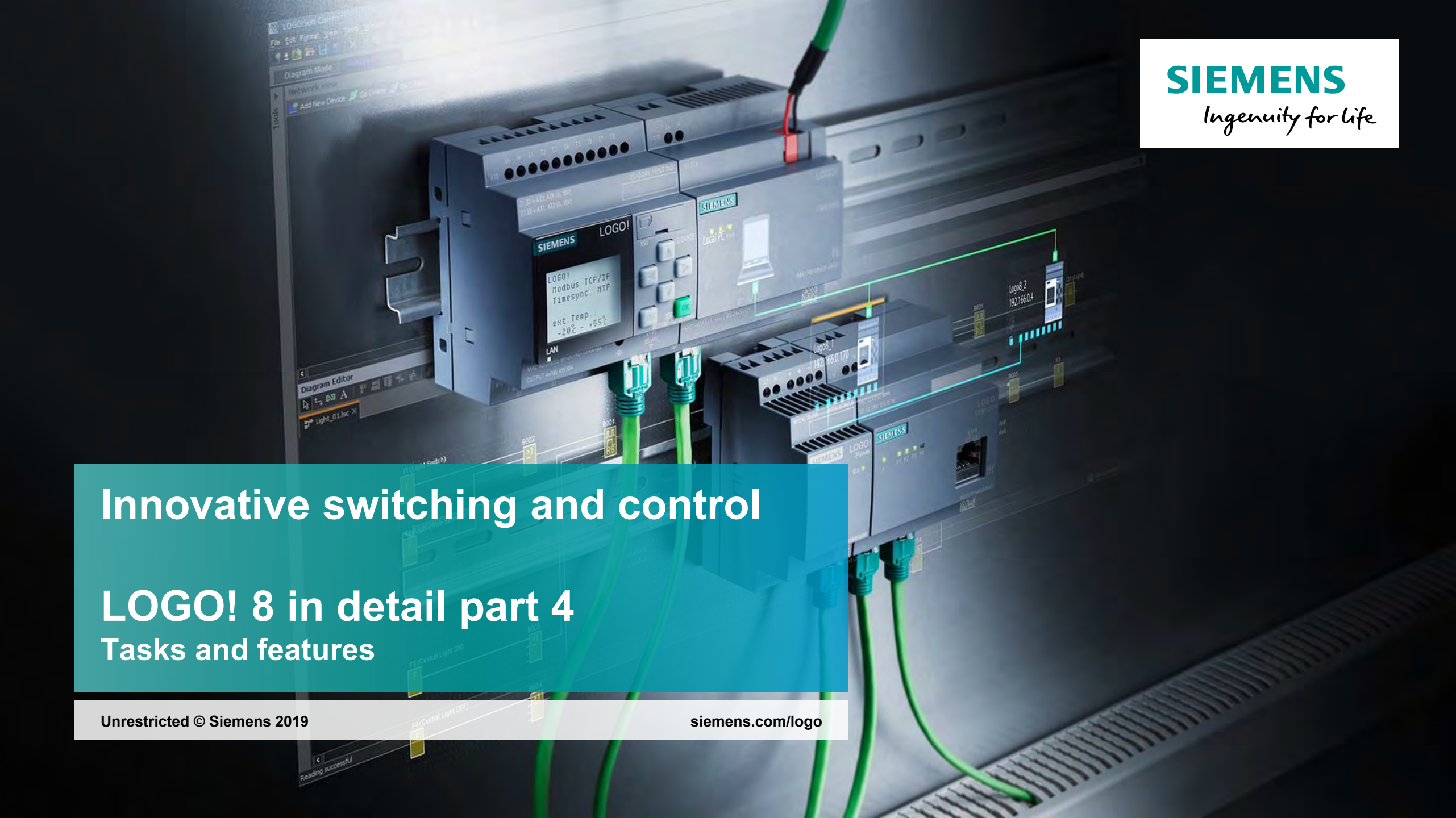

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Innovative switching and control

LOGO! 8 in detail part 4

Tasks and features

siemens.com/logo

LOGO! in detail – slides overview

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The LOGO! in detail are split up in 4 parts as follows:

LOGO! in detail part 1
- Installation and overview of the function blocks

LOGO! in detail part 2
Usage at the device and handling of the software

LOGO! in detail part 3
- Knowing how

LOGO! in detail part 4
- Tasks and features

LOGO! in detail – agenda

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1. Preface
2. Typical tasks for LOGO! – Cistern Control
   - Insert constants, basic functions, and special functions
   - Connecting function blocks
   - Insert text fields
   - Moving elements
   - Aligning elements
   - Parameterization of blocks
   - Formatting texts
   - Documentation
   - Program testing
   - Assign program password
   - Select LOGO! Version
   - Starting LOGO!
3. Typical tasks for LOGO! – Conveyor Control
4. Typical tasks for LOGO! – Astronomical clock with time offset
   - Example 1: Automatic lighting with shaded space
   - Example 2: Animal breeding
5. Features – Setting the LOGO! clock
6. Features – Enable analog inputs (AI)
7. Features – Setting Power-on Screen for LOGO! TDE
8. Features – LOGO! Access control
9. Features – LOGO! network view
10. Features – Creating and managing User-Defined functions
11. Features – Master / master communication
12. Features – Master / slave communication

