actual value of another already-programmed function:

- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta

- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

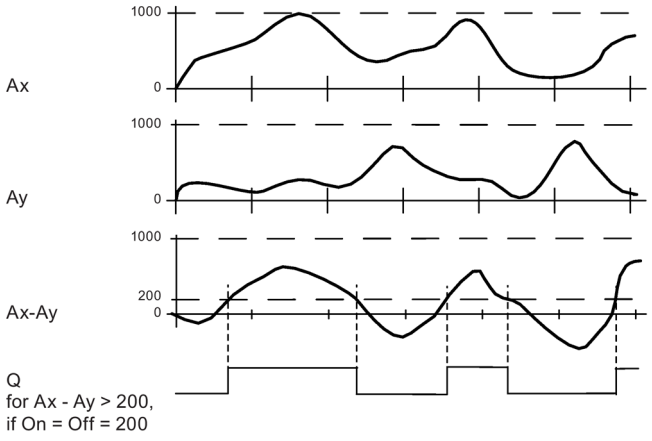
You select the required function by the block number.

Parameter p (number of decimals)

Parameter p applies only to Ax, Ay, Delta, On and Off values displayed in a message text.

Parameter p does not apply to the comparison of on and off values. (The compare function ignores the decimal point.)

Timing diagram



Description of the function

The function reads the value of the signal at the analog input Ax.

This value is multiplied by the value of parameter A (gain). Parameter B (offset) is added to the product, hence

(Ax * gain) + offset = Actual value Ax.

(Ay * gain) + offset = Actual value Ay.

Output Q is set or reset depending on the difference of the actual values Ax – Ay and the set thresholds. See the following calculation rule.

Calculation rule

- If threshold On ≥ threshold Off, then:
  Q = 1, if (actual value Ax - actual value Ay) > On
  Q = 0, if (actual value Ax - actual value Ay) ≤ Off.
- If threshold On < threshold Off, then Q = 1, then:
  On ≤ (actual value Ax - actual value Ay) < Off.

0BA2, 0BA3:

The following **functions/calculation rules** apply:

The function adds the relevant specified offset to the analog values Ax and Ay. The sum is multiplied with the value of the gain parameter. The difference is formed from both calculated values.

Output Q is set if this difference between these values exceeds the threshold you have configured under delta.

Calculation rule:
Q = 1, if:
((Ax + offset) * gain) - ((Ay + offset)*gain) > threshold delta
Q is reset to 0 when the threshold reaches or drops below delta.

Reducing the input sensitivity of the analog comparator

You can delay the output of the analog comparator selectively by means of the "on delay" and "off delay" SFBs. By doing so, you determine that output Q is only set if the input trigger length Trg (= output of the analog comparator) exceeds the defined on delay time.

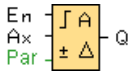
This way you can set a virtual hysteresis, which renders the input less sensitive to short changes.

Particular characteristics to be noted when configuring

For help on analog block parameters, refer to the Analog value processing (Page 425) section.

Special functions (Page 340)

5.3.3.4 Analog watchdog



Short description

This special function saves the process variable of an analog input to memory, and sets the output when the output variable exceeds or drops below this stored value plus a configurable offset.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description		
Input **En**	A positive edge (0 to 1 transition) at input **En** saves the analog value at input **Ax** ("Aen") to memory and starts monitoring of the analog range Aen +- Delta.		
Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1 2]		
Parameter	Value range	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	

	Threshold 1 (Difference value above Aen, on/off threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Threshold 2 (Difference value below Aen, on/off threshold)	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p (Number of decimals)	0, 1, 2, 3	/
Output **Q**	**Q** is set/reset, depending on the stored analog value and the offset.		

[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data.

[2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data.

[3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value).

[4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).

Parameters Threshold 1 and Threshold 2

The two threshold parameters Threshold 1 and Threshold 2 can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq

- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

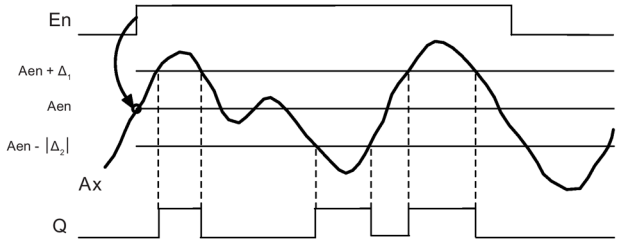
The thresholds are represented by the symbol Δ on the LOGO! Base Module and in the timing diagram below.

0BA4:
Gain: Range of values: 0.00 to 10.00

Parameter p (number of decimals)

Parameter p applies only to the display of Aen, Ax, Threshold 1 and Threshold 2 values in a message text.

Timing diagram



Description of the function

A 0 to 1 transition at input En saves the value of the signal at the analog input Ax. This saved process variable is referred to as "Aen".

Both the analog actual values Ax and Aen are multiplied by the value at parameter A (gain), and parameter B (offset) is then added to the product, as follows:

(Ax * gain) + offset = Actual value Aen, when input En changes from 0 to 1, or

(Ax * gain) + offset = Actual value Ax.

Output Q is set when the signal at input En = 1 and if the actual value at input Ax is out of range of Aen + Threshold 1 / Aen - Threshold 2.

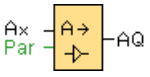
Output Q is reset, when the actual value at input Ax lies within the range of Aen + Threshold 1 / Aen - Threshold 2, or when the signal at input En changes to lo.

Particular characteristics to be noted when configuring

Refer to the help on analog block parameters in the Analog value processing (Page 425) section.

Special functions (Page 340)

5.3.3.5 Analog amplifier



Short description

This SFB amplifies an analog input value and returns it at the analog output.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connections	Description
Input **Ax**	Input Ax is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1] [2]

Parameter	Value range	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p (Number of decimals)	0, 1, 2, 3	/
Output **AQ**	**AQ**	-32768 to +32767	-3.402823E38 to +3.402823E38
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data. [2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data. [3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value). [4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).			

0BA4:
A: Gain
Range of values: 0.00 to 10.00

Parameter p (number of decimals)

Parameter p applies only to the display of Ax and Ay values in a message text.

Parameter p does not apply to the comparison of On and Off values. (The compare function ignores the decimal point.)

Description of the function

The function reads the value of an analog signal at the analog input Ax.

This value is multiplied by the gain parameter A. Parameter B (offset) is added to the product, as follows:

(Ax * gain) + offset = Actual value Ax.

The actual value Ax is output at AQ.

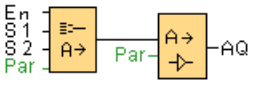
Particular characteristics to be noted when configuring

For help on analog block parameters, refer to the Analog value processing (Page 425) section.

Analog output

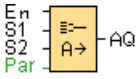
If you connect this special function to a real analog output, then note that the analog output can only process values from 0 to 1000. To do this, connect an additional amplifier between the analog output of the special function and the real analog output. With this amplifier you standardize the output range of the special function to a value range of 0 to 1000.

Example: additional amplifier behind an analog multiplexer.



Special functions (Page 340)

5.3.3.6 Analog multiplexer



Short description

When enabled, the analog multiplexer SFB displays one of four pre-defined analog values, depending on input conditions.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	**Description**		
Input **En**	1 on input En (Enable) switches, dependent on S1 and S2, a parameterized analog value to the output AQ. 0 on input EN switches 0 to the output AQ.		
Inputs **S1** and **S2**	S1 and S2 (selectors) for selecting the analog value to be issued. S1 = 0 and S2 = 0: The value V1 is issued S1 = 0 and S2 = 1: The value V2 is issued S1 = 1 and S2 = 0: The value V3 is issued S1 = 1 and S2 = 1: The value V4 is issued		
Parameter	Value range	Integer	Float
	V1 to V4 (Analog values that will be issued)	-32768 to +32767	-3.402823E38 to +3.402823E38
	p (Number of decimal places)	0, 1, 2, 3	/
Output **AQ**	AQ	-32768 to +32767	-3.402823E38 to +3.402823E38

Parameters V1 to V4

The values for V1 to V4 can be provided by the value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog multiplexer: AQ

- PI controller: AQ
- Analog Ramp: AQ
- Mathematic instruction: AQ
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

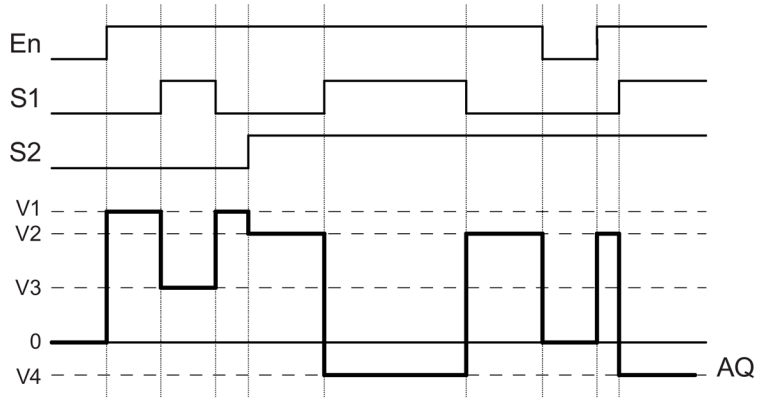
- Float calculation instruction: Aq

You select the required function by the block number.

Parameter p (number of decimal places)

Parameter p applies only to the display of AQ, V1, V2, V3 and V4 values in a message text.

Timing diagram



Description of function

If input En is set, then the function issues one of four possible analog values V1 to V4 at the output AQ, depending on the inputs S1 and S2.

If the input En is not set, then the function issues the analog value 0 at output AQ.

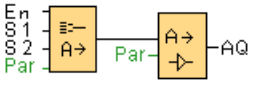
Particular characteristics to be noted when configuring

For help on analog block parameters, refer to the Basics (Page 425) section.

Analog output

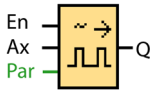
If you connect this special function to a real analog output, then note that the analog output can only process values from 0 to 1000. To do this, connect an additional amplifier between the analog output of the special function and the real analog output. With this amplifier you standardize the output range of the special function to a value range of 0 to 1000.

Example: additional amplifier behind an analog multiplexer.



Special functions (Page 340)

5.3.3.7 Pulse Width Modulator (PWM)



Short description

The Pulse Width Modulator (PWM) instruction modulates the analog input value Ax to a pulsed digital output signal. The pulse width is proportional to the analog value Ax.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description		
Input **En**	A positive edge (0 to 1 transition) at input En enables the PWM function block.		
Input **Ax**	Analog signal to be modulated to a pulsed digital output signal. Input is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1 2]		
Parameter	Value range	Integer	Float
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	

	Range Min	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Range Max	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Pt	Periodic time over which the digital output is modulated Range of value: 0 to 99	
	p (Number of decimals)	0, 1, 2, 3	/
Output **Q**	Q is set or reset for the proportion of each time period according to the proportion of the standardized value Ax to the analog value range.		

[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data.

[2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data.

[3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value).

[4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).

0BA1- 0BA5:
The PWM function block did not exist prior to 0BA6.

Parameter PT

The periodic time PT can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta

- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Parameter p (number of decimals)

Parameter p applies only to the display of the Ax value in a message text.

Description of the function

The function reads the value of the signal at the analog input Ax.

This value is multiplied by the value of parameter A (gain). Parameter B (offset) is added to the product, as follows:

(Ax * Gain) + Offset = Actual value Ax

The function block calculates the proportion of the value Ax to the range. The block sets the digital output Q high for the same proportion of the PT (periodic time) parameter, and sets Q low for the remainder of the time period.

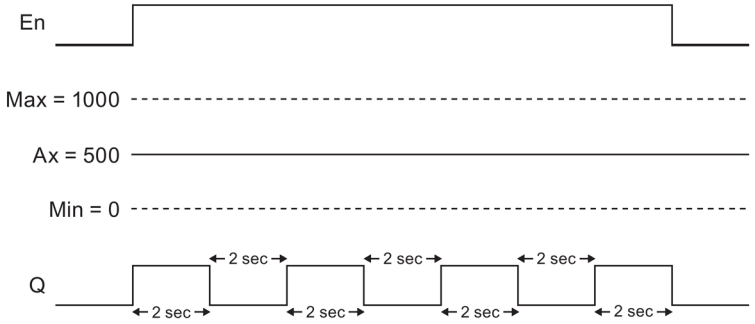
Examples with Timing Diagrams

The following examples show how the PWM instruction modulates a digital output signal from the analog input value:

Example 1

Analog input value: 500 (range 0 to 1000)
Periodic time T: 4 seconds

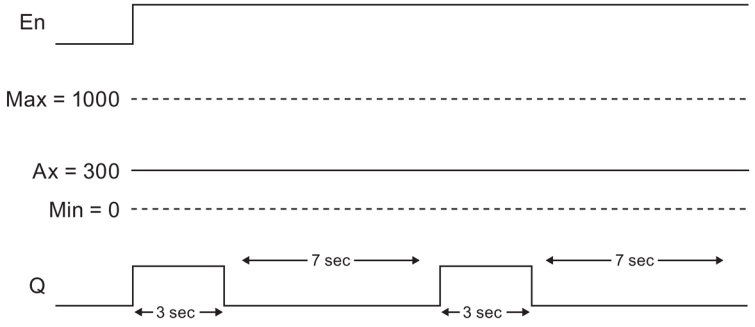
The digital output of the PWM function is 2 seconds high, 2 seconds low, 2 seconds high, 2 seconds low and continues in that pattern as long as parameter "En" = high.



Example 2

Analog input value: 300 (range 0 to 1000)
Periodic time T: 10 seconds

The digital output of the PWM function is 3 seconds high, 7 seconds low, 3 seconds high, 7 seconds low and continues in that pattern as long as parameter "En" = high.



Calculation rule

Q = 1, for (Ax – Min) / (Max – Min) of time period PT
Q = 0, for PT – [(Ax – Min) / (Max – Min)] of time period PT.

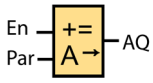
Note: Ax in this calculation refers to the actual value Ax as calculated using the Gain and Offset. Min and Max refer to the minimum and maximum values specified for the range.

Particular characteristics to be noted when configuring

Refer to the help on analog block parameters in the Analog value processing (Page 425) section.

Special functions (Page 340)

5.3.3.8 Mathematic instruction



Short description

The mathematic instruction block calculates the value AQ of an equation formed from the user-defined operands and operators.

Connection	Description
Input **En**	A positive edge at input En enables the mathematic instruction function block
Parameter	**V1:** Value 1: First operand **V2:** Value 2: Second operand **V3:** Value 3: Third operand **V4:** Value 4: Fourth operand Range of values: -32768 to 32767 **Operator 1:** First operator **Operator 2:** Second operator **Operator 3:** Third operator **Priority 1:** Priority of first operation **Priority 2:** Priority of second operation **Priority 3:** Priority of third operation* **p:** Number of decimals Possible settings: 0, 1, 2, 3
Output **AQ**	The output AQ is the result of the equation formed from the operand values and operators. AQ will be set to 32767 if a divide by 0 or overflow occurs, and -32768 if a negative overflow (underflow) occurs.
* 3 priorities cannot be the same.	

0BA1- 0BA5:
The mathematic instruction function block did not exist prior to 0BA6.

Parameters V1, V2, V3, and V4

The values V1, V2, V3, and V4 can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq

- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Parameter p (number of decimals)

Parameter p applies to the display of V1, V2, V3, V4 and AQ in a message text.

Description of the function

The mathematic instruction function combines the four operands and three operators to form an equation. The operator can be any one of the four standard operators: +, -, *, or /. For each operator, you must set a unique priority of High ("H"), Medium ("M"), or Low ("L"). The high operation will be performed first, followed by the medium operation, and then by the low operation. You must have exactly one operation of each priority. The operand values can reference another previously-defined function to provide the value. The mathematic instruction function rounds the result to the nearest integer value.

The number of operand values is fixed at four and the number of operators is fixed at 3. If you need to use fewer operands, use constructions such as " + 0" or " * 1" to fill the remaining parameters.

You can also configure the behavior of the function when the Enable parameter "En"=0. The function block can either retain its last value or be set to 0.

Possible errors: Zero division and overflow

If the mathematic instruction function block execution results in zero division or overflow, it sets internal bits that indicate the type of error that occurred. You can program an mathematic instruction error detection function block in your circuit program to detect these errors, and to control the program behavior as needed. You program one mathematic instruction error detection (Page 487) function block to reference one specific mathematic instruction function block.

Examples

The following tables show some simple example mathematic instruction block parameters, and the resulting equations and output values:

V1	Operator1 (Priority 1)	V2	Operator2 (Priority 2)	V3	Operator3 (Priority 3)	V4
12	+ (M)	6	/ (H)	3	- (L)	1

Equation: (12 + (6 / 3)) - 1
Result: 13

V1	Operator1 (Priority 1)	V2	Operator2 (Priority 2)	V3	Operator3 (Priority 3)	V4
2	+ (L)	3	* (M)	1	+ (H)	4

Equation: 2 + (3 * (1 + 4))
Result: 17

V1	Operator1 (Priority 1)	V2	Operator2 (Priority 2)	V3	Operator3 (Priority 3)	V4
100	- (H)	25	/ (L)	2	+ (M)	1

Equation: (100 – 25) / (2 + 1)
Result: 25

Special functions (Page 340)

5.3.3.9 Analog filter (0BA7 and later versions only)

Short Description

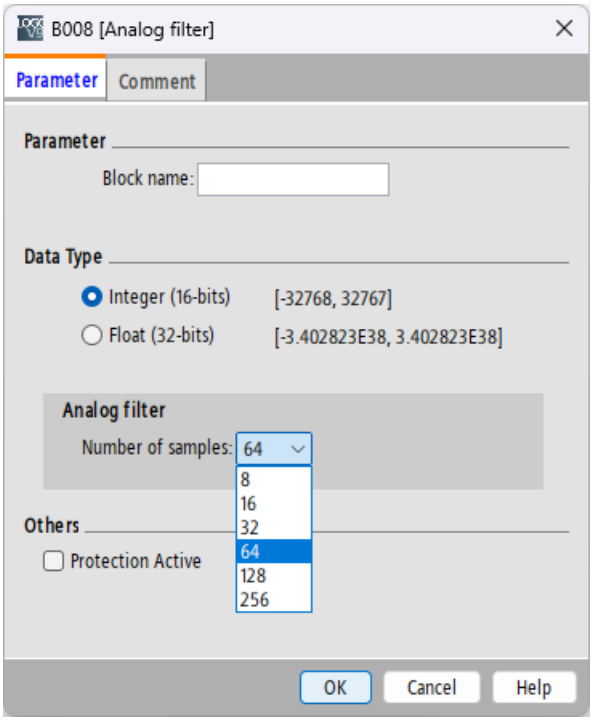
The Analog filter function block is used to smooth the analog input signal.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description
Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1] [2]
Parameter	**Sn** (Number of samples): determines how many analog values are sampled within the program cycles that are determined by the set number of samples. LOGO! samples an analog value within every program cycle. The number of program cycles is equal to the set number of samples. Possible settings: 8, 16, 32, 64, 128, 256
Output **AQ**	**AQ** outputs an average value of the analog input **Ax** over the current number of samples, and it is set or reset depending on the analog input and the number of samples.
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data. [2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data. [3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value). [4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).	

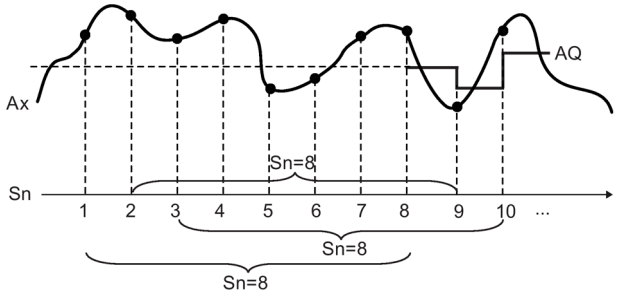
Parameter

You can set the number of samples to the following values:



After you set the parameter, the analog filter calculates the average value of the samples and assigns this value to AQ.

Timing diagram



Description of function

The function outputs the average value after sampling the analog input signal according to the set number of samples. This SFB can reduce the error of analog input signal.

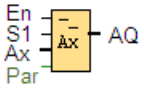
Note

You can use up to 16 analog filter function blocks in the circuit program for LOGO! 9.

You can use up to eight analog filter function blocks in the circuit program for LOGO! 0BA7 or 0BA8.

Special Functions Overview (Page 340)

5.3.3.10 Max/Min (0BA7 and later versions only)



Short description

The Max/Min function block records the maximum or minimum value.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description
Input **En**	The function of input En (**En**able) depends on the settings of parameter Mode and the selection of check box "when En = 0, reset Max/Min".
Input **S1**	This input is enabled when you set **Mode =2:** A positive transition (0 to 1) at input **S1** sets the output **AQ** to the maximum value. A negative transition (1 to 0) at input **S1** sets the output **AQ** to the minimum value.

Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1] [2]
Parameter	**Mode** Possible settings: 0, 1, 2, 3 Mode = 0: AQ = Min Mode = 1: AQ = Max Mode = 2 and S1= 0 (low): AQ = Min Mode = 2 and S1= 1 (high): AQ = Max Mode = 3 or a block value is referenced: AQ = Ax
Output **AQ**	**AQ** outputs a minimum, maximum, or actual value depending on the inputs, or is reset to 0 if configured to do so when function is disabled
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data. [2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data. [3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value). [4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).	

Parameter Mode

You can set the values for parameter **Mode** based on the actual values of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq

- Analog ramp: Aq
- Mathematic instruction: Aq
- Up/Down counter: Cnt
- Threshold trigger: Fre
- Max/Min: Ax
- PI controller: Aq
- Analog filter (0BA7 only): Aq
- Average value (0BA7 only): Aq
- On-delay: Ta
- Off-delay: Ta
- On-/Off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay (pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway lighting switch: Ta
- Multiple functions switch: Ta
- Stopwatch (0BA7 only): Aq

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

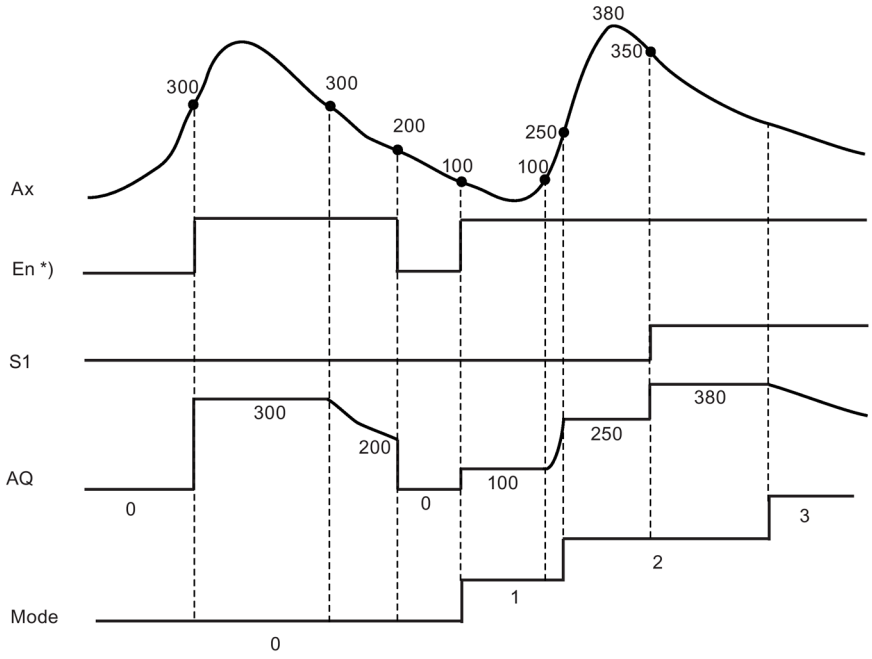
- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

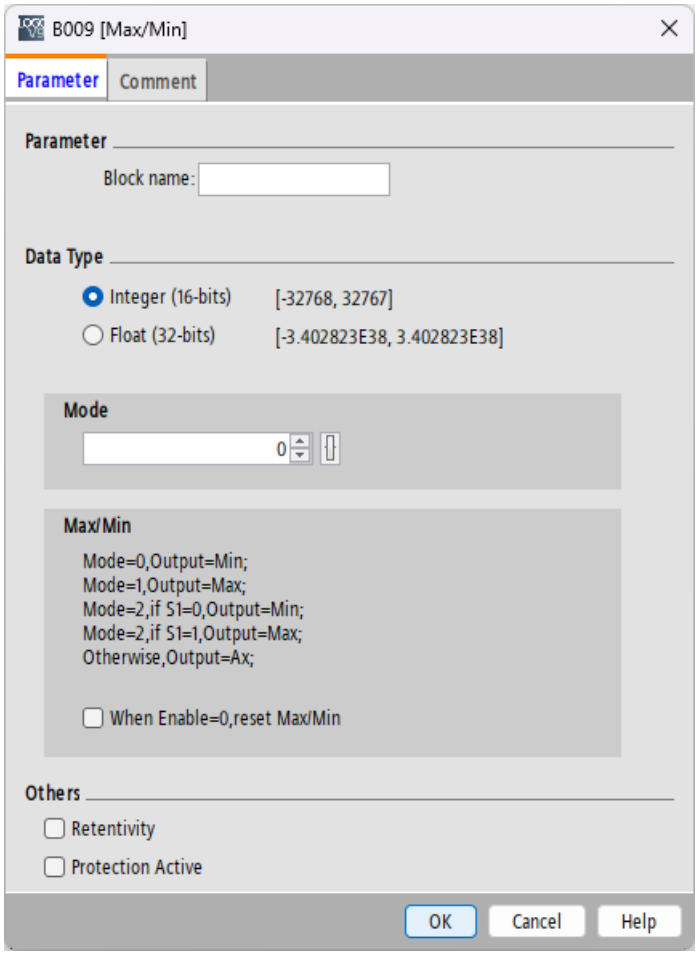
You can select the required function by the block number.

Timing diagram



*) If you select the check box "when En = 0, reset Max/Min"

Description of the function



If you select the check box "when Enable = 0, reset Max/Min":

- Enable = 0: The function sets the AQ value to 0.
- Enable = 1: The function outputs a value at AQ, depending on the settings of Mode and S1.

If you do not select the check box "when Enable = 0, reset Max/Min":

- Enable = 0: The function holds the value of AQ at the current value.
- Enable = 1: The function outputs a value at AQ, depending on the settings of Mode and S1.

Mode = 0: The function sets AQ to the minimum value

Mode = 1: The function sets AQ to the maximum value

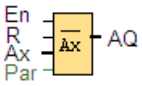
Mode = 2 and S1 = 0: The function sets AQ to the minimum value

Mode = 2 and S1 = 1: The function sets AQ to the maximum value

Mode = 3 or a block value is referenced: The function outputs actual analog input value.

Special functions (Page 340)

5.3.3.11 Average value (0BA7 and later versions only)



Short description

The average value function samples the analog input signal during configured time period and outputs the average value at **AQ**.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

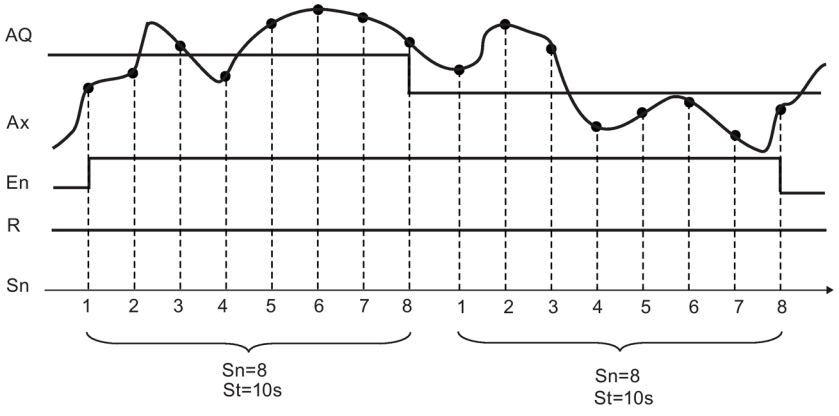
Connection	Description
Input **En**	A positive edge (0 to 1 transition) at input En (**En**able) sets the output **AQ** to the average value of input Ax after the configured time. A negative edge (1 to 0 transition) holds the output at its last calculated value.
Input **R**	A positive edge (0 to 1 transition) at input R (**R**eset) resets the output AQ to 0.
Input **Ax**	Input **Ax** is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1] [2]

Parameter	**St** (Sampling time): You can set it to Seconds, Days, Hours or Minutes. Range of values: If St = Seconds: 1 to 59 If St = Days: 1 to 365 If St = Hours: 1 to 23 If St = Minutes: 1 to 59 **Sn** (Number of samples): Range of values: If St = Seconds: 1 to St*100 If St = Days: 1 to 32767 If St = Hours: 1 to 32767 If St = Minutes and St ≤ 5 minutes: 1 to St * 6000 If St = Minutes and St ≥ 6 minutes: 1 to 32767
Output **AQ**	**AQ** outputs the average value over the specified time of sampling. When Sn = 1, AQ is the last value of Ax.
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data. [2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data. [3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000 (internal value). [4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).	

Parameter St and Sn

Parameter **St** represents the sampling time and parameter **Sn** represents the number of samples.

Timing diagram



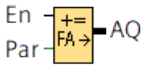
Description of the function

When **En** = 1, the average value function calculates the average value of the samples during the configured time interval. At the end of the sampling time, this function sets output **AQ** to this calculated average value.

When **En** = 0, the calculation stops, and **AQ** retains the last calculated value. When **R** = 0, **AQ** is reset to 0.

Special functions (Page 340)

5.3.3.12 Float calculation instruction (LOGO! 9 and later versions)



Short Description

The float calculation instruction block calculates the float output of an equation formed from the user-defined operands and operators. The float calculation instruction supports two kinds of operator input: Standard and Advances.

Connection	Description
Input **En**	A positive edge at input En enables the float calculation instruction function block
Parameter	The operand values are float: **V1:** Value 1: First operand **V2:** Value 2: Second operand **V3:** Value 3: Third operand **V4:** Value 4: Fourth operand Range of values: -3.402823E+38 to +3.402823E+38
Output **AQ**	The output AQ is the result of the equation formed from the operand values and operators.

0BA1- 0BA8:
The float calculation instruction function block did not exist prior to LOGO! 9.

Parameter V1, V2, V3, and V4

The values V1, V2, V3, and V4 can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt
- On-delay: Ta

- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre
- Float/Integer converter: eAq
- Integer/Float converter: eAq
- Float calculation instruction: Aq

You select the required function by the block number.

Description of the function

The float calculation instruction combines four operands and the formula editor. You can input the operand values or reference the actual value of another previously-defined function.

For the mathematic formula, LOGO!Soft Comfort support the standard and advanced mathematic formula. You can use the keyboard in LSC to input up to 100 characters, and up to 11 numbers and operators.

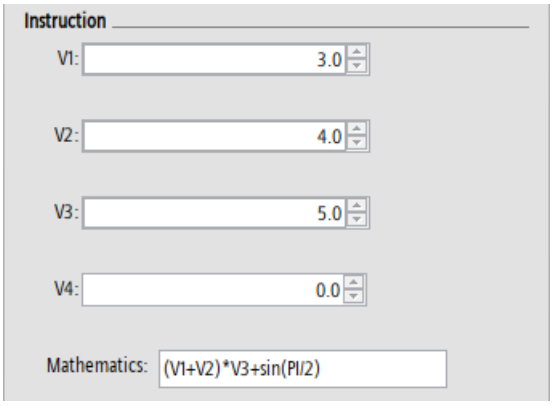
You can also configure the behavior of the function when the Enable parameter "En"=0. The function block can either retain its last value or be set to 0.

Possible errors: Zero division, overflow or invalid value

If the float calculation instruction function block execution results in zero division, overflow or invalid value, it sets internal bits that indicate the type of error that occurred. You can program an mathematic instruction error detection function block in your circuit program to detect these errors, and to control the program behavior as needed. You can program one mathematic instruction error detection (Page 487) function block to reference one specific mathematic instruction function block.

Example

The following is an example of float calculation instruction parameters, equation and the output value.



Result: 36.0

Special functions (Page 340)

5.3.4 Analog value processing

5.3.4.1 Basics

Analog and digital

An analog signal is a physical quantity, which, within a given range, can adopt any value - any continuous intermediate value. The opposite of analog is *digital*. A digital signal knows just two states: 0 and 1 or "off" and "on".

From electrical signal to analog value

Basic order of events

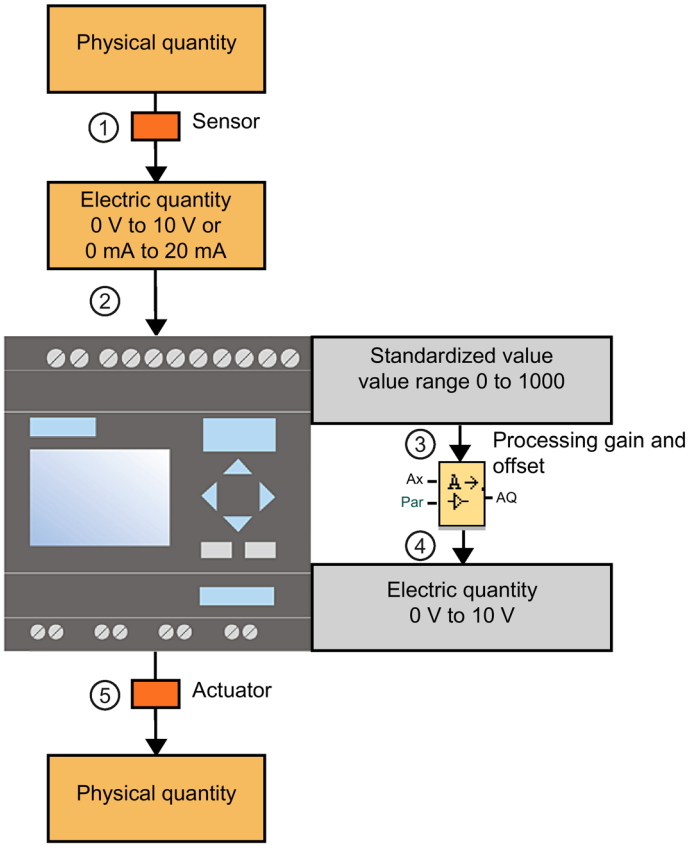
Several steps are required for LOGO! to process physical quantities:

1. LOGO! can read in electric voltages from 0 V to 10 V or electric currents from 0 mA to 20 mA to one analog input.
   The physical quantities (for example, temperature, pressure, speed etc.) must therefore be converted into one electric quantity. This conversion is performed by an external sensor.
2. LOGO! reads in the electric quantity and, with further processing, converts it into a standardized value within the range 0 to 1000. This value is then used in the circuit program as the input of an analog special function.
3. In order to adapt the standardized value to the application, LOGO! uses an analog special function, while taking into consideration the gain and offset, to calculate the analog value. The analog value is then evaluated by the special function (for example, analog amplifier). If

an analog special function has an analog output, then the analog value is used as the output of the special function.

4. With the LOGO! you can also convert analog values back into an electric voltage. In doing so, the voltage can adopt values between 0 V and 10 V.
5. Using this voltage, LOGO! can control an external actuator, which converts the voltage and also the analog value back into a physical quantity.

The following diagram illustrates this order of events.



Gain

The standardized value is multiplied with a parameter. Using this parameter you can boost the electric quantity; hence, this parameter is called the "gain".

Zero point offset

You can add or subtract a parameter to or from the boosted standardized value.

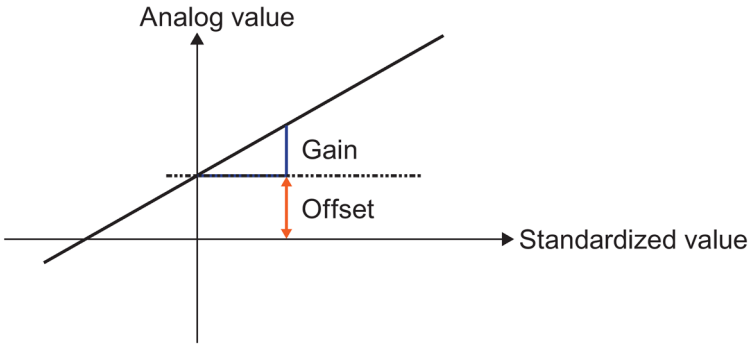
Using this parameter you can move the zero point of the electric quantity; hence, this parameter is called the "zero point offset".

Gain and offset

The analog value is therefore calculated as follows:

Analog value = (standardized value x gain) + offset

The following diagram illustrates this formula and the significance of gain and offset:



The straight line in the graphic describes which standardized value is being converted into which analog value. Gain corresponds to the slope of the straight line and offset to the movement of the zero point of the straight line on the y-axis.

Analog output

If you connect a special function (that has an analog output) to a **real** analog output, then note that the analog output can only process values from 0 to 1000.

Possible settings with LOGO!Soft Comfort (Page 427)

Possible settings with LOGO! (Page 429)

Example: Heating Control (Page 430)

0BA0 to 0BA4 (Page 431)

5.3.4.2 Possible settings with LOGO!Soft Comfort

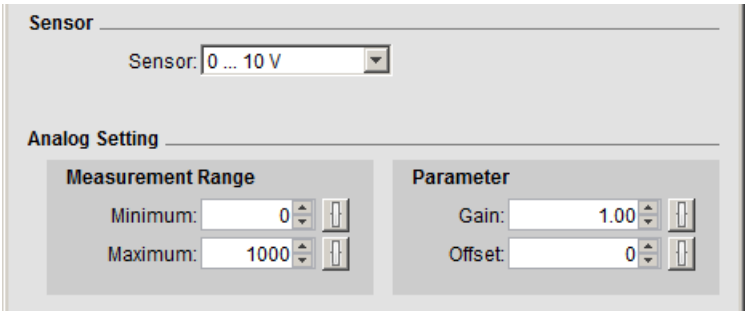
Sensor

Set your sensor type. (0 V to 10 V; 0 mA to 20 mA; 4 mA to 20 mA; PT100/PT1000; no sensor)

With sensor type 4 mA to 20 mA the value range for the standardized value is 200 and 1000.

Measurement range

Stipulate the measurement range. The measurement range is the value range shown for the analog value.



LOGO!Soft Comfort then automatically calculates the gain and offset from this.

Gain and offset

If you want to set the gain, you can enter values between -10.00 and 10.00. The value 0 makes no sense, as, irrespective of the applied analog value, you will always obtain the value 0 as a result.

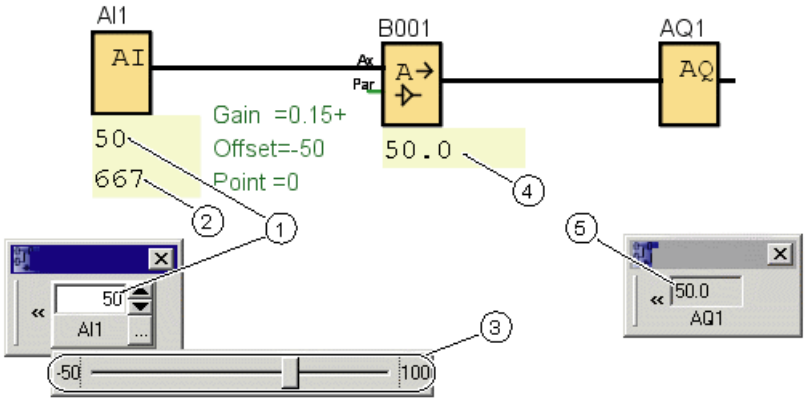
If you wish to set the offset, enter values between -10000 and 10000.

Rounding error

LOGO!Soft Comfort calculates the gain and zero point offset with utmost precision, while LOGO! calculates internally using whole numerical values; therefore, not all parameter combinations are possible on LOGO!. In this case, prior to transferring to LOGO!, LOGO!Soft Comfort detects a rounding error and proposes a possible replacement value range.

Simulation in LOGO!Soft Comfort

With simulation in LOGO!Soft Comfort you can read the following values:



① Physical value; the ranges are stipulated by the measuring range (3)
② Standardized value
③ Measurement range
④ Analog value (after processing gain and offset)
⑤ Analog value on the analog output

5.3.4.3 Possible settings with LOGO!

If you directly program your circuit program on the LOGO!, then you can only enter the gain and offset parameters. You can calculate the gain and offset as follows:

External value range min_{Sensor} - max_{Sensor}:

Range of a physical quantity that the sensor can measure.

Standardized value range min_{norm} - max_{norm}:

Value range of the standardized values.

With sensors that provide 0 to 10 V or 0 to 20 mA, the standardized value range is 0 – 1000.

With sensors that provide 4 to 20 mA, the standardized range is 200 – 1000.

So for gain and offset it follows:

Gain = (max_{Sensor} - min_{Sensor}) / (max_{norm} – min_{norm})

Offset = [(min_{Sensor} x max_{norm}) – (max_{Sensor} x min_{norm})] / (max_{norm} – min_{norm})

If you have calculated either the gain or the offset in accordance with the formulas above, you can then calculate the respective other value in accordance with the following formula:

Gain = (min_{Sensor} - Offset) / min_{norm}

Offset = (min_{Sensor} – (Gain x min_{norm})

5.3.4.4 Example

Prerequisites

Sensor: temperature sensor, measuring range: -50 °C to 100 °C

Temperature to be measured: 25 °C

Order of events with LOGO!Soft Comfort

1. The sensor converts the temperature from 25 °C to a voltage value of 5.0 V.
2. LOGO!Soft Comfort converts the 5.0 V to the standardized value 500.
3. Using the sensor and measurement range data, LOGO!Soft Comfort calculates and ascertains the value 0.15 for the gain and the value -50 for the offset.
   According to the formula:
   Analog value = (standardized value × gain) + offset
   LOGO!Soft Comfort calculates as analog value:
   Analog value = (500 × 0.15) - 50 = 25

Order of events with LOGO!

1. The sensor converts the temperature from 25 °C to a voltage value of 5.0 V.
2. LOGO! converts the 5.0 V to the standardized value 500.
3. From the sensor and measuring range data, you must establish the values for gain and offset.
   According to the formulas:
   $\text{Gain} = (\text{max}_{\text{Sensor}} - \text{min}_{\text{Sensor}}) / (\text{max}_{\text{norm}} - \text{min}_{\text{norm}})$
   and
   $\text{Offset} = \text{min}_{\text{Sensor}} - (\text{Gain} \times \text{min}_{\text{norm}})$
   it follows that
   Gain = (100 – (-50)) / (1000 – 0) = 0.15
   Offset = -50 – (0.15 × 0) = -50
4. According to the formula
   Analog value = (standardized value × gain) + offset
   LOGO! calculates as analog value:
   Analog value = (500 × 0.15) - 50 = 25

Additional examples

Physical quantity	Electric quantity of sensor	Standardized value	Gain	Offset	Analog value
	0 V 5 V 10 V	0 500 1000	0.01	0	0 5 10
	4 mA 12 mA 20 mA	0 500 1000	10	0	0 5000 10000

Physical quantity	Electric quantity of sensor	Standardized value	Gain	Offset	Analog value
	0 mA 10 mA 20 mA	0 500 1000	1	50	50 550 1050
1000 mbar 3700 mbar 5000 mbar	O V 6.75 V 10 V	0 675 1000	4	1000	1000 3700 5000
-30 °C 0 °C 70 °C	0 mA 6 mA 20 mA	0 300 1000	0.1	-30	-30 0 70

5.3.4.5 0BA0 to 0BA4

Restriction for device family 0BA4

The Gain cannot be a negative value.

Calculation with the device families 0BA0 to 0BA3

With LOGO! devices from these device families, LOGO! adds or subtracts the parameter offset to or from the standardized value **before** multiplying the value with the parameter gain.

Therefore, the following formulas apply:

Analog value = (standardized value + offset) x (gain x 100)

Gain (in percent) = (max_{Sensor} - min_{Sensor}) / [(max_{norm} – min_{norm}) x 100]

Offset = [(min_{Sensor} x max_{norm}) – (max_{Sensor} x min_{norm})] / (max_{Sensor} – min_{Sensor})

Gain (in percent) = min_{Sensor} / [(min_{norm} + offset) x 100]

Offset = [max_{Sensor} / (gain x 100)] - max_{norm}

Gain

This parameter is given in %.

The Gain (Page 425) cannot be a negative value.

Zero point offset

You can enter values between -999 and +999 for the zero point offset (Page 425).

5.3.5 Control and regulate

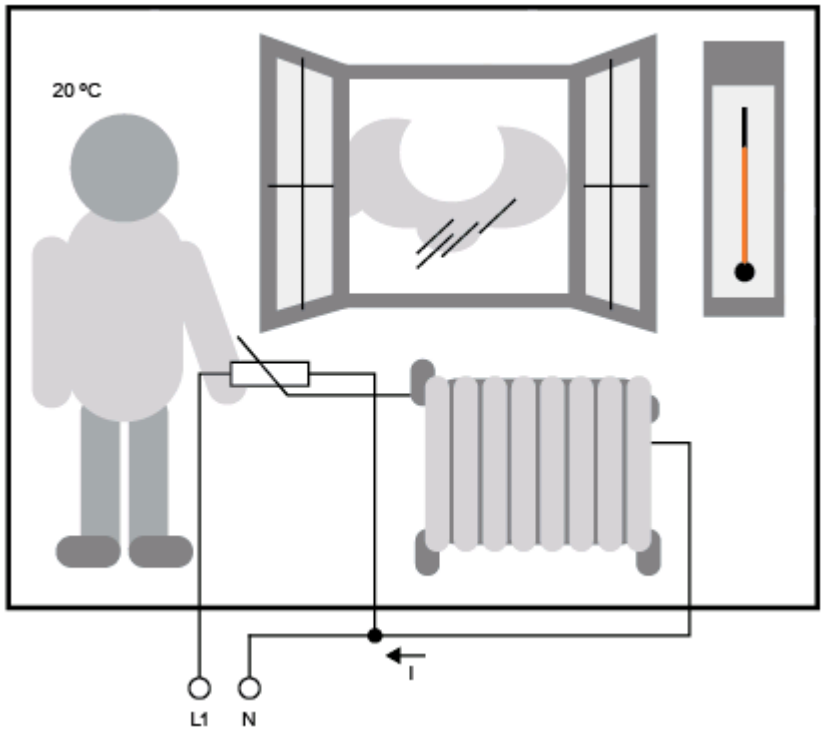
5.3.5.1 Control and regulate basics

In engineering, quantities can be both controlled and regulated.

Controlling manipulates a quantity without being able to compensate for outside influences. Regulating maintains a quantity at a specific value in order to compensate for outside influences.

In the following example, controlling means that the person can set the heat output at a fixed value. The heater cannot compensate for the drop in room temperature when a window is opened.

In the example below, regulating means that the person can increase the heat output if the room temperature drops below 20 °C. If the room temperature rises above 20 °C, the heat output is reduced.

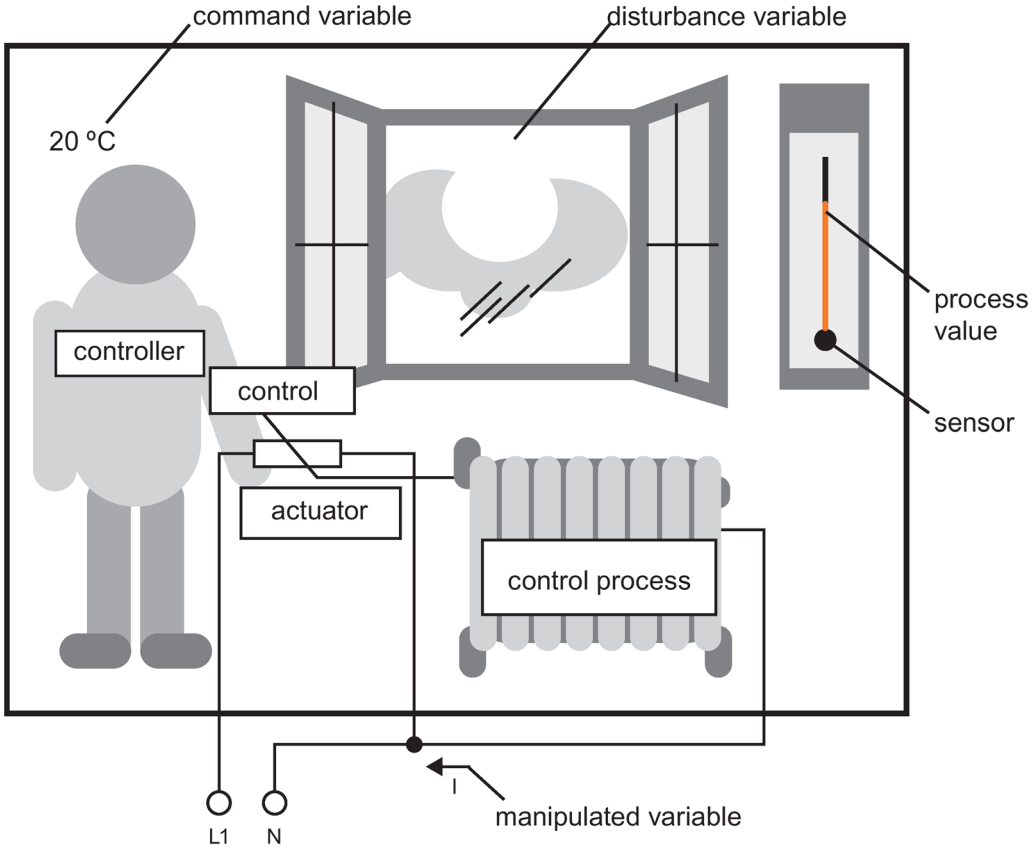


Basic concepts of regulating

In the example, the current for the electric heating is the **manipulated variable**. The changeable resistance is the **actuator**. The hand that operates the actuator is the **control**. The actual room temperature is the controlled variable or the **process value**. The desired room temperature is the **command variable** or the setpoint value. The electric heating is the **control process**. The thermometer is the **sensor**. The temperature loss from opening the window is the **disturbance variable**.

So this means that the person measures the process value (room temperature) with the sensor (thermometer), compares the process value (room temperature) with the command

variable (desired room temperature) and uses the actuator (changeable resistance) to manually regulate the manipulated variable (heating current), in order to compensate for the disturbance variable (temperature drop from opening the window). The person is therefore the controller.

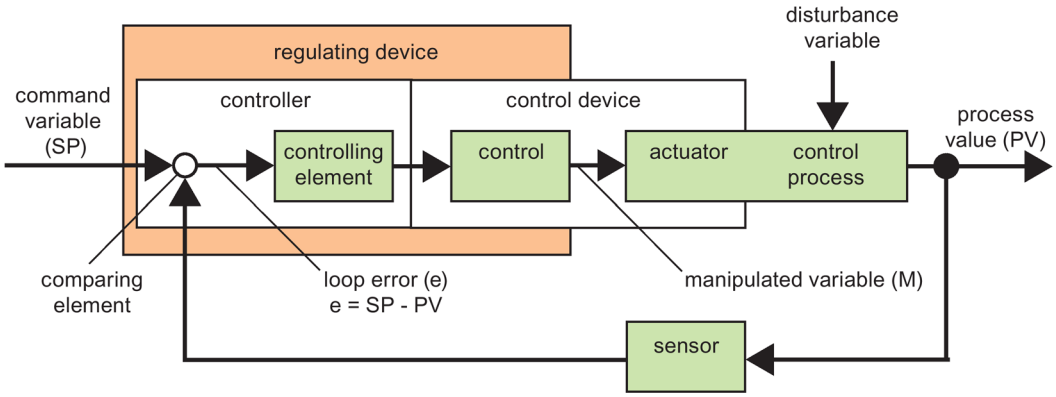


The **control device** consists of the actuator and the control.

The control and controller together form the **regulating device**.

The following picture gives an abstract portrayal of the situation described above.

The comparing element uses the sensor to compare the command variable with the process value. If the command variables and process value deviate from one another, this results in a positive or negative loop error that in turn changes the process value.



Control loop

The process value x influences the manipulated variable M by means of the regulating device. This creates a closed circuit that is also known as a **control loop**.

If, in the example above, the window is opened, the temperature in the room drops. The person must increase the heat output of the heater. If the heat output increases too much, it gets too hot. The person must then reduce the heat output.

If the heat output increases or reduces too quickly, then the control loop starts to oscillate. The room temperature fluctuates. It is either too hot or too cold. To prevent this, the person must carefully and slowly reduce or increase the heat output.

Loop error

The loop error is the difference between the command variable and the process value. In other words: the deviation of a process value from a set value.

e = SP – PV

The loop error e brings about a change to the manipulated variable M.

The example above illustrates this very well: if, with a desired temperature of 20 °C (= command value w), the room temperature is 22 °C (= process value PV), this results in the loop error:

e = SP – PV = 20 °C - 22 °C = -2 °C

In this case, the negative sign indicates a reversing action: the heat output reduces.

In a control loopstate of equilibrium, the loop error is zero or very small. If the command variable changes or there is a disturbance, a loop error arises. The manipulated variable M corrects the loop error.

Controller basics (Page 435)

Description of the individual parameters (Page 438)

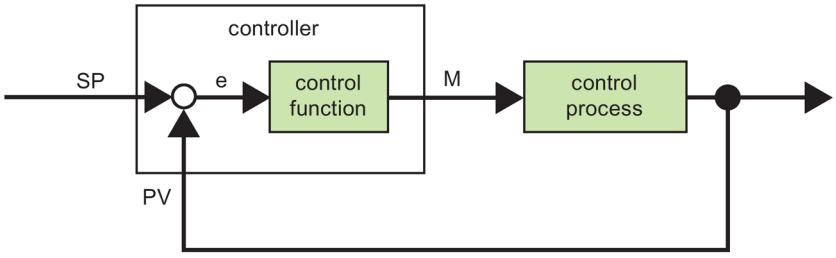
PI controller (Page 439)

Heating control (Page 306)

Analog ramp (Page 443)

5.3.5.2 Controller basics

A controller can be simply portrayed as follows:



The comparing element and the controller function describe the conduct of the controller.

The following describes the most important types of controller. A controllerstep response tells us a lot about its conduct. The step response describes how a controller reacts to the erratic change in the process value.

The three basic types of controllers are as follows:

- Proportional-action controller (P controller)
- Integral-action controller (I controller)
- Differential-action controller (D controller – not described here)

Controllers can combine the three types. For example, a PI controller is a proportional/integral controller.

P Controller

A proportional-action controller (P controller) changes the manipulated variable M proportional to the loop error. The P controller works immediately. By it cannot drive the loop error to zero.

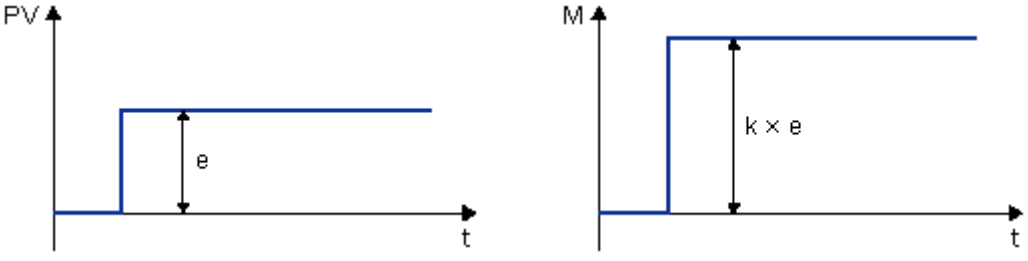
$M_{Pn} = k_P \times e_n$

M_{Pn}: Manipulated variable of the P controller at the time n

k_P: Gain of the P controller

e_n: Loop error at the time n

The following picture shows a jump in process value and step response of the controller:



Summary

The P controller has the following characteristics:

- It cannot correct faults with the control process > lasting loop error.
- It reacts immediately to a change in the process value.
- It is stable.

I Controller

An integral-action controller (I controller) changes the manipulated variable M proportional to the loop error and to the time. The I controller works by delayed action. It completely remedies a loop error.

In order to calculate the value of the manipulated variable at a period of time **n**, the time up until this period of time must be divided into small time slices. The loop errors at the end of each time slice must be added up (integrated) and they are then entered in the calculation.

$M_{In} = k_I \times (T_S / T_I) \times (e_n + e_{n-1} + e_{n-2} + e_{n-3} + \ldots + e_0) = k_I \times (T_S / T_I) \times e_n + M_{In-1}$

M_{In}: Manipulated variable of the I controller at the time n

M_{In-1}: Manipulated variable of the I controller at the time n-1; also called integral sum

k_I: Gain of the I controller

T_S: Sampling time, duration of a time slice

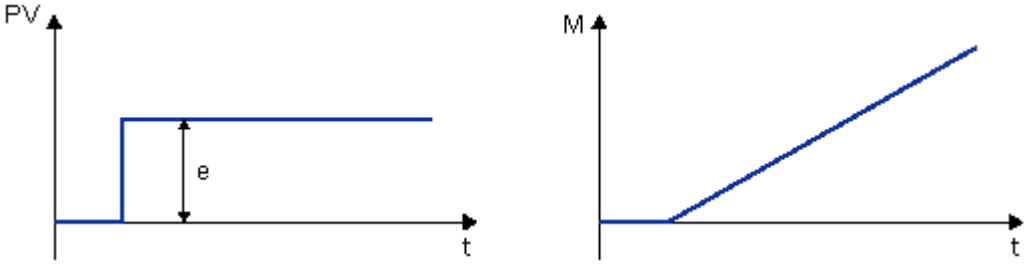
T_I: Integral time: by means of this time, the influence of the integral part is controlled on the manipulated variable, also known as integral-action time

e_n: Loop error at the time n

e_{n-1}: Loop error at the time n-1; etc.

e_0: Loop error at the beginning of the calculations

The following picture shows a jump in process value and step response of the controller:



Summary

The I controller has the following characteristics:

- It sets the process value exactly to the command variable.
- By so doing, it tends to oscillate and is unstable.
- It requires more time to carry out the control action than the P controller .

PI controller

A PI controller reduces the loop error immediately and will eventually drive the loop error to zero.

$M_n = M_{Pn} + M_{In} = k_P \times e_n + k_I \times (T_S / T_I) \times e_n + M_{In-1}$

M_n: Manipulated variable at the time n

M_{Pn}: Proportional part of the manipulated variable

M_{In}: Integral part of the manipulated variable

M_{In-1}: Manipulated variable of the I controller at the time n-1; also called integral sum

k_P: Gain of the P controller

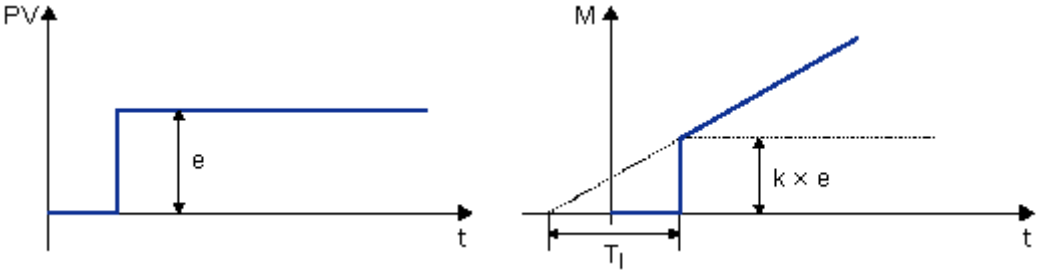
k_I: Gain of the I controller

T_S: Sampling time, duration of a time slice

T_I: Integral time; by means of this time the influence of the integral part is controlled on the manipulated variable, also known as the integral-action time

e_n: Loop error at the time n

The following picture shows a jump in process value and step response of the controller:



Summary

The PI controller has the following characteristics:

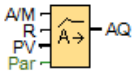
- The P controller components quickly intercept an occurring loop error.
- The I controller components can then remedy the remaining loop error.
- The controller components supplement each other so that the PI controller works quickly and precisely.

5.3.5.3 Description of the individual parameters

Controller parameters	Portrayed in LOGO!	Possible value range in the LOGO!
Mn Manipulated variable at the time n	Output of the PI controller block	0 to 1000
kP Gain of the P part kI Gain of the I part	In the LOGO!, the parameter KC applies as an increase for the I part and the P part of the controller equally Should you enter KC=0, then the P part of the controller switches off. In this special case, k is automatically set to 1 for the I part. If KC = 0: kP = 0 and kI = 1 If KC ≠ 0: kP = kI = KC	0.00 to 99.99
T_S Sampling time, duration of a time slice	Fixed	500 ms
T_I Integral time	Parameter T_I: if you set this parameter to 99.59 min, then you switch off the I part of the controller.	00:01 min to 99.59 min
e_n Loop error at the time n; generally applies: E = SP - PV	Refer to SP and PV	"
SP	The parameter SP is the set-value assignment w. For this parameter you can use the analog output of a different special function.	-10000 to +20000
PV	PV is the process value x and is calculated as follows: PV = analog value on input * gain) + offset. You can connect the input for example by means of an analog input with a PT100 sensor.	"
	The gain parameter has an effect on PV	0.0 to 10.0
	The offset parameter has an effect on PV	-10000 to +20000
	PV is restricted by the parameters Min. and Max.	In each case: 10000 to +20000
	The Dir parameter gives the action direction of the controller. Positive means: If set value > process value then the process value is increased; if set value < process value then the process value is reduced. Negative means: If set value > process value then the process value is reduced; if set value < process value then the process value is increased. Example, heat regulation: if the set value is greater than the process value (room is too cold), the manipulated variable increases the process value.	- or +

Refer to the PI controllers - description of special function for more details (for example, switching from manual to automatic mode, parameter sets, etc.).

5.3.5.4 PI controller



Short description

A PI controller is a proportional-action and integral-action controller. You can use both proportional action and integral action individually or combined.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	**Description**		
Input **A/M**	Set the mode of the controller: 1: automatic mode 0: manual mode		
Input **R**	Use the input R to reset the output AQ. As long as this input is set, the input A/M is disabled. The output AQ is set to 0.		
Input **PV**	Analog value: process value, influences the output		
Parameter	Range of values	Integer	Float
	Min.: Minimum value for PV	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	-3.402823E38 to +3.402823E38
	Max.: Maximum value for PV	• Analog resolution 0 - 1000: -20000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Gain	• Analog resolution 0 - 1000: -10.00 to 10.00 • Analog resolution 0 - 4095: -10.00 to 10.00 • Analog resolution 0 - 10000: -10.00 to 10.00	
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	SP: Set-value assignment	• Analog resolution 0 - 1000: -10000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	Mq: Value from AQ with manual mode	• Analog resolution 0 - 1000: 0 to 1000 • Analog resolution 0 - 4095: 0 to 4095 • Analog resolution 0 - 10000: 0 to 10000	
	KC: Gain	00.00 to 99.99	
	TI: Integral time	00:01 min to 99:59 min	00:01 min to 99:59 min
	Dir: Action direction of the controller	Possible settings: + or -	Possible settings: + or -
	p: Number of decimal places	Possible settings: 0, 1, 2, 3	/

Connection	Description		
Output **AQ**	Analog output (manipulated variable)	0 to 1000	-3.402823E38 to +3.402823E38

Parameters SP and Mq

The actual value of another already-programmed function can provide the set-value SP and the value for Mq:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

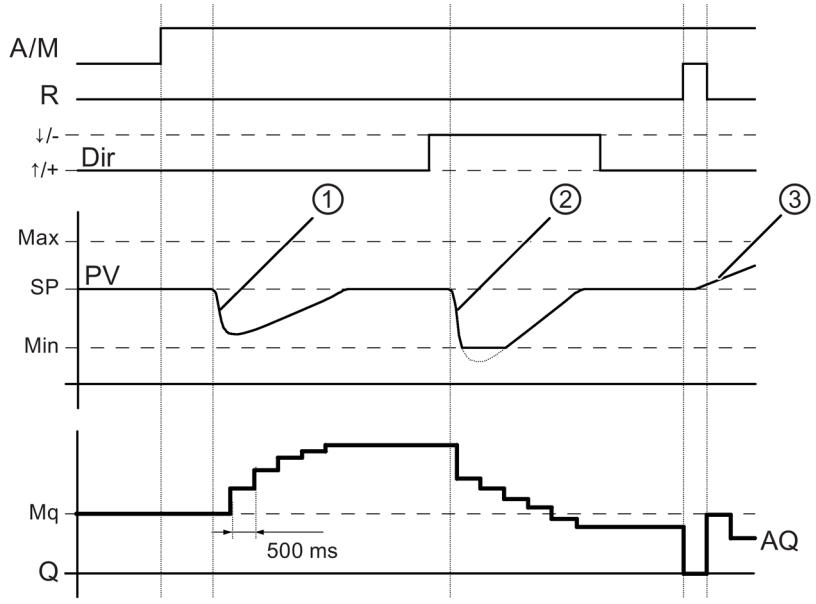
You select the required function by the block number.

Parameter P (number of decimal places)

Parameter p only applies for displaying the values from PV, SP, Min. and Max. in a message text.

Timing diagram

The nature, manner and speed with which the AQ changes depends on the parameters KC and TI. Thus, the course of AQ in the diagram is merely an example. A control action is continuous; therefore the diagram portrays just an extract.



① A disturbance causes the PV to drop, as Dir is positioned upwards, AQ increases until PV corresponds again to SP.

② A disturbance causes the PV to drop, as Dir is positioned downwards, AQ decreases until PV corresponds again to SP.

Dir is coordinated to the basic conduct of a control loop. The direction (dir) cannot be changed during the term of the function. The change in Dir here is shown for the purposes of clarification.

③ As the input R sets AQ to 0, PV changes. This is based on the fact that PV increases, which on account of Dir = upwards causes AQ to drop.

PI controller trend view in simulation or online test

When you view the circuit program in an Online test (Page 50) or in a simulation (Page 43), LOGO!Soft Comfort displays a trend view of the PI controller showing input PV, output AQ and the parameter SP. The trend view shows the change in AQ and PV over time, in reference to the SP. The time sampling period is configurable, allowing you to see frequent samples over a short amount of time, or less-frequent samples over a longer period of time.

Description of function

If the input A/M is 0, then the special function issues output AQ with the value that you set with parameter Mq.

If the input A/M is 1, then automatic mode commences. As the adopted value Mq is an integral sum, the controller function begins the calculations in accordance with the formulas given in Control and regulate basics (Page 432). Use the updated value PV in the formulas:

Updated value PV = (PV * gain) + offset

If the updated value PV = SP, then the special function does not change the value of AQ.

Dir = upwards/+ (timing diagram numbers 1 and 3)

- If the updated value PV > SP, then the special function reduces the value of AQ.
- If the updated value PV < SP, then the special function increases the value of AQ.

Dir = downwards/- (timing diagram number 2)

- If the updated value PV > SP, then the special function increases the value of AQ.
- If the updated value PV < SP, then the special function reduces the value of AQ.

With a disturbance, AQ increases or decreases until the updated value PV again corresponds to SP. The speed with which AQ changes depends on the parameters KC and TI.

If the input PV exceeds the parameter Max., then the updated value PV is set to the value of Max. If the PV falls short of the parameter Min., then the updated value PV is set to the value of Min.

If the input R is 1, then the AQ output is reset. As long as R is set, the input A/M is disabled.

Sampling time

The sampling time fixs at 500 ms.

Parameter sets

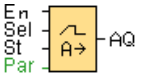
In order to simplify the use of the PI controller, the parameters for KC, TI and Dir are already given as sets for the following applications:

Parameter set	Application example	Parameter KC	Parameter TI (s)	Parameter Dir
Temperature fast	Temperature, cooling control of small spaces; small volumes	0.5	30	+
Temperature slow	Heating, ventilation, temperature, cooling control of large spaces; large volumes	1.0	120	+
Pressure 1	Quick pressure change, compressor control	3.0	5	+
Pressure 2	Slow pressure change, differential pressure control (flow controller)	1.2	12	+
Full level 1	Vat and/or reservoir filling without drain	1.0	99:59	+
Full level 2	Vat and/or reservoir filling with drain	0.7	20	+

Characteristics when configuring

Observe the control and regulate basics (Page 432).

5.3.5.5 Analog ramp



Short Description

The Analog Ramp instruction allows the output to be changed from the current level to the selected level at a specified rate.

LOGO! 9 and later versions support two data types: integer (16-bit) and float (32-bit).

Connection	Description
Input **En**	A change in the status from 0 to 1 at input En (**En**able) applies the start/stop level (Offset "B" + **StSp**) to the output for 100 ms and starts the ramp operation to the selected level. A change in the status from 1 to 0 immediately sets the current level to Offset "B", which makes output AQ equal to 0.
Input **Sel**	Sel = 0: The step 1 (level 1) is selected. Sel = 1: The step 2 (level 2) is selected. A change in status of Sel causes the current level to start changing to the selected level at the specified rate.

Connection	Description		
Input **St**	A change in the status from 0 to 1 at input **St** (Decelerated Stop) causes the current level to decrease at a constant rate until the start/stop level (Offset "B" + StSp) is reached. The start/stop level is maintained for 100 ms and then the current level is set to Offset "B", which makes output AQ equal to 0.		
Parameter	Range of values	Integer	Float
	L1 and **L2**: Levels to be reached; value range for each level	• Analog resolution 0 - 1000: -10000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	-3.402823E38 to +3.402823E38
	MaxL: Maximum value that must not be exceeded.	• Analog resolution 0- 1000: -10000 to 20000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	StSp: Start/Stop offset: value that is added to Offset "B" to create the start/stop level. If the Start/Stop offset is 0, then the start/stop level is Offset "B").	• Analog resolution 0 - 1000: 0 to 20000 • Analog resolution 0 - 4095: 0 to 32767 • Analog resolution 0 - 10000: 0 to 32767	• 0 • +1.175495E-38 to +3.402823E38
	Rate: Speed with which level 1, level 2 or offset is reached. Steps/seconds are issued.	• Analog resolution 0 - 1000: 1 to 10000 • Analog resolution 0 - 4095: 1 to 32767 • Analog resolution 0 - 10000: 1 to 32767	+1.175495E-38 to +3.402823E38
	Gain	• Analog resolution 0 - 1000: 0.00 to 10.00 • Analog resolution 0 - 4095: 0.00 to 10.00 • Analog resolution 0 - 10000: 0.00 to 10.00	-3.402823E38 to +3.402823E38
	Offset	• Analog resolution 0 - 1000: -10000 to 10000 • Analog resolution 0 - 4095: -32768 to 32767 • Analog resolution 0 - 10000: -32768 to 32767	
	p: Number of decimal places	0, 1, 2, 3	/
Output **AQ***	The output **AQ** is scaled using the formula: (Current Level - Offset "B") / Gain "A"	-32768 to 32767	-3.402823E38 to +3.402823E38
*: When AQ is displayed in parameter mode or message mode, it is displayed as an unscaled value (engineering units: current level).			

Parameters Level1 and Level2

The level parameters Level 1 and Level 2 can be provided by the actual value of another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Mathematic instruction: Aq

- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Thresholder trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

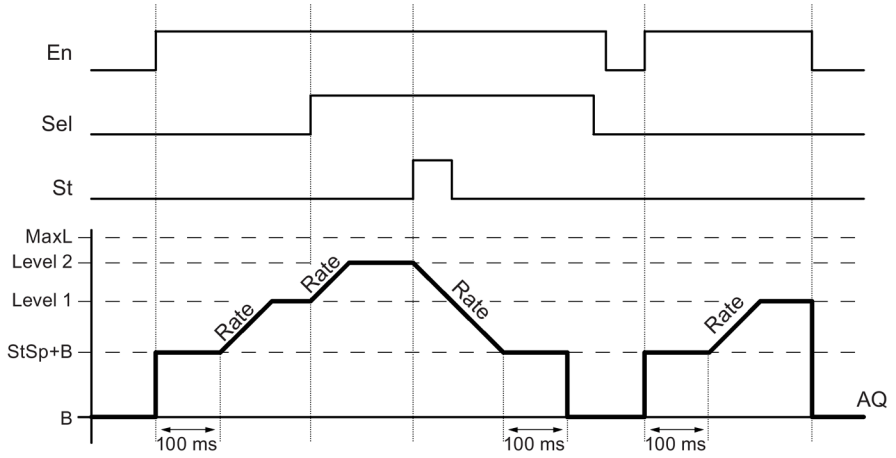
You select the required function by the block number.

Parameter p (number of decimal places)

Parameter p only applies for displaying the values of AQ, level 1, level 2, MaxL, StSp, and Rate in a message text.

Timing diagram for AQ

When the parameter Gain = 1, the timing diagram for AQ is as follows:



Description of function

If the input En is set, then the function sets the value StSp + Offset "B" for 100 ms.

Then, depending on the connection of Sel, the function runs from the level StSp + Offset "B" to either level 1 or level 2 at the acceleration set in Rate.

If the input St is set, the function runs to a level of StSp + B at the acceleration set in Rate. Then the function holds the level at StSp + Offset "B" for 100 ms. After 100 ms, the level is set to Offset "B". Output AQ. The scaled value (output AQ) is 0.

If the input St is set, the function can only be restarted once the inputs St and En have been reset.

If input Sel has been changed, depending on the connection of Sel, the function runs from the current target level to the new target level at the rate that is specified.

If the input En is reset, the function immediately sets the current level to Offset "B".

The current level is updated every 100 ms. Note the relationship between output AQ and the current level:

Output AQ = (current level – Offset "B") / Gain "A"

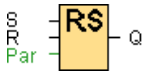
Particular characteristics to be noted when configuring

For help on analog block parameters, refer to the Analog value processing (Page 425) section.

Special functions (Page 340)

5.3.6 Miscellaneous

5.3.6.1 Latching relay

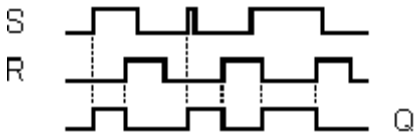


Short description

A signal at input S sets output Q. A signal at input R resets output Q.

Connection	Description
Input **S**	Set output Q with a signal at input S (Set).
Input **R**	Reset output Q with a signal at input R (Reset). Output Q is reset if S and R are both set (reset has priority over set).
Parameter	**Retentivity** set (on) = the status is retentive in memory.
Output **Q**	Q is set with a signal at input S and remains set until it is reset with signal at input R.

Timing diagram



Description of the function

The latching relay represents a simple binary memory logic. The output value depends on the input states and the previous status at the output.

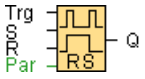
Logic table of the latching relay:

S	R	Q	Remark
0	0	x	Status unchanged
0	1	0	Reset
1	0	1	Set
1	1	0	Reset

When retentivity is enabled, the output signal corresponds with the signal status prior to the power failure.

Special functions (Page 340)

5.3.6.2 Pulse relay

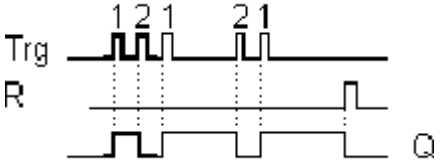


Short description

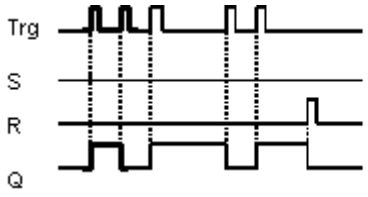
The output is set and reset with a short one-shot at the input.

Connection	Description
Input **Trg**	You switch output Q on or off with a signal at input Trg (Trigger) input.
Input **S**	A one-shot at input S (Set) sets the output to logical 1.
Input **R**	A one-shot at input R (Reset) resets the output to logical 0
Parameter	**Selection:** RS (input R priority), or SR (input S priority) **Retentivity** set (on) = the status is retentive in memory.
Output **Q**	Q is switched on with a signal at Trg and is reset again at the next Trg pulse, if both S and R = 0.

0BA0-0BA3:
The special function does not have an S input and priority preselection.
The following applies to output Q:
Q is switched on with a signal at Trg and is switched off again with the next signal at Trg or R.



Timing diagram



Description of the function

The status of output Q changes with each 0 to 1 transition at input Trg and if both S and R = 0, that is, the output is switched on or off.

Input Trg does not influence the SFB when S = 1 or R = 1.

A one-shot at input S sets the pulse relay, that is, the output is set to logical 1.

A one-shot at input R resets the pulse relay to its initial state, that is, the output is set to logical 0.

Either the input R takes priority over input S (the signal at input S has no effect as long as R = 1), or the input S takes priority over input R (the signal at input R has no effect as long as S = 1), depending on your configuration.

0BA0-0BA3:

The valid function is:
The status at output Q is toggled with each 0 to 1 transition at input Trg, that is, the output is switched on or off.

You reset the pulse relay to its initial state with a one-shot at input, that is, the output is reset to 0.

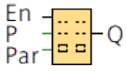
The pulse relay is reset and output Q = 0 after power on or by a reset signal.

Caution

If Trg = 0 and Par = RS, the "Pulse relay" SFB corresponds with the "Latching relay" SFB function.

Special functions (Page 340)

5.3.6.3 LCD message (LOGO! 9 and later versions)

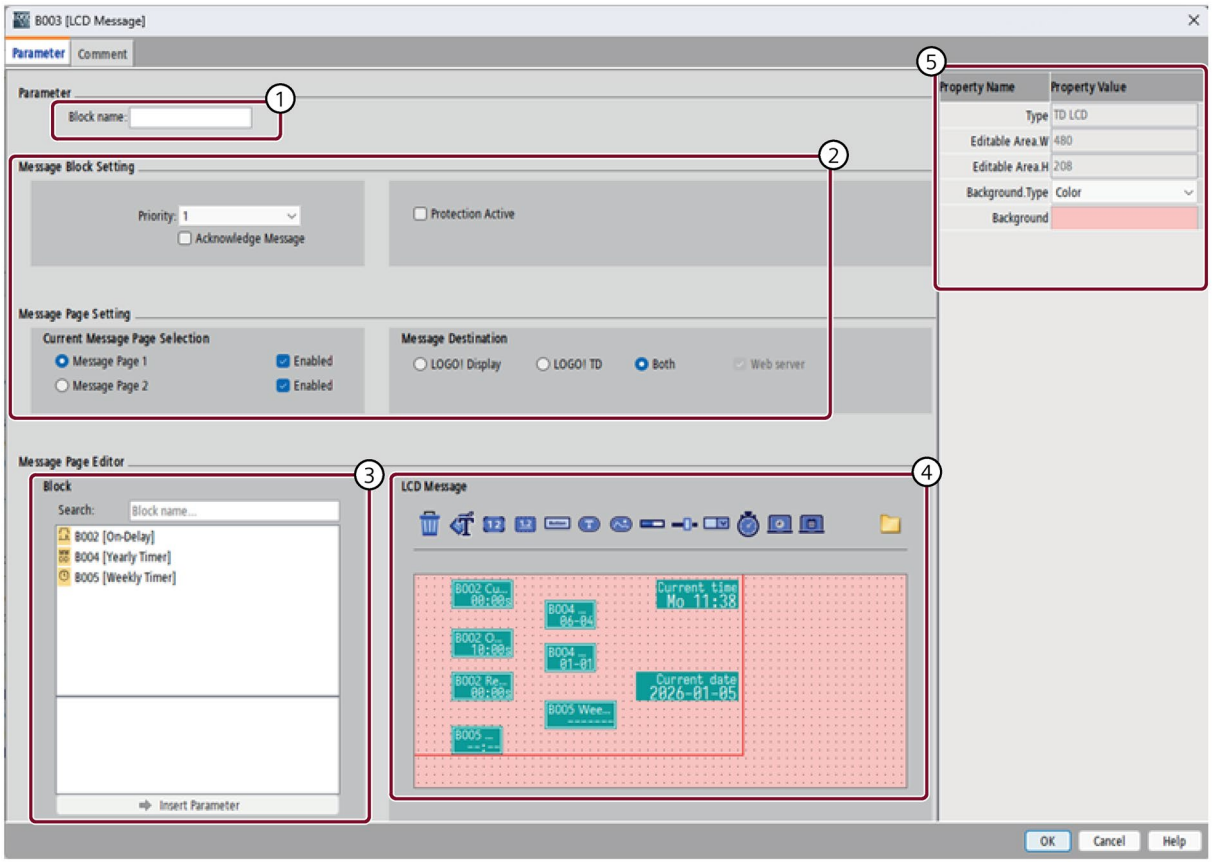


Short description

This function displays message pages and parameters of other blocks on the LOGO! onboard display or LOGO! TDE when LOGO! is in **RUN** mode. Each LCD message function block supports at least one message page and two message pages at most. LOGO! 9 supports up to 50 messages pages in one circuit program.

Connection	Description
Input **En**	A 0 to 1 transition at En (**En**able) triggers the output of the LCD message.
Input **P**	P* is the display priority of the message page in which the FB is used. 0 is the lowest, 127 the highest priority. Ack: Acknowledgement of the LCD message
Parameter	**Text:** Input of the LCD message **Par:** Parameter or actual value of another, already configured function block, which can be displayed numerically or as a bar graph (see "Message widget" and "Function widget").
Output **Q**	Q remains set as long as the LCD message is queued.
* If you want to change the display priority on device screen when the BM is running, you can change it using the Selector widget.	

Block configuration



① Block name

② Settings:

- Message page display priority
- Acknowledge Message: when checked, the message page in the set priority will display and block other message pages display. To close the message acknowledge, press the button in the BM onboard screen tool bar.
- Block protection (out of parameter modification)
- Current message page selection
- Message display destination

③ Block area:

Here you can select blocks from your circuit program. Then you choose parameters from the blocks to display in the message page.

④ Message edition area:

Here you can use message widgets in the message pages.

⑤ Properties pane:

Here you can view and configure properties of message pages or message widgets

Settings

In addition to the function block inputs and the parameters of the LCD message, the following settings provide additional control over the display of the LCD message:

- **Current Message Page Selection:** each LCD Message FB supports 2 message pages at most. You can choose to enable one or two pages. Select the page to configure in the LCD Message configuration area.
- **Message destination:** You can choose to display the message page on the following destinations: LOGO! onboard display, the LOGO! TDE, or both.
  - LOGO! Display: LOGO! BM screen, canvas size 320 x 176 in pixels
  - LOGO! TDE: LOGO! TDE screen, canvas size 480 x 208 in pixels
  - Both

  Web server is chosen as the display destination by default. You can display LOGO! message page through the Web server.

Configuring message page background

In the message page properties pane, you can configure the message page background. If you set the background type as color, you need to select a color in the color pallete. If you set the background type as image, you need to select an image in the graph library (Page 52).

Message widget

You can use message widget to display messages. LOGO!Soft Comfort provides two kinds of message widgets:

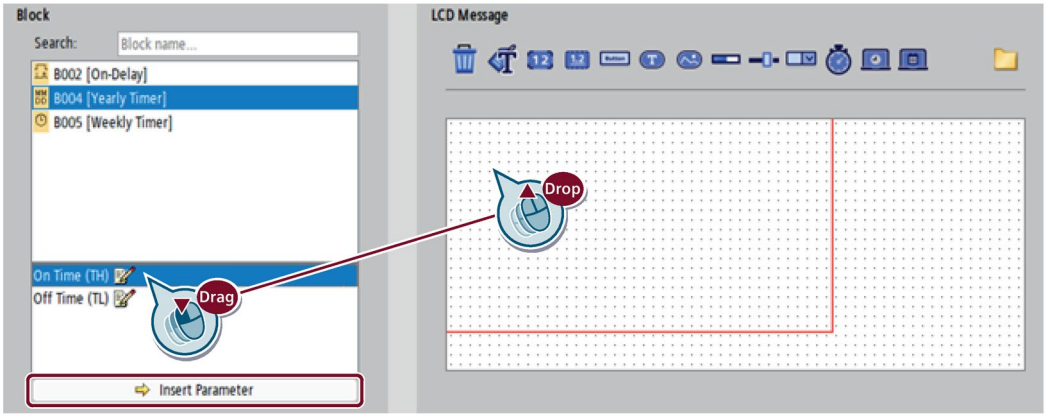
- Function widget

  You can find function widgets in the toolbar of Message Page Editor canvas. Click the widget icon to add a function widget.

- Parameter widget

  The block area lists all the function blocks and parameters from the circuit diagram that can be used as widgets. The widget type and properties are defined by the function block.

  To use a parameter widget, select the desired one then click Insert Parameter button, or drag and drop it to the editor canvas.



Right-click on a widget in the canvas to access the short-cut menu. In the short-cut menu you can find the commands to cut, copy, paste, delete, or select all widgets, or bring the widget to front or back.

Note

You can use a maximum of 64 widgets in a message page, including a maximum of 32 text label widgets and 32 other widgets.

There is a properties pane for the LCD message page and widget. You can read or write the following properties:

- Widget type
- Variable: writable, variable, parameter, range, actions configuration and so on
- UI: position, size, color configuration and so on

Function widget

Text label

This widget is used to display text content. Double-click the widget in the canvas or double-click the text input cell in the properties pane to open the Message Editor. You can enter the text in the Message Editor by typing on a connected keyboard, or by clicking the character keys, or by the keyboard shortcuts to copy (Ctrl + C) and paste (Ctrl + V).

LCD Message supports UTF8 encoding. You cannot input unsupported characters. You can input the maximum of 128 bytes.

Integer number

This widget is used to display the reference actual value as an integer number (Byte, Word, Dword). You need to define the value address bound to the integer number.

If you check the box of Writable in the properties pane, you can change the value on device screen the device is running.

If the integer number is too long to be fully displayed within the widget width, the content will be scrolled to display on the device screen when the diagram is running.

This widget has the following special properties:

- Input range (Max & Min): the maximum and minimum value you can input on device screen. Only available when Writable is checked.
- Filter time: you can select 100 ms to 1000 ms, or select global setting.

This widget has the following bound variables to configure:

- AI, AQ (Word type)
- Variable: V, VX, VR (Byte, Word, Dword type)

Float number

This widget is used to display the reference actual value as a float number. You need to define the value address bound to the float number.

If you check the box of Writable in the properties pane, you can change the value on device screen when the device is running.

If the float number is too long to be fully displayed within the widget width, the content will be scrolled to display on device screen when the diagram is running.

This widget has the following special properties:

- Input range (Max & Min): the maximum and minimum value you can input on device screen. Only available when Writable is checked.
- Display decimals: select from the drop-down list to determine the display number precision.
- Filter time: you can select 100 ms to 1000 ms, or select global setting.

This widget has the following bound variables to configure:

- Variable: V, VX, VR (float type)
- FB parameters (float type)

Button

This widget is used to control a digital value as a pressing button.

This widget has the following special properties:

- Button text
- Action type: Click, Push
- Action value:
  - Click: Value to 0; Value to 1; Reverse
  - Push: Press 1, release 0; Press 0, release 1

This widget has the following bound variables to configure:

- Variable: V, VX, VR (Boolean type)

I/O text

The widget is used to display the reference actual value as the configured text, for example, "On", "Off".

If you check the box of Writable in the properties pane, you can change the digital value (from 0 to 1 or from 1 to 0) on device screen when the device is running.

This widget has the following special properties:

- On text: the display text when the value is 1.
- Off text: the display text when the value is 0.

This widget has the following bound variables to configure:

- Variable: V, VX, VR (Boolean type)
- Digital input, Digital output, Flag, Cursor key, LOGO! TD Function key, Shift register bit, function block output

I/O icon

This widget is used to display the reference actual value as the configured image.

If you check the box of Writable in the properties pane, you can change the digital value (from 0 to 1 or from 1 to 0) on device screen when the device is running.

This widget has the following special properties:

- On image: the display image when the value is 1.
- Off image: the display image when the value is 0.

Double-click the image upload cell in the properties pane to open the Graph Library, where you can select the image to upload.

Note

You can configure at most 64 different images for all the I/O icon widget in the LCD Message.

This widget has the following bound variables to configure:

- Variable: V, VX, VR (Boolean type)
- Digital input, Digital output, Flag, Cursor key, LOGO! TD Function key, Shift register bit, function block output

Bar

This widget is use to display the reference actual value as a horizontal or vertical bar graph on device screen.

This widget has the following special properties:

- Direction: Horizontal, Vertical
- Input Range: Max, Min, the value range depending on the data type of the bound variable

This widget has the following bound variables to configure:

- Variable: V, VX, VR (Byte, Word, Dword type or float type)
- FB parameters (Word type)

Slider

This widget is used to display the reference actual value as a slider.

This widget has the following special properties:

- Direction: Horizontal, Vertical
- Input Range: Max, Min, the value range depending on the data type of the bound variable

This widget has the following bound variables to configure:

- V, VX, VR: Byte, Word, Dword type

Single selector

This widget is used to display the configured selector and you can select configured values from it on device screen.

If you check the box of Writable in the properties pane, you can change the value on device screen when the device is running.

This widget has the following special properties:

- Options

  You can configure at most 8 options for each selector widget. Double-click the options quantity button to open the Option Setting window. To configure each option, you need to set the following items:

  – Options text: the text displays on device screen. UTF-8 characters are supported. The text cannot exceed 32 bytes.

  – Options value: the value range should match the data type of the bound variable.

This widget has the following bound variables to configure:

- V, VX, VR: Byte, Word, Dword type

Scale time

This widget is used to display the reference actual value in a specific time base format.

This widget has the following special properties:

- Time Base:
  – Hours: HH, value range: 0 to + ∞
  – Minutes: HH:MM, value range varies to the bound variables
  – Seconds: HH:MM:SS, value range: 0 to 59
  – 10 Milliseconds: HH:MM:SS:TT, value range: 0 to 99

This widget has the following bound variables to configure:

- V, VX, VR: Byte, Word, Dword type
- FB parameters: Byte, Word, Dword, Timer, Pnum type

System time

This widget is used to display the current system time or the system time when the LCD Message function block is enabled. The time is displayed in the format **00:00:00**.

This widget has the following special properties:

- System time: select Current time or Message enable time

System date

This widget is used to display the current system date or the system date when the LCD Message function block is enabled. The date is displayed in the format **YY-MM-DD**.

This widget has the following special properties:

- System date: select Current date or Message enable date

LCD message simulation

LCD message simulation (Page 244).

Message online test

With the message online test function, you can view the same message texts as shown in the LOGO! Base Module.

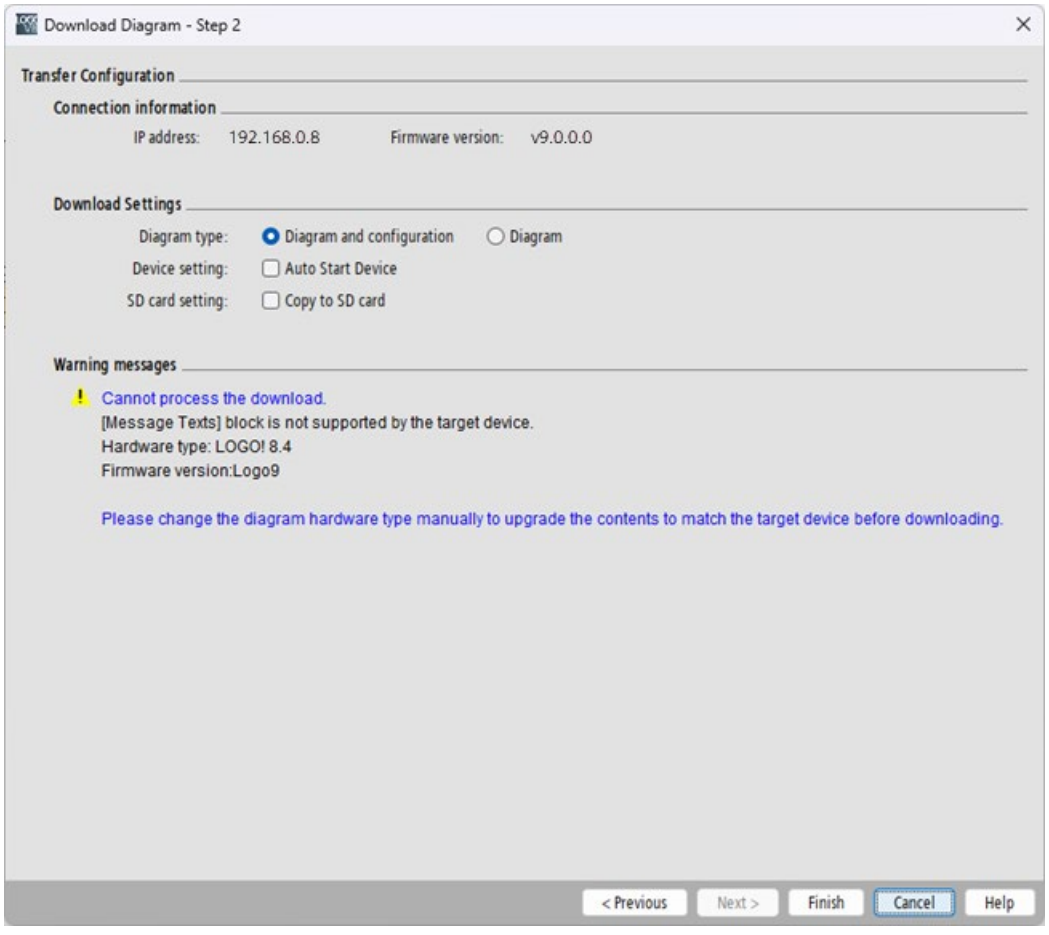
You can start or stop messages online by clicking the toggle button, and the messages are displayed as follows:

During a message online test, none of the message widgets are editable on the LOGO!Soft Comfort simulated device screen. You cannot use LOGO!Soft Comfort to configure LCD message blocks. You can, however, use the "Go to block" button.

Converting message blocks

The LCD Message block is only available for LOGO! 9 (and later versions). Message text block is only available for LOGO! 0BA2 to 0BA8. However, LOGO!Soft Comfort V9.0 (and later versions) supports converting the Message text block to the LCD Message block for LOGO! 9 (and later versions) when necessary.

When downloading a circuit diagram containing Message text blocks to LOGO! 9 (and later versions) device, LOGO!Soft Comfort will remind you the download cannot proceed as the Message text block is not supported by the target device. You can see the detailed information in the Warning messages.



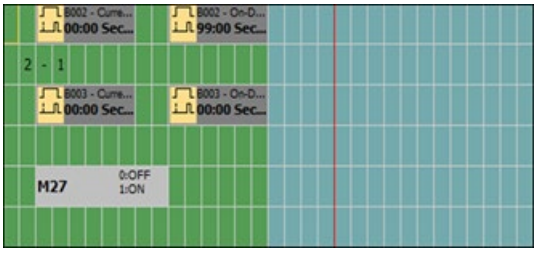
You need to manually convert the Message text block to LCD Message block by changing the Hardware type of the circuit diagram to LOGO! 9.0 (or later versions).

The following table lists the widget mapping between Message text block and LCD Message block:

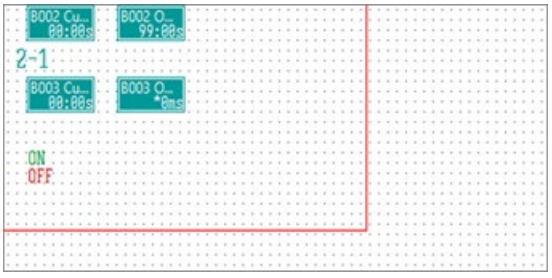
Message text block	LCD Message block
Parameter items	Parameter widgets
ON/OFF (IO status name)	IO text widget
Bar Graph	Bar widget
AI filter	Integer number widget
Scale time	Scale time widget
Current time	Current time widget
Current date	Current date widget
Message enable time	Message enable time widget
Message enable date	Message enable data widget

The following figures are the examples of converting the Message text block to LCD Message block:

Message text



LCD Message



Note

LOGO!Soft Comfort doesn't support converting the LCD Message block to the Message text block.

Note

Diagram batch download

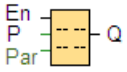
When downloading a circuit diagram with a Message text block to a batch of LOGO! devices, if a LOGO! 9 (or later versions) device is in the target devices list, the download to LOGO! 9 will fail. You can see the download result after the download finishes.

To learn more about diagram batch download, refer to Tools -> Transfer -> Batch Download -> Diagram Batch Download (LOGO! 8.4 and later versions only) (Page 160).

See also

Message text (LOGO! 0BA8) (Page 458)
Message text (LOGO! 0BA6 and LOGO! 0BA7) (Page 464)
Message text (LOGO! 0BA4 and LOGO! 0BA5) (Page 476)
Message text (LOGO! 0BA2 and LOGO! 0BA3) (Page 479)

5.3.6.4 Message text (LOGO! 0BA8)



Short description

This function displays message texts and parameters of other blocks on the LOGO! onboard display or LOGO! TDE when LOGO! is in **RUN** mode.

Connection	Description
Input **En**	A 0 to 1 transition at En (**En**able) triggers the output of the message text.
Input **P**	P is the priority of the message text. 0 is the lowest, 127 the highest priority. Ack: Acknowledgement of the message text

Connection	Description
Parameter	**Text:** Input of the message text **Par:** Parameter or actual value of another, already configured , which can be displayed numerically or as a bar graph (see "Visible parameters or actual values") **Time:** Shows the continuously updated time-of-day **Date:** Shows the continuously updated date **EnTime:** Display of the time of the 0 to 1 transition of the signal at input En **EnDate:** Display of the date of the 0 to 1 transition of the signal at input En **I/O Status Names:** Display of a digital input or output status name, for example "On" or "Off". LOGO! 0BA8 devices can display the status names of following elements: • Digital inputs • Digital outputs • Flags • Cursor keys • LOGO! TDE function keys • Shift register bits • Function block outputs **Analog Input:** Display of analog input value to the shown in message text and updated according to the analog time. **Scale time:** Display of the actual value of a referenced function block as a time value scaled based on the timebase configured for the message text function block. Possible time display formats are as shown below: • hours : minutes : seconds . 10 milliseconds • hours : minutes : seconds • hours : minutes • hours (for example, "**01: 20 : 15 .15**") **Symbol:** Display of characters selected from the supported character sets
Output **Q**	Q remains set as long as the message text is queued.

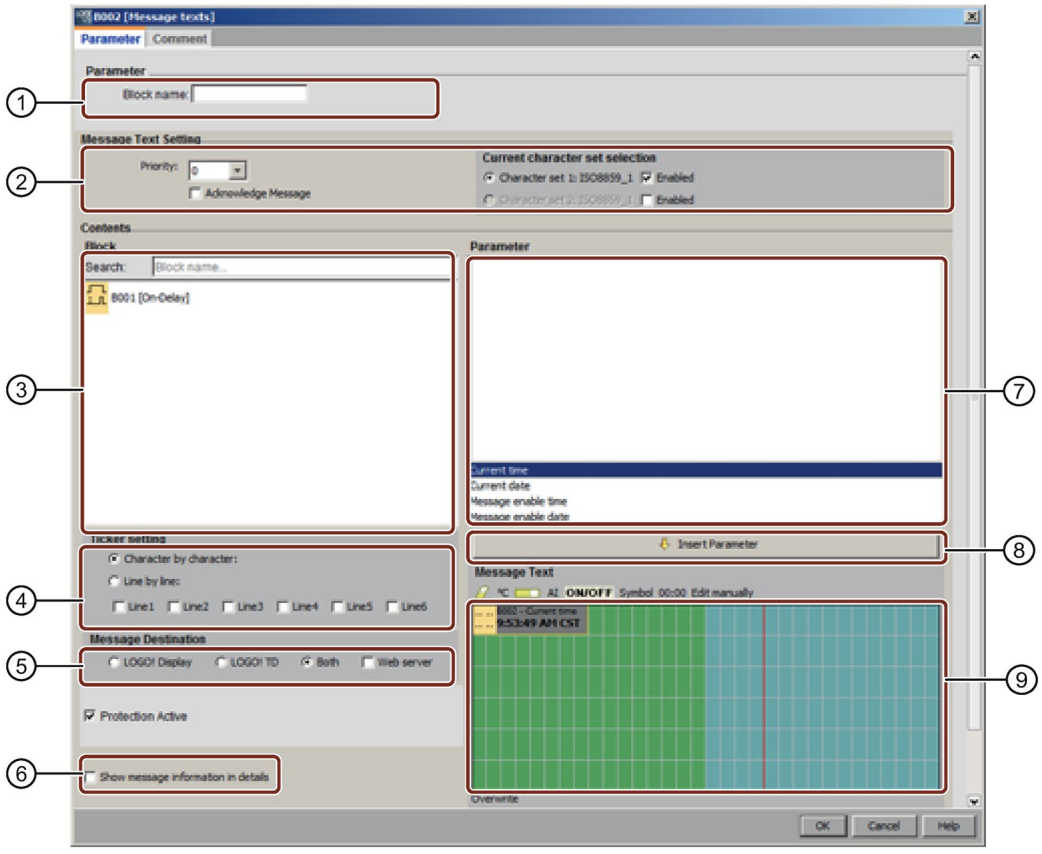
Settings

In addition to the function block inputs and the parameters of the message text, the following settings provide additional control over the display of message texts:

- **Character set selection:** You can choose to compose a message text from characters from the primary character set or the secondary character set. You set the two character sets from either the "Msg Config" menu on the LOGO! Base Module, or by using the LOGO!Soft Comfort File → Message Text Settings (Page 65) menu command.
- **Message destination:** You can choose to display the message text on the LOGO! onboard display, the LOGO! TDE, or both. If you select the Web server as a destination, you can display LOGO! message texts through the Web server.
- **Ticker setting:** The message text can tick or not tick, meaning it can scroll on and off the display. Two types of message ticking exist:
  - Character by character
  - Line by line

  You can configure each individual line of a message text to tick or not to tick at all. The "character by character" or "line by line" setting applies to all lines that you configure to tick. Select the check box beside a line number to enable ticking for that line. The number of lines depends on your selection on the File → Message Text Settings (Page 65) dialog.

Particular characteristics to be noted when configuring



① **Block name area**

Here you can provide a name for the block

② **Settings area**

Here you can configure the following settings:·

- Priority of the message text
- Acknowledge Message check box: if set requires a message to be acknowledged in order to be closed
- Character set selection for the message text

③ **Block area**

Here is where you select blocks from all of the blocks in the circuit program. You can subsequently choose parameters from these blocks to display in the message text.

④ **Tick area**

Here you define the tick parameters for the message text:

- Character by Character tick format
- Line by Line tick format
- Tick enabled checkbox for each display line

⑤ **Message destination area**

Here you choose whether the target destination for the message is the LOGO! onboard display, the LOGO! TDE, or both. If you select the Web server as a destination, you can display LOGO! message texts through the Web server.

⑥ **Show message information in details**

Here you can chose to show the message texts in detail. By default, the message text only show the status of priority, acknowledge message, and character sets. By selecting this function, you can see the ticker setting, message text setting, and message texts in the diagram editor.

⑦ **Block parameters area**

Here you can select the parameters to be displayed in the message text from the block that is selected in the Blocks area.

⑧ **Insert Parameter button**

This button is for inserting a selected block parameter into the message text.

⑨ **Message area**

Here you arrange the message text. The information that you enter in this area corresponds to what is to be displayed on the LOGO! onboard display or LOGO! TDE.

Above this area are additional buttons:

Delete button: for deleting entries from the message area

°C **Special characters button:** for inserting special characters into the message area

Bar Graph button: for placing a horizontal or vertical bar graph into the message area

AI **AI button:** for placing an analog input value into the message area

ON/OFF **ON/OFF button:** for specifying a digital value to be represented by one of two strings corresponding to the 0 state and 1 state, for example "OFF" and "ON".

Symbol **Symbol button:** for opening the virtual keyboard panel. You can insert characters of current character set.

00:00 **Scale time button:** for referencing an actual value and showing it in a specified time base format.

Edit manually **Edit manually button:** for using the static editor to add, move, or delete message text elements without changing the position of any other elements.

Note: For LOGO!Soft Comfort V8.3 and later versions, copying and pasting parameters of message texts in the same circuit diagram are supported.

Below this area is one additional button:

Overwrite:

- If you double click the **Overwrite** button, this button turns grey, you move the cursor over an existing parameter and enter a new parameter, the new parameter is inserted before the existing parameter in the message area.
- If you don't double click the **Overwrite** button, move the cursor over an existing parameter and enter a new parameter, the existing parameter is replaced by the new parameter.

To arrange the message text

The LOGO! 0BA8 devices support six-line message text display. The message area shows a grid of six lines and character positions.

If you choose the LOGO! onboard display as the target destination for the message, the message text area is 32 characters wide for Western European character sets or 16 characters wide for Asian character sets. If you choose the LOGO! TDE as the target destination for the message, the message text area is 40 characters wide for Western European character sets or

20 characters wide for Asian character sets. Either way, the character width of each line is double that of the LOGO! onboard display or LOGO! TDE. If you choose both as the target destination, the message text area is still 32 characters wide for Western European character sets or 16 characters wide for Asian character sets. In this case, there is a red vertical line in the message text area indicating the boundary of the LOGO! TDE display. If you also select the Web server as a destination, the message text displays through the Web server in the same way as on the LOGO! onboard display.

Message lines that are longer than the width of the actual display can be set to "tick". In the message area, LOGO!Soft Comfort indicates the region corresponding to the visible area of the LOGO! onboard display or LOGO! TD in green, and the region that can only be shown by using the message ticking feature in blue.

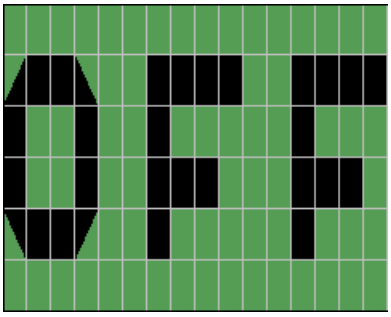
To configure the content of a message text, follow these steps:

1. From the "Block" area, select the block whose parameters you want to output.
2. Drag and drop the parameters required from the "Parameter" area to the "Message Text" area. You can also use the "Insert Parameter" button to insert a parameter value.
3. In the "Message Text" area, you can add parameter data, time or date values from the block parameter area as required and enter text. To enter text, select the character set for the message text, and then type. You can also use the buttons above the message text area to add special characters, bar graphs, analog input values, and names for digital I/O states.

New special characters

There are five new special characters (◧ ◥ ◣ ◢) available for the message text display on LOGO! 0BA8 devices or LOGO! TDE. With these special characters, you can create large texts for message display.

Example:



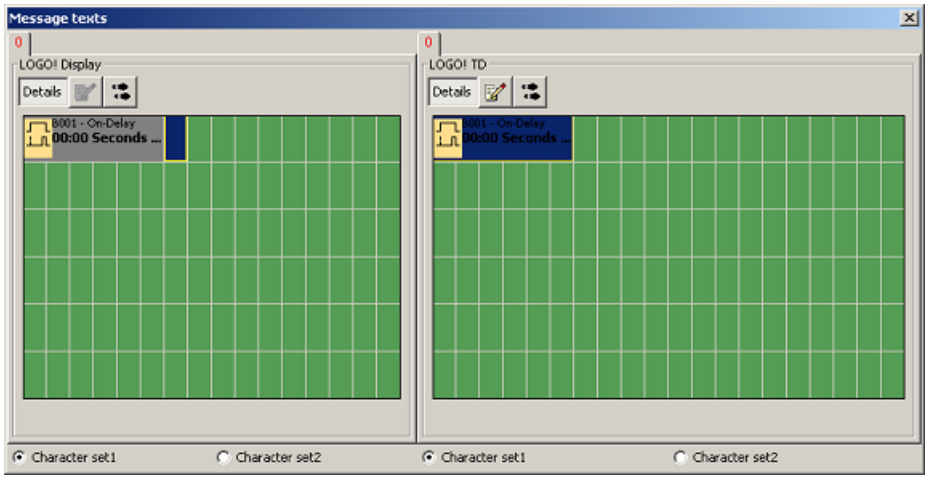
Simulation mode

Layout of message (Page 244)

Message online test

With the message online test function, you can view the same message texts as shown in the LOGO! Base Module.

You can start or stop messages online by clicking the toggle button, and the messages are displayed as follows:



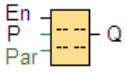
During a message online test, you cannot use LOGO!Soft Comfort to edit message text parameters, change the character set, acknowledge a message text, or shift a message text. You can, however, use the "Go to block" button.

Special Functions Overview (Page 340)

See also

Message text (LOGO! 0BA6 and LOGO! 0BA7) (Page 464)

5.3.6.5 Message text (LOGO! 0BA6 and LOGO! 0BA7)



Short description

This function displays message texts and parameters of other blocks on the LOGO! onboard display or LOGO! TD when LOGO! is in **RUN** mode.

The LOGO! 0BA7 and 0BA6 devices support many new message text features that LOGO! 0BA5 devices and earlier did not support. Some of the new features are **only** for LOGO! 0BA7 devices. You can choose, however, whether to use the message text function block with the new features or LOGO! 0BA5 or earlier message text function blocks in your circuit program. This selection is on the File → Message Text Settings (Page 65) dialog, along with other global settings. You can also use the button "Enable new style message and setting" at the bottom of the message dialog to switch your message text function block to the one with the new features. You can not mix and match the message text function blocks with new features and LOGO! 0BA5 and earlier message text function blocks in your circuit program.

Connection	Description
Input **En**	A 0 to 1 transition at En (**En**able) triggers the output of the message text.
Input **P**	P is the priority of the message text. 0 is the lowest, 127 the highest priority. Ack: Acknowledgement of the message text

Connection	Description
Parameter	**Text:** Input of the message text **Par:** Parameter or actual value of another, already configured , which can be displayed numerically or as a bar graph (see "Visible parameters or actual values") **Time:** Shows the continuously updated time-of-day **Date:** Shows the continuously updated date **EnTime:** Display of the time of the 0 to 1 transition of the signal at input En **EnDate:** Display of the date of the 0 to 1 transition of the signal at input En **I/O Status Names:** Display of a digital input or output status name, for example "On" or "Off". LOGO! 0BA7 devices can display the status names of following elements: • Digital inputs • Digital outputs • Flags • Cursor keys • LOGO! TD function keys • Shift register bits • Function block outputs **Analog Input:** Display of analog input value to the shown in message text and updated according to the analog time. **Scale time (0BA7 only):** Display of the actual value of a referenced function block as a time value scaled based on the timebase configured for the message text function block. Possible time display formats are as shown below: • hours : minutes : seconds . 10 milliseconds • hours : minutes : seconds • hours : minutes • hours (for example, "**01: 20 : 15 .15**") **Symbol (0BA7 only):** Display of characters selected from the supported character sets
Output **Q**	Q remains set as long as the message text is queued.

Settings

In addition to the function block inputs and the parameters of the message text, the following settings provide additional control over the display of message texts:

- **Character set selection:** You can choose to compose a message text from characters from the primary character set or the secondary character set. You set the two character sets from either the "Msg Config" menu on the LOGO! Base Module, or by using the LOGO!Soft Comfort File → Message Text Settings (Page 65) menu command.
- **Message destination:** You can choose to display the message text on the LOGO! onboard display, the LOGO! TD, or both.
- **Tick settings:** The message text can tick or not tick, meaning it can scroll on and off the display. The tick capabilities and your choices are described in more detail below.

Description of the function

With a 0 to 1 transition of the signal at input En, and with LOGO! in run mode, the LOGO! onboard display and/or LOGO! TD displays your configured message text.

When the "Acknowledgement message" checkbox is not selected, the message text is hidden with a 1 to 0 signal transition at input En.

When the "Acknowledgement message" checkbox is selected, then after input En is reset to 0, the message text is displayed until acknowledged by pressing the OK button. The message text cannot be acknowledged as long as input En is high.

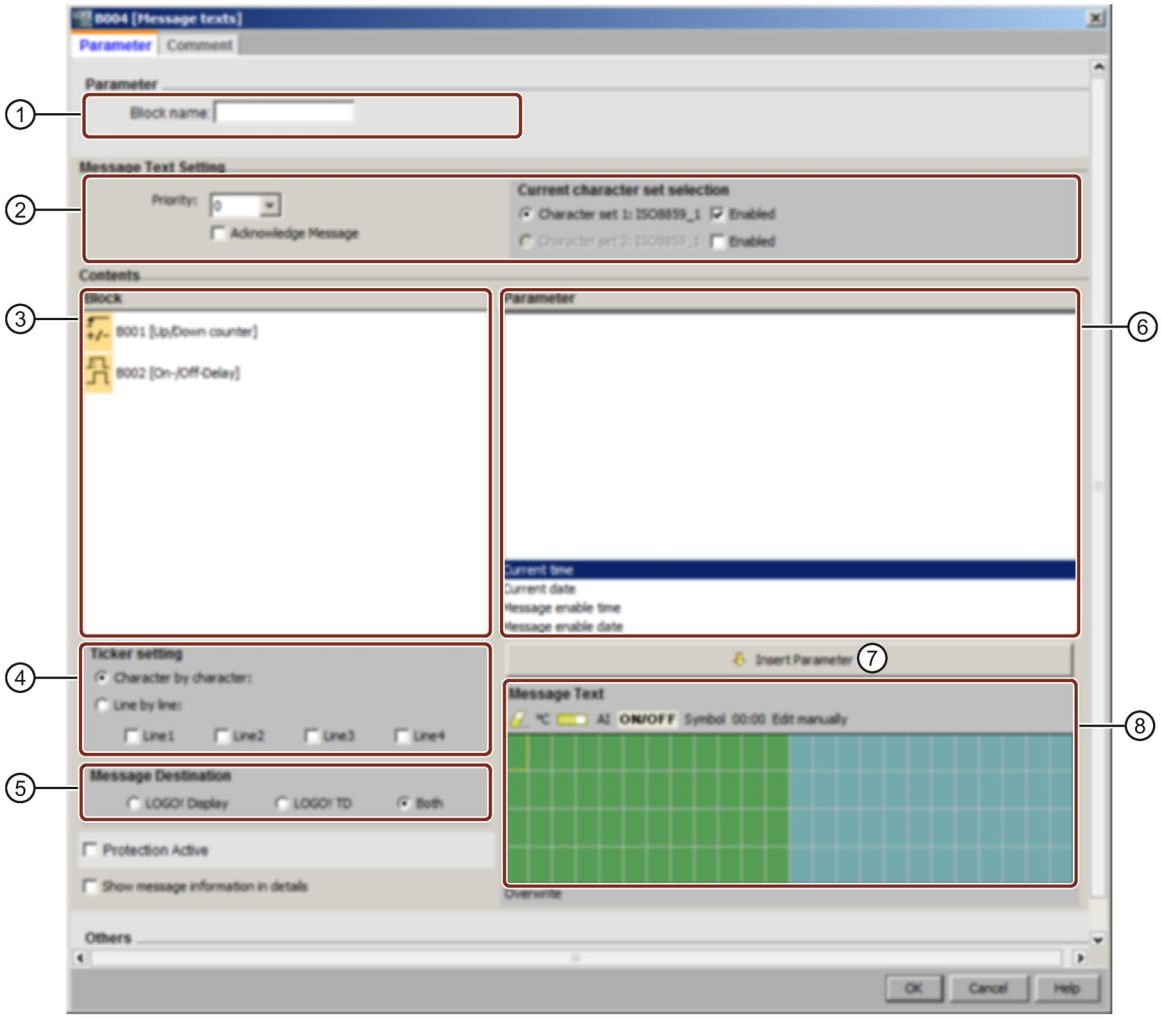
If several message text functions were triggered with En=1, the message with the highest priority (0 = lowest, 127 = highest) is displayed. This also implies that a new message text is only displayed if its priority is higher than that of previously enabled message texts.

If the circuit program uses flag M27 (Page 316) , then whenever M27=0 (low) LOGO! only displays message texts that are in the primary character set (Character Set 1). If M27=1 (high), then LOGO! only displays message texts that are in the secondary character set (Character Set 2).

After a message text is disabled or acknowledged, the display automatically shows the previously active message text with the highest priority.

You can change between the display in RUN mode and the message texts by means of the ▲ and ▼ buttons.

Particular characteristics to be noted when configuring



① **Block name area**

Here you can provide a name for the block

② **Settings area**

Here you can configure the following settings:·

- Priority of the message text
- Acknowledge Message check box: if set requires a message to be acknowledged in order to be closed
- Character set selection for the message text

③ **Block area**

Here is where you select blocks from all of the blocks in the circuit program. You can subsequently choose parameters from these blocks to display in the message text.

④ **Tick area**

Here you define the tick parameters for the message text:

- Character by Character tick format
- Line by Line tick format
- Tick enabled checkbox for each display line

⑤ **Message destination area**

Here you choose whether the target destination for the message is the LOGO! onboard display, the LOGO! TD, or both.

⑥ **Block parameters area**

Here you can select the parameters to be displayed in the message text from the block that is selected in the block area.

⑦ **Insert Parameter button**

This button is for inserting a selected block parameter into the message text.

⑧ **Message area**

Here you arrange the message text. The information that you enter in this area corresponds to what will be displayed on the LOGO! onboard display or LOGO! TD.

Above this area are additional buttons:

Delete button: for deleting entries from the message area

°C **Special characters button:** for inserting special characters into the message area

Bar Graph button: for placing a horizontal or vertical bar graph into the message area

AI **AI button:** for placing an analog input value into the message area

ON/OFF **ON/OFF button:** for specifying a digital value to be represented by one of two strings corresponding to the 0 state and 1 state, for example "OFF" and "ON".

Edit manually **Edit manually button:** for using the static editor to add, move, or delete message text elements without changing the position of any other elements.

For LOGO! 0BA7 only:

Symbol **Symbol button:** for opening the virtual keyboard panel. You can insert characters of current character set.

00:00 **Scale time button:** for referencing an actual value and showing it in a specified time base format.

To arrange the message text

The message area shows a grid of four lines and character positions. The message text configuration area is 24 characters wide for Western European character sets or 16 characters wide for Asian character sets. Either way, the character width of each line is double that of the LOGO! onboard display or LOGO! TD. Message lines that are longer than the width of the actual display can be set to "tick". In the message area, LOGO!Soft Comfort indicates the region corresponding to the visible area of the LOGO! onboard display or LOGO! TD in one color, and the region that can only be shown by using the message ticking feature in another color.

To configure the content of a message text, follow these steps:

1. From the "Block" area, select the block whose parameters you want to output.
2. Drag and drop the parameters required from the "Parameter" area to the "Message Text" area. You can also use the "Insert Parameter" button to insert a parameter value.
3. In the "Message Text" area, you can add parameter data, time or date values from the block parameter area as required and enter text. To enter text, select the character set for the message text, and then type. You can also use the buttons above the message text area to add special characters, bar graphs, analog input values, and names for digital I/O states.

Message text character set

LOGO! 0BA6 and higher versions support five character sets for messages. Of these, you can select two for the display of message texts with the File → Message Text Settings (Page 65) menu command or from the "Msg Config" menu of LOGO!. Of the fifty possible message texts that you can configure, you can select any number of them to be from the first language and any number from the second language. For example, you could configure fifty message text function blocks that have a single message text for Character Set 1. Alternatively, you could configure twenty-five message text function blocks, each of which has two message texts: one for Character Set 1 and one for Character Set 2. Any combination is valid such that the total does not exceed fifty.

The Message text dialog displays the character sets that are currently available for your message text, as configured in the message text settings. To use a character set, select the "Enabled" check box, and the button for the character set. Characters that you subsequently type will be from the character set that you enabled and selected. If you deselect the "Enabled" check box for a character set, LOGO!Soft Comfort will prompt you for confirmation and then delete the message text, if it exists, that corresponds to that character set.

The character set of a message text is independent of the language setting for the LOGO! onboard display menus. They can be different.

Chinese character set

The LOGO! Base Module and LOGO! TD support the Chinese character set (GB-2312) for the People's Republic of China. The devices use Microsoft Windows encoding for this character set. The Windows encoding allows the devices to display the same characters as shown in the LOGO!Soft Comfort message text editor when you are using a Chinese emulator or a Chinese version of Microsoft Windows.

The Chinese character set requires a Chinese version of Windows or a Chinese emulator to properly display Chinese characters in the LOGO!Soft Comfort message text editor. You must start the Chinese emulator before you open the message text function block in LOGO!Soft Comfort.

Message ticker

You can configure a message text to tick, or to not tick. Two types of message ticking exist:

- Character by character
- Line by line

Messages that tick character by character scroll off the characters of the message line one character at a time to the left with the additional characters scrolling in one at a time from the right. The time interval for the tick is specified by the TickTime message text setting.

Messages that tick line by line by line scroll one half of the message off the display to the left with the second half of the message scrolling in from the right. The time interval for the tick is ten times the TickTime parameter. The two halves of the message simply alternate on the LOGO! onboard display or LOGO! TD.

The tick time is the interval of time by which a character or a line of text ticks off the screen. The tick time is a global message text parameter for all message texts.

Example: Tick Message Character by Character

The following illustration shows the configuration in LOGO!Soft Comfort of a one-line, 24-character message text:

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}

If you set this message to tick "character by character" with a tick interval of 0.1 seconds, then the initial appearance of this message line on the LOGO! onboard display or LOGO! TD is as shown in this illustration:

X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} X_{13} X_{14} X_{15} X_{16} X_{17} X_{18} X_{19} X_{20} X_{21} X_{22} X_{23} X_{24}

After 0.1 second, one character of the message line ticks. The message appears as follows on the LOGO! onboard display or LOGO! TD:

X_2 X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} X_{13} X_{14} X_{15} X_{16} X_{17} X_{18} X_{19} X_{20} X_{21} X_{22} X_{23} X_{24} X_1

After the next 0.1 second, another character of the message line ticks. The message appears as follows on the LOGO! onboard display or LOGO! TD:

X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} X_{13} X_{14} X_{15} X_{16} X_{17} X_{18} X_{19} X_{20} X_{21} X_{22} X_{23} X_{24} X_1 X_2

Example: Tick Message Line by Line

The following example uses the same message configuration as the previous example:

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}

If you set this message to tick "line by line" with a tick interval of 0.1 seconds, then the initial appearance of this message on the LOGO! onboard display or LOGO! TD is the left half of the message as shown in this illustration:

X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} X_{13} X_{14} X_{15} X_{16} X_{17} X_{18} X_{19} X_{20} X_{21} X_{22} X_{23} X_{24}

After 1 second (10 x 0.1 second), the message ticks to show the right half of the message as shown in this illustration:

X_{13} X_{14} X_{15} X_{16} X_{17} X_{18} X_{19} X_{20} X_{21} X_{22} X_{23} X_{24} X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12}

The screen display alternates between the two message halves every second.

You can configure each individual line of a message text to tick or not to tick at all. The "character by character" or "line by line" setting applies to all lines that you configure to tick. Select the check box beside a line number to enable ticking for that line.

Bar graphs

You can specify a bar graph representation for the actual value of any other function block in your circuit program. The bar graph can be horizontal or vertical on the LOGO! onboard display or LOGO! TD. You can configure up to four bar graphs per message text.

Use the bar graph button in the message text area to place a bar graph in the message text area. From the Bar Setting dialog you must provide the following information:

- Block from your circuit program that the bar graph represents
- Minimum and maximum value for the bar graph: LOGO! will calculate the length or height of the bar graph by scaling the actual value between the minimum and maximum values.
- Orientation of the bar graph: horizontal or vertical
- Width or height of the bar graph, in character spaces

Example:

Consider a bar graph in a message text with the following characteristics:

- Configured bar graph length: 4 character spaces
- Orientation: Horizontal
- Configured minimum value: 1000
- Configured maximum value: 2000
- Actual value: 1750

The resulting bar graph will be 3 character spaces long.

Text representation of digital I/O states

You can assign names such as "On" or "Off" to the two states of a digital input or output. With the LOGO! 0BA6 and 0BA7 series, you can display this name of a digital I/O state in a message text. The maximum number of characters for a state name is eight for Western language character sets; for Asian language character sets the number of characters is four. Use the ON/OFF button in the message text area to define names for the two states of a digital input or output to be used in the message text.

Within a single message text, you can configure up to four digital I/O state name displays.

Within one circuit program, a maximum of 20 I/O state names can be used in message text function blocks.

Display of remaining timer time

With the LOGO! 0BA6 series, you can display the remaining time of a timer in a message text. Prior to this feature you could display the current elapsed time of a timer and the timer parameters.

When placed in a message text, the remaining time will show the time that remains before the timer expires. For timers with multiple timer values (for example on-delay time, off-delay time), you can display the remaining time of each one in a message text.

Display of analog inputs

You can also select analog inputs to be displayed in a message text. Use the AI button in the message text area to select a specific AI to place in the message text area.

If you have analog inputs in a message text, the global message text setting (Page 65) for the Analog input filter timer specified how often the message text is updated with current values. The refresh time choices are 100 ms, 200 ms, 400 ms, 800 ms, and 1000 ms. If you have more than one analog input in a message text, the refresh rate applies to them all.

Static editor (Edit manually)

LOGO!Soft Comfort provides a static editor for message texts that can help when you need to reposition text elements. For example, it has a recycle bin area where you can temporarily move message text elements in order to rearrange the position of elements on the display area. You can move elements up, down, left, or right without changing the position of any other elements.

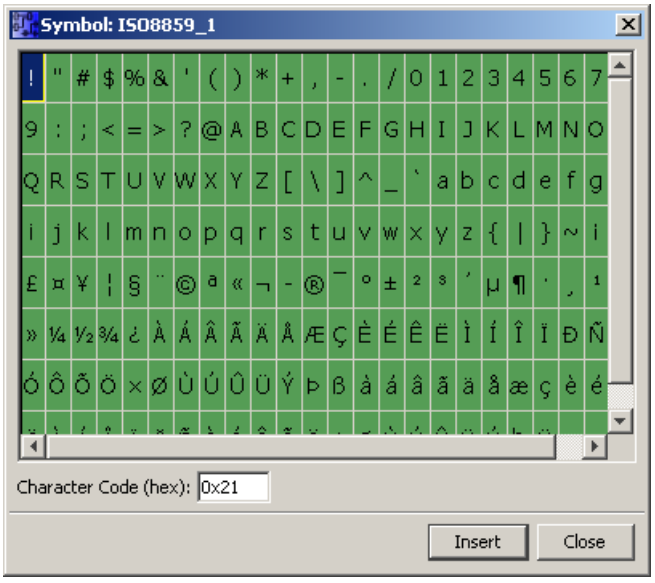
To use the static editor, click the "Edit manually" button above the message text area. You will also be prompted to edit manually if you try to place or move elements in the message area that have a position conflict with existing elements.

0BA0-0BA3:
Maximum number of message texts: 5
Not supported: message ticker, bar graphs, analog inputs, I/O status names, and remaining timer time.

0BA4-0BA5:
Maximum number of message texts: 10
Not supported: message ticker, bar graphs, analog inputs, I/O status names, and remaining timer time.

Virtual keyboard

You can access the virtual keyboard by clicking the Symbol button above the message text menu. The virtual keyboard dialog is shown as follows:

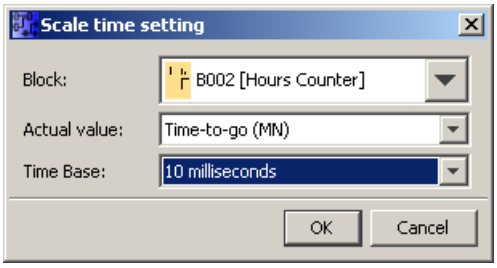


The virtual keyboard displays some of the characters of the current character set. When you select a character, you can view its corresponding character code in the "Character Code (hex)" field. To insert the selected character, click the "Insert" button.

LOGO! does not support all of the characters of all of the character sets. For SJIS character set, the supported code area is [0x21, 0x7E] && [0xA1, 0xDF], and for other character sets, the supported code area is [0x21, 0x7E] && [0xA1, 0xFF]. You can find the detailed descriptions of the supported characters and their character codes on the DVD for LOGO!Soft Comfort.

Scale time

To configure the time scale for a function block, click 00:00 button to display the "Scale time setting" dialog:



With this dialog, you can configure the scale time base for a function block value. You select a function block, an actual value and a time base, and click "**OK**" to confirm your settings.

The calculation for displaying a time value in a message text based on the configured time base is shown below, where "**C**" represents the actual value:

Time base of message text	Time format	Calculation for time value
Hour	xx	C
Minute	xx : xx	C / 60 : C % 60
Second	xx : xx : xx	(C / 60) / 60 : (C / 60) % 60 : C % 60
10 milliseconds	xx : xx : xx : xx	C / 100 / 60 / 60 : ((C / 100 / 60) % 60 : (C / 100) % 60 : C % 100

/: Integer division

%: Remainder of integer division

Copying and pasting text characters

Whenever you enter characters into the message text area or into the I/O status name text edit area, you can use the keyboard shortcuts for copy (Ctrl-c) and paste (Ctrl-v). You can copy and paste characters between any document on your computer, text in a message text, text in an I/O status name, or text in the LOGO! TD Power-up screen (Page 108) text edit area. LOGO!Soft Comfort verifies that any characters to be pasted are valid for the selected character set. Only character entry areas of text messages, I/O status names, and the LOGO! TD Power-up screen support copy and paste. You cannot, for example, copy and paste bar graphs, function block parameters, or anything other than text characters of the selected character set.

You cannot use Ctrl-x to cut characters for pasting, except from a document on your computer. LOGO!Soft Comfort does not support the cut operation from the message text, I/O status name, or LOGO! TD Power-up screen editing dialogs.

LOGO!Soft Comfort V7.0 keeps the text information when you copy and paste a Message text function block.

If you paste a Message text function block to another circuit program with a different character set, LOGO!Soft Comfort keeps only the characters of the character set of the circuit program into which you are pasting. LOGO!Soft Comfort displays a "?" in place of the unsupported characters.

Message text after changing the character set

LOGO!Soft Comfort V7.0 keeps the text information when you change the character set.

LOGO!Soft Comfort keeps only the characters supported by the current character set, and displays a "?" in place of the unsupported characters.

Restrictions

The following restrictions apply to message text function blocks:

- Up to 50 message text functions are available.
- Up to 32 total bar graphs in message texts are available.
- LOGO!Soft Comfort supports all of the defined features for message texts. When programming directly on the LOGO! device, you can only program a limited number of the

message text features. See the *LOGO! Manual* for a description of message text programming from the LOGO! device.

- Each message line can contain 24 characters (Western language character sets) or 16 characters (Asian language character sets). Within a message text the following limitations apply:
  - Maximum number of parameters: 4
  - Maximum number of bar graphs: 4
  - Maximum number of I/O status names: 4 for LOGO! 0BA6 devices; LOGO! 0BA7 devices support a maximum of eight I/O status names in one message text function block, and a maximum of 40 I/O status names in all message text function blocks.
  - Maximum number of time/date values: 4
  - Maximum number of analog inputs: 2

Particular characteristics to be noted when configuring

The message text can be configured in the block properties dialog. You can enter up to four lines for each message text (the text display of the LOGO! onboard display and LOGO! TD has four rows) and set the priority. You can move to the next line using the cursor keys or the mouse. Hit the [ENTER] key to confirm all your entries in the block properties dialog and to close the dialog.

You can also specify the actual values of other blocks in the text lines. To do so, select the relevant block from the **Block** dialog. A **Parameter** dialog opens to display a list of all parameters available for the selected block. The block parameter you select in this dialog is written to the selected text line. The actual parameter value is now included when you call the message text.

Set the "Acknowledge message" attribute to specify whether a message is be acknowledged before it is closed.

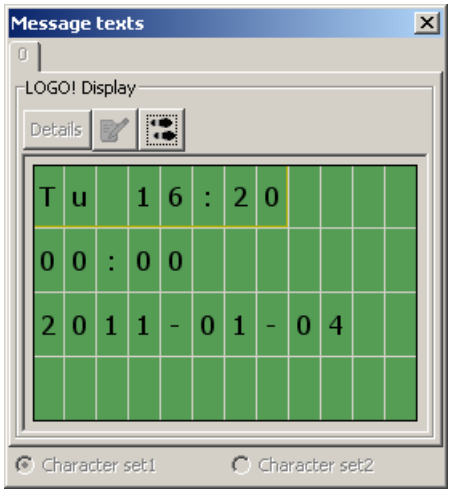
Simulation mode

Layout of message texts (Page 244)

Message online test (0BA7 only)

With the message online test function, you can view the same message texts as shown in the LOGO! Base Module.

You can start or stop messages online by clicking the toggle button, and the messages are displayed as follows:



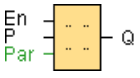
During a message online test, you cannot use LOGO!Soft Comfort to edit message text parameters, change the character set, acknowledge a message text, or shift a message text. You can, however, use the "Go to block" button.

Special Functions Overview (Page 340)

See also

Message text (LOGO! 0BA4 and LOGO! 0BA5) (Page 476)

5.3.6.6 Message text (LOGO! 0BA4 and LOGO! 0BA5)



Short description

This function displays message texts and parameters of other blocks on the LOGO! onboard display when LOGO! is in **RUN** mode.

Connection	Description
Input **En**	A 0 to 1 transition at En (Enable) triggers the output of the message text.
Input **P**	P is the priority of the message text. 0 is the lowest, 30 the highest priority Ack: Acknowledgement of the message text
Parameter	**Text:** Input of the message text **Par:** Parameter or actual value of another, already configured function (see "Visible parameters or actual values") **Time:** Shows the continuously updated time-of-day **Date:** Shows the continuously updated date **EnTime:** Shows the time of the 0 to 1 transition **EnDate:** Shows the 0 to 1 transition of the date
Output **Q**	Q remains set as long as the message text is queued.

Description of the function

With a 0 to 1 transition of the signal at input En, the display outputs your configured message text (actual value, text, TOD, date) in RUN mode.

Acknowledgement disabled (Ack = Off):

The message text is hidden with a 0 to 1 signal transition at input En.

Acknowledgement enabled (Ack = On):

After input En is reset to 0, the message text is displayed until acknowledged by pressing the OK button. The message text cannot be acknowledged as long as input En is high.

If several message text functions were triggered with En=1, the message with the highest priority (0 = lowest, 30 = highest) is displayed. This also implies that a new message text is only displayed if its priority is higher than that of previously enabled message texts.

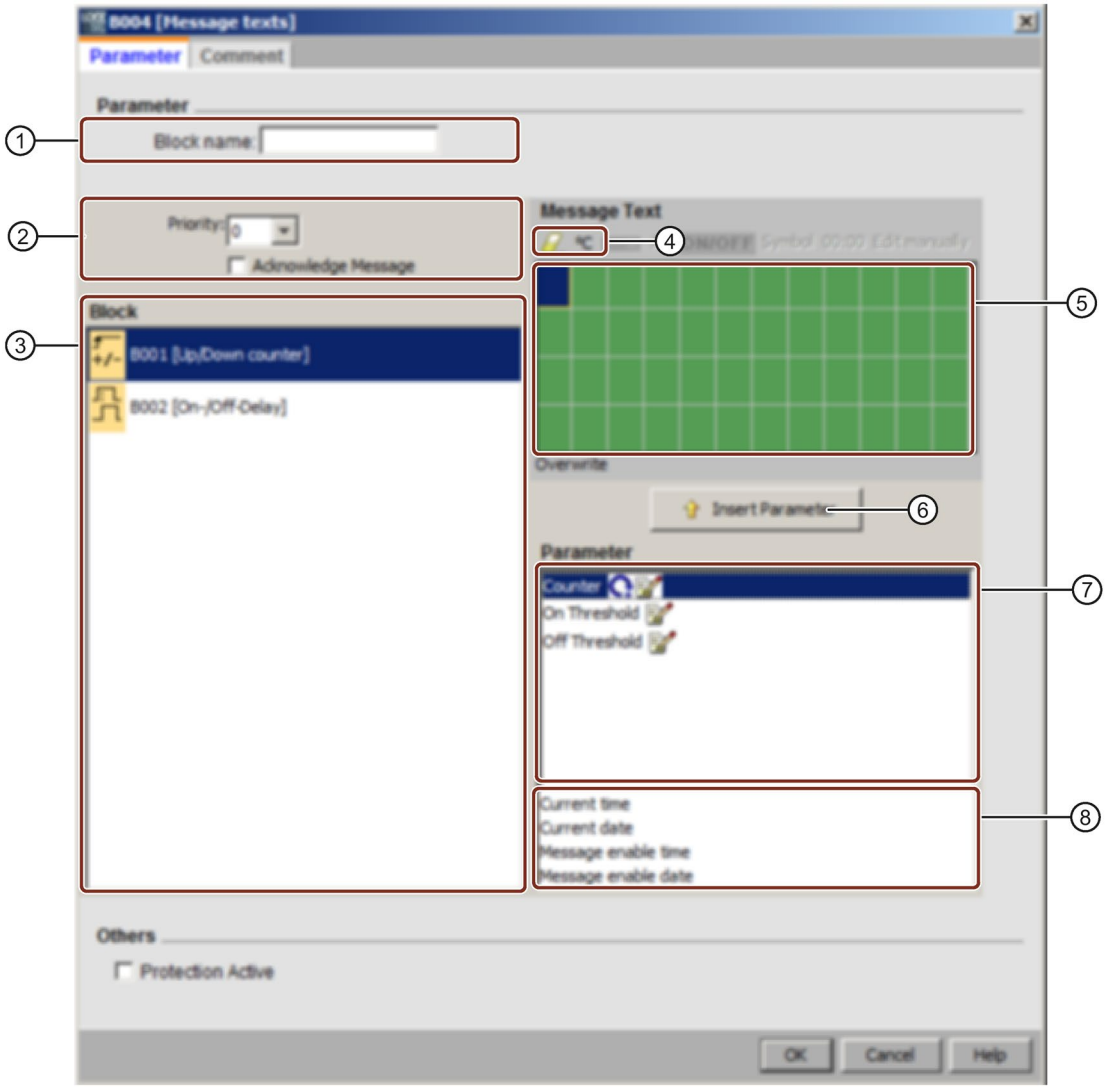
After a message text is disabled or acknowledged, the function automatically shows the previously active message text that takes the highest priority.

You can change between the display in RUN mode and the message texts by means of the ▲ and ▼ buttons.

Restrictions

Up to ten message text functions are available.

Particular characteristics to be noted when configuring



① **Block name area**

Here you can provide a name for the block.

② **Setting area**

Here you will find the following settings:

- Priority of the message text
- Check box for message text acknowledgment

③ **Block area**

Here is where you select blocks from all of the blocks in the circuit program. You can subsequently choose parameters from these blocks to display in the message text.

④ **Delete button**

Button for deleting entries from the **message area**

Special characters button

Button for inserting special characters in the **message area**

⑤ **Message area**
You arrange the message text in this area. Information entered in this area corresponds with that on the LOGO! onboard display.

⑥ **Insert button**
Button for inserting a selected block parameter into the message text.

⑦ **Block parameter area**
Shows the parameters of a block selected from the **block area** which you can output in the message text.

⑧ **General parameter area**
Shows general parameters such as the current date.

To arrange the message text

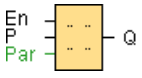
1. From the **"Block"** area, select the block whose parameters you want to output.
2. Drag and drop the parameters required from the **block parameters** to the **messages area**. You may also use the **"Insert"** button to do so.
3. In the **messages area**, you can add parameter data as required.

Simulation mode

Layout of message (Page 244)

Special functions (Page 340)

5.3.6.7 Message text (LOGO! 0BA2 and LOGO! 0BA3)



The message text is only available for devices as of hardware series 0BA2.

Short description

Display of a configured message text in RUN mode.

Connection	Description
Input **En**	The message text is output with a 0 to 1 transition at input En (Enable).
Parameter **P**	P is the priority of the message text. 0 is the lowest, 9 the highest priority.
Parameter	Par: Parameter or actual value of another, already programmed function (see "Displayable parameters or actual values")
Output **Q**	Q remains set as long as the message text is queued.

Description of the function

In RUN mode, a 0 to 1 transition of the signal at input En triggers the output of your configured message text on the display. The message text is closed after a 1 to 0 transition at input En and if the acknowledgment attribute is not set. If the acknowledgment attribute is set, the message text is not closed until input En=0 and the message is acknowledged at the LOGO! with OK. The status at output Q remains 1 as long as the message text is displayed.

Of several message text functions triggered with En=1, the one with the highest priority is displayed. Low-priority messages can also by displayed by pressing the ▼ button on the LOGO!.

You can switch between the standard display and the message text display by means of the LOGO! buttons ▲ and ▼.

Restrictions

Up to five message text functions are available.

Particular characteristics to be noted when configuring

The message text can be configured in the block properties dialog. You can enter up to four lines for each message text (the text display of the LOGO! has four rows) and set the priority. You can move to the next line using the cursor keys or the mouse. Hit the [ENTER] key to confirm all your entries in the block properties dialog and to close the dialog.

You may also enter the actual values of other blocks in the text lines. To do so, select the relevant block from the **Block** dialog. A **Parameter** dialog opens to display a list of all parameters available for the selected block. The block parameter you select in this dialog is written to the selected text line. The actual parameter value is now included when you call the message text.

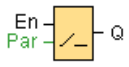
Set the "Acknowledge message" attribute to specify whether a message is be acknowledged before it is closed.

Simulation mode

Layout of message (Page 244)

Special functions (Page 340)

5.3.6.8 Softkey



Short description

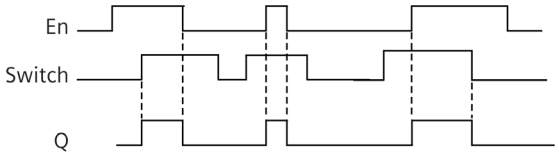
This SFB provides the action of a mechanical pushbutton or switch.

Connection	Description
Input **En**	Output Q is set with a 0 to 1 signal transition at input En (Enable) and if in addition, 'Status=On' has been confirmed in configuration mode.
Parameter	**Type:** Sets either a momentary pushbutton action for one cycle (On) or a switching action of the function (Off). **Status**: On or Off state that is applied in the initial cycle after program startup.
Output **Q**	Output Q remains set 1, as long as En = 1 and the parameter Type = Switch and Status = On. Output Q is set for the duration of one cycle if En = 1, Type = Momentary Pushbutton and Status = On.

Factory state

The default of the parameter Type is switching action.

Timing diagram



Description of the function

The output is set when input En is set and the 'Status' parameter is set to 'On' and confirmed with OK. This action is performed irrespective of a configured switch or pushbutton function.

The output is reset to '0' in the following three cases:

- With a 1 to 0 signal transition at input En
- When a pushbutton function is configured and one cycle has expired after its actuation
- When the 'Status' parameter sets the 'Off' status in configuration mode, and this has been confirmed with OK

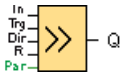
Particular characteristics to be noted when configuring

The softkey can be used both with momentary pushbutton or switching action. At the status parameter you can define the on (actuated) or off state for the switch/pushbutton.

If the softkey is assigned a pushbutton action, the output is always set for the duration of one cycle with a 0 to 1 transition at input En when the pushbutton is in on state, or if the pushbutton state changes from Off to On when En=1.

Special functions (Page 340)

5.3.6.9 Shift register (LOGO! 8.FS4 and later versions only)



Short description

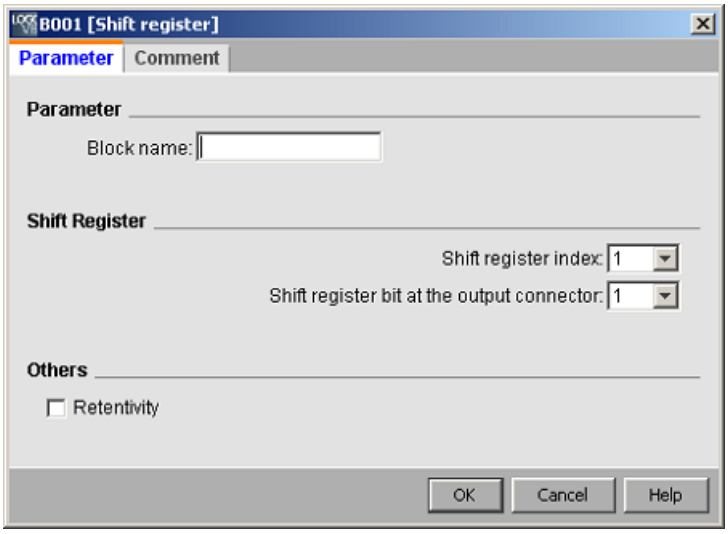
The shift register function reads an input value and shifts the bits. The output value corresponds with the configured shift register bit. The shift direction can be changed at a special input.

For LOGO! 8.FS4 devices, you can use a maximum of four shift registers with eight bits for each shift register in one circuit program.

Connection	Description
Input **In**	The function when started reads this input value.
Input **Trg**	The SFB is started with a positive edge (0 to 1 transition) at input Trg (Trigger). A 1 to 0 transition is irrelevant.
Input **Dir**	You define the shift direction of the shift register bits Sx.1 to Sx.8 at the Dir input: Dir = 0: shift up (Sx.1 >> Sx.8) Dir = 1: shift down (Sx.8 >> Sx.1) **NOTE:** "x" refers to the index of the shift register.
Input **R**	The SFB is reset with a positive edge (0 to 1 transition) at input **R** (Reset). When the SFB is reset, all the shift register bit (Sx.1 to Sx.8) and the output at **Q** are set to 0.
Parameter	**Shift register index:** the index of shift register in the circuit program. Possible settings: 1 to 4 **Shift register bit** that determines the value of output Q. Possible settings: 1 to 8 **Retentivity** set (on) = the status is retentive in memory.
Output **Q**	The output value corresponds with the configured shift register bit.

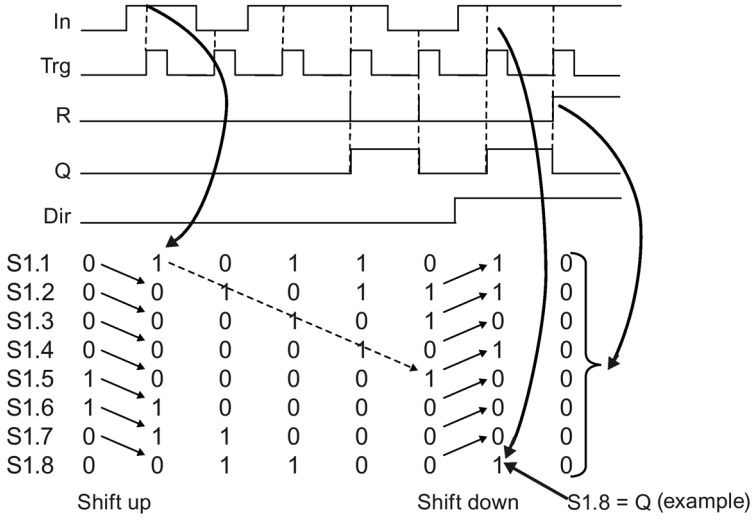
Parameter

LOGO! 8.FS4 devices provide four shift registers, with eight bits for each shift register. The shift register index corresponds to one of the four shift registers in the circuit program. The shift register bits are numbered in Sx.y, in which x is the index, and y is the bit number.



Timing diagram

If the shift register index is 1, the shift register bits will be S1.1 to S1.8.



Description of the function

The function reads the value of input In with a positive edge (0 to 1 transition) at input Trg (Trigger).

This value is written to shift register bits (Page 315) Sx.1 to Sx.8, depending on the set shift direction:

- Dir = 0 (Shift up): Sx.1 accepts the value of input In, the previous value of Sx.1 is shifted to Sx.2, Sx.2 to Sx.3 ... Sx.7 to Sx.8
- Dir = 1 (Shift down): Sx.8 accepts the value of input In; the previous value of S1.8 is shifted to Sx.7, Sx.7 to Sx.6 ... Sx.2 to Sx.1.

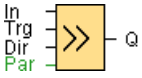
A positive edge (0 to 1 transition) at input **R** (Reset) reset the shift register. All the shift register bit (Sx.1 to Sx.8) and the output at **Q** are set to 0.

Q outputs the value of the configured shift register bits.

If retentivity is not enabled, the shift function restarts at Sx.1 or Sx.8 after a power failure.

Special functions (Page 340)

5.3.6.10 Shift register (0BA7 to 0BA8)



Short description

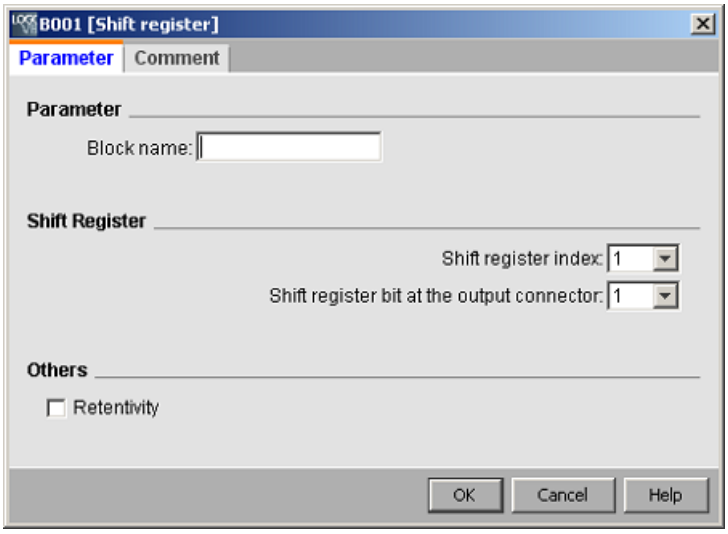
The shift register function reads an input value and shifts the bits. The output value corresponds with the configured shift register bit. The shift direction can be changed at a special input.

For LOGO! 0BA6, you can use only one shift register in one circuit program, but for LOGO! 0BA7 and LOGO! 0BA8 devices, you can use a maximum of four shift registers with eight bits for each shift register in one circuit program.

Connection	Description
Input **In**	The function when started reads this input value.
Input **Trg**	The SFB is started with a positive edge (0 to 1 transition) at input Trg (Trigger). A 1 to 0 transition is irrelevant.
Input **Dir**	You define the shift direction of the shift register bits Sx.1 to Sx.8 at the Dir input: Dir = 0: shift up (Sx.1 >> Sx.8) Dir = 1: shift down (Sx.8 >> Sx.1) **NOTE:** "x" refers to the index of the shift register.
Parameter	**Shift register index:** the index of shift register in the circuit program. Possible settings: 1 to 4 **Shift register bit** that determines the value of output Q. Possible settings: 1 to 8 **Retentivity** set (on) = the status is retentive in memory.
Output **Q**	The output value corresponds with the configured shift register bit.

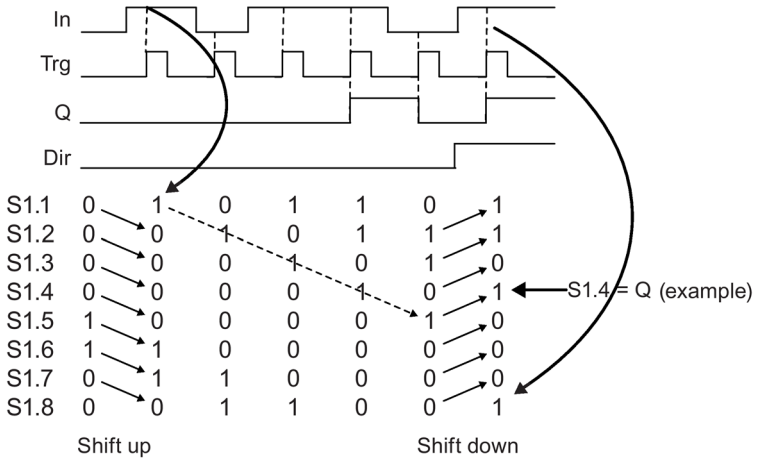
Parameter

LOGO! 0BA7 or 0BA8 devices provide four shift registers, with eight bits for each shift register. The shift register index corresponds to one of the four shift registers in the circuit program. The shift register bits are numbered in Sx.y, in which x is the index, and y is the bit number.



Timing diagram

If the shift register index is 1, the shift register bits will be S1.1 to S1.8.



Description of the function

The function reads the value of input In with a positive edge (0 to 1 transition) at input Trg (Trigger).

This value is written to shift register bits (Page 315) Sx.1 to Sx.8, depending on the set shift direction:

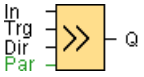
- Dir = 0 (Shift up): Sx.1 accepts the value of input In, the previous value of Sx.1 is shifted to Sx.2, Sx.2 to Sx.3 ... Sx.7 to Sx.8
- Dir = 1 (Shift down): Sx.8 accepts the value of input In; the previous value of S1.8 is shifted to Sx.7, Sx.7 to Sx.6 ... Sx.2 to Sx.1.

Q outputs the value of the configured shift register bits.

If retentivity is not enabled, the shift function restarts at Sx.1 or Sx.8 after a power failure.

Special functions (Page 340)

5.3.6.11 Shift register (0BA4 to 0BA6)

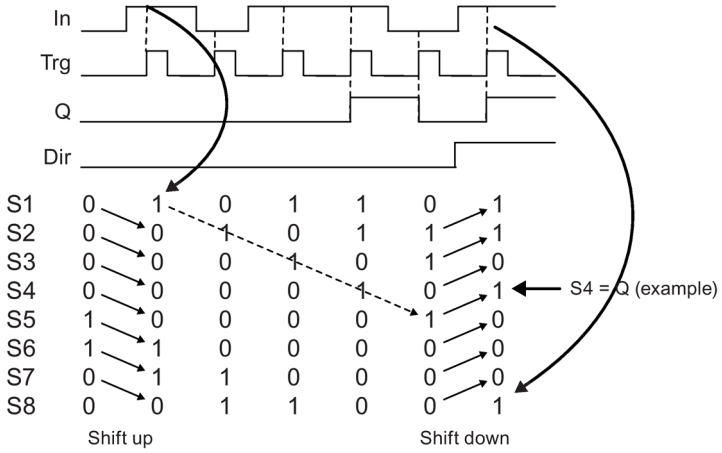


Short description

The shift register function reads an input value and shifts the bits. The output value corresponds with the configured shift register bit. The shift direction can be changed at a special input. For device series 0BA4 to 0BA6, you can use only one shift register in one circuit program.

Connection	Description
Input **In**	The function when started reads this input value.
Input **Trg**	The SFB is started with a positive edge (0 to 1 transition) at input Trg (Trigger). A 1 to 0 transition is irrelevant.
Input **Dir**	You define the shift direction of the shift register bits S1...S8 at the Dir input: Dir = 0: shift up (S1 >> S8) Dir = 1: shift down (S8 >> S1)
Parameter	**Shift register bit** that determines the value of output Q. Possible settings: S1 to S8 **Retentivity** set (on) = the status is retentive in memory.
Output **Q**	The output value corresponds with the configured shift register bit.

Timing diagram



Description of the function

The function reads the value of input In with a positive edge (0 to 1 transition) at input Trg (Trigger).

This value is written to shift register bits (Page 315) S1 or S8, depending on the set shift direction:

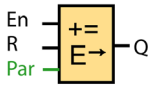
- Shift up: S1 accepts the value of input In; the previous value of S1 is shifted to S2, S2 is shifted to S3, etc.
- Shift down: S8 accepts the value of input In; the previous value of S8 is shifted to S7, S7 is shifted to S6, etc.

Q outputs the value of the configured shift register bits.

If retentivity is not enabled, the shift function restarts at S1 or S8 after a power failure.

Special functions (Page 340)

5.3.6.12 Mathematic instruction error detection



Short description

The mathematic instruction error detection block sets an output if an error has occurred in the referenced mathematic instruction or float calculation instruction function block.

Connection	Description
Input **En**	Enable the mathematic instruction error detection function block.
Input **R**	Reset the output.

Connection	Description
Parameter	**Referenced FB:** block number of a mathematic instruction **Error to detect:** Zero division, Overflow, Invalid Value or Zero division OR Overflow OR Invalid Value. **Auto Reset:** Reset the output when the failure condition clears.
Output **Q**	Q is set high if the error to detect occurred in the last execution of the referenced mathematic instruction function block.

0BA6 - 0BA8:
The mathematic instruction error detection function block only detects error of Zero division, Overflow or Zero division OR Overflow for 0BA6 - 0BA8.

0BA1- 0BA5:
The mathematic instruction error detection function block did not exist prior to 0BA6.

Parameter Referenced FB

The value for the Referenced FB parameter references the block number of an already-programmed mathematic instruction or float calculation instruction function block.

Description of the function

The mathematic instruction error detection block sets the output when the referenced Mathematic instruction (Page 411) or Float calculation instruction function block has an error. You can program the function to set the output on a zero division error, an overflow error, or when either type of error occurs.

If you select the "Automatically reset" check box, the output is reset prior to the next execution of the function block. If not, the output retains its state until the mathematic instruction error detection block is reset with the R parameter.

In any scan cycle, if the referenced mathematic instruction or float calculation instruction function block executes before the mathematic instruction error detection function block, the error is detected in the same scan cycle. if the referenced mathematic instruction or float calculation instruction function block executes after the mathematic instruction error detection function block, the error is detected in the next scan cycle.

Mathematic instruction error detection logic table

In the table below, Error to Detect represents the parameter of the mathematic instruction error detection instruction that selects which type of error to detect.

Zero represents the zero division bit set by the mathematic instruction at the end of its execution: 1 if the error occurred, 0 if not.

OF represents the overflow bit set by the mathematic instruction: 1 if the error occurred, 0 if not.

IV represents the invalid value bit set by the mathematic instruction: 1 if the error occurred, 0 if not.

Zero division OR Overflow OR Invalid Value represents the logical OR of the zero division bit, the overflow bit and the invalid value bit of the referenced mathematic instruction.

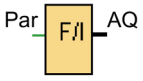
Output (Q) represents the output of the mathematic instruction error detection function. An "x" indicates that the bit can be either 0 or 1 with no influence on the output.

Error to Detect	Zero	OF	IV	Output (Q)
Zero division	1	x	x	1
Zero division	0	x	x	0
Overflow	x	1	x	1
Overflow	x	0	x	0
Invalid Value	x	x	1	1
Invalid Value	x	x	0	0
Zero division OR Overflow OR Invalid Value	1	0	0	1
Zero division OR Overflow OR Invalid Value	0	1	0	1
Zero division OR Overflow OR Invalid Value	0	0	1	1
Zero division OR Overflow OR Invalid Value	1	1	0	1
Zero division OR Overflow OR Invalid Value	1	0	1	1
Zero division OR Overflow OR Invalid Value	0	1	1	1
Zero division OR Overflow OR Invalid Value	1	1	1	1
Zero division OR Overflow OR Invalid Value	0	0	0	0

If the referenced mathematic instruction or float calculation instruction function block is null, then the output is always 0.

Special functions (Page 340)

5.3.6.13 Float/Integer converter (LOGO! 8.FS4 and later versions only)



Short description

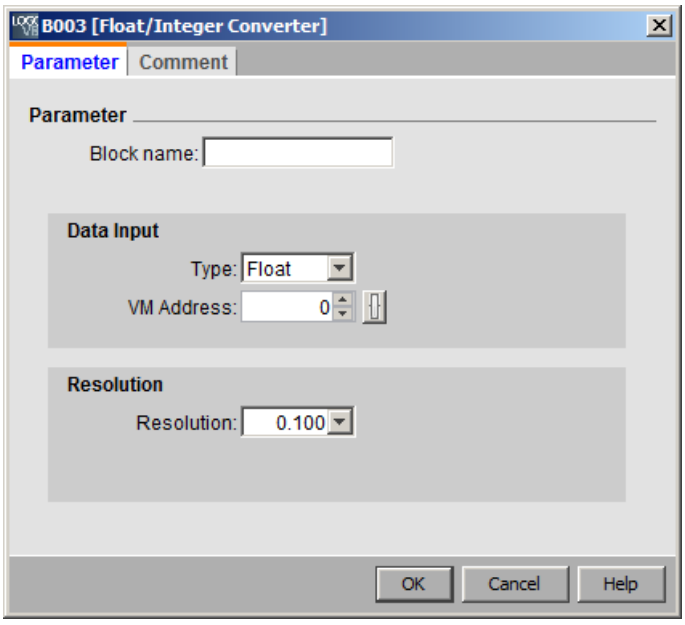
This function convert a float stored in VM to an integer and output the result via the parameter (eAq) or Aq.

LOGO! 0BA8 and previous versions devices can only deal with integers. If you transfer some float from outer system by network with S7/Modbus protocol, LOGO! cannot deal with it directly. With float to integer converter, you can convert floating numbers stored in VM to integers. This SFB does the conversion by dividing the float by a resolution. You need to set a suitable resolution for the input float in the parameter tab.

Connection	Description
Analog output **AQ**	AQ is the analog output value. It has the following features. • Used as input value of the other function block. • Signed 16 bit value. • Range of values: -32768 to 32767.
Extended analog output **eAQ**	Extended analog output for programming via parameter reference. • Used as a reference parameter of the other function block. • Signed 32 bits value. • Range of values: -999,999,999 to 999,999,999.
Parameter **Par**	• Type: It specifies the type of input data. – Float: it is a 32 bits single-precision float number; – Double: it is a 64 bits double-precision float number. • VM: Variable Memory Address, starting address of float or double stored in VM. Range of values: – For Float: 0-847 – For Double: 0-843 • Resolution: it's a divider for input data. • Range of values: 0.001 to 1000

Parameter

You can use the following parameters to control the float to integer converter:



Data Input: The input for this SFB is from VM.

- Type: You can chose the input data as **Float** or **Double**.
- VM Address: You can specify the start VM address where the input float stores.
  - Size: The input float occupies 4 bytes while double occupies 8 bytes.
  - Range: Float (0-847), Double (0-843).

Resolution: You can set the multiplier for the input float.

- Range: 0.001-1000
- Precision: 1/1000

Description of the function

You usually need both the blocks Float/Integer converter and Integer/Float converter to complete a task. A typical way to use these function blocks is:

1. Transfer the floats from outer system by network (with S7/Modbus protocol) and store them in VM.
2. Convert the floats stored in VM to integer by Float/Integer converter.
3. Process the integer with LOGO! BM.
4. Convert the result to floats by Integer/Float and store them in the VM.
5. Transfer the floats to outer system (with S7/Modbus protocol).

Calculation rule

Define Q =Data Input/Resolution

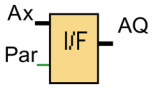
Analog output (Aq)

- if -32768 ≤ Q ≤ 32767, the Analog output = Q.
- if the Q ≥ 32767, then Analog output = 32767.
- if the Q ≤ -32768, then Analog output = -32768.

Extended analog output (eAq)

- if -999,999,999 ≤ Q ≤ 999,999,999, the Extended analog output = Q.
- if the Q ≥ 999,999,999, then Extended analog output = 999,999,999.
- if the Q ≤ -999,999,999, then Extended analog output = -999,999,999.

5.3.6.14 Integer/Float converter (LOGO! 8.FS4 and later versions only)



Short description

This function converts integers to floats, and store them in VM.

LOGO! 0BA8 and previous versions devices only deal with integers. If you transfer some float from outer system by network with S7/Modbus protocol, LOGO! cannot deal with it directly. With this SFB, LOGO! can output floating numbers. This SFB converts integers to floating numbers by multiplying a resolution into the floating number. You need to set a suitable resolution for the input integers in the parameter tab.

Connection	Description
Analog input **Ax**	Input Ax is one of the following analog signals (integer or float): • AI [1]: – LOGO! 9: AI1 to AI16 [3] – 0BA8: AI1 to AI8 [4] • AM [1]: – LOGO! 9: AM1 to AM128 – 0BA8: AM1 to AM64 – 0BA7: AM1 to AM16 – 0BA6: AM1 to AM6 • NAI [1]: – LOGO! 9: NAI1 to NAI128 – 0BA7 or 0BA8: NAI1 to NAI32 • AQ [1]: – LOGO! 9: AQ1 to AQ16 – 0BA8: AQ1 to AQ8 – 0BA7: AQ1 and AQ2 • NFAI [2]: – LOGO! 9: NFAI1 to NFAI16 • FAM [2]: – LOGO! 9: FAM1 to FAM32 • The block number of a function with analog output [1 2]
Extended analog input **eAx**	If the analog input (Ax) is not available, you can assign a value to Extended analog input (eAq) by inputting a value to the eAx field or referring to other FB's parameter. Range of values: -999,999,999 to 999,999,999
Parameter **Par**	• Type: It specifies the type of output data. – Float: it is a 32 bits single-precision float number; – Double: it is a 64 bits double-precision float number. • VM: Variable Memory Address, starting address of float or double stored in VM: – For Float: 0-847 – For Double: 0-843 • Resolution: it's a multiplier for input data. Range of values: 0.001 to 1000
Output Aq	Aq is the analog output value. It has the following features. • Used as input value of the other function block. • Signed 16 bit value. • Range of values: -32768 to 32767.

Connection	Description
Extended analog output **eAq**	Extended analog output for programming through parameter reference. • Used as a reference parameter of the other function block. • Signed 32 bits value. • Range of values: -999,999,999 to 999,999,999.
[1] If the data type of Ax is integer and the data type of this FB is configured as float, LSC will convert Ax into 32-bit receivable float data. [2] If the data type of Ax is float and the data type of this FB is configured as integer, LSC will cut off the decimal numbers of Ax and convert it into 16-bit receivable integer data. [3] AI1 to AI16: 0 to 10 V corresponds with 0 to 1000, 0 to 4095 or 0 to 10000. [4] AI1 to AI8: 0 to 10 V corresponds with 0 to 1000 (internal value).	

Extended analog input eAx

The eAx value can be provided by another already-programmed function:

- Analog comparator: Ax - Ay
- Analog threshold trigger: Ax
- Analog amplifier: Ax
- Analog multiplexer: Aq
- Analog ramp: Aq
- Mathematic instruction: Aq
- PI controller: Aq
- Up/Down counter: Cnt

For the **0BA7** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- On-delay: Ta
- Off-delay: Ta
- On-/off-delay: Ta
- Retentive on-delay: Ta
- Wiping relay(pulse output): Ta
- Edge triggered wiping relay: Ta
- Asynchronous pulse generator: Ta
- Stairway light switch: Ta
- Multiple function switch: Ta
- Stopwatch: Aq
- Analog filter: Aq
- Average value: Aq
- Max/Min: Aq
- Threshold trigger: Fre

For the **0BA8** and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float/Integer converter: eAq
- Integer/Float converter: eAq

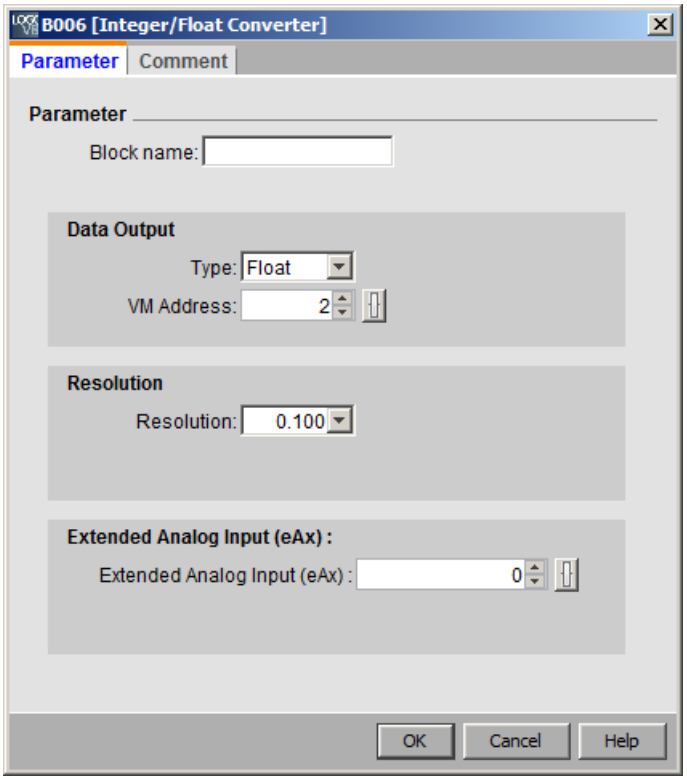
For the LOGO! 9 and later version devices, you can additionally use the actual values of the following already-programmed functions:

- Float calculation instruction: Aq

You select the required function by the block number.

Parameter

In addition to the function block inputs, the following settings provide additional control over the integer to float converter:



Data Output: The output of Integer/Float is stored in VM. You can chose the output type as float or double and the start VM address where the converted float stores.

- Type: You can chose the output data as **Float** or **Double**.
- VM Address: You can specify the start VM address where the output float stores.
  - Size: The input float occupies 4 bytes while double occupies 8 bytes.
  - Range: Float (0-847), Double (0-843).

Resolution: You can set the dividend for the input integer.

- Range: 0.001-1000
- Precision: 1/1000

Extended Analog Input: You can also set the input value here. If you don't connect the input pin **In**, the SFB uses the value set here as its input. It can also be used as reference for other parameter value, such as counter value.

- Range: -999,999,999 ~ 999,999,999

Description of the function

You usually need both the blocks Float/Integer converter and Integer/Float converter to complete a task. A typical way to use these function blocks is:

1. Transfer the floats from outer system by network (with S7/Modbus protocol) and store them in VM.
2. Convert the floats stored in VM to integer by Float/Integer converter.
3. Process the integer with LOGO! BM.
4. Convert the result to floats by Integer/Float and store them in the VM.
5. Transfer the floats to outer system(with S7/Modbus protocol).

Calculation rule

Float Value in VM address

Float Value in VM address = Analog input x Resolution

Analog output (Aq)

- Analog input connector is connected: Analog output = Analog input
- Analog input connector isn't connected:
  - if -32768 ≤ Extended analog input ≤ 32767, the Analog output = Extended analog input.
  - if the Analog input ≥ 32767, then Analog output = 32767.
  - if the Analog input ≤ -32768, then Analog output = -32768.

Extended analog output (eAq):

- If the analog input connector is connected: Extended analog input = analog input.
- Extended analog input connector isn't connected:
  - if -999,999,999 ≤ Extended analog input ≤ 999,999,999, the Extended Analog Output = Extended analog input.
  - if the Extended analog input ≥ 999,999,999, then Extended analog output = 999,999,999.
  - if the Extended analog input ≤ -999,999,999, then Extended analog output = -999,999,999.

5.3.6.15 Additional functions of the LAD Editor

In LAD circuit programs the AND with edge evaluation (Page 336) instruction and the NAND with edge evaluation (Page 337) instruction are available in the group of miscellaneous functions.

5.4 Data log profile (0BA7 and later versions only)

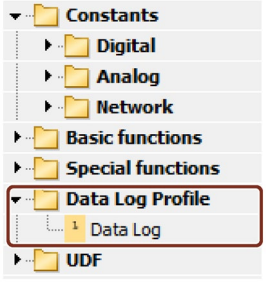
5.4.1 What is a data log?

You can configure a data log to record the actual values of the function blocks and memory areas in a circuit program.

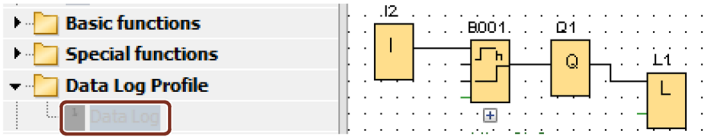
Connection	Description
En	The Data Log begins logging data with a positive edge (0 to 1 transition) at input En (Enable)

Short description

You can access the data log profile in the LOGO!Soft Comfort navigation tree:



You can configure one data log per circuit program. After you configure a data log, the icon in the navigation tree becomes gray so that you can no longer select it:



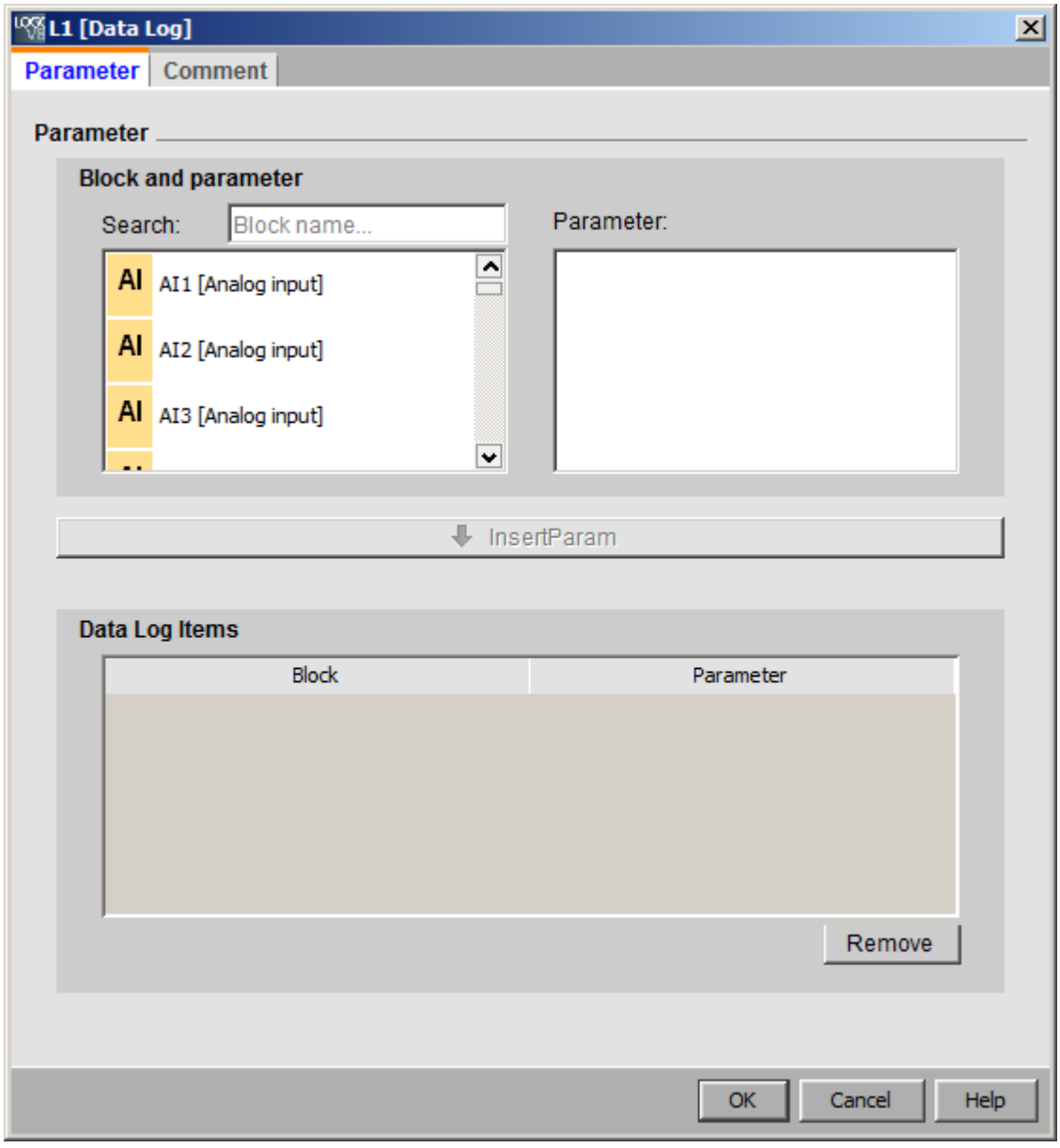
5.4.2 Configuring the data log

In a circuit program, you can only configure one data log to record the actual values of function blocks, and the following memory areas:

- I
- Q
- M
- AI
- AQ
- AM
- FAM

For digital I/O and memory, you must log data in groups of eight bits, for example, I1 to I8, Q9 to Q16, M17 to M24. For analog data, you select one value to log, for example, AI1, AQ2, or AM1. You configure function block values in groups of eight bits or single values, depending on the value type (digital or non-digital).

You can log a maximum of 32 items (analog values or eight-bit digital groups) in the data log.



You can only configure the data log from LOGO!Soft Comfort. You can not create, configure, or delete the data log from a LOGO! device.

5.4.3 Transferring the data log

After configuring the data log, you can download the circuit program into LOGO! devices (0BA7 or later versions) which store the data log in internal EEPROM.

You can transfer the data log to your PC or an SD card in .CSV format. To upload the data log from the internal EEPROM to your PC, use the menu command "Tools -> Transfer -> Upload Data Log (0BA7 and later versions only) (Page 105)", and the LOGO! devices (0BA7 and later versions) must be in STOP mode.

5.4.4 Opening an uploaded data log

After successfully uploading the data log into your PC, double-click this .CSV file and it opens in Microsoft Excel by default. You can also open it with a text editor regardless.

5.5 UDF (0BA7 and later versions only)

5.5.1 What is a UDF?

A UDF (**U**ser-**D**efined **F**unction block) provides you a convenient way to deal with circuit logic that is composed of a group of function blocks and used in several places of a circuit program or among multiple circuit programs. A UDF helps you avoid copying and pasting a common set of blocks to multiple places and results in more readable program logic with fewer connection lines. With a UDF, you can do the modifications of all occurrences of the circuit logic at just one place.

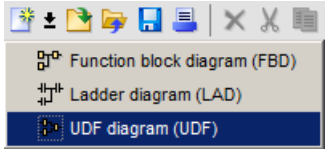
To create and use a UDF, follow these steps:

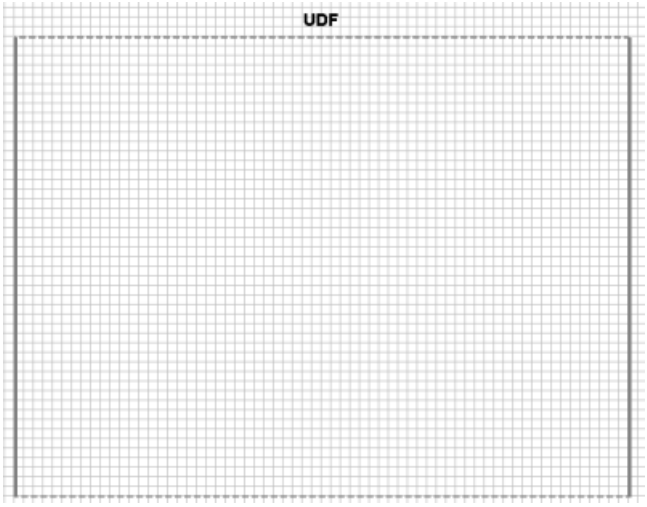
1. **Edit mode**: create and edit a UDF
   - You can create a new UDF via menus or toolbars, and edit this UDF.
   - You can use a group of selected blocks in an existing circuit program as the start contents of the new UDF.
   - You can save the UDF to a UDF library path where you can import the UDF later.
   - You can create your own UDF library or copy a UDF library from a third party.
2. **Use mode**: use the UDF in an FBD or in another UDF (nested UDF)

   If you have imported the UDF, it is available in the block tree like general function blocks. You can use it in the same way as a general function block.

5.5.2 Creating a UDF

You can create an empty UDF from the File → New (Page 58) menu command.





A UDF has a rectangle to indicate its edit area. You can edit the position and dimensions of this area.

Restrictions for a UDF:

- Input (analog + digital): 8
- Output (analog + digital): 4
- Parameter: 8

Not all blocks can be added to a UDF. Below table lists function blocks that **cannot** be added to a UDF:

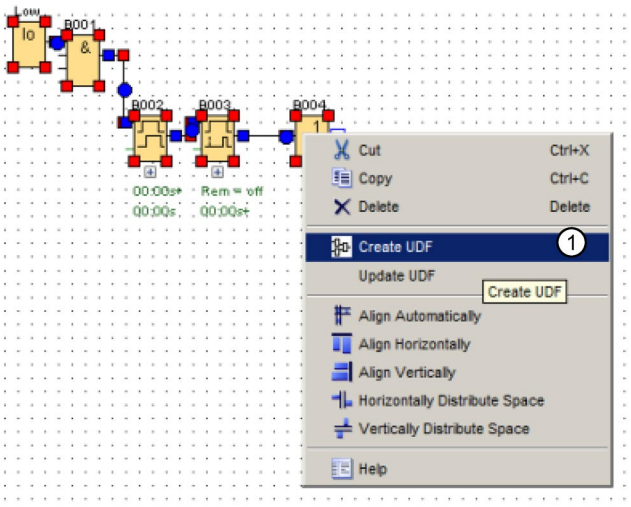
Input	Open connector	Network analog input	PI controller
Cursor key	Analog input	Network float analog input	Float mathematics instruction
LOGO! TD function key	Analog output	Network output	LCD Message
Shift register bit	Float analog flag	Network analog output	Shift register
Output	Network input	Network float analog output	Data log

Note

Analog resolution

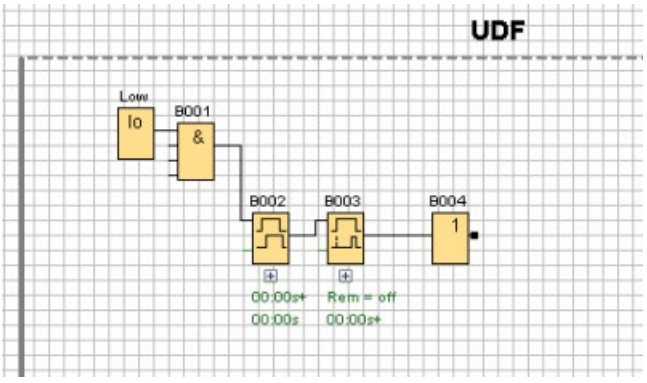
If you have changed the analog resolution in the I/O settings (Page 69) for your diagram, you need to re-configure the parameters of certain function blocks in your UDF. Otherwise, the UDF may become invalid in your diagram.

You can also create a UDF from selected figures. To create a new UDF, select the blocks, right-click, and select "①" from the following context menu.



If the selection includes blocks that a UDF does not support, LOGO!Soft Comfort excludes them from the UDF. If an included function block is connected to an excluded one, LOGO!Soft Comfort creates an input or output in place of the excluded block. If the number of inputs and outputs would exceed the restrictions, LOGO!Soft Comfort does not make inputs or outputs that would exceed the restriction.

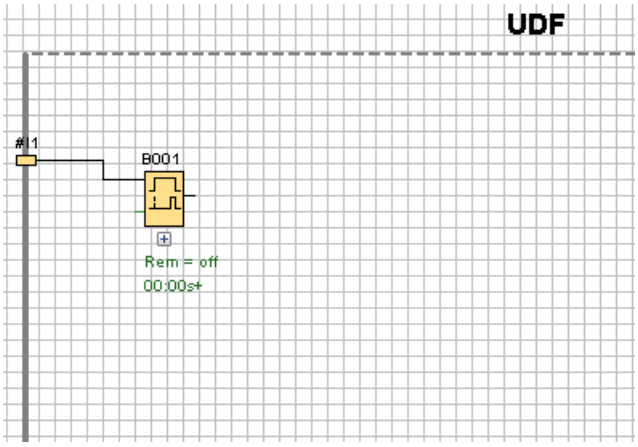
LOGO! Soft Comfort creates the UDF and opens it in the UDF Editor:



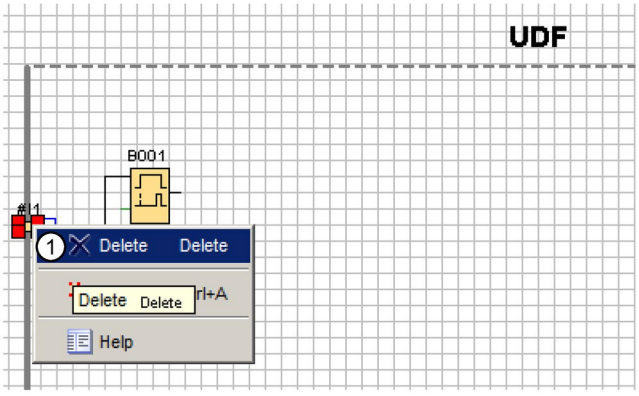
5.5.3 Editing the UDF

Add/Remove connectors

You can create an input/output by dragging a connection line from a block to the left or right side of the UDF edit rectangle area:

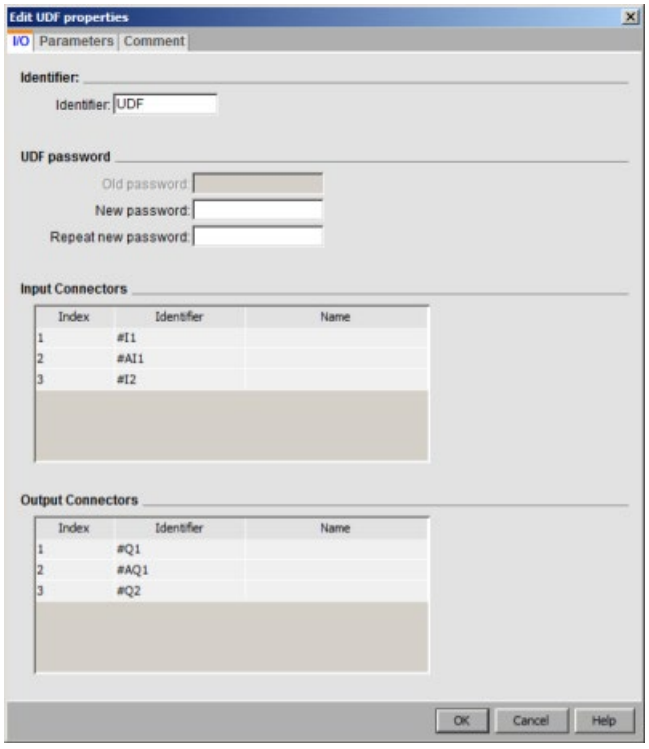


To remove an input/output, select the yellow connector figure and select "①" in the context menu. The corresponding connection line(s) will be deleted as well:



Configure UDF properties

UDF properties include information such as identifier, password, connector names, parameters, comments and so on. To edit the UDF properties, double-click the identifier text above the UDF edit box or use menu command "Edit -> Edit UDF properties (Page 87)". LOGO!Soft Comfort displays the following dialog:

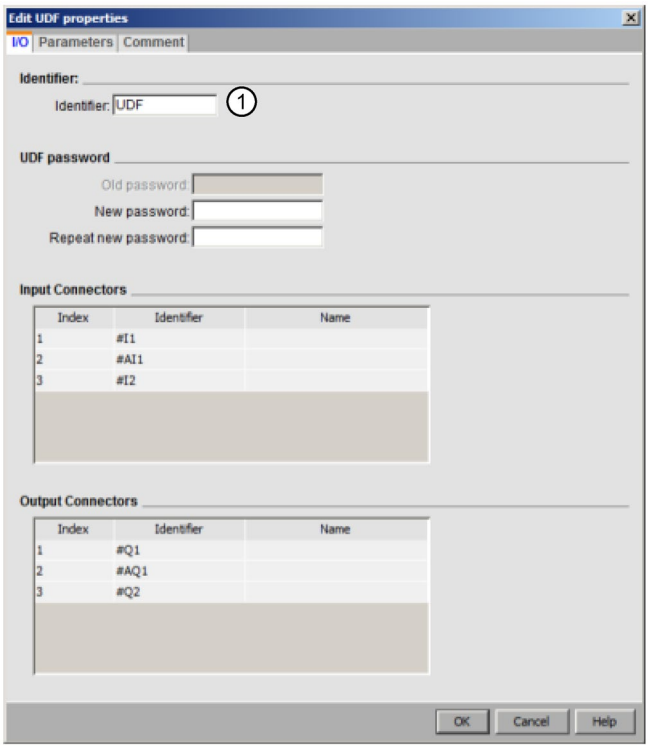


The dialog includes three tabs:

- I/O
- Parameters
- Comment

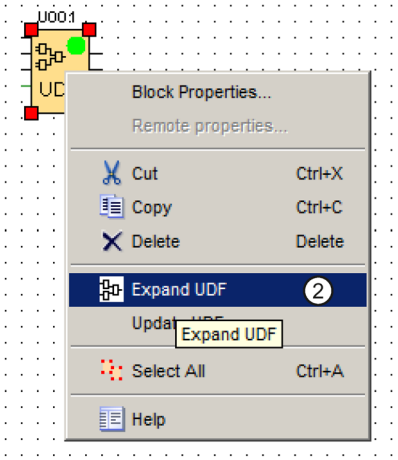
The I/O-specific tab

From this tab, you can configure the identifier, the UDF password, and the names of input connectors and output connectors:



In Field "①" of the above dialog, you can enter an identifier for your UDF. The identifier is "UDF" by default.

UDF password offers the capability to hide the details of a UDF such that a UDF library can be distributed without the details. In the use mode, you can right-click the UDF, and select "②" in the following context menu list to expand the UDF and view its details:



0BA0 : 0BA9

0BA8 and earlier versions:

UDF password is only available for LOGO! 0BA8 and earlier versions devices.

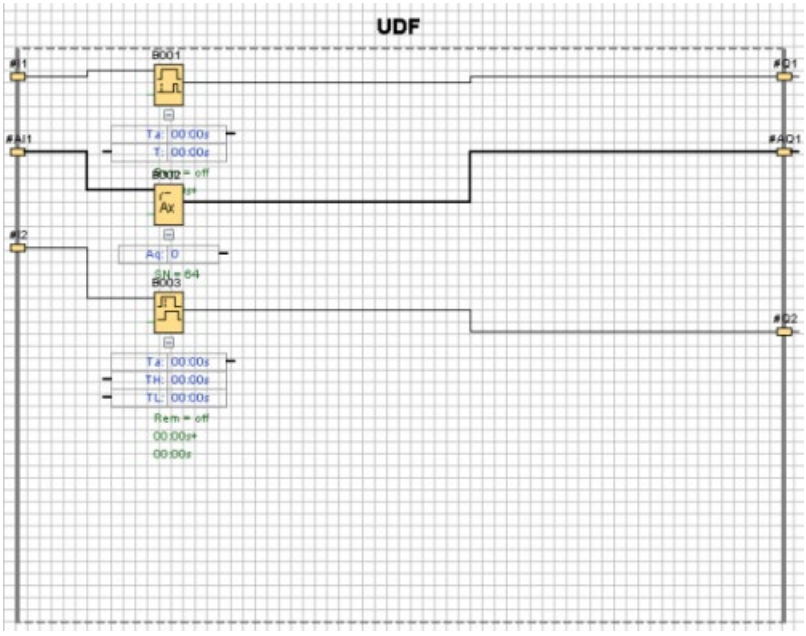
When using an UDF diagram with password to LOGO! 9 (or later versions), LSC will remove the UDF password when converting the diagram.

Note

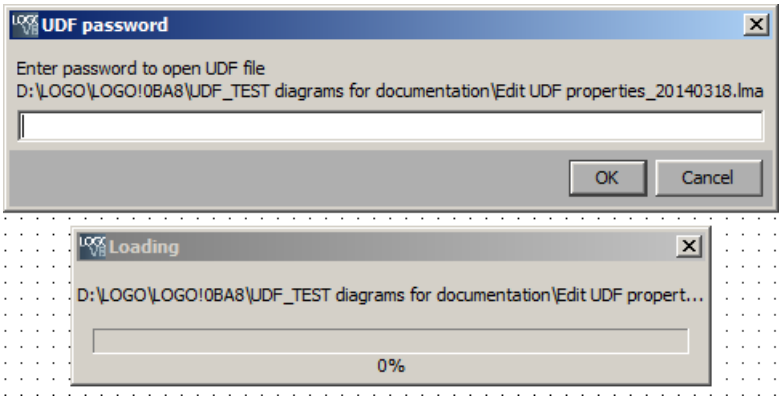
The UDF circuit diagram password rule is as follows:

- The maximum length of password is 10.
- English characters (uppercase or lowercase letters) and digits are supported.

If you did not configure a password for the UDF, LOGO!Soft comfort displays the expanded UDF content when you select "①":

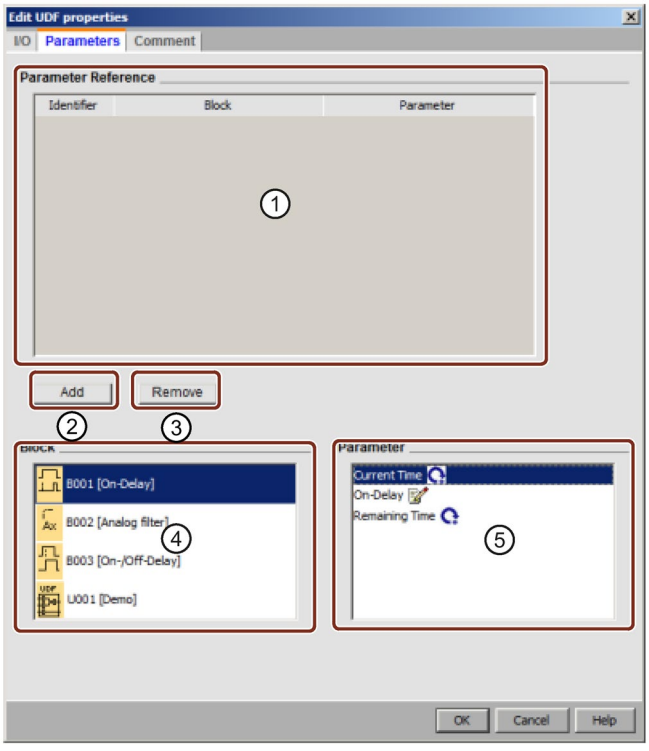


If you did configure a password for the UDF and select "①", you must first enter the password before LOGO!Soft comfort displays the expanded UDF content:



The parameter-specific tab

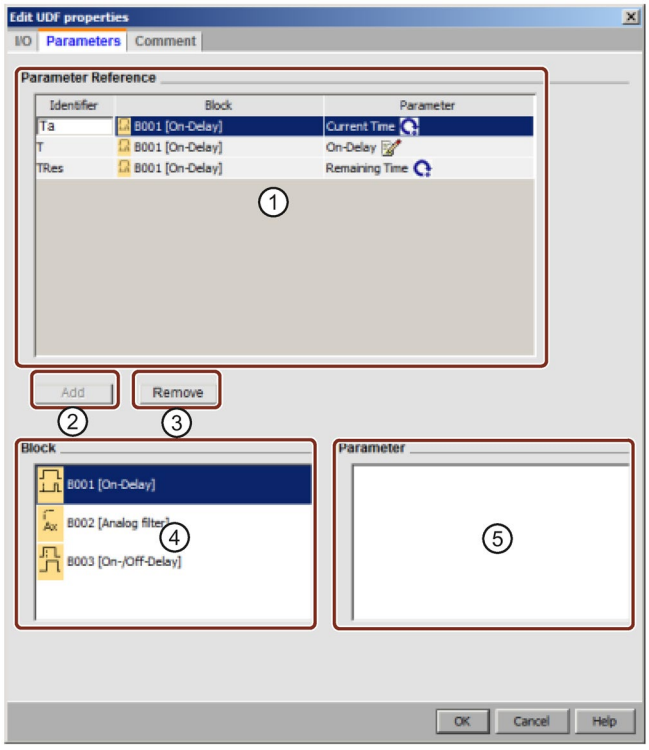
In this tab, you can configure the parameters of the UDF:



You can reference the available parameters of the function blocks used in the UDF as the parameters of the UDF. "④" shows the function blocks, while "⑤" shows the parameters that the selected block includes. Double-click a parameter or use "②" to move a parameter from "⑤" to "①".

To remove a parameter from ①, select the parameter and click ③. The parameter then re-appears in ⑤.

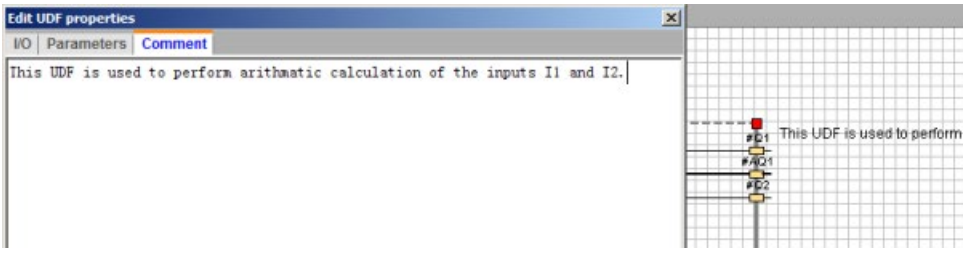
Use the first column in ① to identify each parameter. Set a unique identifier for each parameter:



The comment-specific tab

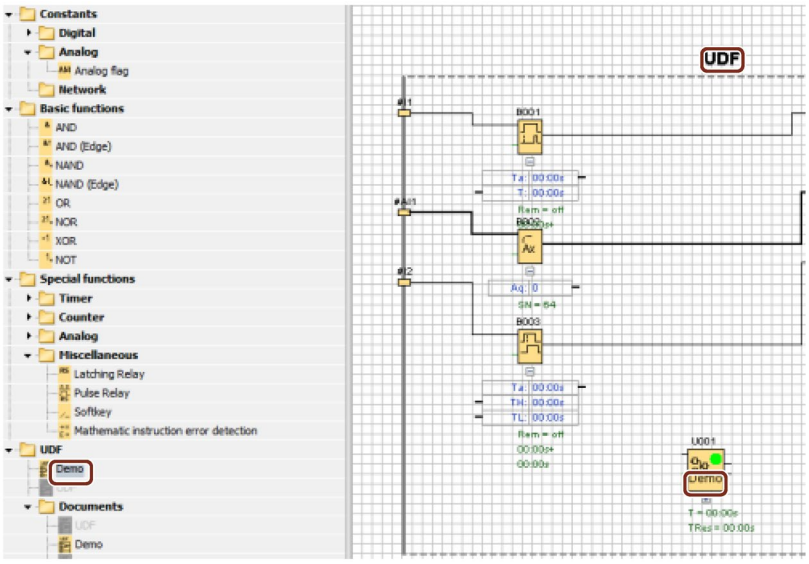
You can use this tab to add a description of your UDF.

The comment can describe how to use the UDF, the function of the inputs and outputs, and any other details. By default, the comment appears to the right of the UDF edit box, but you can place it wherever you choose:

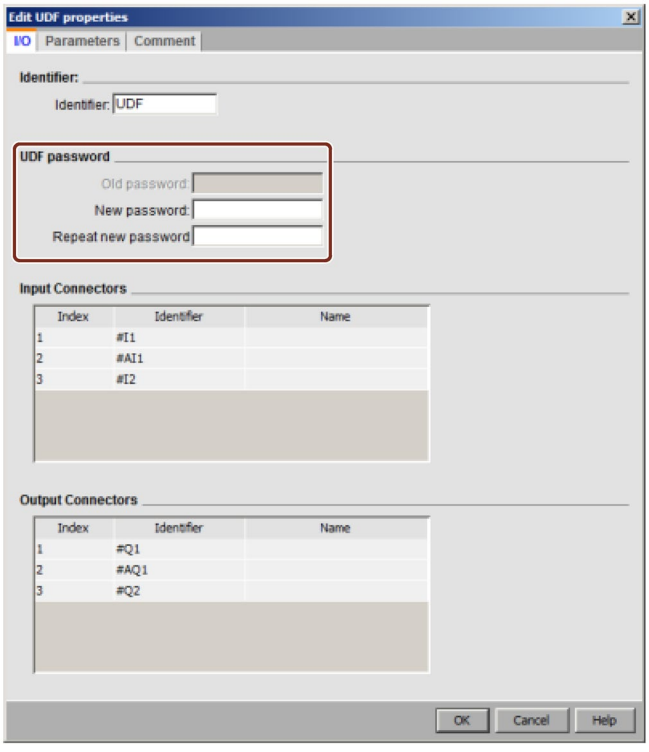


UDF identifier

The UDF identifier appears on the UDF edit box as an easy, short identifier of the UDF, and also appears in the block tree:



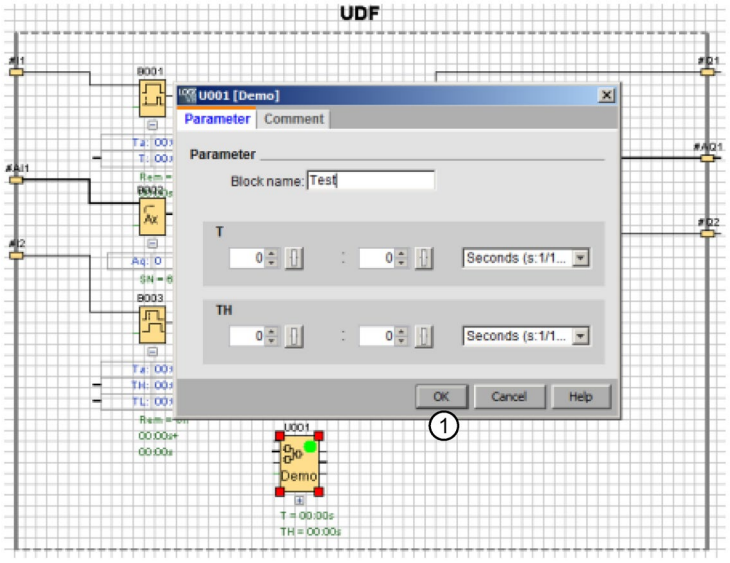
Double-click the UDF identifier above the expanded UDF to open the following properties dialog. You can enter up to eight characters for the UDF name. You can also password-protect the UDF in the following dialog:



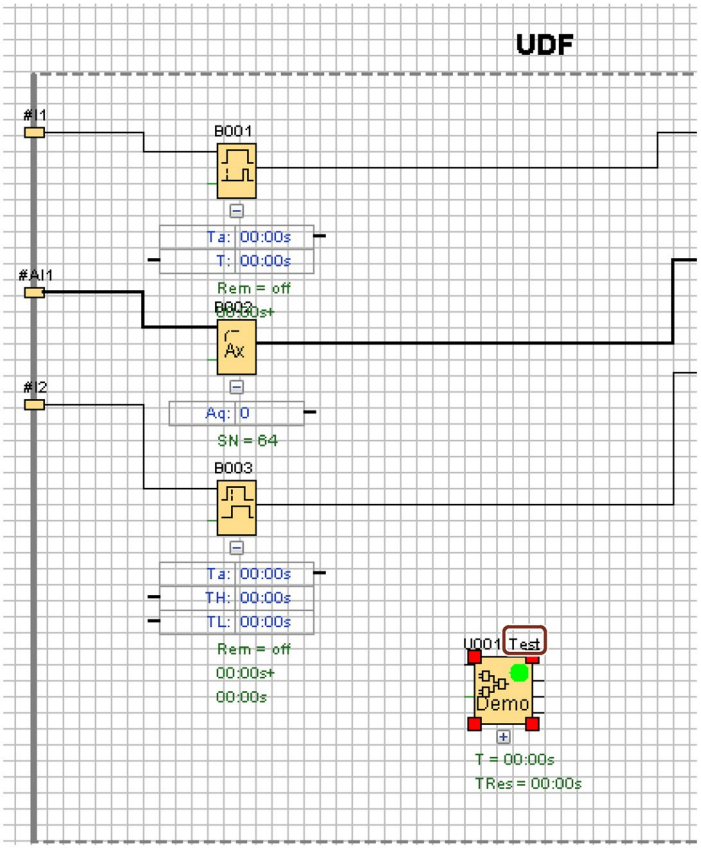
User-defined name for a UDF block

You can also configure a user-defined name for a UDF. It is the block name which appears above the UDF block as other function blocks in a circuit program.

To configure a user-defined name for the UDF, double-click the UDF block and LOGO!Soft Comfort displays the following dialog:



Enter a name for the UDF, and click "①" in the above dialog. Then LOGO!Soft Comfort displays the new UDF block name :



5.5.4 Saving the UDF

Saving a UDF

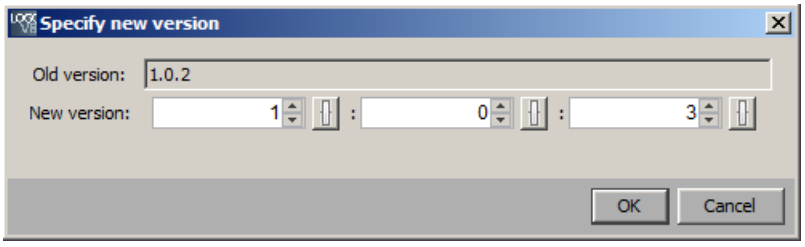
You can save a single UDF as .lma file by clicking or selecting "File -> Save (Page 61)"/"File -> Save As (Page 62)" from the menu bar.

Saving a UDF library

You can configure a UDF library structure that represents either a single UDF or a folder of multiple UDFs. See Tools -> Options: UDF (Page 219) for UDF library path configuration.

Version control in the edit mode

You can revise a UDF as needed to add new functions or to resolve logic problems. LOGO!Soft Comfort uses "version" to identify differences; the valid version range is 0.0.1 to 255.255.255. If you make any change to a UDF and click , the following dialog appears:

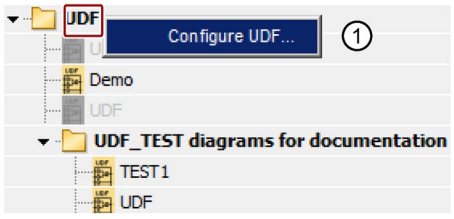


The new version must be an increment from the previous value. For example, in the example shown above, version 1.0.3 or 0.254.3 would be invalid.

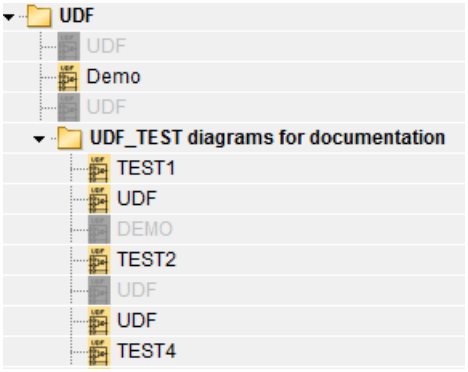
5.5.5 Using the UDF in an FBD circuit program or another UDF

There are two methods available to configure a UDF library:

- Select the Tools -> Options: UDF (Page 219) menu command
- Right-click "UDF" in the following instruction tree and select "①" to call the dialog for configuring the UDF library



The block tree shows the UDFs and UDF library that you have configured:



Note

UDF compatibility

A UDF created on LOGO! Base Module 0BA8 is invalid for LOGO! Base Module 0BA7.

A UDF created on LOGO! 9 (or later versions) is invalid for LOGO! 0BA8 and LOGO! 0BA7.

Note

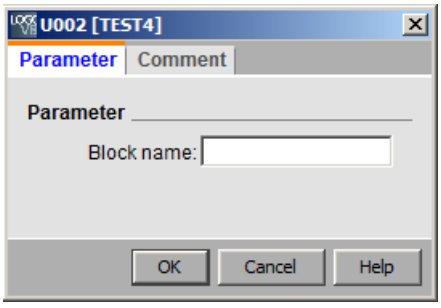
Not all UDFs can be used in a circuit program. Invalid UDFs appear in the block tree, but are gray. A UDF is invalid if it meets one or more of these conditions:

- The UDF has no blocks or connectors
- The UDF has input or output connectors, but no block connections
- The UDF contains blocks, but no in or out connectors

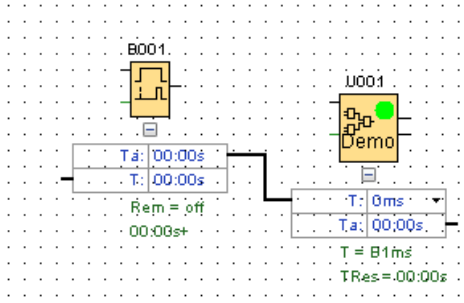
A circuit program can have at most 16 different UDFs.

- LOGO! 0BA7 - 0BA8: support at most 64 UDF instances in a circuit diagram.
- LOGO! 9 and later versions: support at most 128 UDF instances in a circuit diagram.

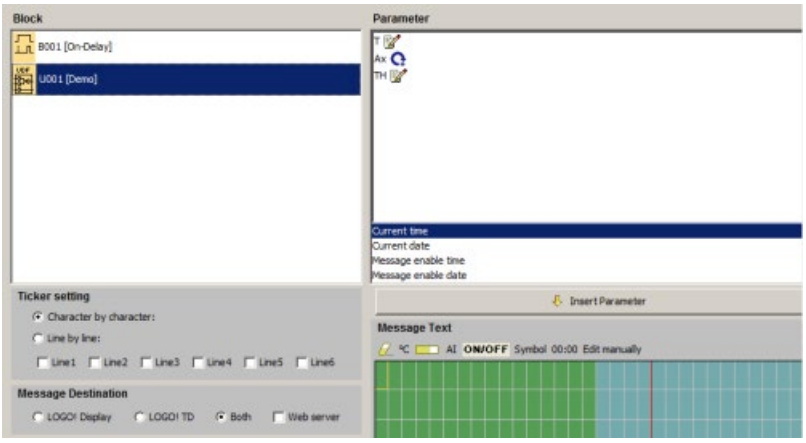
Within a circuit program, interaction with UDFs is consistent to other function blocks. Double-clicking, for example, produces the following dialog. With this dialog, you can set user-defined names and comments as other function blocks.



Similarly, other blocks can reference UDF parameters, for example, you can drag the input connector of the parameter box of a function block to the output connector of the parameter box of a UDF block:



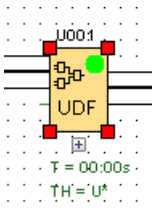
You can include editable UDF parameters in message texts (Page 458):



Note

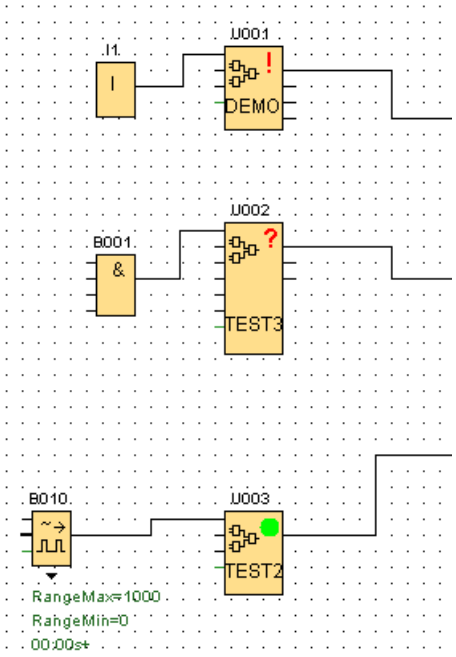
You can not invert the input connectors of a UDF.

If a UDF internally references a parameter that is provided by another already-programmed function block, this parameter appears as "**U***" when you use the UDF in a circuit program, for example:

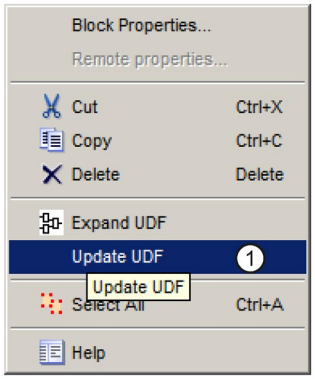


5.5.6 Synchronizing UDF versions

You can use a UDF in multiple circuit programs. If you update a UDF to a new version, synchronize the UDF instances, including any nested UDF instances, to the new version. Depending on how you use the UDF, LOGO!Soft Comfort indicates various conditions pertaining to the UDF update.



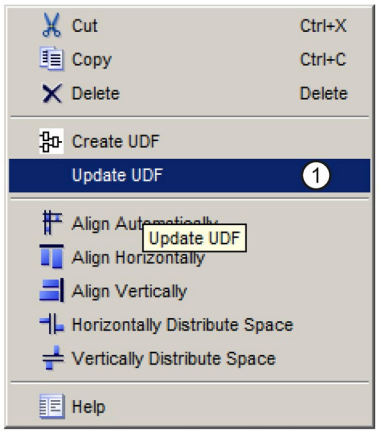
LOGO!Soft Comfort displays a warning signal (**!**) in the upper right corner to indicate that the UDF is out of date. You can right-click the block, and select "①" from the following context menu to update the UDF to a new version.



LOGO!Soft Comfort displays a question mark (**?**) if the UDF is not available in the current library. You have to re-import the UDF to the current UDF library to remove this problem.

A green mark (●) means the UDF is configured and of the latest version.

You can also update multiple UDFs at once. Select a group of UDFs, right-click, and select "①" from the context menu below. If there are conflicts, LOGO!Soft Comfort only updates the UDFs that can be updated without conflict. LOGO!Soft Comfort leaves those with conflicts as is, and produces a failure report in the "Info Window".



5.6 Circuit programs

With LOGO!Soft Comfort you can start right away to design your own circuit programs. The tutorial (Page 225) section provides you with detailed information about the creation and simulation of circuit programs.

You first use the LOGO!Soft Comfort software to write your programs, and secondly let LOGO!Soft Comfort calculate (Page 175) the minimum LOGO! version that you need to put your ideas into practice!

No particular program settings are required.

The type of LOGO! device you can use to put your ideas into practice depends on a number of factors:

- The number of I/O to be used
- Memory requirements (Page 520) of the circuit program
- The use of particular SFBs

5.6.1 LOGO! hardware

LOGO! hardware series

LOGO!Soft Comfort lets you create programs for LOGO! devices of various series. LOGO! device series vary in performance, memory space, number of program blocks (for example, flag blocks) and in the structure of the devices.

Because there are device-specific differences with regard to the functions, you must not only distinguish between the LOGO! versions, but also take their version status into account. You can identify the version status by the suffix of the LOGO! order number.

The current LOGO! BM versions belong to the 10th generation. They can be identified by the last digits of their order number: 0BA8, 08_0BA0 and 08_0BA1.

You can identify the first three generations of LOGO! devices by the 0, 1 and 2 suffix. The major difference in the first three generations of LOGO! lies in their modular structure. Long and AS-Interface versions are no longer available as of version 0BA3. The standard devices are now equipped with an expansion interface, to which you can connect expansion modules (digital/analog and bus modules) for adapting the LOGO! to suit your personal requirements. This modular structure, however, has little to no influence on programming. You can still program your LOGO! in the usual way. All you have to take into consideration is that AS-Interfaces and analog I/O are determined by the position at which the relevant expansion module is installed.

Current devices

Name	Order number
LOGO! 12/24RCE *	6ED1052-1MD08-0BA3
LOGO! 24CE *	6ED1052-1CC08-0BA3
LOGO! 24RCE (AC/DC)	6ED1052-1HB08-0BA3
LOGO! 230RCE (AC/DC)	6ED1052-1FB08-0BA3
LOGO! 12/24RCEo *	6ED1052-2MD08-0BA3
LOGO! 24CEo *	6ED1052-2CC08-0BA3
LOGO! 24RCEo (AC/DC)	6ED1052-2HB08-0BA3
LOGO! 230RCEo (AC/DC)	6ED1052-2FB08-0BA3

* With analog inputs

Memory space is identical for all these devices.

The following expansion modules are available for the standard devices:

Name	Order no.
LOGO! DM8 230R	6ED1055-1FB00-0BA3
LOGO! DM8 12/24R	6ED1055-1MB00-0BA3
LOGO! AM4 AIAQ	6ED1055-1MF00-0BA3
LOGO! TDE	6ED1055-4MH08-0BA3

You can use the description to identify the different properties of LOGO!:

- **12** means 12 V Version
- **24** means 24 V Version
- **230** means 115/230 V Version
- **R** means relay outputs (without R transistor outputs)
- **C** means integrated time/timer switch
- **o** means without display
- **E** means the LOGO! ... E version (with Ethernet interface)
- **DM** means digital module
- **AM** means analog module
- **TDE** means text display with Ethernet interfaces

Special functions, depending on LOGO! versions

Special function	0BA0 Stand-ard	0BA 0 ...L	0BA 0 ...LB 11	0BA 1 all	0BA 2 all	0BA 3 all	0BA 4 all	0BA5 all	0BA6 all	0BA7 all	LOGO ! 8 (0BA8 Stand ard)	LOGO!8. 1&8.2 (LOGO! 8.FS4) / LOGO! 8.3 & 8.4	LOGO ! 9.0
On delay	X	X	X	X	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Off delay	X	X	X	X	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Retentive on delay	X	X	X	X	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
On/off delay	-	-	-	-	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Latching relay	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Pulse relay	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Wiping relay	-	X	X	X	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Edge-triggered wiping relay	-	-	-	-	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Weekly timer)*	X	X	X	X	X	X	X	X	X	X	X	X	X
Yearly timer)*	-	-	-	X	X	X	X	X	X	X	X	X	X
Up/Down counter	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Hours counter	-	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Symmetrical pulse generator	X	X	X	X	X	X	X	X	X	X	X	X	X
Asynchronous pulse generator	-	-	-	X	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Random generator	-	-	-	-	X	X	X	X	X	X	X	X	X
Threshold trigger	-	X	X	X	X	X	X	X	X	X	X	X	X
Analog threshold trigger	-	-	-	-	X	X	X	X	X	X	X	X	X
Analog comparator	-	-	-	-	X	X	X	X	X	X	X	X	X
Stairway lighting switch	-	-	-	-	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr

Special function	0BA0 Standard	0BA 0 ...L	0BA 0 ...LB 11	0BA 1 all	0BA 2 all	0BA 3 all	0BA 4 all	0BA5 all	0BA6 all	0BA7 all	LOGO! 8 (0BA8 Standard)	LOGO!8.1&8.2 (LOGO! 8.FS4) / LOGO! 8.3 & 8.4	LOGO! 9.0
Multiple function switch	-	-	-	-	X	X	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Message text	-	-	-	-	X	X	X	X	X	X	X	X	-
LCD Message	-	-	-	-		-		-	-	-	-	-	X
Softkey	-	-	-	-	-	Xr	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Shift register	-	-	-	-	-	-	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Analog watchdog	-	-	-	-	-	-	Xr	Xr	Xr	Xr	Xr	Xr	Xr
Analog Amplifier	-	-	-	-	-	-	X	X	X	X	X	X	X
Analog Differential trigger	-	-	-	-	-	-	X	X	X	X	X	X	X
Analog multiplexer	-	-	-	-	-	-	-	X	X	X	X	X	X
PI Controller	-	-	-	-	-	-	-	Xr	Xr	Xr	Xr	Xr	Xr
Analog Ramp	-	-	-	-	-	-	-	-	X	X	X	X	X
Pulse width moderator (PWM)	-	-	-	-	-	-	-	-	X	X	X	X	X
Mathematic instruction	-	-	-	-	-	-	-	-	X	X	X	X	X
Float mathematic instruction	-	-	-	-	-	-	-	-	-	-	-	-	X
Mathematic instruction error detection	-	-	-	-	-	-	-	-	X	X	X	X	X
Astronomical clock	-	-	-	-	-	-	-	-	-	X	X	X	X
Stopwatch	-	-	-	-	-	-	-	-	-	Xr	Xr	Xr	Xr
Analog filter	-	-	-	-	-	-	-	-	-	X	X	X	X
Max/Min	-	-	-	-	-	-	-	-	-	Xr	Xr	Xr	Xr
Average value	-		-	-	-	-	-	-	-	Xr	Xr	Xr	Xr
Float/Integer converter	-	-	-	-	-	-	-	-	-	-	-	X	X
Integer/Float converter	-	-	-	-	-	-	-	-	-	-	-	X	X

X = Yes; - = No

)* = Use of this function only makes sense for LOGO! versions with integrated real-time clock.

r= retentive

5.6.2 Memory

5.6.2.1 Memory requirements

The blocks in your circuit program require a certain amount of memory space. The table shows you how much of the memory space each block occupies.

The "Rem" column (retentivity enabled) specifies the memory space required for data backup after power failure.

For LOGO! 9 devices

Block	RAM (Bytes)	Rem (Bytes)
AND	1	-
AND (Edge)	2	-
NAND	1	-
NAND (Edge)	2	-
OR	1	-
NOR	1	-
XOR	1	-
NOT	1	-
On delay	2	5
Off delay	2	5
On/off delay	4	5
Retentive on delay	2	5
Wiping relay	2	5
Edge-triggered wiping relay	5	6
Asynchronous pulse generator	4	5
Random generator	4	-
Stairway lighting switch	6	5
Multiple function switch	8	5
Weekly timer	16	-
Yearly timer	7	-
Astronomical clock	28	-
Stopwatch	1	17
Up/Down counter	12	5
Hours counter	11	17
Threshold trigger	6	-
Analog threshold trigger	• Integer: 9 • Float: 16	-
Analog differential trigger	• Integer: 11 • Float: 16	-
Analog comparator	• Integer: 9 • Float: 16	-

Block	RAM (Bytes)	Rem (Bytes)
Analog watchdog	• Integer: 9 • Float: 16	• Integer: 3 • Float: 5
Analog amplifier	• Integer: 5 • Float: 8	-
Pulse width modulator (PWM)	• Integer: 13 • Float: 18	-
Analog multiplexer	• Integer: 9 • Float: 16	-
Analog ramp	• Integer: 15 • Float: 28	-
PI controller	• Integer: 18 • Float: 23	• Integer: 2 • Float: 4
Analog filter	• Integer: 2 • Float: 2	-
Max/Min	• Integer: 3 • Float: 2	• Integer: 7 • Float: 13
Average Value	• Integer: 4 • Float: 4	• Integer: 24 • Float: 30
Mathematic instruction	13	-
Float mathematics instruction	84	-
Mathematic instruction error detection	5	1
Latching relay	0	1
Pulse relay	1	2
LCD Message	9	-
Softkey	2	1
Shift register	2	2
Float/Integer converter	10	-
Integer/Float converter	12	-

For LOGO! 8 devices

Block	RAM (Bytes)	Rem (Bytes)
AND (Edge)	12	-
NAND	12	-
OR (Edge)	12	-
NOR	12	-
XOR	8	-
NOT	8	-
On delay	12	3

Block	RAM (Bytes)	Rem (Bytes)
Off delay	16	3
On/off delay	16	3
Retentive on delay	16	3
Wiping relay	12	3
Edge-triggered wiping relay	20	4
Asynchronous pulse generator	16	3
Random generator	16	-
Stairway lighting switch	16	3
Multiple function switch	20	3
Weekly timer	24	-
Yearly timer	12	-
Astronomical clock	40	-
Stopwatch	28	19
Up/Down counter	32	5
Hours counter	36	13
Threshold trigger	20	-
Analog threshold trigger	20	-
Analog differential trigger	20	-
Analog comparator	24	-
Analog watchdog	24	3
Analog amplifier	12	-
Pulse width modulator (PWM)	32	-
Mathematic instruction	24	-
Mathematic instruction error detection	16	1
Latching relay	12	1
Pulse relay	12	1
Message text	12	-
Softkey	12	2
Analog multiplexer	20	-
PI Controller	44	2
Analog filter	20	-
Max/Min	20	7
Average value	32	20
Analog ramp	40	-
Shift register	16	1
Float/Integer converter	20	-
Integer/Float converter	24	-

For LOGO! 0BA7 and LOGO! 0BA8 devices

Block	RAM (Bytes)	Rem (Bytes)
AND (Edge)	12	-
NAND	12	-
OR (Edge)	12	-
NOR	12	-
XOR	8	-
NOT	8	-
On delay	12	3
Off delay	16	3
On/off delay	16	3
Retentive on delay	16	3
Wiping relay	12	3
Edge-triggered wiping relay	20	4
Asynchronous pulse generator	16	3
Random generator	16	-
Stairway lighting switch	16	3
Multiple function switch	20	3
Weekly timer	24	-
Yearly timer	12	-
Astronomical clock	40	-
Stopwatch	28	19
Up/Down counter	32	5
Hours counter	36	13
Threshold trigger	20	-
Analog threshold trigger	20	-
Analog differential trigger	20	-
Analog comparator	24	-
Analog watchdog	24	3
Analog amplifier	12	-
Pulse width modulator (PWM)	32	-
Mathematic instruction	24	-
Mathematic instruction error detection	16	1
Latching relay	12	1
Pulse relay	12	1
Message text	12	-
Softkey	12	2
Analog multiplexer	20	-
PI Controller	44	2
Analog filter	20	-
Max/Min	20	7
Average value	32	20
Analog ramp	40	-
Shift register	16	1

For LOGO! 0BA6 devices

Block	RAM (Bytes)	Rem (Bytes)
AND (Edge)	12	-
NAND	12	-
OR (Edge)	12	-
NOR	12	-
XOR	8	-
NOT	4	-
On delay	8	3
Off delay	12	3
On/off delay	12	3
Retentive on delay	12	3
Wiping relay	8	3
Edge-triggered wiping relay	16	4
Asynchronous pulse generator	12	3
Random generator	12	-
Stairway lighting switch	12	3
Multiple function switch	16	3
Weekly timer	20	-
Yearly timer	12	-
Up/Down counter	28	5
Hours counter	28	9
Threshold trigger	16	-
Analog threshold trigger	16	-
Analog differential trigger	16	-
Analog comparator	24	-
Analog watchdog	20	3
Analog amplifier	12	-
Pulse width modulator (PWM)	24	-
Mathematic instruction	20	-
Mathematic instruction error detection	12	1
Latching relay	8	1
Pulse relay	12	1
Message text	8	-
Softkey	8	2
Analog multiplexer	20	-
PI Controller	40	2
Analog ramp	36	-
Shift register	12	1

For LOGO! 0BA5 devices

Block	RAM (Bytes)	Rem (Bytes)
AND (with/without edge evaluation)	12	-
NAND	12	-
OR (with/without edge evaluation)	12	-
NOR	12	-
XOR	8	-
NOT	4	-
On delay	8	3
Off delay	12	3
On/off delay	12	3
Retentive on delay	12	3
Wiping relay	8	3
Edge-triggered wiping relay	16	4
Asynchronous pulse generator	12	3
Random generator	12	-
Stairway lighting switch	12	3
Multiple function switch	16	3
Weekly timer	20	-
Yearly timer	8	-
Up/Down counter	24	5
Hours counter	24	9
Threshold trigger	16	-
Analog threshold trigger	16	-
Analog differential trigger	16	-
Analog comparator	24	-
Analog value monitoring	20	-
Analog amplifier	12	-
Latching relay	8	1
Pulse relay	12	1
Message text	8	-
Softkey	8	2
Analog multiplexer	20	-
Controller	40	2
Analog ramp	36	-
Shift register	12	1

For LOGO! 0BA4 devices

Block	RAM (Bytes)	Rem (Bytes)
AND (with/without edge evaluation)	12	-
NAND	12	-
OR (with/without edge evaluation)	12	-
NOR	12	-

Block	RAM (Bytes)	Rem (Bytes)
XOR	8	-
NOT	4	-
On delay	8	3
Off delay	12	3
On/off delay	12	3
Retentive on delay	12	3
Wiping relay	8	3
Edge-triggered wiping relay	16	4
Asynchronous pulse generator	12	3
Random generator	12	-
Stairway lighting switch	12	3
Multiple function switch	16	3
Weekly timer	20	-
Yearly timer	8	-
Up/Down counter	24	5
Hours counter	24	9
Threshold trigger	16	-
Analog threshold trigger	16	-
Analog differential trigger	16	-
Analog comparator	24	-
Analog value monitoring	20	-
Analog amplifier	12	-
Latching relay	8	1
Pulse relay	12	1
Message text	8	-
Softkey	8	2
Shift register	12	1

0BA0-0BA3: The following specifications apply:

The blocks in your circuit program require a certain amount of memory space. The table below shows you how much memory space the blocks use in the various memory areas:

Block	Par	RAM	Timer	REM
Basic functions	0	0	0	0
On delay	1	1	1	0
Off delay	2	1	1	0
On/off delay	2	1	1	0
Retentive on delay	2	1	1	0
Wiping relay	1	1	1	0
Edge-triggered wiping relay	1	1	1	0
Symmetrical pulse generator	1	1	1	0

Block	Par	RAM	Timer	REM
Asynchronous pulse generator	3	1	1	0
Random generator	2	1	1	0
Stairway lighting switch	1	1	1	0
Multiple switch	2	1	1	0
Weekly timer	6	2	0	0
Yearly timer	2	0	0	0
Up/Down counter*	2	(2)	0	(2)
Hours counter	2	0	0	4
Threshold trigger	3	3	1	0
Analog threshold trigger	4	2	0	0
Analog comparator	3	4	0	0
Latching relay*	0	(1)	0	(1)
Pulse relay*	0	(1)	0	(1)
Message texts	1	0	0	0
Softkey*	1	(1)	0	(1)

*: Depending on whether the function is configured with or without retentivity, it occupies the following memory space:

- Retentivity off: The function occupies RAM space
- Retentivity on: The function occupies REM space

Here you will find information on memory space provide by LOGO!. (Page 527)

5.6.2.2 Memory space

For LOGO! 9 devices, you can use up to 800 blocks in your circuit program.

The maximum memory space a LOGO! circuit program can use is as follows:

- RAM: 12000 bytes
- Retentive data (REM): 1024 bytes

For LOGO! 0BA7 and LOGO! 0BA8 devices, you can use up to 400 blocks in your circuit program.

The maximum memory space a LOGO! circuit program can use is as follows:

- RAM: 8000 bytes (if 0BA7) or 8500 bytes (if 0BA8)
- Retentive data (REM): 250 bytes

For LOGO! 0BA6 devices, you can use up to 200 blocks in your circuit program.

The maximum memory space a LOGO! circuit program can use is as follows:

- RAM: 3800 bytes
- Retentive data (REM): 250 bytes

The Info Window displays the memory space used when you select the Tools → Determine LOGO! (Page 175) menu command, or when you press the function key (Page 39) [F2].

0BA0 : 0BA9	The following specifications apply						
	LOGO! series	**Blocks**	**Par**	**RAM**	**Timer**	**REM**	**Flags**
	LOGO! 0BA4 to 0BA5	130	Not re-stricted	Not re-stricted	Not re-stricted	60	24
	LOGO! 0BA2 to 0BA3	56	48	27	16	15	8
	LOGO! 0BA1	56	48	27	16	15	4
	LOGO! 0BA0	30	27	24	10	0/7	0

A circuit program consists of a number of blocks, which start with an input and end with an output.

Nesting depth (LOGO! series 0BA0, 0BA1)

The number of blocks in a circuit program describes the nesting depth.

I/O in the sense of nesting depth are:

- Inputs (I (Page 313) , AI (Page 318))
- High, Low (Hi, Lo (Page 315))
- Memory markers (M (Page 316))
- Outputs (Q (Page 314))

Blocks in the sense of nesting depth are:

- Basic functions (Page 335)
- Special functions (Page 340)

Further inputs/outputs according to the nesting depth are:

- Inputs AS-Interface (Ia (Page 33))
- Outputs AS-Interface (Qa (Page 34))

LOGO! restricts the nesting depth for your circuit program. Your circuit program has a maximum nesting depth of 58 objects.

This determines the following:

1 input + 56 blocks +1 output

Max. depth of a circuit program = 58 objects

During a simulation or download, the system returns an error message if you enter a program in LOGO!Soft Comfort that exceeds the maximum nesting depth.

Implementing large circuit programs

You can implement large circuit programs by means of signal recursion. You implement signal recursion by appending a flag block (Page 316) to the end of the program and connecting the remaining blocks to the output of the flag block. LOGO! interprets the flag as the output of the first program and also as the terminal block of the downstream blocks. LOGO! interprets the large program with flag as two separate programs. If no more flags are available, you can use an output block instead.

5.6.3 Blocks and block numbers

5.6.3.1 Blocks

Blocks represent terminals or functions. LOGO!Soft Comfort distinguishes between various types of block and identifies them by means of an abbreviation:

Block type	Identifier
Input	I
Output	Q
Shift register bit	S
Status 1 (high)	Hi
Status 0 (low)	Lo
Open connector	X
Cursor key	C
Function	B
LOGO! TD function key	F
Flag	M
Analog input	AI
Analog output	AQ
Analog flag	AM
Float analog flag	FAM
Network input	NI
Network analog input	NAI
Network output	NQ
Network analog output	NAQ
Network float analog input	NFAI
Network float analog output	NFAQ
Data Log Profile	L
UDF	UDF

5.6.3.2 Block numbers

Block number assignment

LOGO!Soft Comfort assigns every block you insert in the circuit program a **block number**. LOGO! displays the number of the current block at the top of the display. LOGO!Soft Comfort displays the block number directly above the inserted block.

The LOGO! onboard display uses block numbers for orientation and for the assignment of logical links. In LOGO!Soft Comfort you can also track cut connections by means of their indicated block number.

Constants and terminals (Page 312) use the terminal name or a simple block name for identification rather than a block number. You can assign additional block identifiers to inputs (Page 313), outputs (Page 314), and flags (Page 316) with comments. The high and low (Page 315) signal blocks do not have a block number.

Determination of block numbers on a LOGO!

LOGO! has no default position for analog inputs or digital outputs. The hardware structure determines the block number.

On a LOGO! without modular structure, the position of an analog or digital output is fixed.

5.7 Network projects

Introduction

With LOGO!Soft Comfort V8.0 and later versions, you can design your own network project in the project mode.

A network project typically consists of the following elements:

- Devices selected from the project tree
- Circuit diagrams for the devices
- Tag table for the devices
- User Defined Web Page project for the devices (LOGO!Soft Comfort V9.0 and later versions)
- Settings of the devices
- Network configuration of the devices

The tutorial (Page 251) section provides you with detailed information about the creation, device setting and Ethernet configuration of network projects.

The LAD and UDF Editors are not available in the project mode.

User Defined Web Page

6

6.1 General introduction

LOGO!Soft Comfort V9.0 and later versions supports creating user defined web pages for LOGO! 8.2 and later versions BM devices in a network project. You can view the user defined web pages through the Web serve of the BM.

In the User Defined Web Page, you can:

- conveniently integrate different components including variables;
- customize individual web pages.

6.1.1 Basic concept

Having a general idea of User Defined Web Page is the prerequisite for using it. The basic concept about the whole project is as follows:

Project

An UDW project contains Pages and a Navigator. Each page contains pre-defined components, such as Text, Image, Digital Value and so on.

Pages

Pages contains a Login page, a Home page and some user-defined pages. Home page is a default page, while you can determine whether to create Login page or user-defined pages according to your requirements. You can create your own Login page for logging on UDW project deployed on LOGO! BM. Either Login page, Home Page or other page is a web page, and you can visit it in web browser after deploying a project to LOGO! BM.

Navigator

Navigator is a floating page of the web site and it intends to aid users to switch between different web pages or log off during the runtime operation.

Navigator is a floating page for accessing different pages or log off in the deployed UDW project.

Component

LOGO!Soft Comfort provides a couple of pre-defined components for UDW. Each component has different render effect in web page. Each component contains some properties.

Variable

Variable is read/write data element of LOGO! BM, such as I, Q, AI, AQ, etc. Variable can be bound with component. You can read/write variable via components.

Default Tag

A default tag is generated with certain components and not configurable.

Tag Table

A Tag Table will be generated automatically for each LOGO! device (0BA7 and later versions only) in the network project. Tags in the tag table can be bound with certain components. Refer to Tools -> Tag Table (0BA7 and later versions only) (Page 212) to learn more about tag table. Refer to Setting the variable (Page 581) to learn how to bind a tag from the tag table to a component

6.1.2 Web project compatibility

Project compatibility

- LOGO!Soft Comfort V9.0 (or later versions) supports opening LWE (LOGO! Web Editor) projects.

  When opening a LWE project with LSC V9.0 (or later versions), LSC converts the LWE project into an User Defined Web project.
- LOGO!Soft Comfort V9.0 (or later versions) supports uploading LWE projects from LOGO! BM.
- LSC V9.0 (or later versions) supports downloading LWE projects to LOGO! BM.
- LSC V9.0 (or later versions) doesn't support deploying the LWE WebApp to AWS Cloud. When LSC converts the LWE project to an User Defined Web project, all the IoT functions in the LWE project will be removed.
- LOGO! Web Editor doesn't support User Defined Web projects created by LOGO!Soft Comfort V9.0 (or later versions).

LOGO! Base Module

UDW projects are compatible to the following LOGO! BM devices:

- LOGO! 8 6ED1052-xxx08-0BA0 (LOGO! 8.2)
- LOGO! 8 6ED1052-xxx08-0BA1 (LOGO! 8.3)
- LOGO! 8 6ED1052-xxx08-0BA2 (LOGO! 8.4)
- LOGO! 9 6ED1052-xxx08-0BA3 (LOGO! 9.0)

Note

LWE (LOGO! Web Editor) project and User Defined Web project

- If you insert a SD card into LOGO! 9.0 BM, and the SD card contains a LWE project, LOGO! 9.0 BM cannot run the LWE project. You should use LSC V9.0 (or later versions) to convert it to an UDW project, and then download the UDW project to LOGO! 9.0 BM.
- If you insert a SD card into LOGO! BM V8.1, 8.2, 8.3 or 8.4, and the SD card contains an User Defined Web project, the LOGO! BM cannot run the Web project. You should use LSC V9.0 (or later versions) to download it to the LOGO! BM.

Browser

Siemens recommends you use below web browsers which support HTML5:

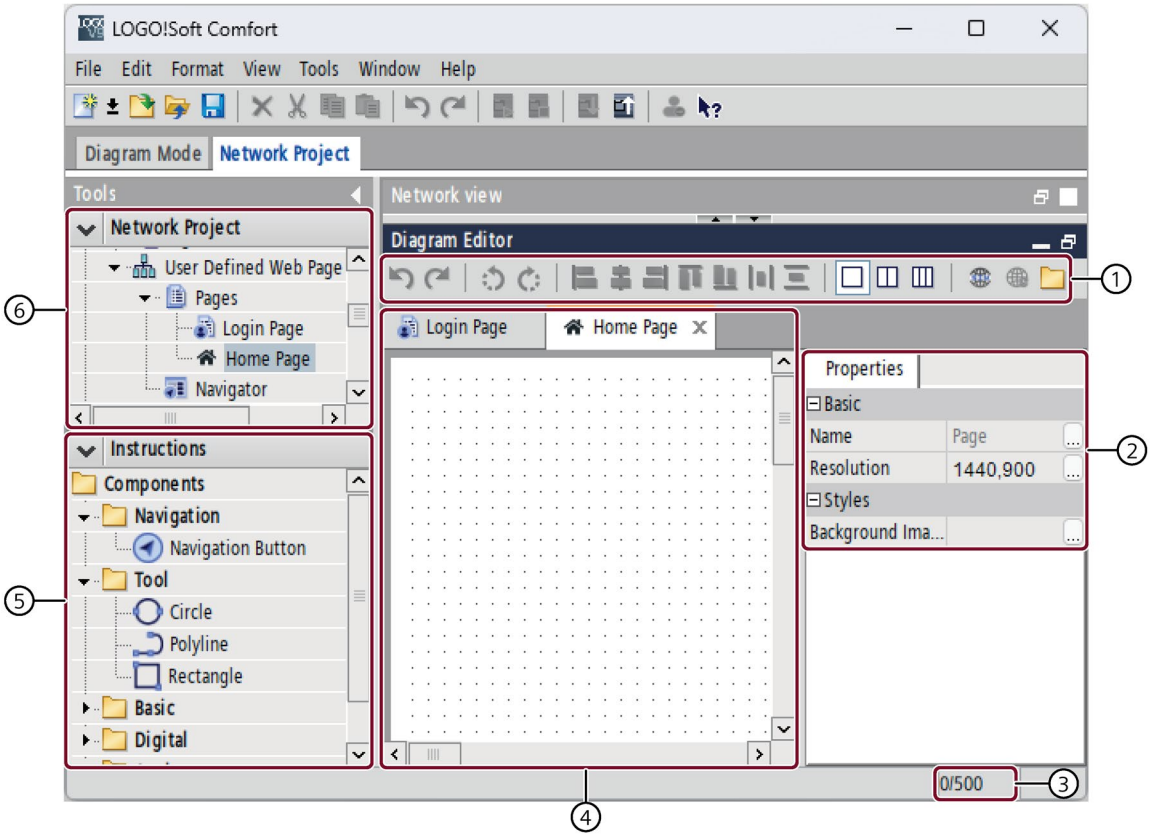
- **Microsoft Edge** version 90.0 and later versions
- **Mozilla Firefox** version 91.8 and later versions
- **Google Chrome** version 91.0 and later versions
- **Apple Safari** version 17.6 and later versions

Note

Siemens recommends you use the latest version of Google Chrome for visiting Web project.

6.2 User interface

When you create a web project, the user interface is as follows:



① Editor toolbar (Page 535)
② Properties pane (Page 565)
③ Used components quantity and limit *
④ Editor pane (Page 564)
⑤ Component pane (Page 539)
⑥ Project pane (Page 537)

*At most 500 components are supported in each web page (Login page excluded).

6.2.1 Function keys and shortcut keys

LOGO!Soft Comfort provides the following shortcuts for frequently called functions in User Defined Web Page:

Function keys in User Defined Web Page

[F1]	Calls the context sensitive Online Help
[F3]	Web project simulation

Shortcuts in User Defined Web Page

[Ctrl+Z]	Edit -> Undo (Page 565)
[Ctrl+Y]	Edit -> Redo (Page 565)
[Alt+L]	Edit -> Left Rotate (Page 566)
[Alt+R]	Edit -> Right Rotate (Page 566)
[Alt+D]	Edit -> Bring to Front [1] (Page 566)
[Alt+B]	Edit -> Sent to Back [2] (Page 566)
[Delete]	Edit -> Delete [3] (Page 566)
[Ctrl+X]	Edit -> Cut (Page 566)
[Ctrl+C]	Edit -> Copy (Page 566)
[Ctrl+V]	Edit -> Paste (Page 566)
[Ctrl+A]	Edit -> Select All (Page 566)

[1] The shortcut for Bring to Front function when LOGO!Soft Comfort is in German is [Ctrl+D].
[2] The shortcut for Send to Back function when LOGO!Soft Comfort is in German is [Ctrl+B].
[3] The shortcut for Delete function when LOGO!Soft Comfort is in Spanish and French is [S].

6.2.2 Editor toolbar

The icons of the editor toolbar provide quick access to commands.

In UDW, you can use the mouse-over-button function to display the icon name, which represents the tooltip. This helps you quickly recall the function of the icon.

The following commands are found in the edit toolbar:

- Undo (Page 565)
- Redo (Page 565)
- Left Rotate (Page 566)
- Right Rotate (Page 566)
- Align Left (Page 568)
- Align Center (Page 568)
- Align Right (Page 568)
- Align Top (Page 568)
- Align Bottom (Page 568)
- Distribute Horizontally (Page 568)

Distribute Vertically (Page 568)

Undo Split (Page 570)

Split into two windows (Page 570)

Split into three windows (Page 570)

Simulation (Page 571)

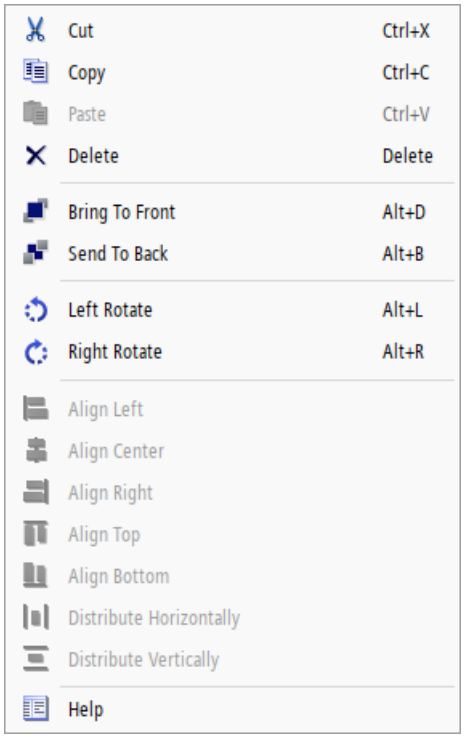
Reload (Page 571)

Graph Library (Page 573)

6.2.3 Shortcut menu

Editor pane shortcut menu

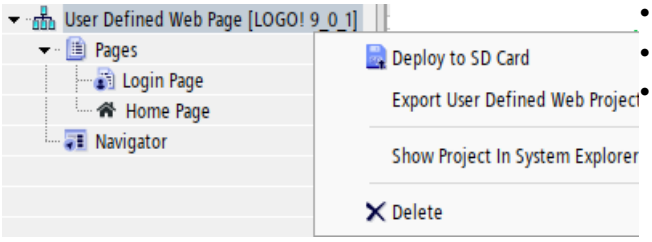
By right-clicking one or more components, or right-clicking the open page, you can open the Editor pane shortcut menu that offers you all the commands.



- Commands -> Edit components (Page 566)
  - Cut
  - Copy
  - Paste
  - Delete
  - Bring To Front
  - Sent To Back
  - Select All
- Commands -> Rotate components (Page 566)
  - Left Rotate
  - Right Rotate
- Commands -> Align components (Page 568)
  - Align Left
  - Align Center
  - Align Right
  - Align Top
  - Align Bottom
  - Distribute Horizontally
  - Distribute Vertically

Project pane shortcut menu

By right-clicking the web project icon in the project pane, you can open the project pane shortcut menu that offers you the following commands.



- Deploy to SD Card (Page 572)
- Export LWE Project (Page 573)
- Show Project System Explorer (Page 572)

6.2.4 Project pane

In the Project pane, you can create and manage your UDW projects. When you create a web project (Page 583), **Pages** and **Navigator** are created automatically.

- Pages (Page 537)
- Navigator (Page 539)

6.2.4.1 Pages

Pages is the container of your pages. Page is the main editing area of User Defined Web Page. You can edit pages with the provided components, and save the pages as html file in project. After downloading the project to LOGO! Base module, you can view them in web browser. You can navigate among different pages with Navigator.

The **Pages** can contain one default **Home Page**, a Login page and other pages. You can open a page by double-clicking the **page** icon, or right-clicking the **page** icon and select **Open** button.

Page properties

- **Basic**
  - Name: Page
  - Resolution: you can modify the width and height of the page in the **Size** window.
- **Styles**
  - Background Image: you can select a appropriate picture for the current page from **Graph Library**.

Note

Graph Library is the LOGO! Web Editor build-in graphics library. It contains four parts: Build-In Graph, Color, My Graph and User Local File System. You can choose any of the graphic for the image by selecting the picture, and confirm the selection by clicking **OK** button. For detailed information, refer to the chapter Graph Library (Page 573).

Home page

This is the home page for your project, and the Home page cannot be deleted.

When you create a new project (Page 583), the **Home Page** is created under the **Pages** in the Project tree.

Login page

You can add a Login page for your project. When the Login page is enabled, you need to input a password to login. When the project is deployed on LOGO! BM, you need to enter the correct LOGO! user name and password to access the project on Web Sever.

You can perform the following operations for the Login page:

- Create a Login page

  Right-click the **Pages** icon and select **Create Login Page**. Then the Login Page is open in Editor pane.
- Open or delete the Login page

  Right-click the Login page icon and select **Open** or **Delete** from the shortcut menu.
- Enable or disable the Login page

  Right-click the Login page icon and select the **Enable** or **Disable** from the shortcut menu.

Other pages

You can add more pages according to your need. The pages you add can be deleted.

You can perform the following operations for the new page:

- Create a new page

  Right-click the Pages icon and select **New Page**.

  Then a page (page_number) is created below the **Home Page** and the new page is open in Editor pane.

  Note

  In addition to Home page and Login page, you can create up to 19 other pages for a web project.

- Open, delete or rename the created page

  Right-click the page_x icon and select the corresponding options (**Open**, **Delete** or **Rename**) from the shortcut menu depending on your need.

6.2.4.2 Navigator

Navigator is a floating page of the web site and it is intended for switching among different web pages or log off during the runtime operation.

When you create a new project (Page 583), a **Navigator** is created in the Project tree.

Open a Navigator

Double-click the Navigator icon .

Switch pages through Navigator

When you created other pages for your Web project, the navigator automatically adds the corresponding navigator item components (Page 563). Then you can switch from the Home Page to other pages when visiting the project on the Web Server.

If you remove all the navigator item components from the navigator, home page is the default displaying page after the project is deployed on BM.

6.2.5 Components pane

6.2.5.1 Components overview

The components can be classified to six segments: Navigation, Tools, Basic, Digital, Analog and Miscellaneous.

You can configure the component based on your requirements.

Note

At most 500 components are supported in each web page (Login page excluded.)

Navigation		Navigation Button (Page 541)
Tools		Circle (Page 541)
		Polyline (Page 542)
		Rectangle (Page 543)
Basic		Image (Page 544)
		Link (Page 545)
		PDF (Page 546)
		Text (Page 547)
		Navigator Item (Page 563)
Digital		Push Button (Page 548)
		Switch Button (Page 550)
Analog		Analog Bar (Page 551)
		Analog Slider (Page 552)
		Analog Value (Page 554)
		Rainbow (Page 555)
Miscellaneous		LOGO! Clock (Page 556)
		Scale Time (Page 557)
		Trend View (Page 558)
		Webcam (Page 560)
		Login (Page 562)

6.2.5.2 Navigation Button

Use the Navigation Button component to navigate from one page to another.

Add a Navigation Button

1. Select the **Navigation Button** component in the component pane.
2. Drag it to the Editor pane and release the mouse button.
3. Set the Link values in Navigation Button Properties pane.

Properties for Navigation Button

- **Basic**
  - Name: Navigation Button
  - Location: you can modify the location coordinate for the Navigation Button.
  - Size: you can modify the width and height information for the Navigation Button.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** depending on your need. Click the **OK** button for save the correction or click the **Reset to Default** button to reset to the default setting.
  - Item Text Color: click **Item Text Color** swatch, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
- **Values**
  - Link: select the page from the drop-down menu. The menu lists all the pages that the system generates by default and the pages that you have created.
  - Text: Type the name for the page you select.

6.2.5.3 Circle

Use the Circle component when you want to draw a circle or an ellipse.

In the Circle Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the border and transparency (Page 581)

Draw circles and ellipses

1. Select the **Circle** component .
2. Draw a circle by dragging the **Circle** component directly where you want it to be in the Editor pane.
3. Do one of the following:
   - To draw an ellipse, drag the circle component into the editor pane, and then drag the blue square on the borderline until the ellipse is the desired size, or specify the value for **Location** and **Size** in the Property pane.
   - To select the circle or ellipse, specify the **Border Width** and **Border Style** in the Property pane. If you want to fill border and background with the color, select color swatches separately.

Properties for Circle

- **Basic**
  - Name: Circle
  - Location: you can modify the location coordinate for the circle.
  - Size: you can modify the width and height information for the circle.
- **Styles**
  - Border Width: adjust the value depending on your need.
  - Border Style: select `dotted`, `dashed`, `solid` or `double` depending on your need.
  - Border Color: click **Border Color** swatches, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
  - Transparency: value ranges from 1 to 100, adjust the value depending on your need.
  - Fill: click the check box depending on whether to fill the circle with background color.

6.2.5.4 Polyline

Use the **Polyline** component when you want to draw one polyline.

Draw a polyline

1. Select the **Polyline** component .
2. Position the pointer where you want the line to begin in the Editor pane, and click to define the first anchor point.
3. Click again where you want the segment to end.
4. Continue clicking to set anchor points for additional straight segments.

   The anchor point you add always appears as a blue solid square.

5. Complete the polyline drawing by doing one of the following:
   - Select a different tool.
   - Press the **ESC key** on your keyboard.
   - Right-click anywhere on the Editor pane other than the anchor points.
6. Set the properties for the polyline as you need.

Modify the polyline

1. Select the polyline you want to change.

   The anchor points of the path appear.
2. Select and drag the anchor point you want to change where you want.

Move the polyline

- Select a line segment (but not the anchor points) and drag it where you want.

Properties for polyline

- **Basic**
  - Name: Polyline
- **Styles**
  - Weight: enter the width of the polyline.
  - Color: click color swatches, select a color swatch, and click **OK** button.
  - Dashed: select different polyline types Solid, Round Dot, Square Dot, Dash, Dash Dot, Long Dash, Long Dash Dot or Long Dash Dot Dot depending on your need.
  - Transparency: value ranges from 1 to 100, adjust the value depending on your need.

6.2.5.5 Rectangle

Use the **Rectangle** component when you want to draw a rectangle or a square.

In the Rectangle Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the border and transparency (Page 581)

Draw rectangles and squares

1. Select the **Rectangle** component .
2. Draw a rectangle or a square by dragging the **Rectangle** component directly where you want it to be in the Editor pane.
3. To select the rectangle or square, specify the **Border Width** and **Border Style** in the Property pane.

Properties for Rectangle

- **Basic**
  - Name: Rectangle
  - Location: you can modify the location coordinate for the rectangle.
  - Size: you can modify the width and height information for the rectangle.
- **Styles**
  - Border Width: adjust the value depending on your need.
  - Border Style: select dotted, dashed, solid or double depending on your need.
  - Border Color: click **Border Color** swatches, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
  - Transparency: value ranges from 1 to 100, adjust the value depending on your need.
  - Fill: click the check box depending on whether to fill the rectangle with background color.

6.2.5.6 Image

Use the Image component when you want to add an image.

In the Image Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background image (Page 580)

Add an Image component

1. Select the **Image** component .
2. Drag the **Image** component directly where you want the image to be in the Editor pane.

   Note

   To guarantee better performance when visiting the project through web pages, it's recommended to upload images within the size limit:
   - GIF < 2 MB
   - PNG/JPG/JPEG < 256 KB

   If the image size exceeds the limit, then the uploaded image will be compressed.

3. Edit the image in the Property pane by selecting the appropriate pictures for image in **Graph Library**.

Properties for Image

- **Basic**
  - Name: Image
  - Location: you can modify the location coordinate for the image.
  - Size: you can modify the width and height information for the image.
- **Values**
  - Image: select the appropriate pictures from **Graph Library**.

6.2.5.7 Link

Use the Link component when you want to add a Uniform Resource Locator (URL) link.

In the **Link** Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the style of text (Page 580)

Add a link component

1. Select the **Link** component .
2. Drag the **Link** component directly where you want the line of link to be in the Editor pane.
3. To set the text value of link, click "..." at the end of the row "Text" and enter the value as you need.

4. To set the link target, enter the URL in the row "Link Target".

Note

If you enter more text than can fit within link area, the apostrophe (...) appears in the end of the link area. You should adjust the link area by dragging the blue square on the border or modifying the value for **Size** in the Property pane.

Each link is independent.

5. Click the down arrow at the end of the row "Link Response Mode" and select the mode you need.

Properties for Link

- **Basic**
  - Name: Link
  - Location: you can modify the location coordinate for the link.
  - Size: you can modify the width and height information for the link.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
  - Fill: click the check box depending on whether to fill the link area with background color.
  - Text Align: align the text on left, center or right.
- **Values**
  - Text: type the name for the link.
  - Link Target: URL of the link target. Press [Enter] key to make the input valid.
- **Animation**
  - Link Response Mode: select the link response mode.

6.2.5.8 PDF

Use the **PDF** component to upload a pdf file in the web project. The PDF file should be no more than 15 MB.

In the **PDF** Properties, you can customize the position, size, and style of the object. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background image (Page 580)
- Setting the style of text (Page 580)

Add a PDF component

1. Select the **PDF** component in the component pane.
2. Drag it to the Editor pane and release the mouse button.
3. Set the name for PDF component.
   - Click "..." at the right end of the row **Value** in the PDF properties pane.
   - Change the Text value as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The text value will change to the default value when you select **Reset to Default**.
4. Upload the PDF file to the web project.
   - Click "..." at the right of the row **PDF File** in the PDF properties pane.
   - Select a PDF file and click **Open**.

Properties for PDF component

- **Basic**
  - Name: PDF
  - Location: you can modify the location coordinate for the PDF component.
  - Size: you can modify the width and height information for the PDF component.
- **Values**
  - Text: Type the name for the PDF component.
  - PDF File: select the pdf file you want to add.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center or right.
  - Background Image: select the appropriate pictures from Graph Library.

6.2.5.9 Text

Use the Text component when you want to add word description.

In the **Text** Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the style of text (Page 580)

Add a text component

1. Select the **Text** component .
2. Drag the **Text** component directly where you want the line of text to be in the Editor pane.
3. Enter the text by double-clicking the text component to edit inline or changing the **Text Value** in the Property pane.

   When the text reaches a boundary, it automatically wraps to fit inside the defined area
4. Press **ESC** key or click other area to exit edit mode.

Properties for Text

- **Basic**
  - Name: Text
  - Location: you can modify the location coordinate for the text.
  - Size: you can modify the width and height information for the text.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
  - Fill: click the check box depending on whether to fill the text area with background color.
  - Text Align: align the text on left, center or right.
- **Values**
  - Text: type the content.

6.2.5.10 Push Button

The **Push Button** component is a special digital value component.

In the **Push Button** Properties, you customize the position, size, and style of the object. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Add a Push Button component

1. Select the **Push Button** component in the component pane.
2. Drag it to the Editor pane and release the mouse button.
3. To define the **Push Button** runtime behavior, click "..." at the right end of the row **Mouse Mode** in the push button properties pane.
   - **Click**: in web page, the status of push button changes by mouse click. Click mode supports the following block types: Q, M, V, VX.
   - **Hold**: in web page, the status of push button changes by holding mouse press. Hold mode supports the following block types: Q, M, V, VX, Cursor Key and Function Key.
4. Set the **On Image** or **Off image** for the push button component.
   - Click "..." at the right end of the row **On Image** or **Off Image** in the push button properties pane.
   - Select an image from the Graph Library and click **OK**.
5. Set the name for **Push Button** component.
   - Click "..." at the right end of the row **Off Text** or **On Text** in the push button properties pane.
   - Change the text as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The text value will change to the default value when you select **Reset to Default**.
6. Set the variable (Page 581).

Properties for Push Button

- **Basic**
  - Name: Push Button
  - Location: you can modify the location coordinate for the push button.
  - Size: you can modify the width and height information for the push button.
- **Animation**
  - Mouse Mode: select the mouse mode.
  - On Image: select the appropriate pictures for on-state in **Graph Library**.
  - Off Image: select the appropriate pictures for off-state in **Graph Library**.
  - On Text: enter the display content for on-state.
  - Off Text: enter the display content for off-state.

- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center, or right.

6.2.5.11 Switch Button

Use **Switch Button** when you want to present the digital value "0" and "1" visually. "0" is for "off-state", and "1" is for "on-state".

In the **Switch Button** Properties, you customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Add a Switch Button component

1. Select the **Switch Button** component .
2. Drag the **Switch Button** component directly where you want it to be in the Editor pane.
3. Set the variable (Page 581).
4. Set the **On Image** or **Off image** for the switch button component.
   - Click "..." at the right end of the row **On Image** or **Off Image** in the push button properties pane.
   - Select an image from the Graph Library and click **OK**.
5. Set the **On Text** and **Off Text** for **Switch Button** component.
   - Click "..." at the right end of the row **Off Text** or **On Text** in the switch button properties pane.
   - Change the text as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The text value will change to the default value when you select **Reset to Default**.

Properties for Switch Button

- **Basic**
  - Name: Switch Button
  - Location: you can modify the location coordinate for the Switch Button.
  - Size: you can modify the width and height information for the Switch Button.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: follow the below table to select each value.
  - Writable: for the writable block types, you can enable the write function by clicking the check box next to **Writable**.
- **Animation**
  - On Image: select the appropriate pictures for on-state in **Graph Library**.
  - Off Image: select the appropriate pictures for off-state in **Graph Library**.
  - On Text: enter the display content for on-state.
  - Off Text: enter the display content for off-state.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center, or right.

6.2.5.12 Analog Bar

Use the **Analog Bar** component when you want to create an analog bar to show the dynamic variable.

In the **Analog Bar** Properties, you customize the position, size, and style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Add an Analog Bar component

1. Select the **Analog Bar** component .
2. Drag the **Analog Bar** component directly where you want it to be in the Editor pane.

3. Set the variable (Page 581).
4. Set the range for **Analog Bar** component in the properties pane.
   - Click "..." at the right end of the row **Max. value** and **Min. value**.
   - Change the value as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The value will change to the default value when you select **Reset to Default**.

Properties for Analog Bar

- **Basic**
  - Name: Analog Bar
  - Location: you can modify the location coordinate for the analog bar.
  - Size: you can modify the width and height information for the analog bar.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
  - Block Format: select Signed or Unsigned for the Block value.
  - Decimal Places: select the number of decimal places for the variable value.
- **Animation**
  - Max. Value: set the maximum value for the analog bar depending on your need.
  - Min. Value: set the minimum value for the analog bar depending on your need.
  - Color: click **Color Setting** swatches, according to different ranges, select a corresponding color swatch, and click **OK** button.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Border Color: click **Border Color** swatches, select a swatch, and click **OK** button.

6.2.5.13 Analog Slider

Use the **Analog Slider** component when you want to create an analog slider to show the slider variable.

In the **Analog Slider** Properties, you customize the position, size, and style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)

Add an Analog Slider component

1. Select the **Analog Slider** component .
2. Drag the **Analog Slider** component directly where you want it to be in the Editor pane.
3. Set the variable (Page 581).
4. Set the range for **Analog Slider** component in the properties pane.
   - Click "..." at the right end of the row **Max. value** and **Min. value**.
   - Change the value as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The value will change to the default value when you select **Reset to Default**.

Properties for Analog Slider

- **Basic**
  - Name: Analog Slider
  - Location: you can modify the location coordinate for the analog slider.
  - Size: you can modify the width and height information for the analog slider.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
  - Block Format: select Signed or Unsigned for the Block value.
  - Decimal Places: select the number of decimal places for the variable value.
  - Writable: for the writable block types, you can enable the write function by clicking the check box next to **Writable**.
- **Animation**
  - Max. Value: set the maximum value for the Analog Slider depending on your need.
  - Min. Value: set the minimum value for the Analog Slider depending on your need.
  - Background Image: select the appropriate picture from **Graph Library**.
  - Thumb Image: select the appropriate picture from **Graph Library**.

6.2.5.14 Analog Value

Use the **Analog Value** component when you want to show the analog value.

In the **Analog Value** Properties, you customize the position, size, and style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Add an Analog Value component

1. Select the **Analog Value** component .
2. Drag the **Analog Value** component directly where you want it to be in the Editor pane.
3. Set the variable (Page 581).

Properties for Analog Value

- **Basic**
  - Name: Analog Value
  - Location: you can modify the location coordinate for the analog value.
  - Size: you can modify the width and height information for the analog value.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
  - Block Format: select Signed or Unsigned for the Block value.
  - Decimal Places: select the number of decimal places for the variable value.
  - Writable: for the writable block types, you can enable the write function by clicking the check box next to **Writable**.
  - Unit: set the unit for the variable.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center, or right.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.

6.2.5.15 Rainbow

The **Rainbow** component shows numeric values in the form of an analog gauge. The **Rainbow** is for display only and cannot be controlled by the operator.

In the Rainbow Properties, you customize the position, size, and style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the style of text (Page 580)

Add a Rainbow component

1. Select the **Rainbow** component in the component pane.
2. Drag it to the Editor pane and release the mouse button.
3. Set the variable (Page 581).
4. Set the range for **Rainbow** component in the properties pane.
   - Click "..." at the right end of the row **Max. value** and **Min. value**.
   - Change the value as you want.
   - Save the change by clicking **OK** or quit the change by clicking **Cancel**.

     The range value will change to the default value when you select **Reset to Default**.
5. Set the color for each range.
   - Click "..." at the right end of the row **Color**.
   - In the Color Setting window, customize the range and its color. You can add a range by clicking "+" button.

     Note

     You can add five ranges for a Rainbow component at most.

   - Save the color setting.

Properties for Rainbow

- **Basic**
  - Name: Rainbow
  - Location: you can modify the location coordinate for the Rainbow.
  - Size: you can modify the width and height information for the Rainbow.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
  - Block Format: select Signed or Unsigned for the Block value.
  - Decimal Places: select the number of decimal places for the variable value.
- **Animation**
  - Max. Value: set the maximum value for the analog bar depending on your need.
  - Min. Value: set the minimum value for the analog bar depending on your need.
  - Color: click **Color Setting** swatches, according to different ranges, select a corresponding color swatch, and click **OK** button.
- **Styles**
  - Background color: select the background color.
  - Fill: select the check box if you want to fill the Rainbow area with background color.
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.

6.2.5.16 LOGO! Clock

Use the **LOGO! Clock** component to show the date and time information from LOGO! Base Modules.

In the **LOGO! Clock** Properties, you customize the position, size, and style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the style of text (Page 580)

Add a LOGO! Clock component

You can only read the date and time information from LOGO! Base Modules.

1. Select the **LOGO! Clock** component .
2. Drag the **LOGO! Clock** component directly where you want it to be in the Editor pane.
3. Set the variable (Page 581).

Properties for LOGO! Clock

- **Basic**
  - Name: LOGO! Clock
  - Location: you can modify the location coordinate for the text.
  - Size: you can modify the width and height information for the text.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Background Color: click **Background Color** swatches, select a color, and click the **OK** button.
  - Fill: select the check box if you want to fill the text area with background color.
  - Text Align: align the text on left, center, or right.
  - Time format: select the time format.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from the tag table depending on your need.

6.2.5.17 Scale Time

Use the **Scale Time** component when you want to display a time value.

In the **Scale time** Properties, you can customize the position and size of the component. You can do the following operations in particular:

- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Scale time is the process value of a referenced function block which displayed as a time value. Possible time display formats show as the following: hours(h), minutes(HH:mm), seconds(HH:mm:ss), 10 milliseconds(HH:mm:ss:ms), yearly on/off time(MM-dd), weekly on/off time(HH:mm), yearly on/off time(dd/MM).

Add a scale time component

1. Select the **Scale Time** component .
2. Drag the **Scale Time** component directly where you want it to be in the Editor pane.
3. Set the variable for Scale time under Properties -> Variable:
   - Set the time as hours/minutes/seconds/10 Milliseconds (Page 581)
   - When you set on-time and off-time as yearly/weekly, you must set the block type and block number as you use in the LOGO!Soft Comfort circuit diagram.

Properties for Scale Time

- **Basic**
  - Name: Scale Time
  - Location: you can modify the location coordinate for the scale time.
  - Size: you can modify the width and height information for the scale time.
- **Binding**
  - Variable Name: select the **Default Tag** or variable from tag table depending on your need.
  - Block Type: select the type of variable.
  - Block Number: select the block number.
  - Time: Set the unit for the Scale time.
  - Writable: for the writable block types, you can enable the write function by clicking the check box next to **Writable**.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center, or right.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.

6.2.5.18 Trend View

Use the **Trend View** component to display tag values from the current process in the form of trends as a function of the time. The scope of the chart is determined by the maximum tag value. One Trend View component can display 10 tags at most.

In the **Trend View** Properties, you customize the position, size, title, and title style of the component. You can do the following operations in particular:

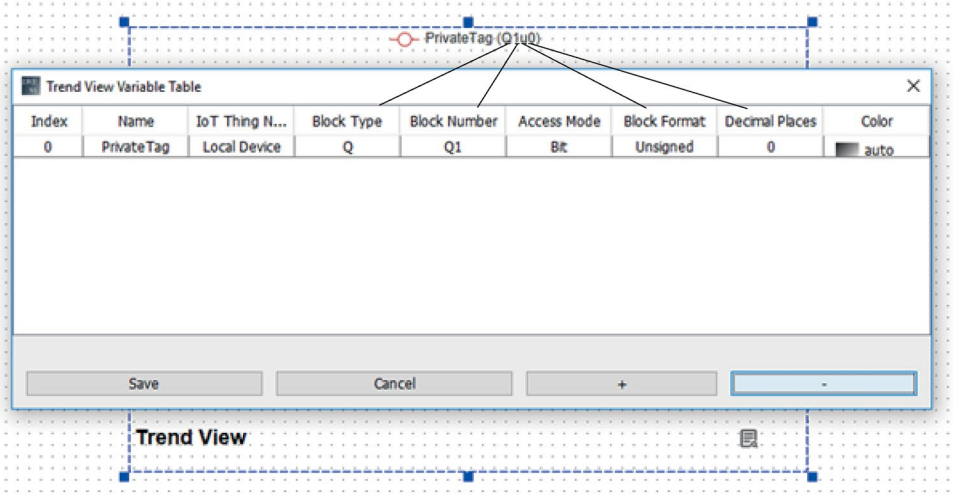
- Changing size and position of an component (Page 578)
- Setting the style of text (Page 580)

Add a Trend View component

Set the animation properties of trends under **Properties** -> **Animation**:

1. Select the **Trend View** component in the component pane.
2. Drag it to the Editor pane and release the mouse button.
3. Set the animation properties of trends under **Properties** -> **Variable**:
   - Click "..." at the right end of the row **Trend View Variable**.
   - In the Trend View Variable table, click "+" to add a new variable.

     You can delete a variable by clicking "-" while it is selected.
   - Specify the properties of the variable and the color it shows in the trend view.
   - Save the table by clicking **Save**.



4. Set the interval time in the **Interval Time** drop-down list.
5. Set the count of interval time in time axes in the **Time Scale Count** drop-down list.

Properties for Trend View

- **Basic**
  - Name: Trend View
  - Location: you can modify the location coordinate for the Trend View.
  - Size: you can modify the width and height information for the Trend View.
- **Values**
  - Trend View Title: Set the title for the Trend View.

- **Styles**
  - Title Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes, or click the **Reset to Default** button to reset to the default settings.
  - Title Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Title Text Align: align the text on left, center, or right.
- **Animation**
  - Interval Time (seconds): set the interval time of the Trend View.
  - Time Scale Count: set the time scale count of the Trend View.
- **Variable**
  - Trend View Variable: Add or delete the Trend View variables.

6.2.5.19 Webcam

Use **Webcam** component to add a real-time monitoring screen in web pages. Before adding the Webcam component to the web project, you need to install your IP web camera and transcode the RTSP address of your camera into HLS.

See Adding image for IP camera (Page 631) or Adding image from USB camera (Page 629) for an example.

User Defined Web Page supports five stream video types through the Http protocol. The supported video types vary from browsers. Refer to HTML5 Video (https://en.wikipedia.org/wiki/HTML5_video) for more information on the supported video formats by a given browser.

In the Webcam properties, you customize the position, size, title, and title style of the component. You can set the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the title and tooltip
- Setting the animation properties

Set the animation properties

You need to provide a stream source for Webcam component under **Properties -> Animation**.

1. Click "..." at the right end of the row **Http live stream address**.
2. In the Webcam-Http Live Stream Address window, enter the address.

Note

According to the security policy of browsers, if the LOGO! web server is in HTTPS mode, then address you fill in the Webcam-Http Live Stream Address field must be HTTPS address. Otherwise the browser will reject the connection.

3. Save the change by clicking **OK** or quit the change by clicking **Cancel**.

   The text value will change to the default value when you select **Reset to Default**.

4. Click the down arrow at the right of the row **Live Stream Video Type** and select the video type.

Set the title and tooltip

Set the title and tooltip under **Properties** -> **Value**:

1. Click "..." at the right end of the row Title/Tooltip.
2. In the Webcam-Title/Webcam-Tooltip window, set the value as you need.
3. Save the change by clicking **OK** or quit the change by clicking **Cancel**.

   The text value will change to the default value when you select **Reset to Default**.

Properties for Webcam

- **Basic**
  - Name: Webcam
  - Location: you can modify the location coordinate for the Webcam.
  - Size: you can modify the width and height information for the Webcam.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Text Align: align the text on left, center, or right.
- **Values**
  - Title: Set the title for the Webcam
  - Tooltip: Set the tooltip for the Webcam
- **Animation**
  - Http Live Stream Address: enter the address of http live stream.
  - Live Stream Video Type: select the video types of the live stream.

6.2.5.20 Login

Login component is only available when you are editing the Login page (Page 537). A Login component is automatically added to the Login Page that you create. Only one Login component is allowed in a web project.

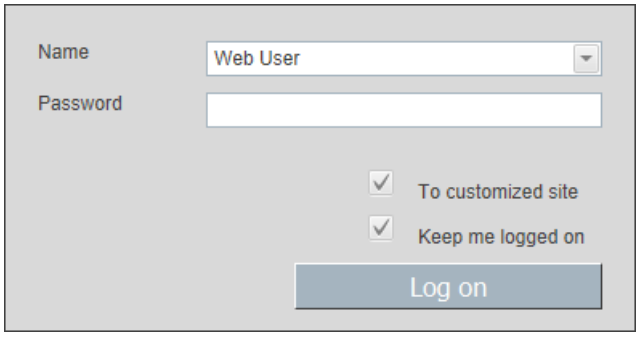
In the Login Properties, you customize the position, size, title, and title style of the object. You can adapt the following properties in particular:

- Changing size and position of an component (Page 578)
- Setting the background color (Page 579)
- Setting the style of text (Page 580)
- Setting the login animation

Set the Login animation

Set the animation properties of Login under **Properties** -> **Animation**:

1. Click the down arrow at the right end of row **To customized site** or **Keep me logged on**.
2. Select **Invisible** or **Visible** to hide or show configuration items on the login page of your web project.



- **To customized site**: if you check the box of this configuration item when logging in, you will be taken directly to the Home page of your web project after login.
- **Keep me logged on:** if you check the box of this configuration item when logging in, you only need to enter the corresponding password for you first login.

Properties for Login

- **Basic**
  - Name: Login
  - Location: you can modify the location coordinate for the Login component.
  - Size: you can modify the width and height information for the Login component.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** information separately in the Font pane. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Text Color: click **Text Color** Swatches, select a swatch, and click **OK** button.
  - Border Width: adjust the value depending on your need.
  - Border Style: select dotted, dashed, solid or double depending on your need.
  - Border Color: click **Border Color** swatches, select a swatch, and click **OK** button.
  - Transparency: value ranges from 1 to 100, adjust the value depending on your need.
  - Background Color: click **Background Color** swatches, select a swatch, and click **OK** button.
  - Fill: click the check box depending on whether to fill the rectangle with background color.
- **Animation**
  - **To customized site**: select to show or hide this configuration item on the login page for the web project.
  - **Keep me logged on:** select to show or hide this configuration item on the login page for the web project.

6.2.5.21 Navigator Item

Navigator Item component is available only when you are editing the Navigator (Page 539), and all other components are not available for use.

Add a Navigator Item

1. Drag **Navigator Item** component under the Navigation bar.
2. Set the Link values in Navigator Item Properties pane.

Note

The added navigator item can be a link to a web page or LOGO! System page (Web server).

Note

You can add at most 20 Navigator Item components in the Navigator.

Properties for Navigator Item

- **Basic**
  - Name: Navigator Item
  - Location: you can only check the location coordinate from the Location pane. You can change the location
  - Size: you can only check the width and height information from the Size pane.
- **Styles**
  - Font: select **Font**, **Font Style** and **Size** depending on your need. Click the **OK** button to save the changes or click the **Reset to Default** button to reset to the default settings.
  - Item Text Color: click Item Text Color swatch, select a swatch, and click OK button.
- **Values**
  - Link: select the page from the drop-down menu. The menu lists all the pages that the system generates by default and the pages that you have created.
  - Text: Type the name for the page you select.

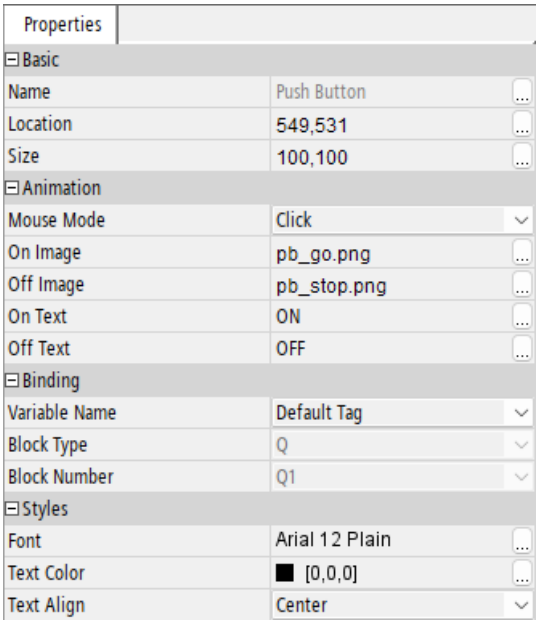
6.2.6 Editor pane

The Editor pane is the working space for the project, and it is shown in the Diagram Editor. It displays the open pages and navigator for project editing. You can switch to different open pages or navigator by clicking the corresponding page tab above the editor pane.

With the scroll bars on the right side and the bottom of the editor pane, you can view the complete project.

6.2.7 Properties pane

The Properties pane provides information about the properties of a component or navigator as a table. Using the example of a push button, you can see the basic and further properties in the Properties pane.



Property items in black are writable and property items in grey are only readable.

There are various input mechanisms for changing properties:

- Direct input in the table cell
- Selection list: if a down arrow shows at the right end of the row.
- Special editors: if '...' shows at the right end of the row.

6.2.8 Commands

6.2.8.1 Undo and Redo

You can use commands to undo or redo the previous action.

You can use this command in one of the following ways:

- Shortcut key (Page 534)
- Edit menu
- Editor toolbar (Page 535)

Undo

Click this command to undo the previous actions.

Redo

Click this command to revert the last undo action.

6.2.8.2 Rotate components

LOGO!Soft Comfort provides commands to rotate the selected component.

You can find these command in the following ways:

- Shortcut key (Page 534)
- Edit menu
- Editor toolbar (Page 535)
- Editor pane shortcut menu (Page 536)

Left Rotate

Click this command to rotate the component anticlockwise. When you select a component, and then click the **Left Rotate** button, you can rotate the component 90 degrees anticlockwise.

Right Rotate

Click this command to rotate the component clockwise. When you select a component, and then click the **Right Rotate** button, you can rotate the component 90 degrees clockwise.

6.2.8.3 Edit components

You can find these command in the following ways:

- Shortcut key (Page 534)
- Edit menu
- Editor pane shortcut menu (Page 536)

Bring to Front

Click this command to move a component to the top position in its group or layer.

Send to Back

Click this command to move a component to the bottom position in its group or layer.

Delete

Click this command to delete the selected components, without copying them to the clipboard. You can retrieve deleted components with the **Undo** function.

When you delete the selected components, a pop-up window of **Confirm Object Deletion** appears. You can confirm the deletion with **Yes** button or cancel the deletion with **No** button in the pop-up window.

Cut

Click this command to delete one or more selected components from editor pane and copy them to the clipboard.

Copy

Click this command to copy one or more selected components to the clipboard, for example, you can copy the selected Polyline, Rectangle, Image and Navigator Item from the Editor pane to the clipboard.

Paste

Click this command to copy the clipboard content to the Editor pane.

Select All

Click this command to select all components in the editing page or Navigator, for example, Polyline, Rectangle, Image or Navigator Item can be selected on the Editor pane.

6.2.8.4 Align components

LOGO!Soft Comfort provides commands to align multiple components in one editing page. You can use these commands to create a web project with neat layout easily.

You can find these commands in the following ways:

- Edit menu
- Editor toolbar (Page 535)
- Editor pane shortcut menu (Page 536)

Align Left

Click this command to align the selected components along their left edges. This command only works after you select more than one component in the page.

Align Center

Click this command to align the selected components vertically along their centers. This command only works after you select more than one component in the page.

Align Right

Click this command to align the selected components along their right edges. This command only works after you select more than one component in the page.

Align Top

Click this command to align the selected components along their top edges. This command only works after you select more than one component in the page.

Align Bottom

Click this command to align the selected components along their bottom edges. This command only works after you select more than one component in the page.

Distribute Horizontally

Click this command to arrange the selected components on the page, keeping the leftmost and rightmost components in their current position while distributing the intermediate components evenly. This command only works after you select more than two components in the page.

When there is not enough space between the selected components, causing them to overlap, the command will maintain the leftmost component's position and distribute the rest evenly.

Distribute Vertically

Click this command to arrange the selected components on the page, keeping the topmost and bottommost components in their current positions while distributing the intermediate components evenly. This command only works after you select more than two components in the page.

When there is not enough space between the selected components, causing them to overlap, the command will maintain the upmost component's position and distribute the rest evenly.

Note

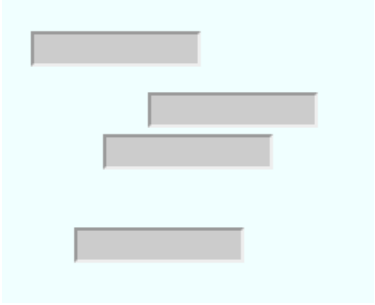
Requirements for using the distribute commands

To ensure Distribute Horizontally and Distribute Vertically commands work correctly, make sure that the selected components are positioned on the page with sufficient space around them. Otherwise, some components may overlap.

Practical example

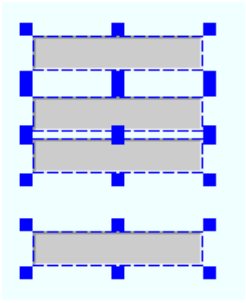
If you need to create a project with eight Analog Value components in two rows in a page, you can use align and distribute commands.

1. Add four Analog Value in the editing page. You can drag four components, or copy one into four.



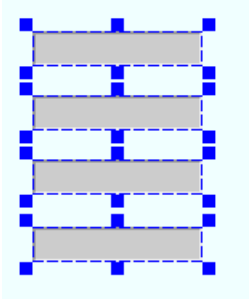
2. Select all components.

3. Use **Align Left** command. Now all four components are aligned along their left edge.

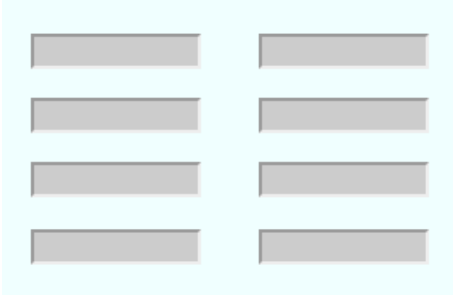


4. Use **Distribute Vertically** command. Now the distance between each component is the same. Now these four components are in a row neatly.

   In practical operation, you can also carry out step 3 and step 4 in reverse order.



5. Copy the row of components into another row on the right.
6. Slightly adjust the row on the right to be the same level with the left row.



6.2.8.5 Split windows

LOGO!Soft Comfort provides commands to arrange the editor pane window.

You can find these commands in the Editor toolbar (Page 535).

Undo Split

You can use this command to undo all splits of editing windows, and only one editing window displays in the editor pane.

Split into two windows

Use this command to split the editor pane into two windows. You can view and edit the circuit diagram in one window while editing the web project in another window.

Split into three windows

Use this command to split the editor pane into three windows.

6.2.8.6 Simulate web project

LOGO!Soft Comfort provides commands to simulate your web project before you deploy it, so you can make timely changes to your project.

You can find these commands in the Editor toolbar (Page 535).

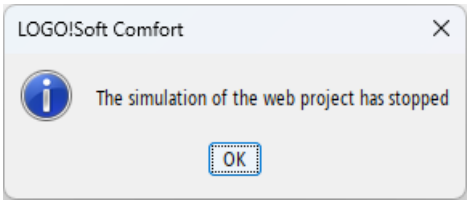
Simulation

Click this command to simulate your web project in a default web browser. You can also press [F3] function key to use this command.

You can end the simulation in the following ways:

- Close the simulation web browser.
- Click the Simulation command again.

When the project simulation ends, LSC prompts a window to remind you that the simulation has stopped.



Note

If you have created a Login page (Page 537)in the web project, the Login page will not be simulated.

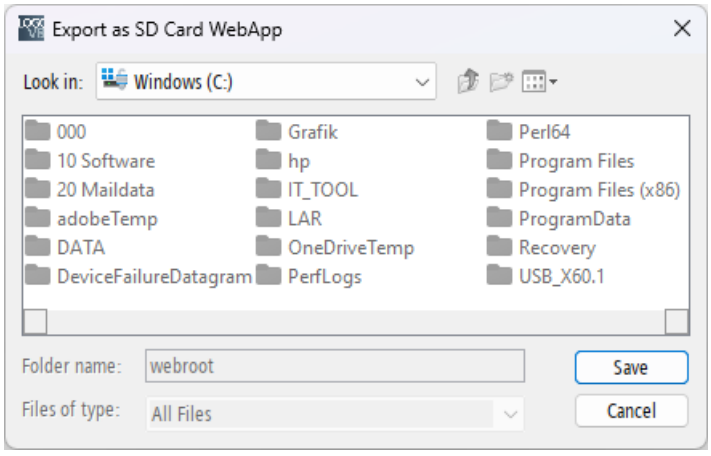
Reload the simulation

Click this command to reload the simulation after you modify your web project. This command is only available when the web project is already in simulation and is being modified.

6.2.8.7 Deploy to SD Card

Click this command to deploy the web project to SD card. You can find this command in the project pane shortcut menu (Page 536).

1. Right-click the LWE project in the project pane.
2. Click **Deploy to SD Card** command in the shortcut menu.
3. Select the directory of the SD card in the local file system.



When you download the network project to BM, LWE builds and compiles a new file folder in project to support https mode.

6.2.8.8 Show Project in System Explorer

Click this command to show where the current web project is saved. You can find this command in the project pane shortcut menu (Page 536).

1. Right-click the web project in the project pane.
2. Click **Show Project in System Explorer** command in the shortcut menu. The system explorer window appears and displays all files of the current project.

Note

As the web project is not encrypted, to avoid any undesired manipulation or malicious hacking from the Internet, please store and transfer web project in a secure environment.

6.2.8.9 Export User Defined Web Project

Click this command to export the web project. You can find this command in the project pane shortcut menu (Page 536).

1. Right-click the web project in the project pane.
2. Click **Export User Defined Web Project** command in the shortcut menu. The system explorer window appears.
3. Select the folder where you want to save the project.
4. Click **Save**.

6.2.9 Graph Library

Graph Library is the build-in graphics library for User Defined Web Page. You can select graphics for the following four components in Property pane.

- Page: the selection for **Background Image**;
- Image: the selection for **Image**;
- Switch Button: the selections for **On Image** and **Off Image**;
- Analog Slider: the selections for **Background Image** and **Thumb Image**.

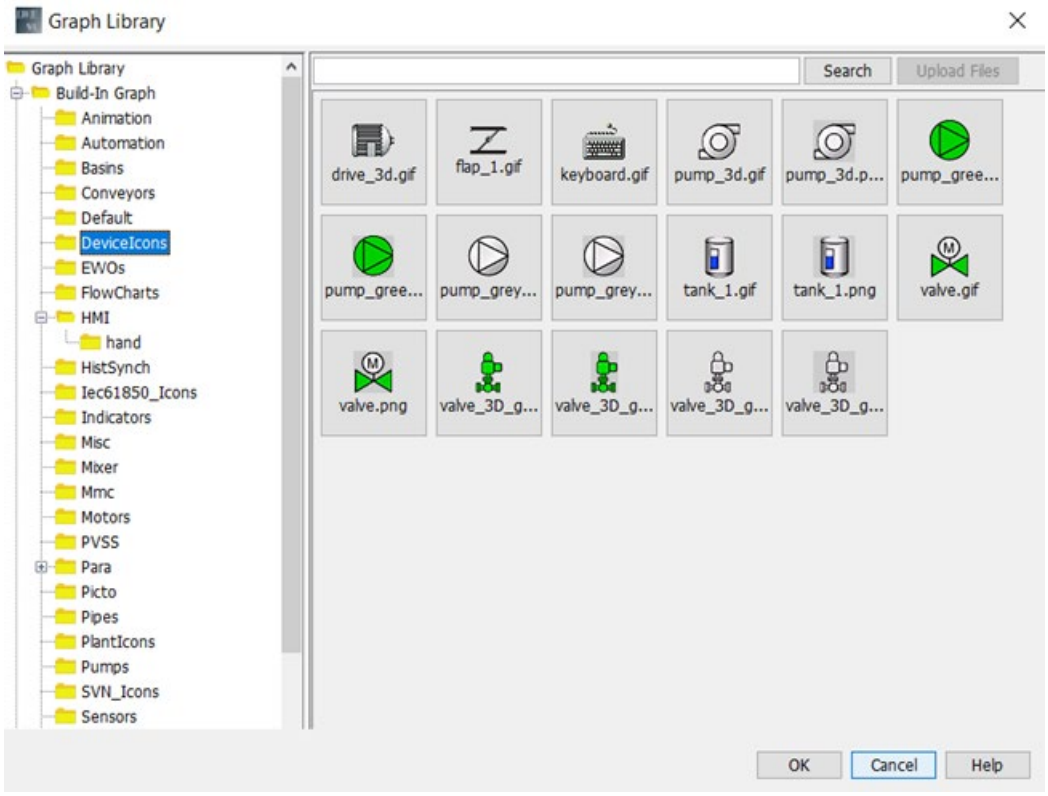
You can also find the Graph Library in the User Defined Web Page editor toolbar (Page 535) to view the build-in graphics and manage the customized graphics.

Graph Library contains below parts:

- Build-In Graph (Page 574)
- Colors (Page 575)
- My Graph (Page 575)
- User Local File System (Page 577)

6.2.9.1 Build-In Graph

In the Build-In Graph folder, each subfolder contains different kinds of graphics. Once you click the subfolder, graphics in this subfolder show on the right side of the dialog box.



In the Build-In Graph folder, you can do the following:

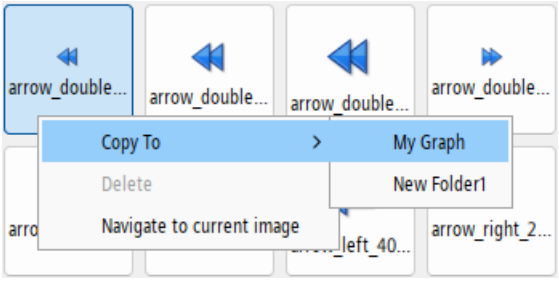
- To select the appropriate image, click the image and confirm the selection by clicking **OK** button.
- To search for any kinds of image, enter keywords in the entry field and click **Search** button or press the **enter** key, and then the result shows on the right side of the dialog box.

Note

For using the search function,

- the search scope is only available for current selected folder.
- only list the images whose name contains the keywords.

- To copy the selected image to My Graph folder or customized folder, right-click the image and select **Copy To**, then the color image appears in My Graph folder or customized folder.



6.2.9.2 Colors

There are different kinds of colors in the Color folder.

In the Color folder, you can do the following:

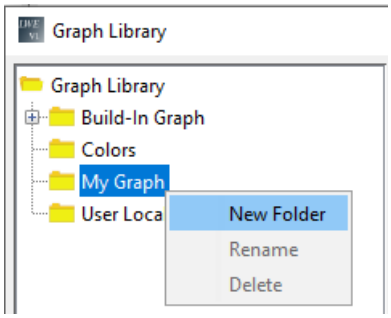
- To select the appropriate color image, click the image and confirm the selection by clicking **OK** button.
- To search for any kinds of the colors, enter keywords in the entry field and click **Search** button or press the **enter** key, and then the result shows on the right side of the dialog box.
- To copy the selected image to My Graph folder or customized folder, right-click the image and select **Copy To**, and then the color image appears in My Graph folder or customized folder.

6.2.9.3 My Graph

My Graph folder is used for creating customized folder. You can import images from local disk to both My Graph folder and customized folder.

In My Graph folder, you can do the following:

- To create customized folder, right-click My Graph folder and select **New Folder**, and then a New Folder appears under the My Graph folder.



Note

The maximum number of supported customized folder is 20.

- To rename the customized folder,
  - right-click the customized folder and select **Rename**;
  - then the name of the customized folder change to editable state, enter the new name;
  - save the change by pressing the **enter** key.
- To delete the customized folder, right-click the customized folder and select **Delete**, and then the customized folder is removed from the My Graph folder.

In My Graph folder or customized folder, you can do the following:

- To Import image from local disk,
  - point to My Graph folder or the customized folder;
  - click **Upload Files** button to find the directory of the image in your local disk;
  - click **Open** button to upload the image;
  - then the image appears on the right side of the dialog box.

Note

Pay attention to the following issues when you import an image:

- Supported image formats: PNG, JPG/JPEG, GIF.
- To guarantee better performance when visiting the project through web pages, Siemens recommends that you upload images within the size limit:

  - GIF ≤ 256 KB

  - PNG/JPG/JPEG ≤ 2 MB
- If the image size exceeds the limit, the uploaded image will be compressed. LSC ensures the accuracy of the image when compressing it.
- It takes few minutes to upload high resolution images.

- To delete the selected image, right-click the image and select **Delete** in shortcut menu, and then the image is removed from My Graph folder or customized folder.

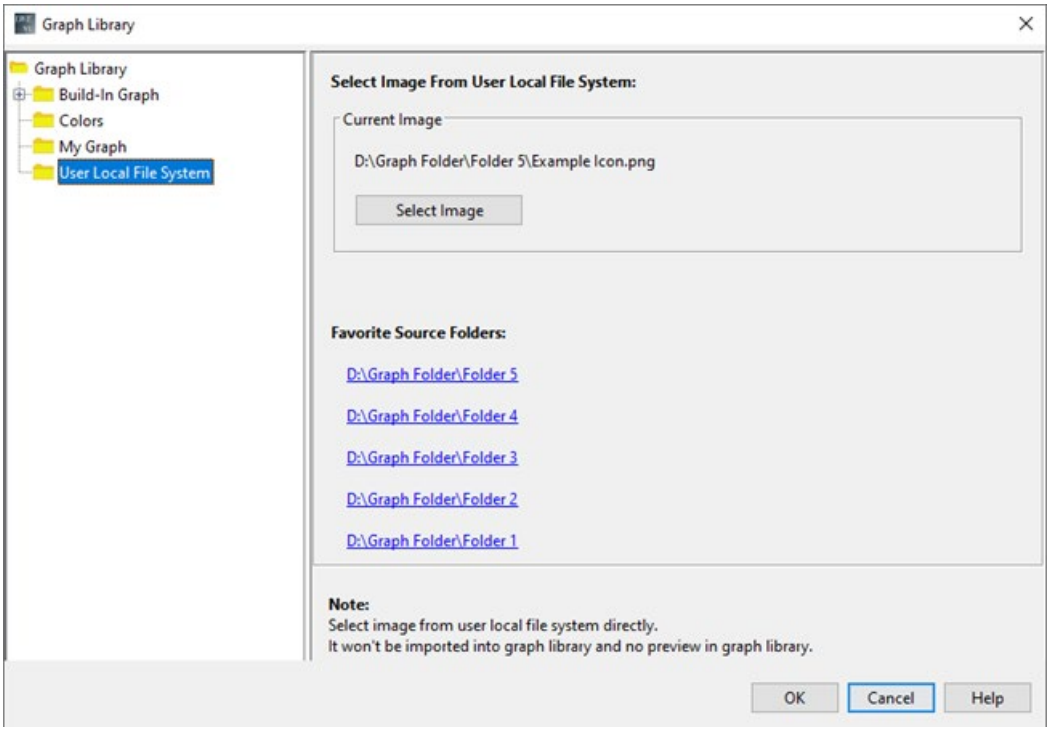
Importing multiple images at one time

1. Click Upload Files to open the file directory.
2. Select multiple images you want to upload:
   - To select a bunch of sequential images, select the first file, hold the [Shift] key and click the last file.
   - To select a bunch of non-sequential images, select the first file, hold the [Ctrl] key and select all other files you want to upload.
   - To select all the images in the folder, use the shortcut key [Ctrl+A].
3. Click **Open** to upload the selected multiple images.

After the upload, you can see the images display in the folder of **Graph Library**.

6.2.9.4 User Local File System

In User Local File System, you can select and use an image from your local file system. The selected image is not imported into graph library, and there's no preview of the selected image in graph library.



To select an image from your local file system, click **Select Image** and the Graph Library dialog appears for you to choose the image.

If you have already configured image for a component by using the User Local File System, you can see the image's stored path in the User Local File System window when you open the image property.

The last five history folder path are shown in the **Favorite Source Folders** pane. Clicking the history folder path directs you to the local folder where the selected image is stored.

Navigate to current image

If you are browsing in the Graph Library and cannot find the image which is currently used for the component, you can right-click any image in the Graph Library and select **Navigate to current image** in the shortcut menu. If the current used image is selected from the User Local File System, clicking "Navigate to current image" directs you to the User Local File System page, where you can see the image's stored path; In other cases, you will be directed to where the image is in the Graph Library, and the image is highlighted for easy recognition.

6.3 Tutorial

6.3.1 Basics

6.3.1.1 Changing size and position of an component

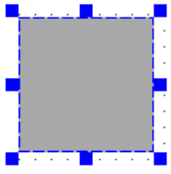
Introduction

When you select a component, it is enclosed by a rectangle with handles. You have the following options for changing the size and position of an object:

- Drag the handles using the mouse.
- Configure properties in the Inspector window.

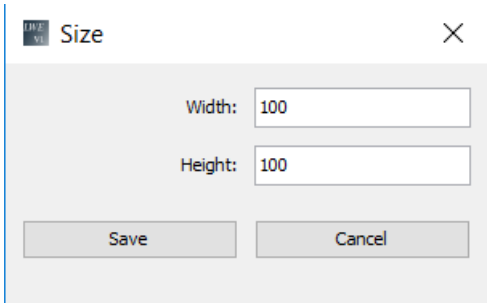
Change object size

1. Select the object you want to resize. The selection rectangle appears. The following figure shows a selected object:



2. Drag a resizing contact of the rectangle to a new position. The size of the object changes.

   Alternatively, click the **size** row in the property pane and enter the "Height" and the "Width" of the object.



3. Click the **Save** button.

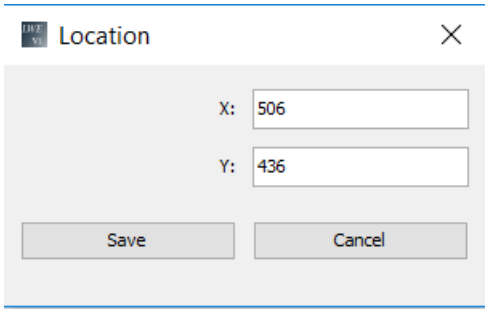
Change object position

1. Select the object whose position you want to change.

   The selection rectangle appears.

2. Click on the object and drag it to the desired position.

   Alternatively, click the location row in the property pane and enter the coordinates "Position X" and "Position Y" for the position. The zero position is located at the top left-hand corner of the screen.



3. Click the **Save** button.

6.3.1.2 Setting the background color

You can set the background color for certain components.

Requirement

The component is created and selected.

Set the background color of an object

1. Click "..." at the right end of the row background color of the properties pane.
   The color will change to the default value when you select Reset to Default.
2. Select a color for the background of the object.
3. Select the check box in the **Fill** row.

6.3.1.3 Setting the background image

You can set the background image for certain components.

Requirement

The component is created and selected.

Set the background image

- Click "..." at the right end of the row background image in the properties pane.
- Select an image from the Graph Library and click **OK**.

6.3.1.4 Setting the style of text

You can design the text of certain components.

- Font
- Text color
- Text Alignment

Requirement

The component is created and selected.

Set the Text style

1. Click "..." at the right end of the row "Font" in the properties pane.
2. Select a font for the selected text.
   The font will change to the default value when you select Reset to Default.
3. Click "..." at the right end of the "Text Color" of the properties pane.
4. Select a color for the text.
   The color will change to the default value when you select Reset to Default.
5. Click the down arrow at the right end of the text align of the properties pane.
6. Select the text alignment as you need.

6.3.1.5 Setting the border and transparency

You can design the border and transparency of certain components.

Requirement

The component is created and selected.

Set the border width and style

1. To set the border width, enter the width value in the row "Border Width" in the properties pane. The unit is pixel.
2. Click the down arrow at the right end of the row "Border style" in the properties pane.
3. Select the border style as you need.
4. Click "..." at the right end of the "Border Color" of the properties pane.
5. Select a color for the border.

   The color will change to the default value when you select Reset to Default.

Set the transparency

To set the transparency, enter the value between 0 (non-transparent) to 100 (completely transparent) in the row "transparency" in the properties pane.

6.3.1.6 Setting the variable

For the digital, analog and some miscellaneous component, you need to set the variable. LOGO!Soft Comfort supports the following two ways of binding the variable to the component:

- Binding variable from Tag Table (Page 212)
- Binding variable by dragging and dropping the function block

Binding variable from Tag Table

The component filters the variables in Tag table, and only the variables which match the component property are displayed in the Variable Name drop down list.

Set the variables under **Properties** -> **Binding**:

1. Click the down arrow at the right of the Variable Name row.
   - If you select **Default Tag**, the variable you select is local and is not configurable.
   - If you select variables from tag table, the variable you select is global.
2. Select block type, block number, block format, decimal places in the corresponding drop-down list.

Block Type	Block Number	Writable
I	I1-I64	Read Only
Q	Q1-Q60	Read and Write
M	M1-M128	Read and Write
AI	AI1-AI16	Read Only
AQ	AQ1-AQ16	Read and Write
AM	AM1-AM128	Read and Write
FAM	FAM1-FAM32	Read and Write
V	VB: 0-850	Read and Write
	Bits: 0-7	Read and Write
VB	0-850	Read and Write
VW	0-849	Read and Write
VD	0-847	Read and Write
Cursor Key	C1-C4	Read Only
Function Key	F1-F4	Read Only
Shift Register	S1.1-S1.8,S2.1-S2.8, S3.1-S3.8,S4.1-S4.8,	Read Only
VX	VX: 0-2047	Read and Write
	Bits: 0-7	Read and Write
VXB	0-2047	Read and Write
VXD	0-2044	Read and Write
VXW	0-2046	Read and Write
VR	VR: 0-511	Read and Write
	Bits: 0-7	Read and Write
VRB	0-511	Read and Write
VRD	0-508	Read and Write
VRW	0-510	Read and Write

3. For the writable block types, you can enable the write function by checking box next to **Writable**.

Binding variable by dragging and dropping the function block

1. Click command to split the editor pane into two windows.
2. Open and drag the circuit diagram into one window and drag the web page into another window.

3. Select the function block in the diagram, then hold down the [Alt] key and drag and drop the function block on the component you want to bind to.
4. Check the component properties pane. The component binding values are synchronized from the function block.

You can tell from the mouse icon whether the function block variable and the component can be bound.

The binding is not allowed.

The binding is allowed.

6.3.2 Opening a web project

You can open a web project by either creating a new web project or by importing an existing web project.

Prerequisite for opening a web project

- Add a LOGO! 8. FS4 or later version device in the network project
- No web project is open or created under the device

Creating a web project

To create a web project, take the following steps:

1. Right-click the LOGO! device in the project tree or the LOGO! device in the Network view, then select **Create Web Project** in the shortcut menu. Or double-click the User Defined Web Page entry under the device in the project tree.
2. Input the project name and select page resolution in the pop-up window, then click **OK**.

Then a new project contains **Pages** and **Navigator** appears under the LOGO! device in the project tree.

You can work with LOGO! BM to upload (Page 101) or download (Page 98) the web project with the circuit program, customize the web pages in the Editor pane (Page 564), combine the different components from the Component pane (Page 539), modify the component properties from Properties pane (Page 565), and visit the whole project through Web Server of the LOGO! Base Module.

Importing a web project

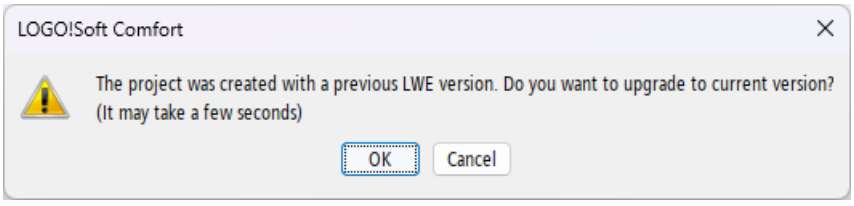
To import an web project, take the following steps:

1. Right-click the LOGO! device in the project tree or the LOGO! device in the Network view, then select **Import Web Project** in the shortcut menu.
2. Select the web project in the system folder, then click **Import project**.

Then the web project appears under the LOGO! device in the project tree.

If the imported web project was created with the LOGO! Web Editor, a pop-up window appears to ask if you accept to convert the LWE project to a web project.

Refer to LWE compatibility (Page 532) for more information.



Tag table compatibility

When you import a LWE project containing a tag table, the LWE project will be converted into a web project. The tag table will be also imported and combined into the tag table in the LSC network project.

When LSC detects a tag table in the imported LWE project, the tag import check window will appear displaying all the tags from the LWE project tag table.

- Check the box "Only show conflicting or erroneous items" to filter out and only display the tags that cannot be imported directly.
- Select the action option.
- Import button is only available when all the conflict and error tags are properly handled. Click the button to starting importing the LWE project.
- Click Cancel button to cancel importing the LWE project.

Check result	Meaning	Action option
None	No error for the tag. The tag can be imported.	• Import: import the tag. • Skip: cancel importing the tag.
Overwritable conflict	The imported tag is exactly the same as the tag in the tag table. The tag can be imported and will replace the tag in the tag table.	• Overwrite: import the tag and replace the one in the tag table. • Skip: cancel importing the tag.
Conflict	The tag has the same tag name as a tag in the tag table but has different variable address. The tag cannot be imported.	• Skip: cancel importing the tag.
Error *	The error tag has the variable incompatible with the LOGO! device. The tag and the LWE project cannot be imported.	

* If there is an error tag detected in the LWE project, the LWE project cannot be imported into the LSC network project. You need to modify your LWE project.

Note

Tag number limit

The tag table of the LOGO! device supports 256 tags at most. If the total number of tags in the tag table and in the imported LWE project exceeds 256, the additional tags will be highlighted in the import check window. You need to select Skip action for these additional tags to cancel importing them.

To learn more about LSC tag table, refer to Tools -> Tag Table (0BA7 and later versions only) (Page 212).

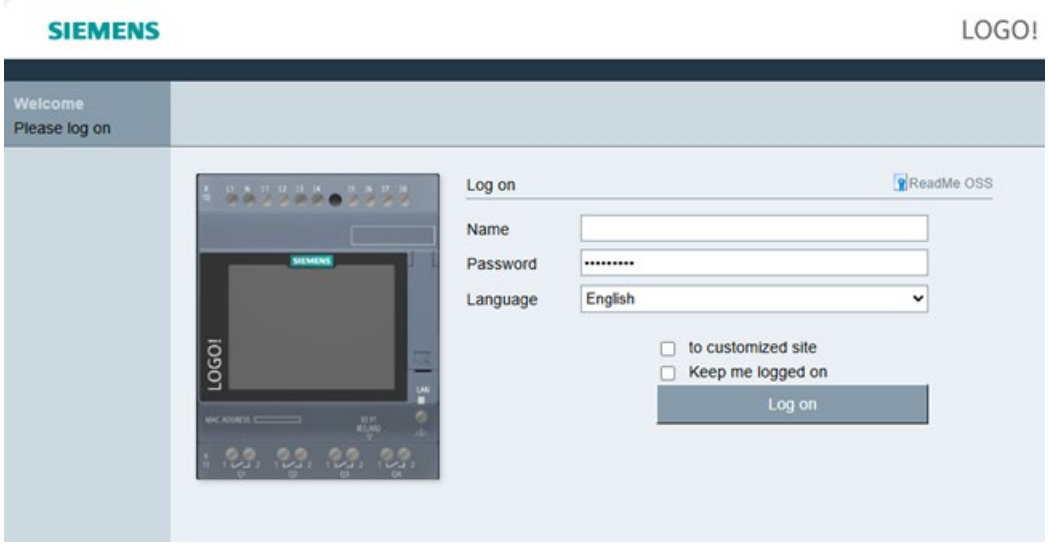
6.3.3 Visiting the project through web browser

After deploying the whole project, you can visit it through the web page.

1. Open the web browser and enter the valid IP address of LOGO! Base Module. Then the Logon page appears.

   Note

   If you configured HTTPS mode for web server access, you need to install the LOGO! PSK certificate or a trust external certificate to the web browser for visiting the web project. On how to install the certificate, refer to the chapter "Security -> Installing LOGO! PSK Certification" in "LOGO! system manual".



2. Enter the correct user name and password.
3. Select the check box before "**to customized site**" and click **Log on** button. Then you can navigate to the customized site after logging on.

Note

If you download the modified project to LOGO! BM, you'd better log in to the corresponding web page again to ensure the correction works.

6.4 HTML development interface

6.4.1 General introduction for html interface

Note

LOGO!Soft Comfort is not compatible with any web projects created through the customized development interface.

Professional clients can modify the web project to meet their specific requirements on webpage.

After you bind the HTML element to a BM data, you can monitor the BM data through webpage.

Working principle

In **DBinit()**, LOGO! JavaScript scans all HTML elements and transfer data with those having **server_binding** class.

In the **server_binding** element, we use **range**, **address**, **type**, **length** to define and bind a data from BM.

Through **show_function** and **show_param**, you can implement a callback method to meet their requirements based on the data refresh.

6.4.2 Develop guideline

Follow the following rules when you update the project by the interface. Otherwise, it cannot work with BM correctly.

- Except for htm files, do not delete, move or modify other files.
- You can add, modify or delete the htm files in web project folder:
  - Do not delete main. htm.
  - You can only modify the part of a htm file between and .
  - Keep the name of a htm file within 11 characters (a maximum of 8 characters for base file name and 3 characters for the extension)
- After customizing the page file, you cannot edit the web pages with LSC. Otherwise, the web project will be overwritten.

6.4.3 LOGO! data access protocol

6.4.3.1 introduction for logo data access protocol

For the use of this interface, your web pages should include all the following JavaScript:

```
<script type="text/javascript" src="/js/utility.js"></script>
<script type="text/javascript" src="/js/storage.js"></script>
<script type="text/javascript" src="/js/bigint.js"></script>
<script type="text/javascript" src="/js/encrypt.js"></script>
<script type="text/javascript" src="/js/ajax.js"></script>
<script type="text/javascript" src="/js/binding.js"></script>
```

Note

You should call the function **DBInit()** in the page initializing routine, which initializes the data binding environments. Otherwise, the refresh framework cannot work.

The web pages created by LSC will automatically load the required JS. For your customized web pages, you can add your own JS, but do not delete the original contents.

6.4.3.2 Define a server_binding element

Define a server_binding **element**

Define a **server_binding** class as below. All attributes in the `div` are required.

```
<div class="server_binding" id="myDiv" show_param="myDiv"
show_function="myCallback" range="132" address="0" type="1"
length="1" block_format="Bool"></div>
```

- **id**: the unique identifier of an element
- **class=server_binding**: scan identifier for JavaScript framework
- **range**: the first part of the address
- **address**: as the third part of the actual address, **address** means the data offset from the **range** start.
- **type**: data type
- **length**: data counts with its type.
- **show_function**: define the function that is used to show the data. This function is a "callback" function. Framework call the callback function when the binding data is refreshed.
- **show_param**: parameter for the callback function.
- **block_format**: value display format

For more information on the parameters, see Data format (Page 590).

Note

Ensure all the parameters are included when you define the **sever_binding** element. Otherwise, the data cannot be bound.

6.4.3.3 Command

This chapter introduces some commands related to LOGO! data access protocol.

Get

To get the data in your webpage, you need to do the following two steps. LOGO!'s JavaScript framework call the callback function When BM data updates.

1. Create a **server_binding** element according to the instruction in Define a server_binding element (Page 587) .
2. Implement the declared callback function.

See an example as below:

```
var myCallback = function myCallback() {
    //get value from framework
    var newValue = this.m_sValue;

    //do your actions...
    $("#myDiv").html(newValue);
}};
```

When the callback_function is called, the JavaScript framework receives a parameter DBRequest. By this parameter, you can get the **server_binding** emelent related information and the updated data as follow.

Property	Parameter
DBRequest.m_nAddress	address
DBRequest.m_nLength	length
DBRequest.m_nRange	range
DBRequest.m_nType	type
DBRequest.m_oSrcElement	server_binding element
DBRequest.m_sShowParam	show_param
DBRequest.m_sValue	value

Set

You need to write your own JavaScript code to implement a set query for a **server_binding** element,

1. Create a DBRequest object for the **server_binding** element.
2. Assign a value to **DBRequest** by SetValue method.
3. Release a set query by **SetQuery** method.
4. Check the **m_iSetPendingFlag** member to make sure the **SetQuery** is complete. The ture value means **SetQuery** is pending while the false value means **SetQuery** is completed.

You can refer to the example below.

```
function DBRequestTest() {
    var oRequest = new DBRequest(document.getElementById("myDiv"));
    oRequest.SetValue(true);
    if (oRequest.SetQuery()) {
        //success
        return true;
    }
    //fail:
    return false;
}
```

Note

You should call the function **DBInit()** in the page initializing routine, which initializes the data binding environments. Otherwise, the refresh framework cannot work.

Two global methods are also provided to help you easily read and submit data if your defined **Div** fully compiles with the standards:

```
_getFormatValue(bindObj, value);   //Format real-time value with
binding info
_doSetValue(divID, value);    //do submit
```

6.4.3.4 Data format

We use **range**, **sub_range**, **address**, **type**, **length** to describe a data.

The **range**, **sub_range**, **address** indicate the address of the data. The **length** of a date indicates its type. For detailed information, refer to the following table.

Address Space Name	range	sub_range	address	length	Recommended Access Mode	Readable/Writable
Digital Input	129	0	0-63	64	Bits	R
Digital output	130	0	0-63	64	Bits	R/W
Digital Marker	131	0	0-111	112	Bits	R/W
Variable	132	0	0-6799	6800	Bits, Bytes, Words, Dwords	R/W
VX	9	0	0-16383	16384	Bits, Bytes, Words, Dwords	R/W
VR	10	0	0-4095	4096	Bits, Bytes, Words, Dwords	R/W
Cursor Key	12	0	0-31	32	Bits	R/W
TDE Function Key	13	0	0-31	32	Bits	R/W
Shift Register	14	0	0-127	128	Bits	R
NetI	16	0	0-127	128	Bits	R
NetQ	17	0	0-127	128	Bits	R/W
Analog Input	18	0	0-239	240	Words	R
Analog Output	19	0	0-239	240	Words	R/W
Analog Marker	20	0	0-1023	1024	Words	R/W
NetAI	21	0	0-1023	1024	Words	R
NetAQ	22	0	0-511	512	Words	R/W
FAM	144	0	0-31	32	Dwords	R/W

range

It is the first part of the address.

sub-range

It is the second part of the address and reserved for future function extension. The default value is 0.

address

As the third part of the address, it means the data offset from the range start.

Note

Ensure that you provide the offset-address by bits no matter what data type you are accessing.

All the address will be validated before access. LOGO! reports an error for an invalid address and truncate the address which is out of range

type

It means data type. LOGO! has four kinds of data.

Id	type	length
1	BOOL	1 bit
2	BYTE	8 bits
4	WORD	16 bits
6	DWORD	32 bits

length

It means the data count with its type.

value

Two global methods are provided to help you easily read and submit data if your defined **Div** fully compiles with the standards:

```
_getFormatValue(bindObj, value);   //Format real-time value with
binding info
_doSetValue(divID, value);    //do submit
```

6.4.4 Example

General procedure

1. Create a web project in LSC.
2. Open the web project temp folder.
3. Open the **main.htm** file with your IDE.
4. Copy and paste below code of the customized components example to replace the content between ** ** and ** ** in the main.htm file.
5. Save the file.

6. Download the diagram and the web project to LOGO! and start the device.
7. Visit the web project in a web browser.

Note

After customizing the page file, you cannot edit the web pages with LSC. Otherwise, the web project will be overwritten.

Example of customized components

Below is an example of customized components:

```
<div id="main" style="width:1440; height:900">

    <!-- analog case: binding VD0 Unsigned -->
    <div class="server_binding" show_function="myCallback"
show_param="testAnalog" id="testAnalog"
    range="132" address="0" type="6" length="1"
block_format="Unsigned"
    style="position: absolute; left: 100px; top: 500px;">
        <input type="text" value="">
        <input type="button" value="submit"
onclick="mySubmit(this)">
    </div>

    <!-- analog case: binding VD0 Float -->
    <div class="server_binding" show_function="myCallback"
show_param="testAnalogFloat" id="testAnalogFloat"
    range="132" address="0" type="6" length="1" block_format="Float"
    style="position: absolute; left: 100px; top: 550px;">
        <input type="text" value="">
        <input type="button" value="submit"
onclick="mySubmit(this)">
    </div>

    <!-- digital case: binding M1 Bool -->
    <div class="server_binding" show_function="myCallback"
show_param="testDigital" id="testDigital"
    range="131" address="0" type="1" length="1" block_format="Bool"
    style="position: absolute; left: 100px; top: 600px;" >
        <input type="text" value="">
        <input type="button" value="submit"
onclick="mySubmit(this)">
    </div>

    <script type="text/javascript">
        function myCallback() {
            let value = this.m_sValue; // get real-time value from
framework
            let id = this.m_sShowParam;// DIV ID
            let bindObj = $("#" + id); // DIV Obj
            value = _getFormatValue(bindObj, value); // Format
realtime value with bingding info
```

```
            $("#" + id).find("input:first").attr("placeholder",
value); // set to your inputText
        }

        function mySubmit(obj) {
            let divID = $(obj).parent().attr("id"); //find DIV ID
            let bindObj = $("#" + divID); // DIV Obj
            let inputVal = bindObj.find("input:first").val().trim();
// get your input
            let value= _getFormatValue(bindObj, inputVal); //format
input with bingding info by api method
            _doSetValue(divID, value); //do submit by api method
        }
    </script>


</div>
```

Specification

1. All you custom codes have to be added between and .
2. The following four parameters define the LOGO! data access and callback JavaScript function:
   - `class="server_binding"`: LOGO! JavaScript will scan all the DIVs and transfer data with those DIV having **server_binding** class**.**
   - `id="mydiv"` : You should assign **id** and **show_param** with the same DIV.
   - `show_param="mydiv"`: You should assign **id** and **show_param** with the same DIV.
   - `show_function="myCallback"`:You need to implement a callback JavaScript function and assign its name to “show_function”.
3. The following four parameters describes the data:
   - `range="132"`: V
   - `type="6"`:WORD
   - `address="0"`:0
   - `length="1"`: 1

   For detailed information, see Data format (Page 590)
4. In your callback method, you can get your binding value by **this.m_sValue**.
5. The global function **_getFormatValue** helps you to format data with **div** binding info.
6. The global function **_doSetValue** helps you to submit data with **div** binding info.

Tips and tricks 7

7.1 Tips and tricks

How to maintain an overview during simulation (Page 594)

A quick and easy way of selecting blocks and placing these into your circuit program (Page 594)

A quick and easy way of connecting blocks in large circuit programs (Page 596)

How to display a corresponding tooltip for a function key (Page 596)

How to identify your circuit program version (Page 596)

How to access functions via the shortcut menu (Page 596)

A quick and easy way of zooming your circuit program window (Page 597)

A quick way of changing block parameters (Page 597)

A quick way of closing circuit diagrams without saving the data (Page 597)

How to establish the cycle time (Page 597)

7.2 How to maintain an overview during simulation

To maintain a clear overview of large circuit programs when working with small or low-resolution monitors, follow these steps:

1. Maximize the LOGO!Soft Comfort application window to full screen size.
2. Close the Info Window and minimize the diagram tree and instruction tree.

Advantage: You have increased the space for editing the circuit program. You can access the I/O toolbars without restriction, since they always remain in the foreground.

Note: You can restore the diagram tree and instruction tree to their original position by left-clicking the icon.

7.3 A quick and easy way of selecting blocks and placing these into your circuit program

You have two alternatives to the standard selection of blocks from the programming toolbar icons:

Alternative 1

1. Expand the catalog from the instruction tree.
2. Click the required block in the catalog to select it.
3. In your circuit program, left-click the block insert position. The block appears at the correct position.
4. To insert more than one instance of a block at a time, double-click the block, which causes LOGO!Soft Comfort to display a stamp icon beside the block. Left-click the locations on the programming interface for placing the multiple block instances.

Advantage: When you change between constants/terminals, basic functions and SFBs, you save yourself having to click the relevant icons in the programming toolbar.

Alternative 2

1. Open the catalog of the programming toolbar.
2. Click any block in the catalog to select it.
3. If you are creating a large program, you can close the catalog and also hide the programming toolbar.
4. Hold down the Ctrl key and left-click the block insert position in your circuit program. LOGO!Soft Comfort displays a mask with block list, from which you can select the required block with a double-click.

   Tip: The mask header also contains an input field. You could, for example, enter the initial letter of the required SFB to restrict the display in the mask to a list of blocks with this initial. You thus do not have to browse the entire mask, and you can quickly find the relevant block.
   LOGO!Soft Comfort inserts the block at the correct position in your circuit program.
5. To insert further instances of this block, left-click the relevant insert positions.

Advantage: You do not have to depend on the catalog to create large programs. You can thus close and hide it to provide more screen space for your circuit program.

7.4 A quick and easy way of connecting blocks in large circuit programs

In addition to the conventional method of creating connections with the programming toolbar icons, you have another alternative:

1. After you have placed the blocks into the circuit program, double-click the input or output of a block.
2. A mask opens with a list of the target blocks. Double-click to select a block.
   Tip: The mask header also contains an input field. You could, for example, enter the initial letter of the required SFB to restrict the display in the mask to a list of blocks with this initial. You thus do not have to browse the entire mask, and you can quickly find the relevant block.
   In addition, you can also use wildcards such as * or ?.

   LOGO!Soft Comfort makes the connection between the two blocks.

Advantage: Particularly when you are handling large circuit programs, this method provides you with a quick and easy means of creating connections.

7.5 How to display a corresponding tooltip for a function key

Prerequisite: The tooltips (Page 90) are enabled.

You can hover over an icon to see a tooltip for the icon, as well as the function key (Page 39) (if available) that performs the corresponding function.

7.6 How to identify your circuit program version

You can specify the version number of your current circuit program in the **Version** field in the File → Properties: Additional Info (Page 73) dialog. LOGO!Soft Comfort maintains the version information when you download and upload the circuit program between the PC and LOGO!.

This special function is only available with devices as of hardware series 0BA2.

7.7 How to access functions via the shortcut menu

Right-click an object to open a shortcut menu that offers you all the major functions for that object.

7.8 A quick and easy way of zooming your circuit program window

Press [CTRL] and turn the mouse wheel.

Result: The size of your circuit program window changes.

7.9 A quick way of changing block parameters

Click the parameter field you want to change, and turn the mouse wheel.

Result: The parameter changes.

7.10 A quick way of closing circuit diagrams without saving the data

You quickly close one or more circuit programs with saving the data:

- Open the **File** menu, press [CTRL] and click the **Close** menu command.

  Result: The currently active circuit program is closed without prompt.
- Open the **File** menu, press [CTRL] and click the **Close All** menu command.

  Result: All open circuit programs are closed without prompt.

Caution: New or changed circuit programs will not be saved.

7.11 How to establish the cycle time

The cycle time is the program processing time (reading inputs, executing programs and writing outputs).

The cycle time of each function is less than 0.1 ms. You can establish the cycle time of the circuit program by using a test program. Refer to the *LOGO! Manual*, Appendix B for more information.

The execution time of individual functions in LOGO! hardware series 0BA3 or older is indeterminate, and the times vary for each function. You can only establish the time for one program cycle. Refer to the *LOGO! Manual*, Appendix B for more information. You can download this from the LOGO! homepage on the Internet.

Troubleshooting

8

8.1 Troubleshooting

This chapter provides you with tips on how to locate and troubleshoot problems.

Sending emails

Diagnostics information is displayed on LOGO! Base module through menu: Diagnostics → Email → Mail Logs. You can refer to the following table to troubleshoot the error cause and fix the error through corresponding solution.

Diagnostics	Possible cause	Possible remedy
Mail busy	Emails are sent too frequently. When the server is sending an email, another email is triggered to send.	As you cannot change the email sending frequency, modify the email sending trigger event.
Time out	• The network connection is unstable. • SMTP server response is time-out.	• Check if your network connection is interrupted. • Check if the communication with the SMTP server is normal.
Failed to parse DNS	• Network connection to DNS server is interrupted. • Some error occurs on the SMTP domain name.	• Check if the connection with the DNS server is normal. • Change DNS server. • Check if the SMTP server domain name is correct.
Failed to login	The login account or login password is incorrect in the SMTP settings.	Check the login account or password in SMTP settings. Additional application code is required for certain SMTP server login. Refer to the user manual of specified email server for detailed information.
Receiver error	• Email receiver is not configured. • Some error occurs on the configured email receiver.	• Check if the email receiving group is configured with email receivers. On how to configure email receiver, refer to Tools -> Transfer -> Email Settings (0BA8 and later versions only) (Page 150) • Check if the receiver email address is correct. • Check if the receiver email address is within the receiving range of the SMTP server.
Net error	The network is disconnected when the server is sending the email.	Check your network connection.
No configuration	SMTP server is not configured in LSC.	Configure SMTP in LSC. Refer to Tools -> Transfer -> Email Settings (0BA8 and later versions only) (Page 150).

Diagnostics	Possible cause	Possible remedy
Server error	• SMTP server rejects the email sending request. • SMTP server response doesn't meet with the SMTP specifications.	Check if error occurs on the SMTP server or the SMTP server login email account.
Failed to verify certificate	The SMTP server certificate is invalid.	• Upload valid certificate in SMTP configuration. • Check if the BM time is correct. Incorrect BM time makes it fail to verify certificate.

Cloud connection

Diagnostics information is displayed on LOGO! Base module through menu: Diagnostics → Cloud → Connection Status. You can refer to the following table to troubleshoot the error cause and possible solution.

Diagnostics	Possible cause	Possible remedy
Failed to parse DNS	• DNS server is not available. • Error occurs when parsing IP address from DNS server.	• Check your network connection. • Check if the gateway configuration is correct. • Check if the broker URL is correct.
Server connection timeout	• No response from server when LOGO! is establishing TCP/TLS connection with it. • Server is not accessible	• Check your network connection. • Check if the broker URL is correct. • Contact server technical support.
Server connection error	Error occurs when LOGO! is establishing TCP/TLS connection with server.	Check connection parameters, for example, port, authentication mode, key, certificate.
No reply from MQTT broker	Server's MQTT service is unavailable.	Contact server technical support.
Failed to send data to MQTT broker	Cloud connection with MQTT broker is interrupted when LOGO! is sending data.	Check your network connection.
Failed to receive data from MQTT broker	• Cloud connection with MQTT broker is interrupted when LOGO! is receiving data. • Received data is invalid, for example, packet format error, unrecognizable packet type.	• Check your network connection. • Check server configuration.
Unacceptable protocol version	The server does not support the level of the MQTT protocol requested by the client.	Check if the server supports MQTT 3.1/3.1.1 protocol.
Identifier rejected	The client identifier is UTF-8 which is not supported by the server.	Contact server technical support.
Server unavailable	The network is connected but MQTT services is unavailable.	Contact server technical support.
Bad user name or password	The data in the user name or password is malformed.	• Check if user name and password are correct. • Contact server technical support.

Diagnostics	Possible cause	Possible remedy
Not authorized	The client is not authorized to connect.	Check if user name and password are provided.
Data from MQTT broker is too long	Data received from the server is malformed or too long.	• Check if data sent from the server is valid. • Contact server technical support.

User Example

A

A.1 How to connect with Hive MQTT

Requirements

- Cloud access is enabled in LOGO!Soft Comfort

Note

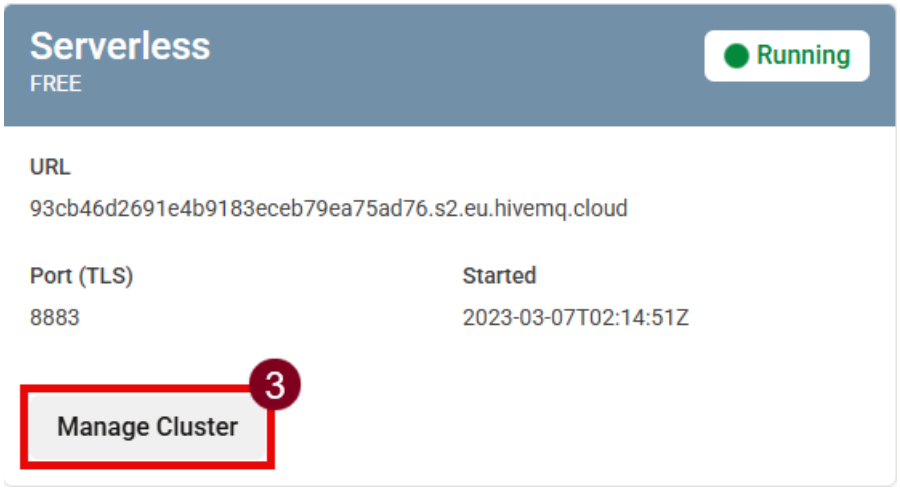
The following example uses HiveMQ Cloud with the version in November 2025, and LOGO!Soft Comfort V9.0.0.

Procedures

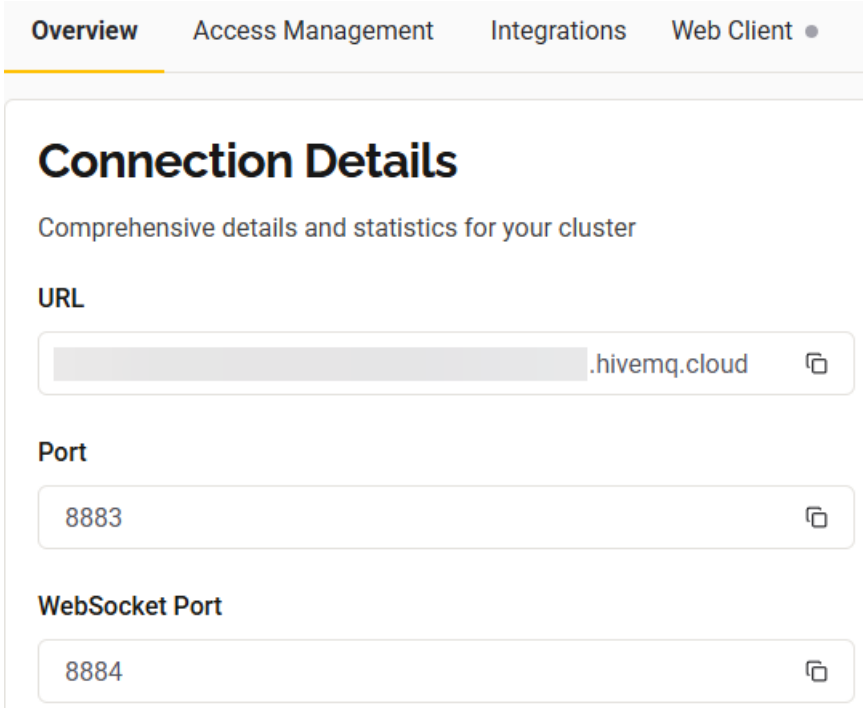
Follow these steps to set up IoT connection between LOGO! BM and Hive MQTT.

1. Sign up in HiveMQ Cloud (https://console.hivemq.cloud/?utm_source=hivemq-com&utm_medium=download-page&utm_campaign=cloud).
2. Sign in.

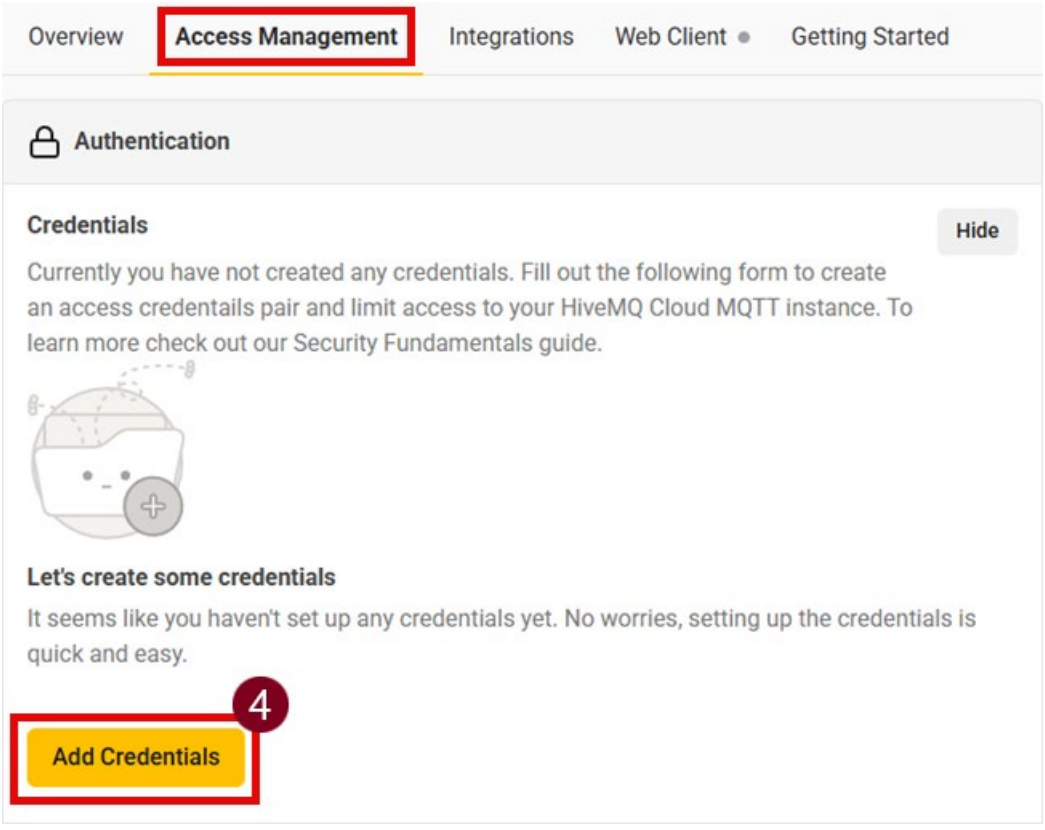
3. Click ③ to get the Cloud connection configuration information.



Here you get the Cluster URL, Port information. Copy and paste these information in a text file for later use in LOGO!Soft Comfort Cloud connection configuration.

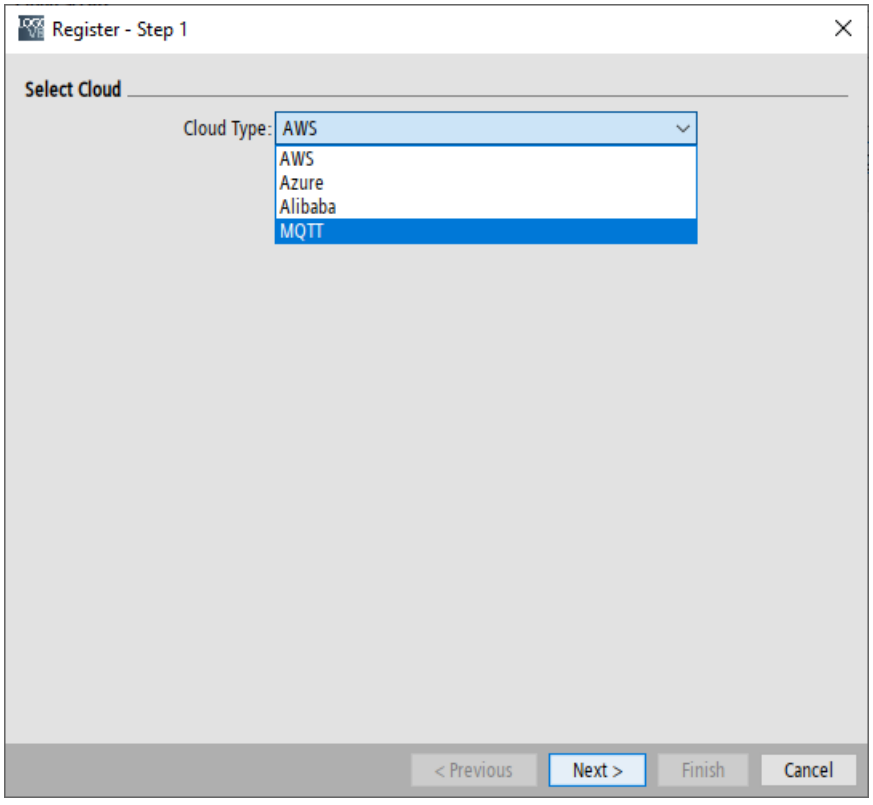


4. Click ④ to set up credentials for your IoT devices. Remember the credential you set, which will be used in LOGO!Soft Comfort configuration.

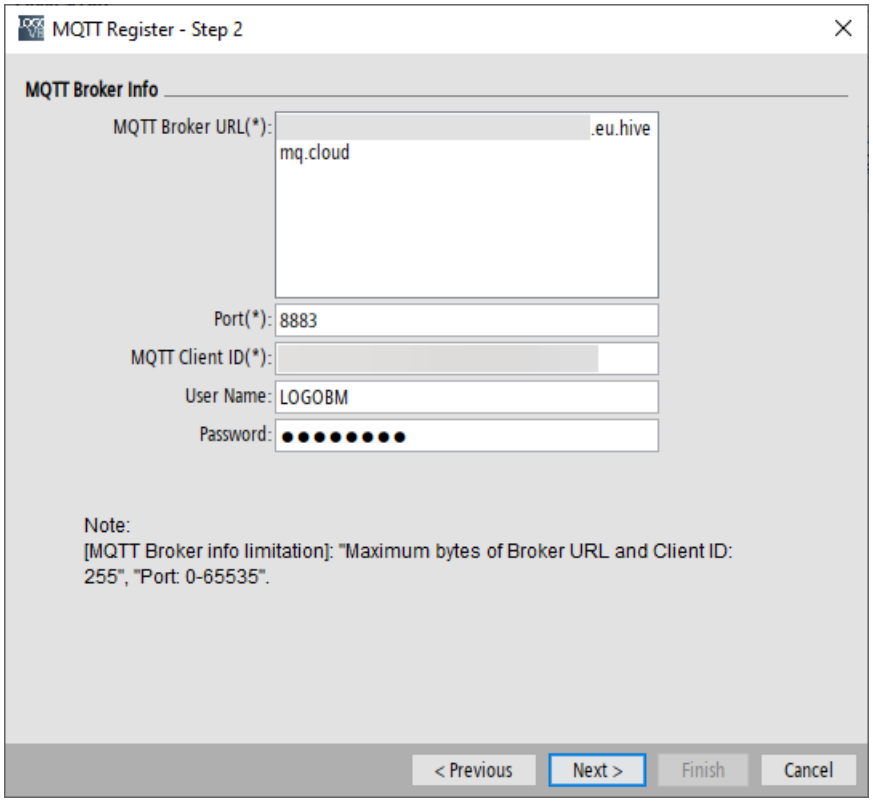


5. Register Hive MQTT IoT thing through Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings (Page 119) in LOGO!Soft Comfort. Click Register Thing button to start the process.

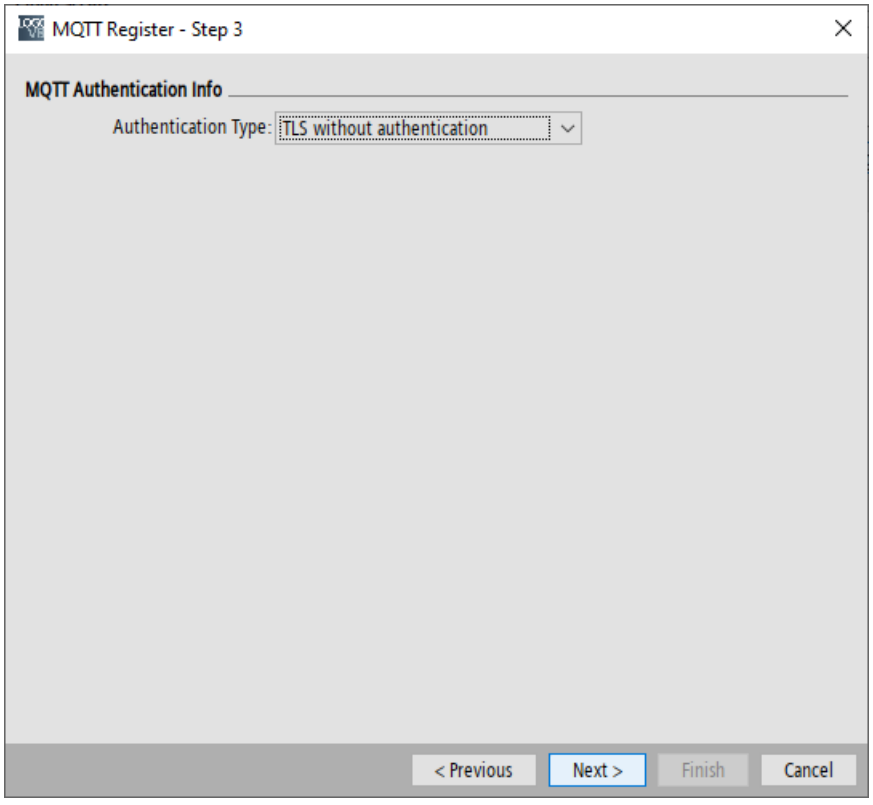
6. Select "MQTT" in Cloud Type and click "Next" button.



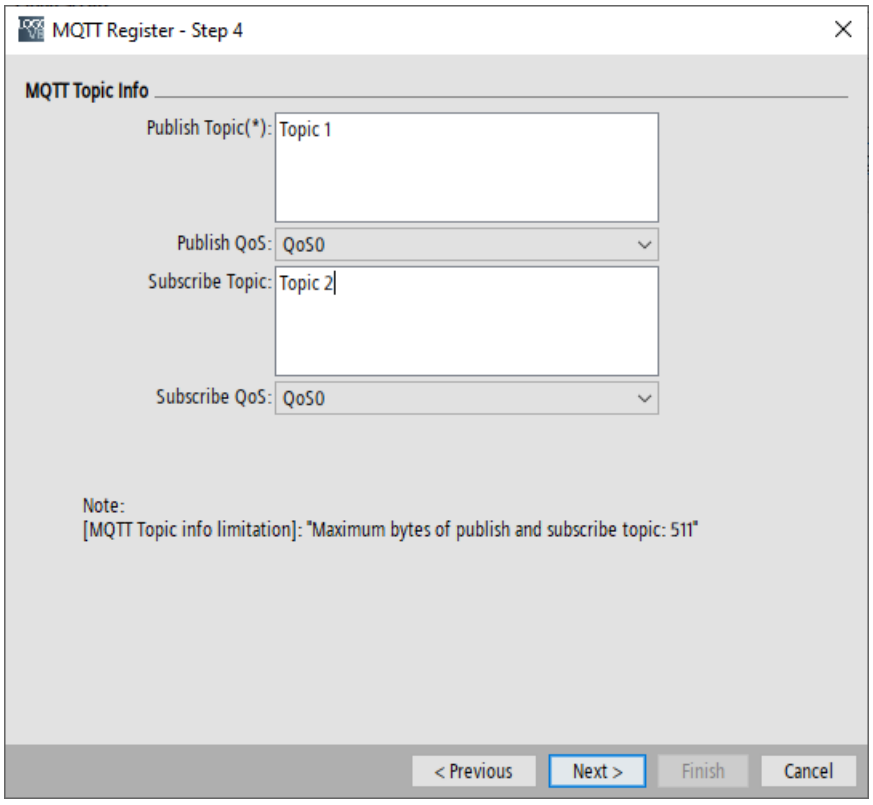
7. Enter MQTT Broker URL, Port which you have gotten in step 3; enter User Name and Password which you have set in step 4; set MQTT Client ID. Then click "Next" button.



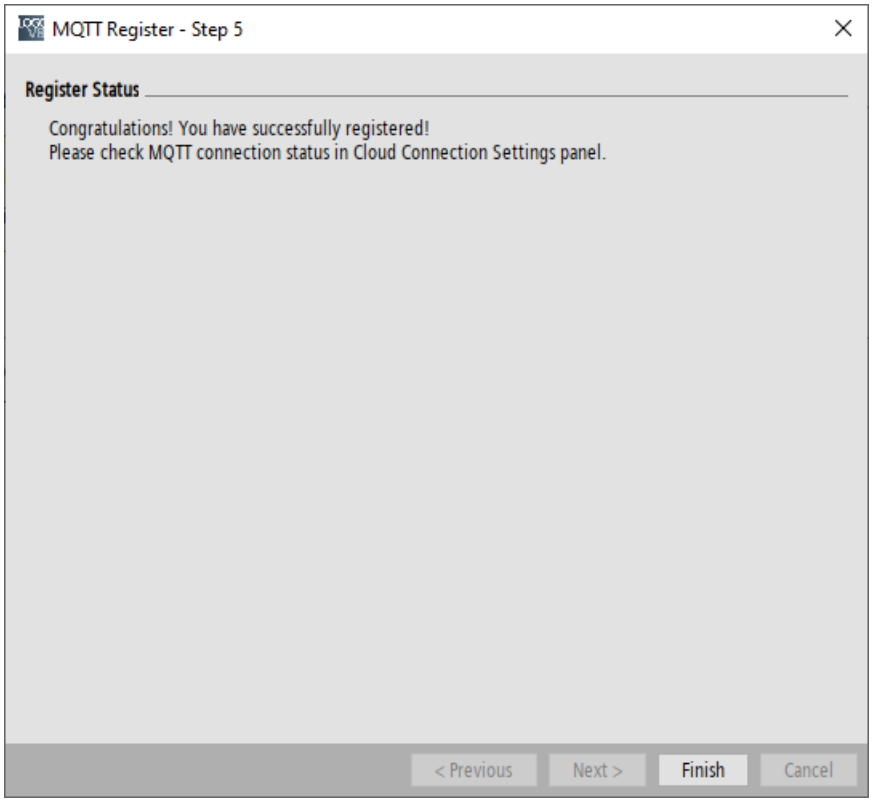
8. Select "TLS without authentication" as the Authentication Type. Then click "Next" button.



9. Enter "Publish Topic" and "Subscribe Topic". You can name them by yourself. Then click "Next" button. Remember these two topic names, which will be used later to subscribe or publish data on Hive MQTT client.



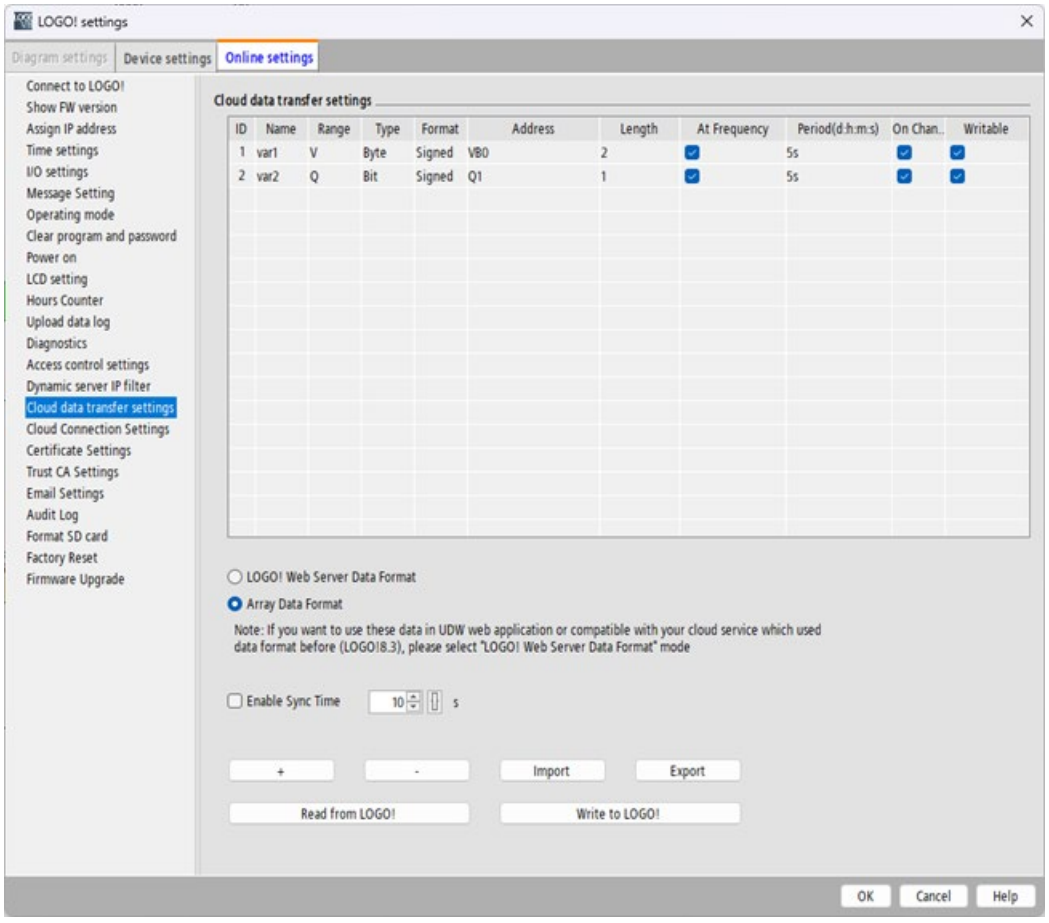
10. The Register Status page shows you that your registration is successful. Click "Finish" button to close the registration dialog.



Subscribe data from LOGO!

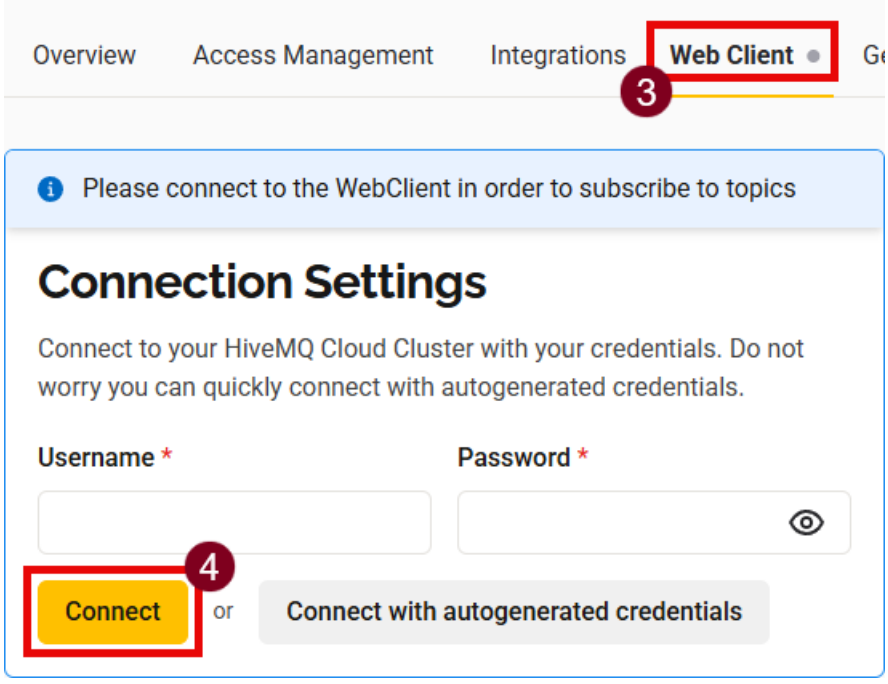
To subscribe and read data from LOGO! BM on Hive MQTT web client, follow these steps:

1. Open cloud data transfer settings window through Tools -> Transfer -> Cloud Settings -> Cloud Data Transfer Settings (0BA8 and later versions only) (Page 116).
2. Add a data item. In this example, we use "Array Data Format". Click "Write to LOGO!" to finish the configuration.



3. Click "Web Client" in Hive MQTT to configure client connection.

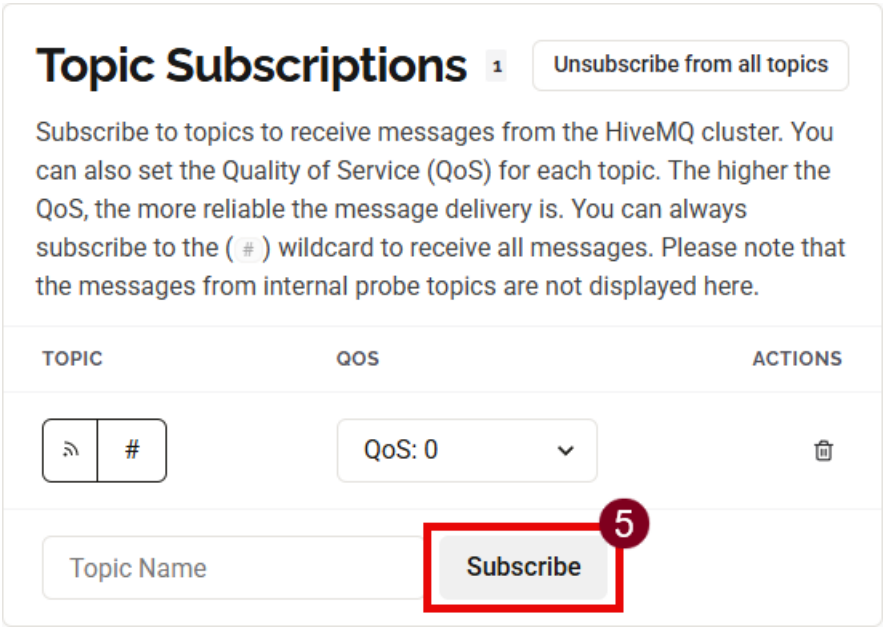
4. Enter the Username and Password, then click "Connect" button. You can use the credential you have created in "Access Management". Or you can click "Connect with autogenerated credentials" button to connect client.



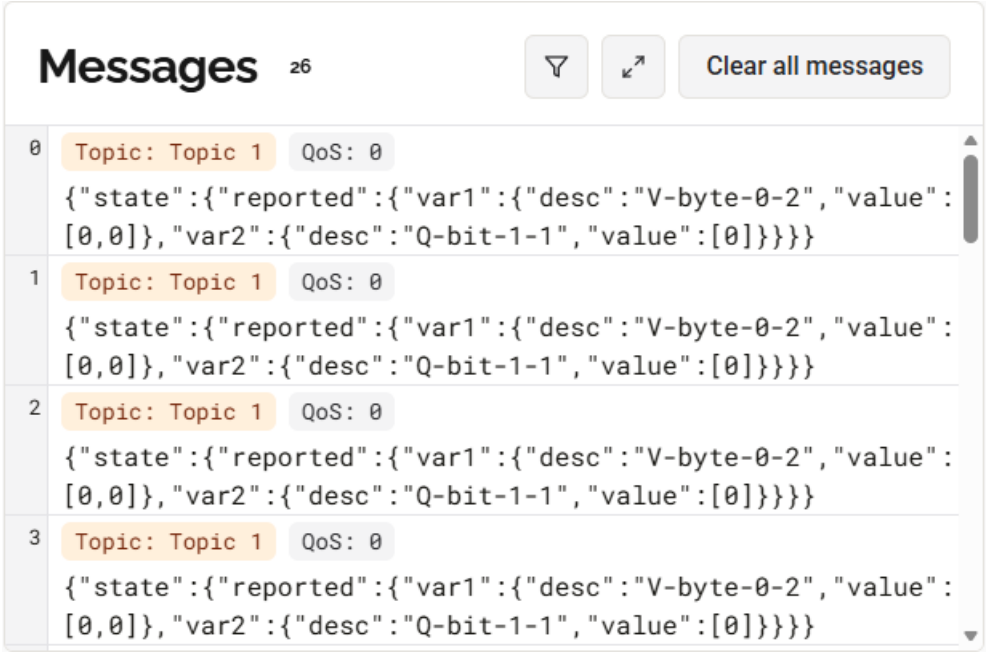
Note

The credential for client connection in Hive MQTT should not be the same credential that you use to configure Cloud connection in LOGO!Soft Comfort. Otherwise, the Cloud connection might be interrupted.

5. Browse to Topic Subscriptions part. Enter the Publish Topic you have configured in Cloud connection in LOGO!Soft Comfort. Then click "Subscribe" button to subscribe messages.



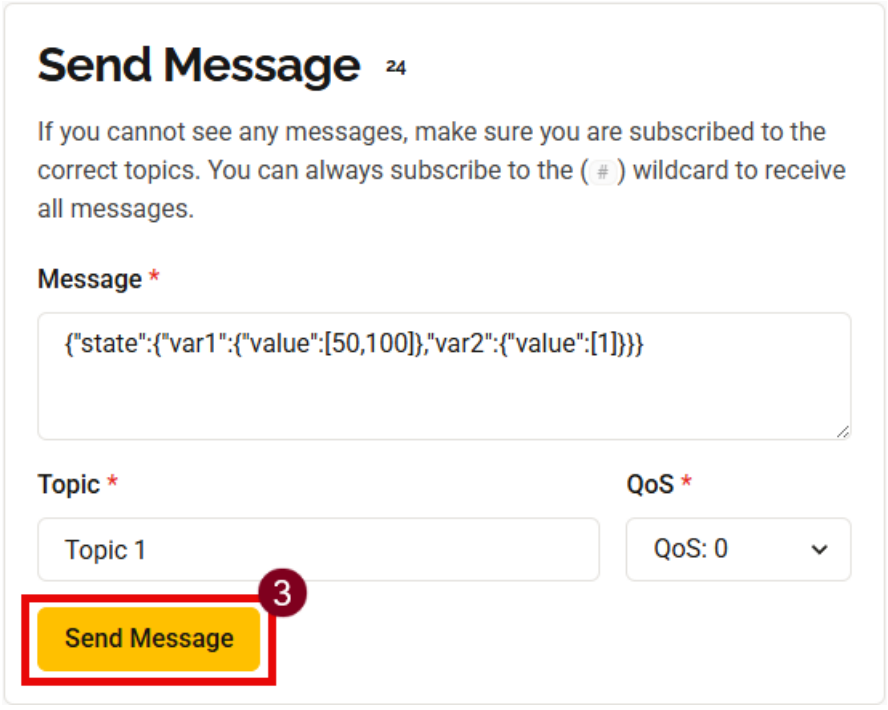
Now you can see messages LOGO! BM sends to the web client.

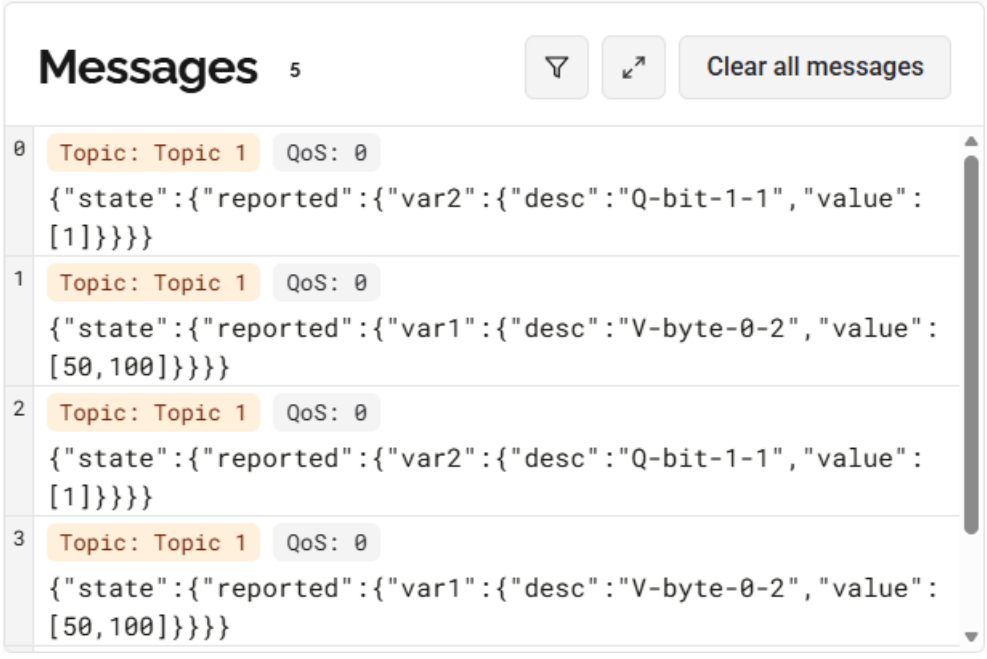


Publish data to LOGO!

To write and publish data from Hive MQTT web client to LOGO! BM, follow these steps:

1. Browse to Send Message part in Hive MQTT web client after client connection completes.
2. Enter the Subscribe Topic you have configured in Cloud connection in LOGO!Soft Comfort.
3. Write the data in integer array format in the Message text field, then click "Send Message" button. Later you can see the successfully published messages in the web client, and you can also see the data is successfully changed in LOGO! BM.





A.2 How to connect with Mosquitto MQTT

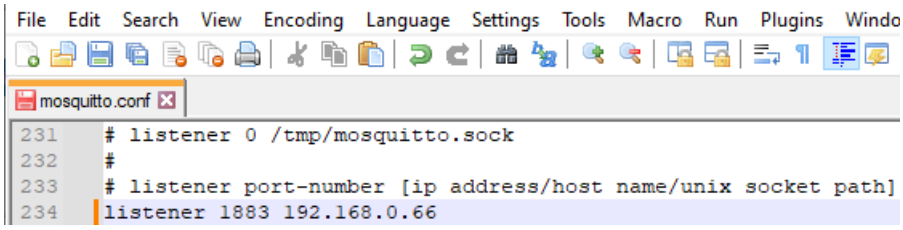
Requirements

- Cloud access is enabled in LOGO!Soft Comfort

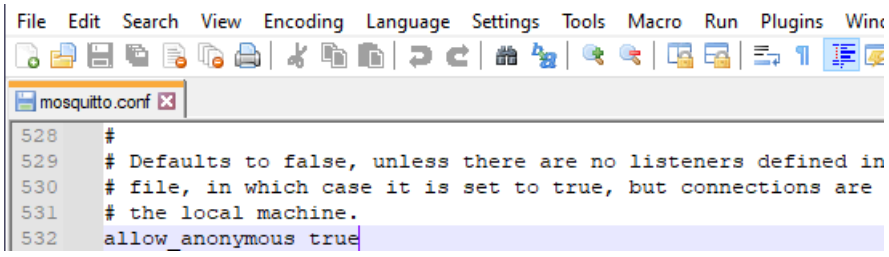
Procedures

Follow these steps to set up IoT connection between LOGO! BM and Mosquitto MQTT.

1. Download Mosquitto MQTT application in Mosquitto Website (https://mosquitto.org/download/).
2. Click the .exe file to install the application on your PC.
3. Open the *mosquitto.conf* file under the root folder of the installed application. Configure the host PC's IP address and Port in *mosquitto.conf* file.



4. Change the configuration of "allow anonyous false" into "allow anonymous true" in *mosquitto conf* file.



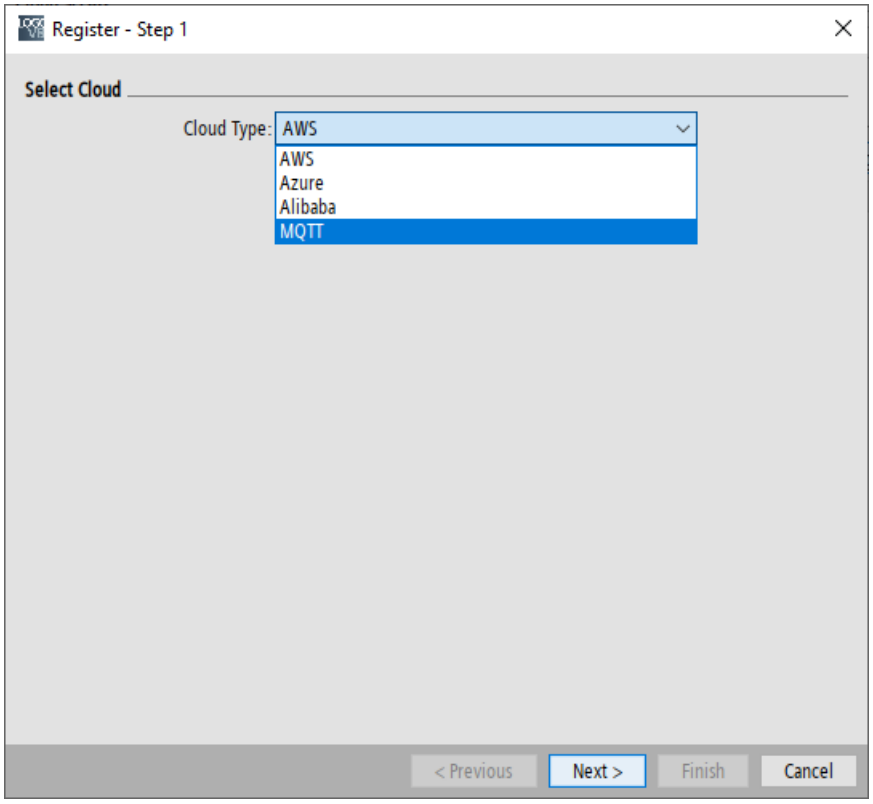
5. Disable the firewall in your PC to ensure the stable connection between LOGO! BM and Mosquitto MQTT.

6. Open the cmd window in root folder of the installed Mosquitto application. Input command `mosquitto -c mosquitto.conf -v` to start Mosquitto application.

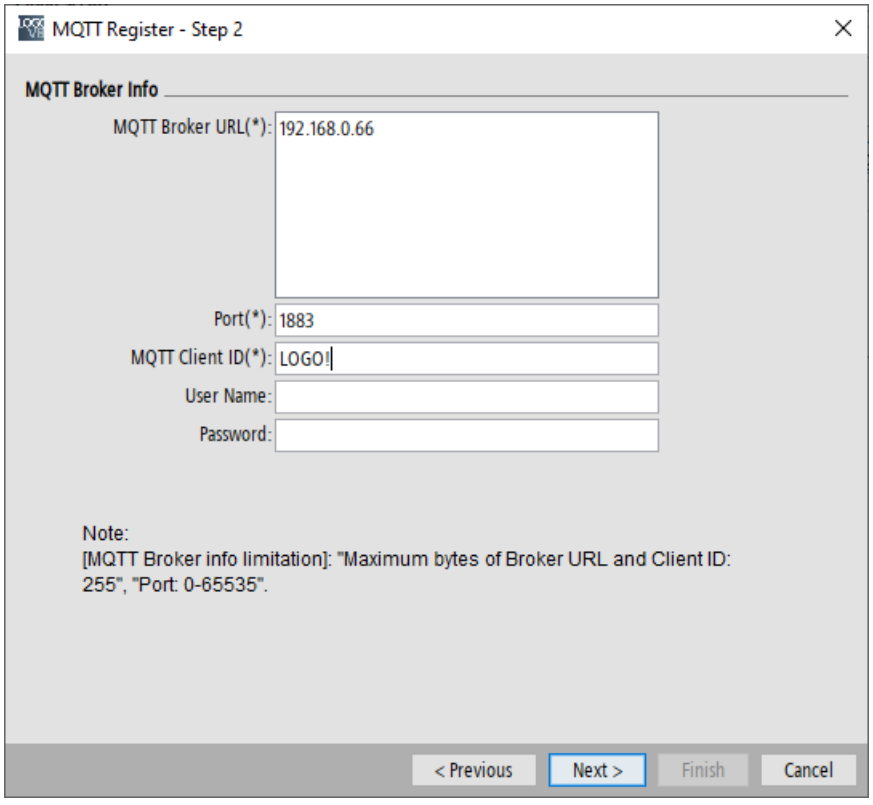
Note

Leave the cmd window open during the whole process of connection. Otherwise, the IoT connection will be interrupted.

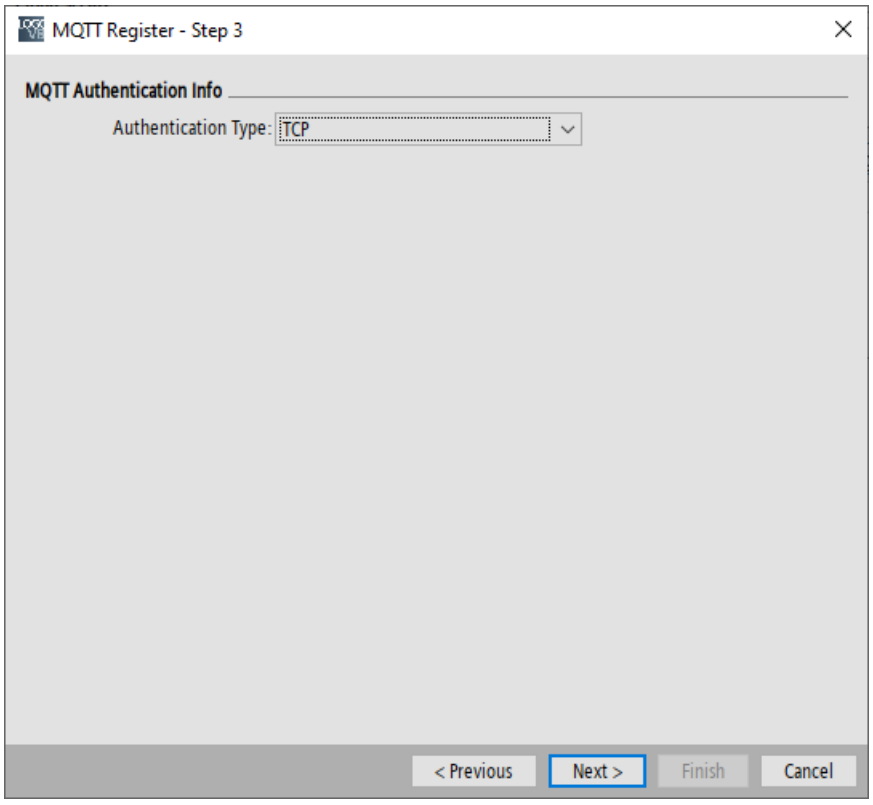
7. Register Mosquitto MQTT IoT thing through Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings (Page 119) in LOGO!Soft Comfort. Click Register Thing button to start the process.
8. Select "MQTT" in Cloud Type and click "Next" button.



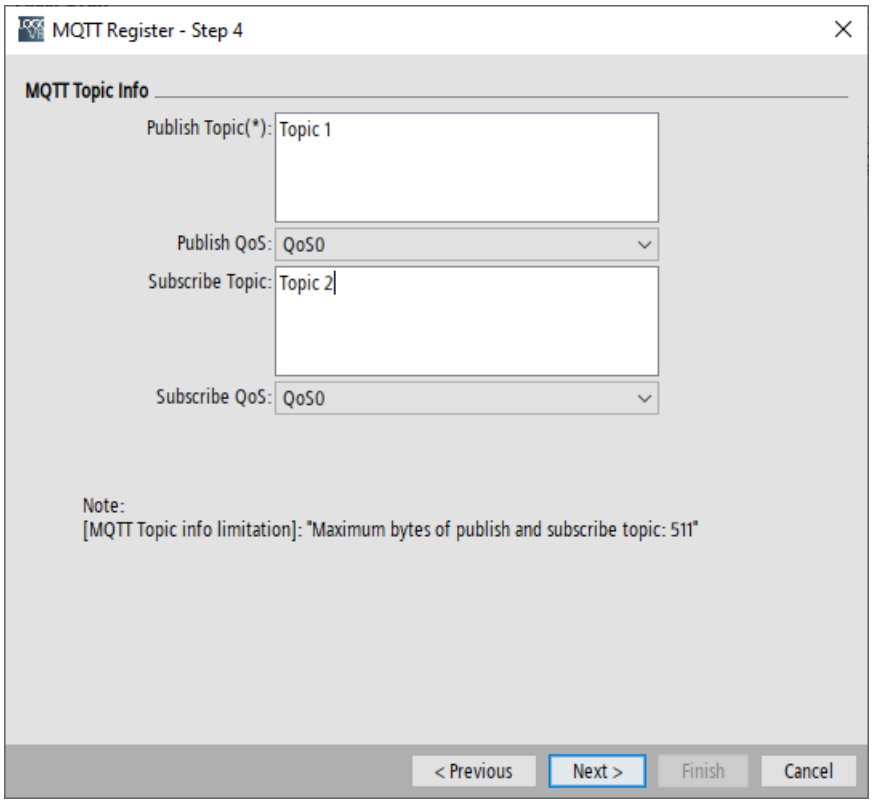
9. Enter MQTT Broker URL, Port which you have configured in step 3; set MQTT Client ID. Then click "Next" button.



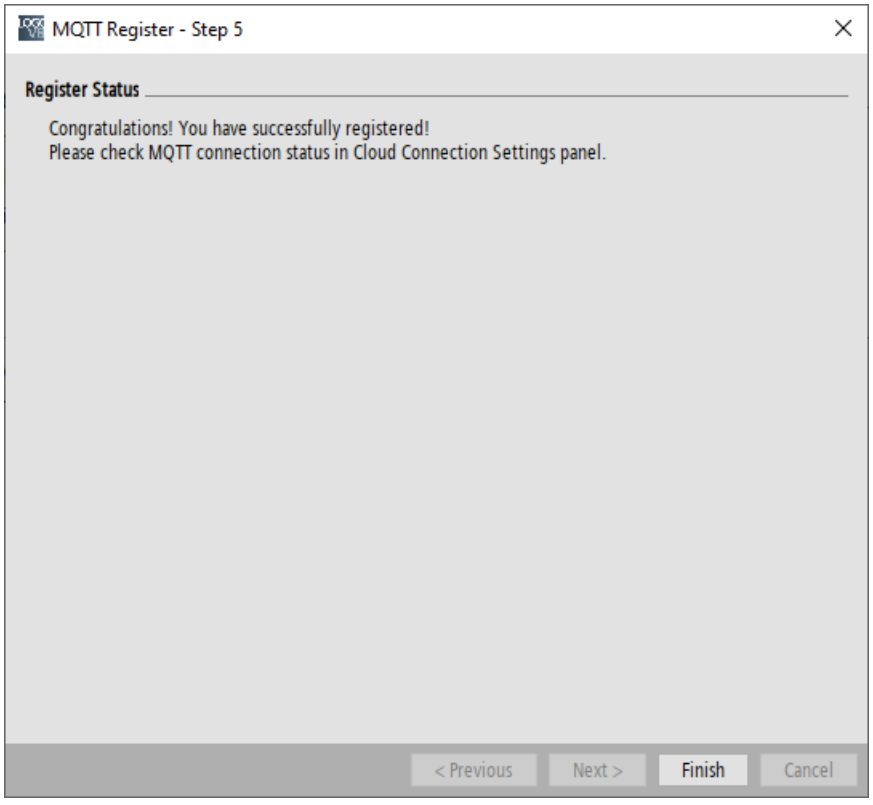
10. Select "TCP" as the Authentication Type. Then click "Next" button. For how to configure Mosquitto when selecting other authentication type, refer to Mosquitto Website (https://mosquitto.org/man/mosquitto-conf-5.html).



11. Enter "Publish Topic" and "Subscribe Topic". You can name them by yourself. Then click "Next" button. Remember these two topic names, which will be used later to subscribe or publish data on Mosquitto MQTT client.

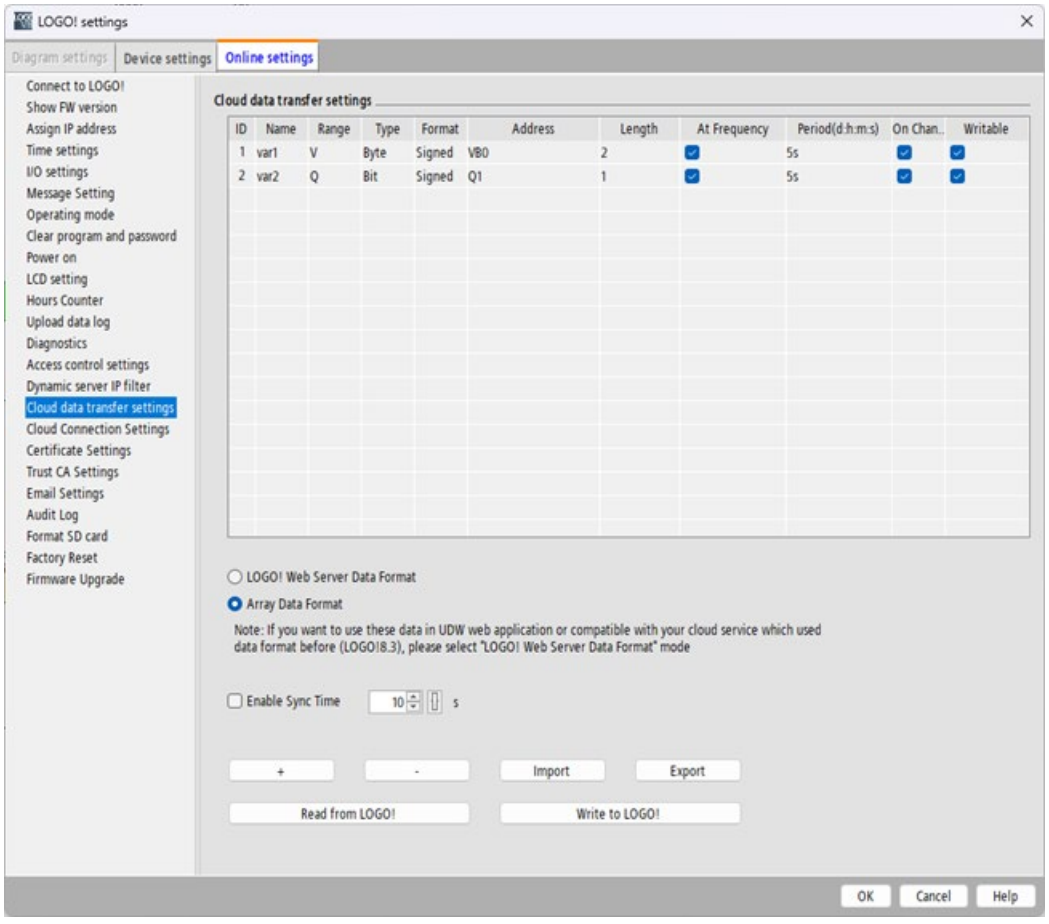


12. The Register Status page shows you that your registration is successful. Click "Finish" button to close the registration dialog.

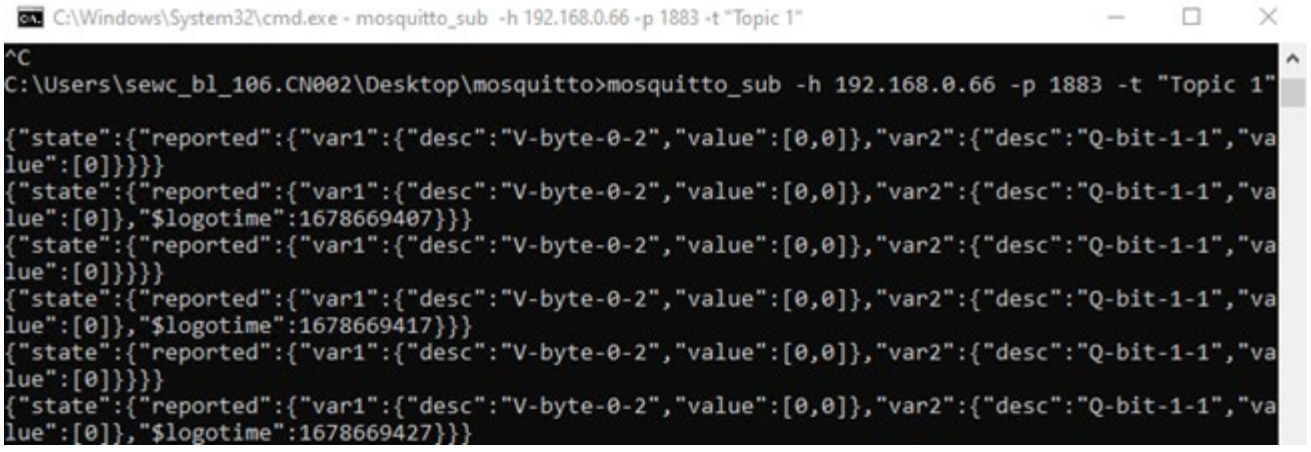


Subscribe data from LOGO!

1. Open cloud data transfer settings window through Tools -> Transfer -> Cloud Settings -> Cloud Connection Settings (0BA8 and later versions only) (Page 119).
2. Add a data item. In this example we use "Array Data Format". Click "Write to LOGO!" to finish the configuration.



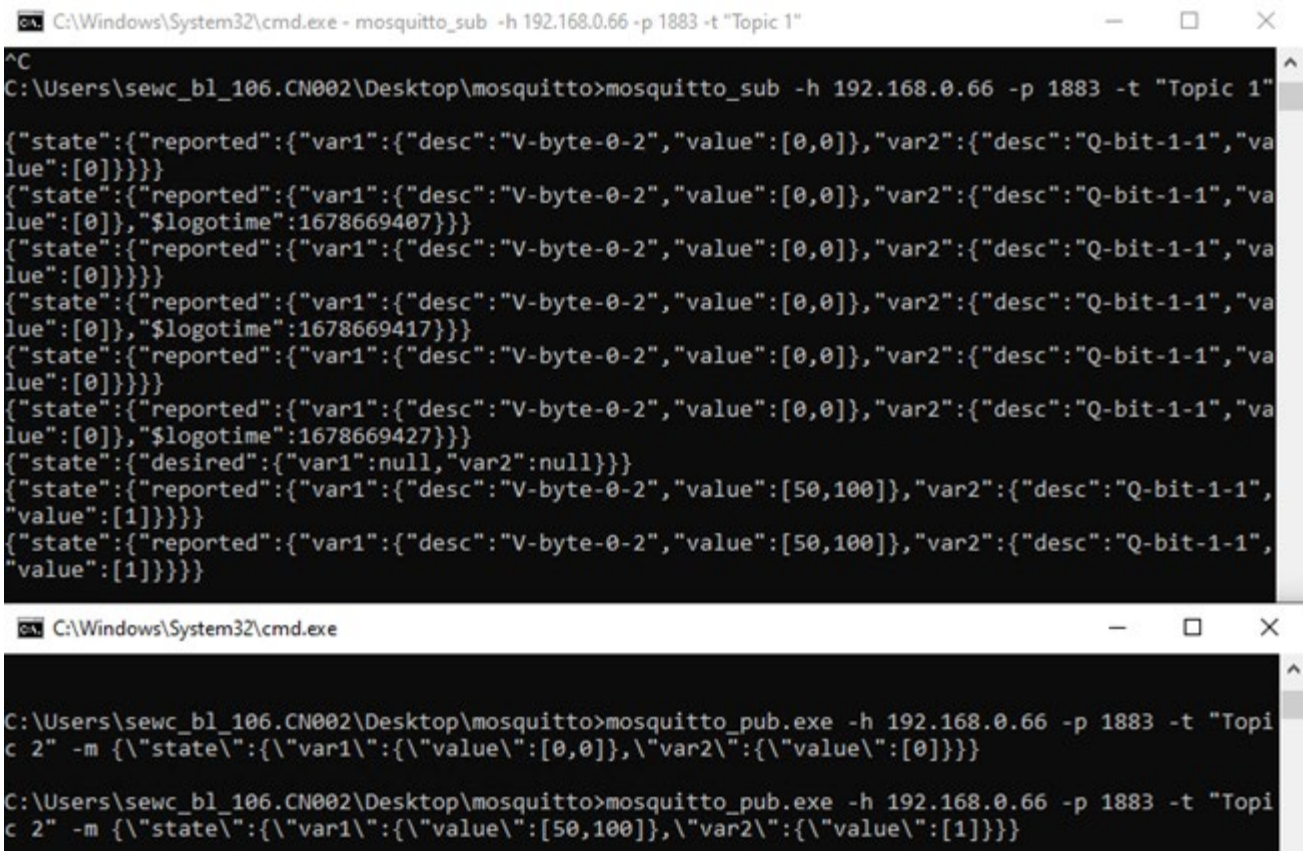
3. Input command in the cmd window: `mosquitto_sub -h 192.168.0.66 -p 1883 -t "Topic 1"`. You will see messages in the cmd window sent from LOGO! BM.



Publish data to LOGO!

1. Open another cmd window in root folder of the installed Mosquitto application.
2. Input the following commands in the new cmd window to publish data to LOGO! BM:
   - `mosquitto_pub.exe -h 192.168.0.66 -p 1883 -t "Topic 2" -m "{\"state\":{\"var1\":{\"value\":[0,0]},\"var2\":{\"value\":[0]}}}`
   - `mosquitto_pub.exe -h 192.168.0.66 -p 1883 -t "Topic 2" -m "{\"state\":{\"var1\":{\"value\":[50,100]},\"var2\":{\"value\":[1]}}}`

In the subscribe cmd window, you can see the successfully published messages, and you can also see the data is successfully changed in LOGO! BM.



A.3 Creating a web project of swimming pool level control and light control system

This practical sample is applicable to swimming pool level control and light control systems, and offer new users a step-by-step introduction. You learn here how to create a whole project and the project contains creation procedures for Pages (Page 622), Tag table (Page 624)and Navigator (Page 625).

For the detailed configuration information of special components, refer to The example for configuring special components (Page 626) chapter.

A.3.1 The example for Pages

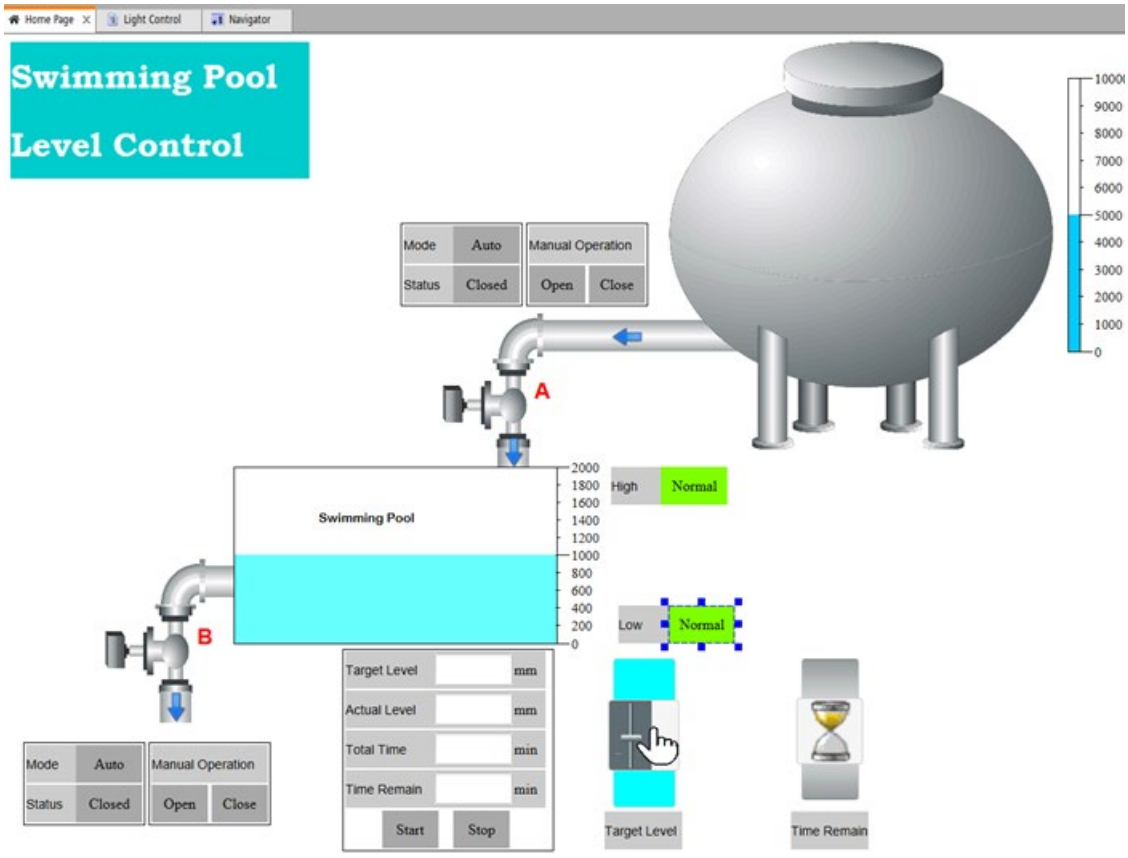
In this swimming pool project, there are two pages:

- Home page is the swimming pool level control system and the page name cannot be changed;
- Light control page is the swimming pool light control system and the page name can be renamed.

Home Page for Swimming Pool Level Control

The swimming pool level control system contains four parts:

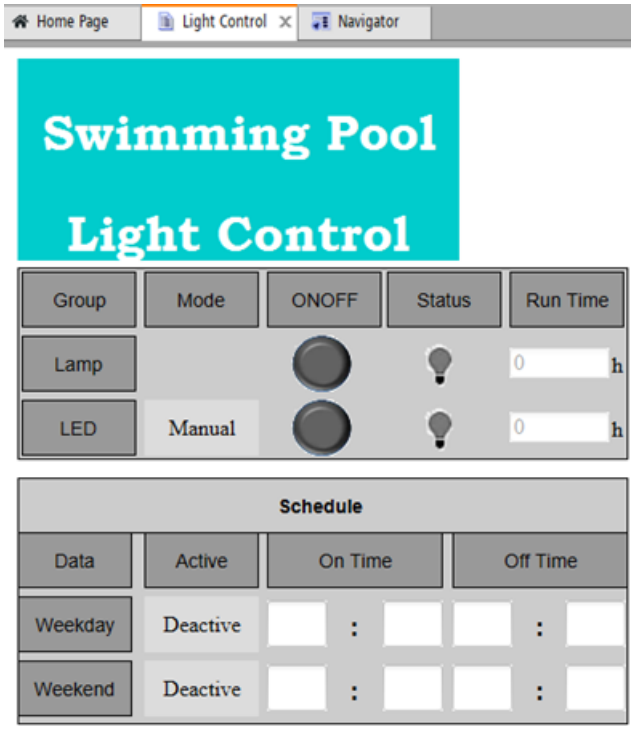
- Tank
  - It is used for water storage.
  - The block contains Image and Analog Bar components.
- Water valve A
  - It is used for connecting tank and swimming pool to control the swimming pool level.
  - It has two modes: Auto and Manual operation. And both of the two modes have two corresponding status: Open or Close.
  - The block contains Text, Rectangle and Switch Button components.
- Swimming pool
  - It is used for swimming and it use the water-level sensor to monitor the actual water level.
  - The block contains Rectangle and Analog Bar components.
- Water valve B
  - It is used for connecting swimming pool and other pipelines.
  - It has two modes: Auto and Manual operation. And both of the two modes have two corresponding status: Open or Close.
  - The block contains Text, Rectangle and Switch Button components.



Page for Swimming Pool Light Control

The swimming pool light control system contains two parts:

- The lamp and LED control
  - It is used for controlling the lights and recording the running time.
  - The block contains Text, Rectangle, Scale Time and Switch Button components.
- Schedule for weekday and weekend
  - It is used for controlling the lighting time.
  - The block contains Text, Rectangle, Scale Time and Analog Value components.

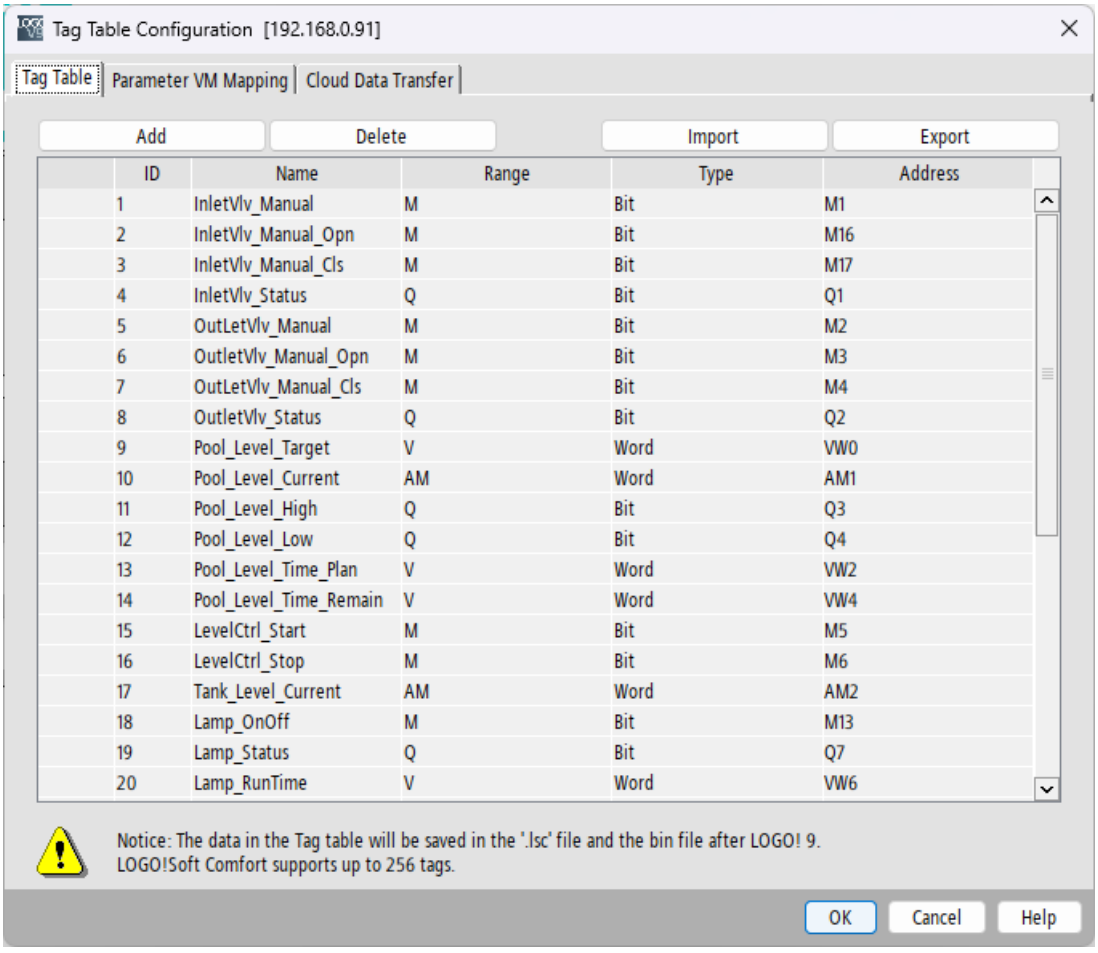


A.3.2 The example for Tag Table

In this swimming pool level control and light control system, you can define both digital value and analog value in the Tag Table. Here is an example for eight kinds of variables:

- The Inlet for Water valve A under the manual mode
- The Outlet for Water valve A under the manual mode
- Level Control for Swimming pool
- Level control for Tank
- Light control for Lamp
- Light control for LED
- Schedule control for Weekday
- Schedule control for Weekend

The variable in Tag table can customize the alias name and it can be bound with some components. Below is just an example screenshot.

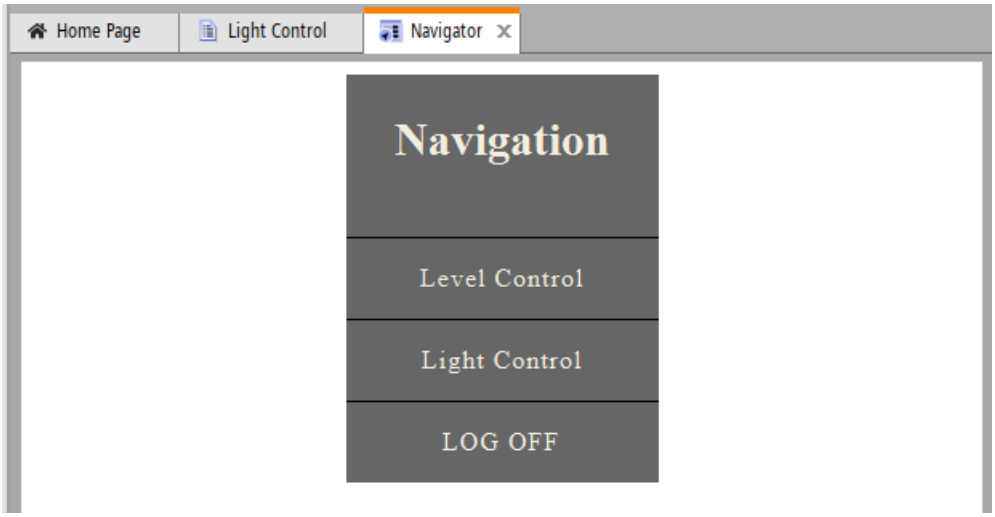


A.3.3 The example for Navigator

In this swimming pool level control and light control system, the Navigation bar contains three options: link to Home Page (renamed to Level Control), link to Light Control page and link for **LOG OFF** button.

After editing the Navigator, the navigation bar allows you to switch between different web pages or log off the project.

Below is just an example screenshot.



A.3.4 The example for configuring special components

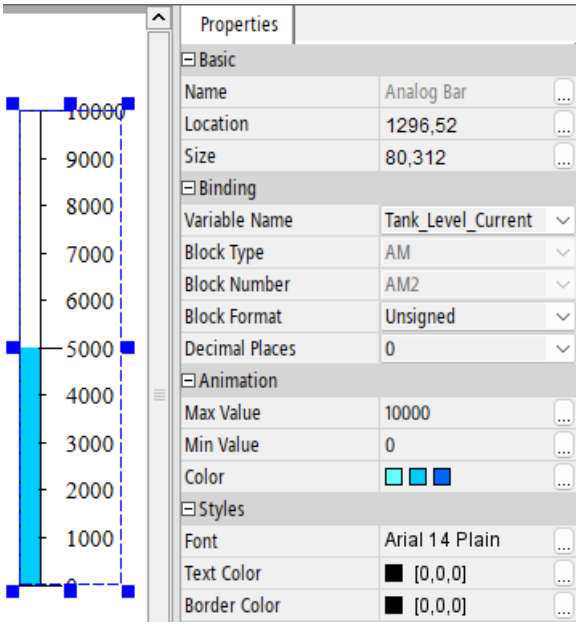
There are more than eleven components in the Component pane. In this swimming pool level control and light control system, each block combines with several components.

For detailed configuration for each component, refer to the section Components pane.

Configuration for Analog Bar

In this example, the tank is used for water storage. When the swimming pool water level under the target waterline, the system will give an alarm to the user. The user needs to open the Water valve A manually to inject water from the tank. For the tank block, it contains **Image** and **Analog Bar** components.

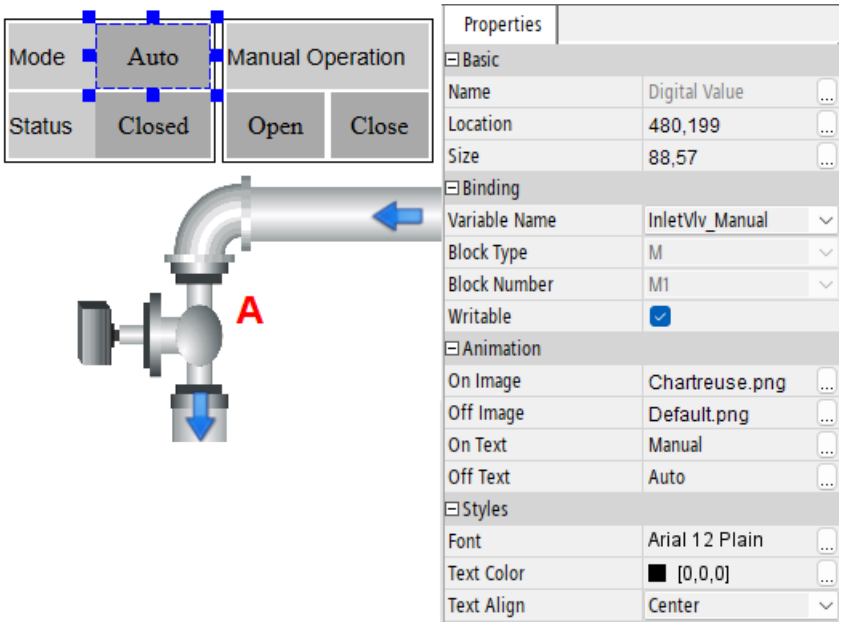
Below is just an example screenshot for configuring **Analog Bar**.



Configuration for Switch Button

In this example, Water valve A is used for connecting tank and swimming pool to control the swimming pool level. When the swimming pool water level under the target waterline, the system will give an alarm to the user. The user needs to open the Water valve A to inject water from the tank manually. For the Water valve A block, it contains **Text**, **Rectangle** and **Switch Button** components.

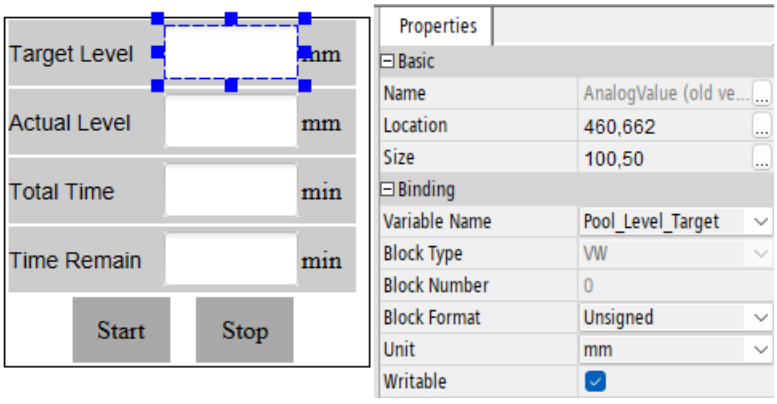
Below is just an example screenshot for configuring **Switch Button**.



Configuration for Analog Value

In this example, swimming pool use the water-level sensor to monitor the actual water level. When the swimming pool water level under the target waterline, the system will give an alarm to the user. This water lever monitor panel also can show the total time and time remain for injecting water. For this panel, it contains **Text**, **Rectangle** and **Analog Value** components.

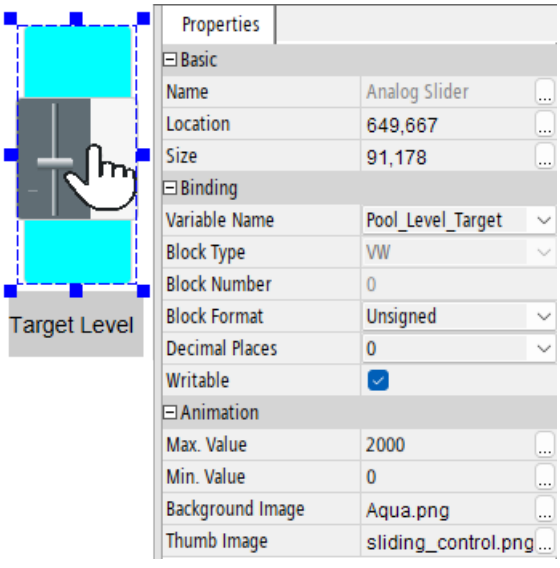
Below is just an example screenshot for configuring **Analog Value**.



Configuration for Analog Slider

In this example, these two sliders are representing target waterline and time remain for injecting water. For these sliders, they contain **Text**, **Rectangle** and **Analog Slider** components.

Below is just an example screenshot for configuring **Analog Slider**.



A.3.5 Example for adding image from USB camera

This chapter takes Cam2web as an example to show how Webcam component works.

Prerequisite

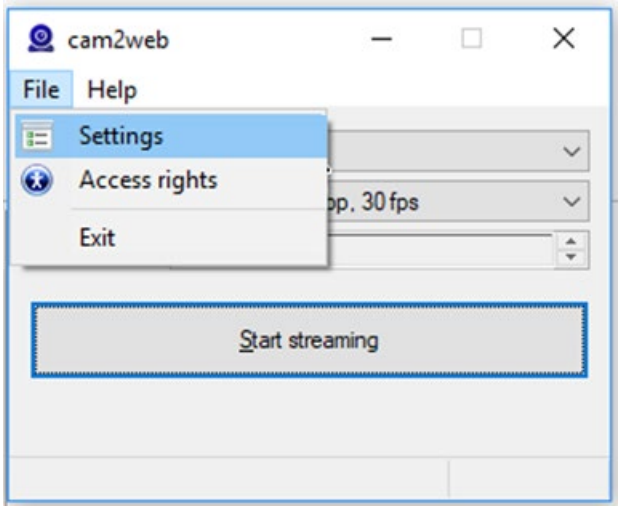
- Connect and start your IP web camera.
- Download Cam2web (http://www.cvsandbox.com/projects/cam2web/) and install it on your PC.

Note

Follow the license terms when using cam2web.

Get the image address

1. Open **cam2web.exe**.
2. Set the port under **File** -> **Setting**.

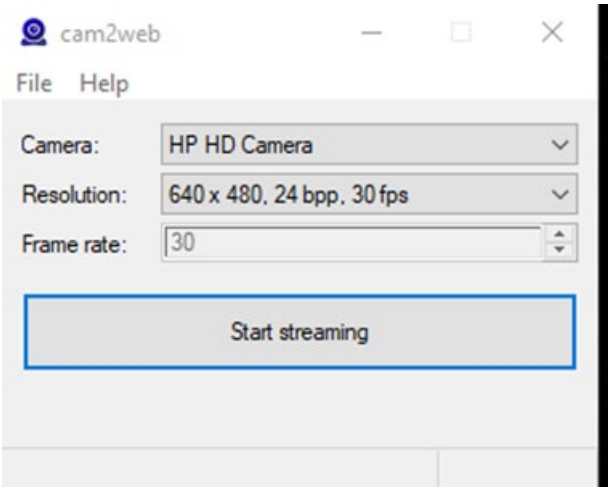


Note

The port you entered must not be occupied by other application.

3. Select the USB camera from the Camera drop-down list and click the **Start streaming** button.

   In this example, "HP HD Camera" is the camera USB camera connected to the laptop.

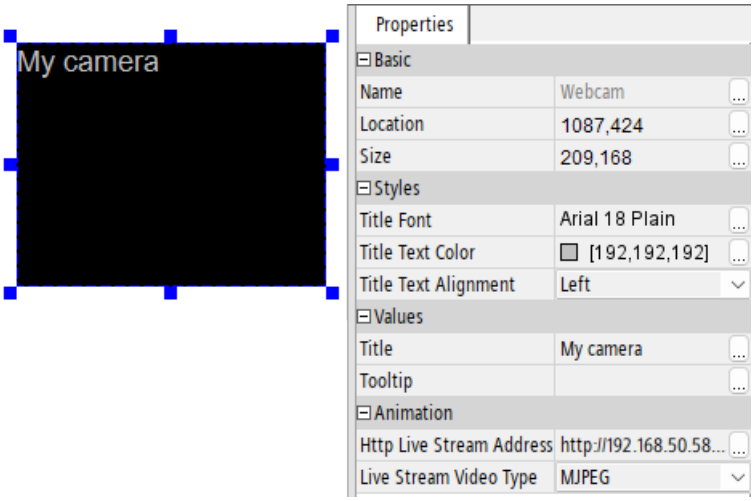


4. Click **Streaming on port ...** to view the live page.
5. Right-click the image and select **Copy image address**.

Set the Webcam Animation and view the video in the web project

1. Create a **Webcam** component in your web project.
2. Click "..." at the right end of the row **Http live stream address**.

3. In the Webcam-Http Live Stream Address window, paste the image address.
4. Click the down arrow at the right end of the row **Live Stream Video Type** and select **MJPEG**.



A.3.6 Example for adding image for IP camera

This chapter takes IP webcam and VLC media player as an example to show how Webcam component works.

Prerequisite

- Install your IP web camera.
- Log in to the page of the IP camera and make sure it can work.
- Get the RTSP address of the camera from the camera information page or instruction manual.

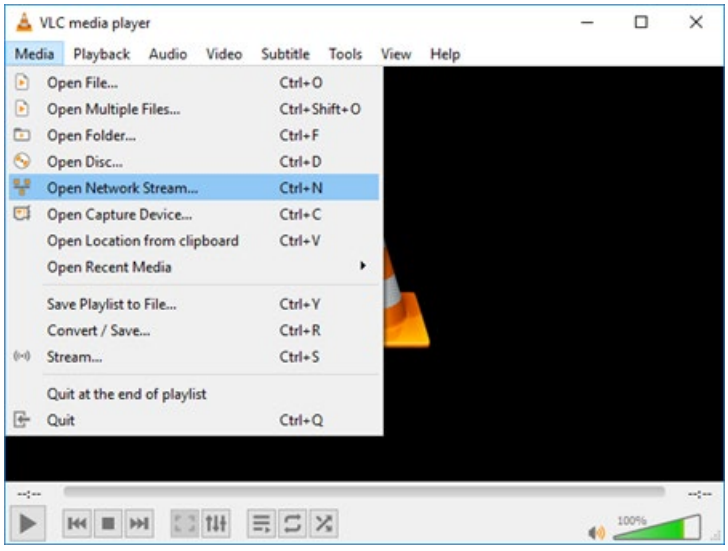
  Example: `rtsp://admin:logo.1234@192.168.0.103/MPEG-4/ch1/main/av_stream`
- Download VLC media player (https://www.videolan.org/) and install it.

Note

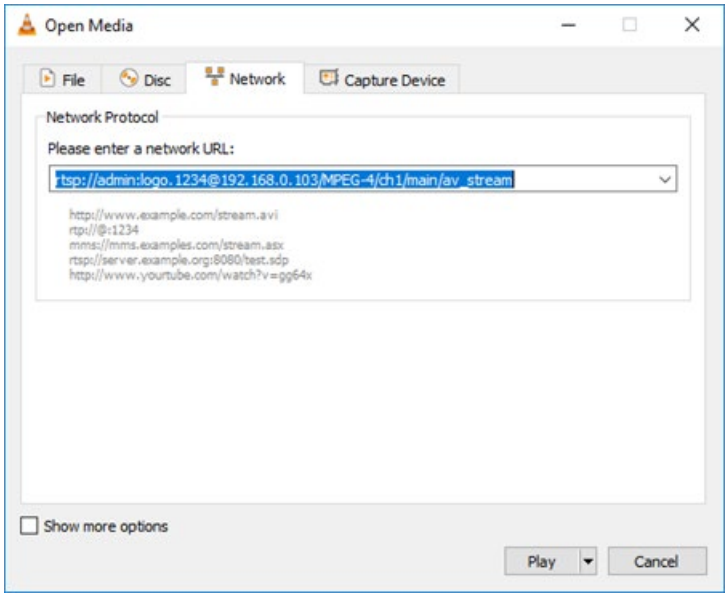
Follow the license terms when using VLC media player.

Transcode RTSP into HLS by VLC media player

1. Go to the Open Media window from **Media** -> **Open Network Stream....**

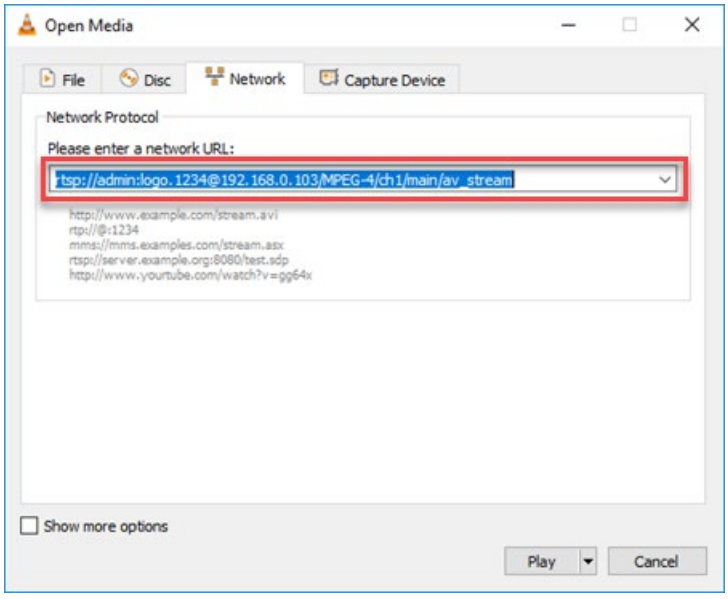


2. Enter the RTSP address in the marked input field and Click Play.



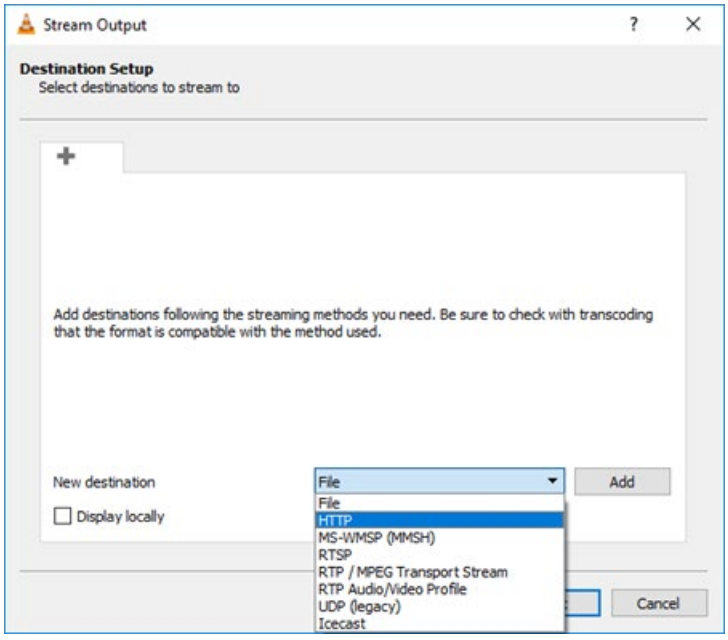
You should see the monitoring video shows in VLC.

3. Restart the VLC.
4. Go to the Open Media window and enter the RTSP address in the marked input field.

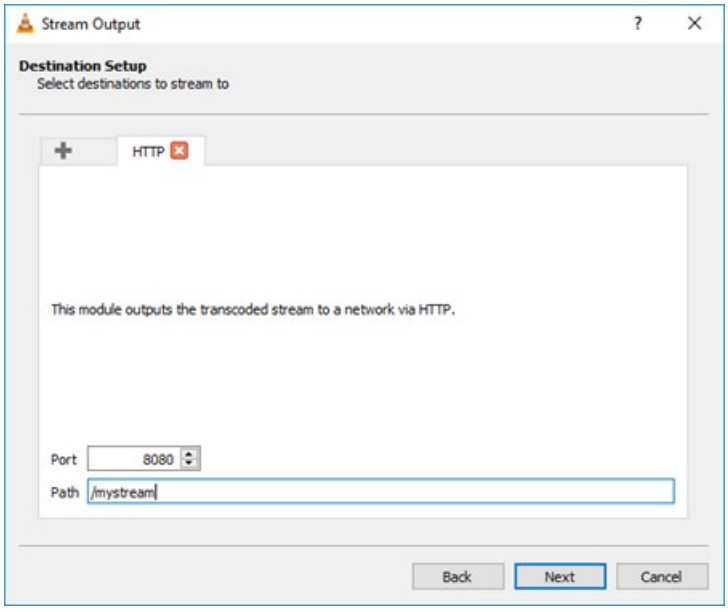


5. Click the down arrow next to **Play**, select **Stream**, and click **Stream**.
6. Click **Next**.

7. Click the down arrow next to **File**, select **HTTP**, and click **Add**.



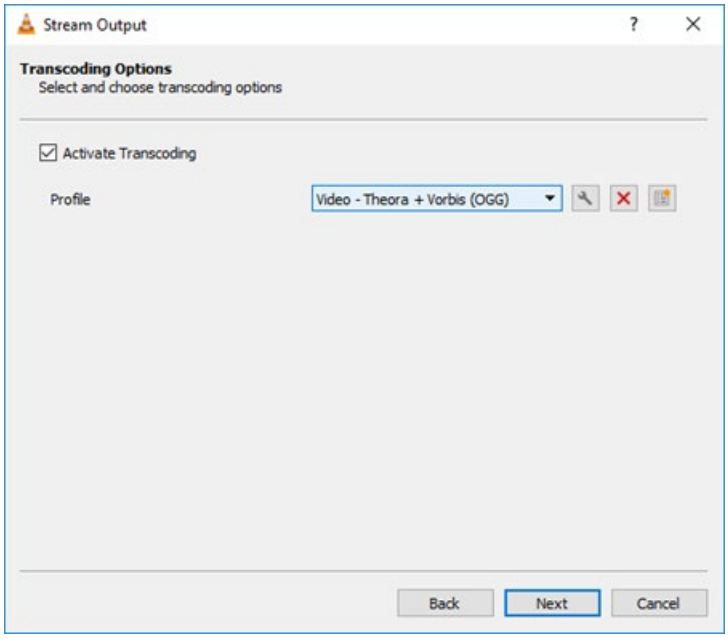
8. Enter the port and path. Click Next.



Note

The port you entered must not be occupied by other application.

9. Check the check box next to Activate Transcoding. Select the Output video type as "Video-Theora + Vorbis (OGG)" and Click **Next**.



10. Click **Stream**.

    Your HTTP Live Stream service works after the transcoding.

Note

Don't close the VLC until the transcoding is finished.

The address is: `http://192.168.0.102:8080/mystream`

192.168.0.102 is the IP address of your computer.

Note

When the Ethernet connection is break off, you may need to configure the VLC player again after reestablishing the Ethernet connection.

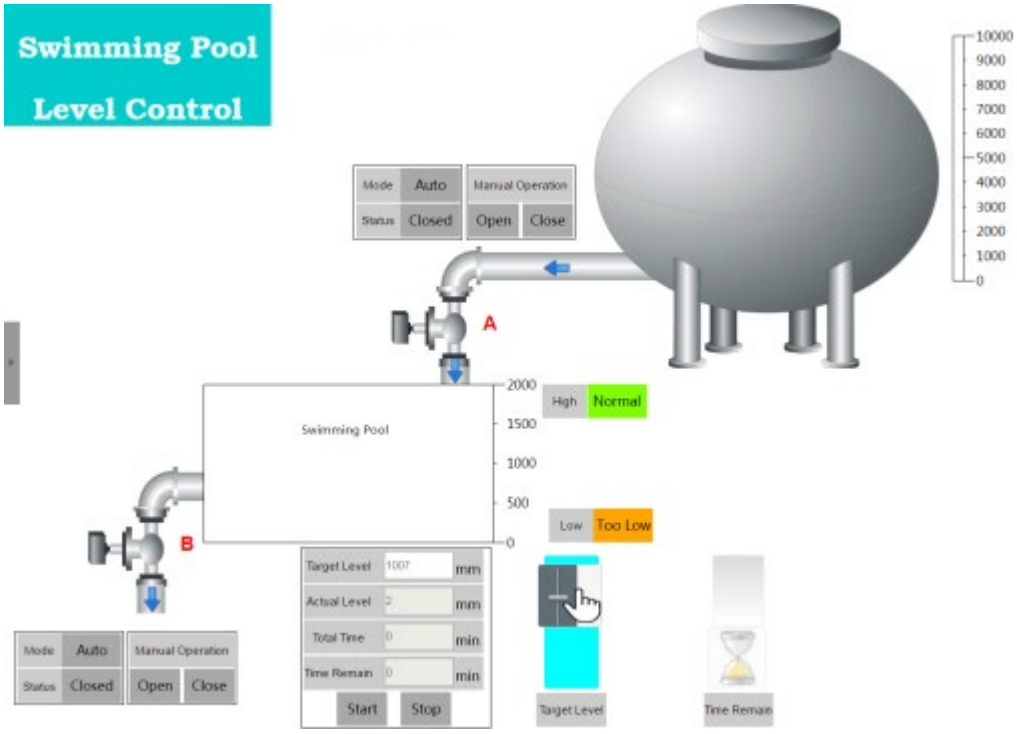
Set the Webcam Animation and view the video in the web project

1. Create a **Webcam** component in your web project.
2. Click "..." at the right of the row **Http live stream address**.
3. In the Webcam-Http Live Stream Address window, enter `http://192.168.0.102:8080/mystream`.
4. Click the down arrow at the right of the row **Live Stream Video Type** and select **OGG**.

A.3.7 Visiting the example project through web page

You can visit this example project through the web page after downloading the diagram and the web project to LOGO!.

Follow the chapter Visiting the project through web browser (Page 585) to open the project. Below is just an example screenshot for visiting the example project through web page.



For more information, refer to ...*Sample/Program* folder in the USB Stick.

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