LOGO! in detail – preface

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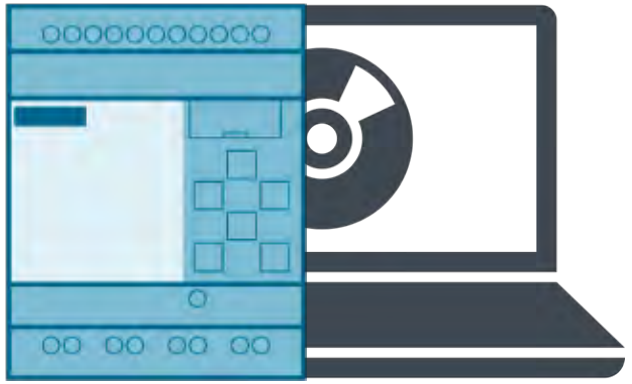
LOGO! in detail, part 4, is intended to show the reader useful examples for typical tasks of LOGO!.

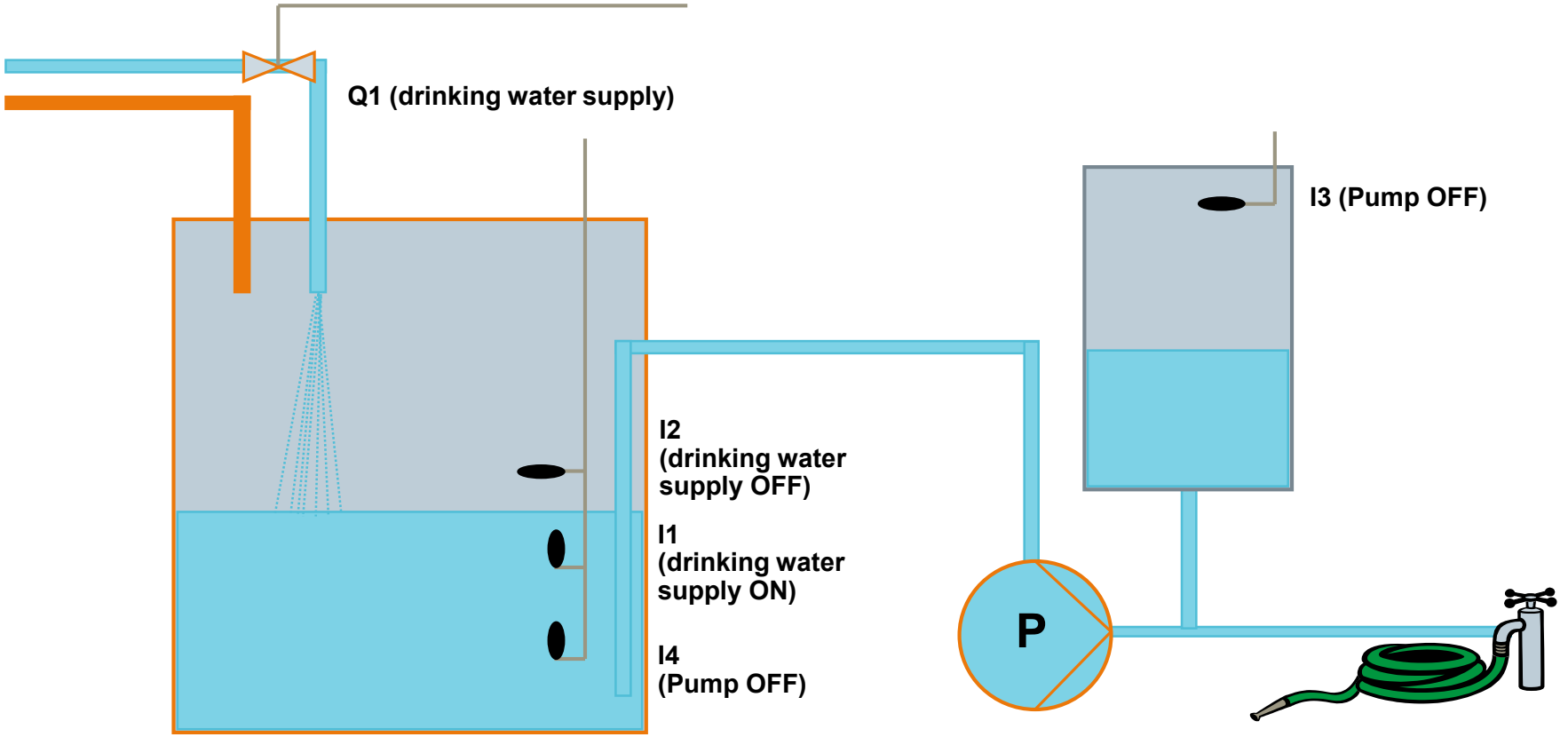
All screenshots were taken of the current version of LOGO! Soft Comfort V8.2.

The download can be found via the following link
https://w3.siemens.com/mcms/programmable-logic-controller/en/logic-module-logo/demo-software/Pages/Default.aspx



Typical tasks for LOGO! – Cistern Control

When the water level drops below the level I1, the drinking water supply (Q1) shall automatically be switched on and when the water level has reached the level I2, the drinking water supply shall automatically be switched off again.



Cistern Control – Insert constants, basic functions, and special functions

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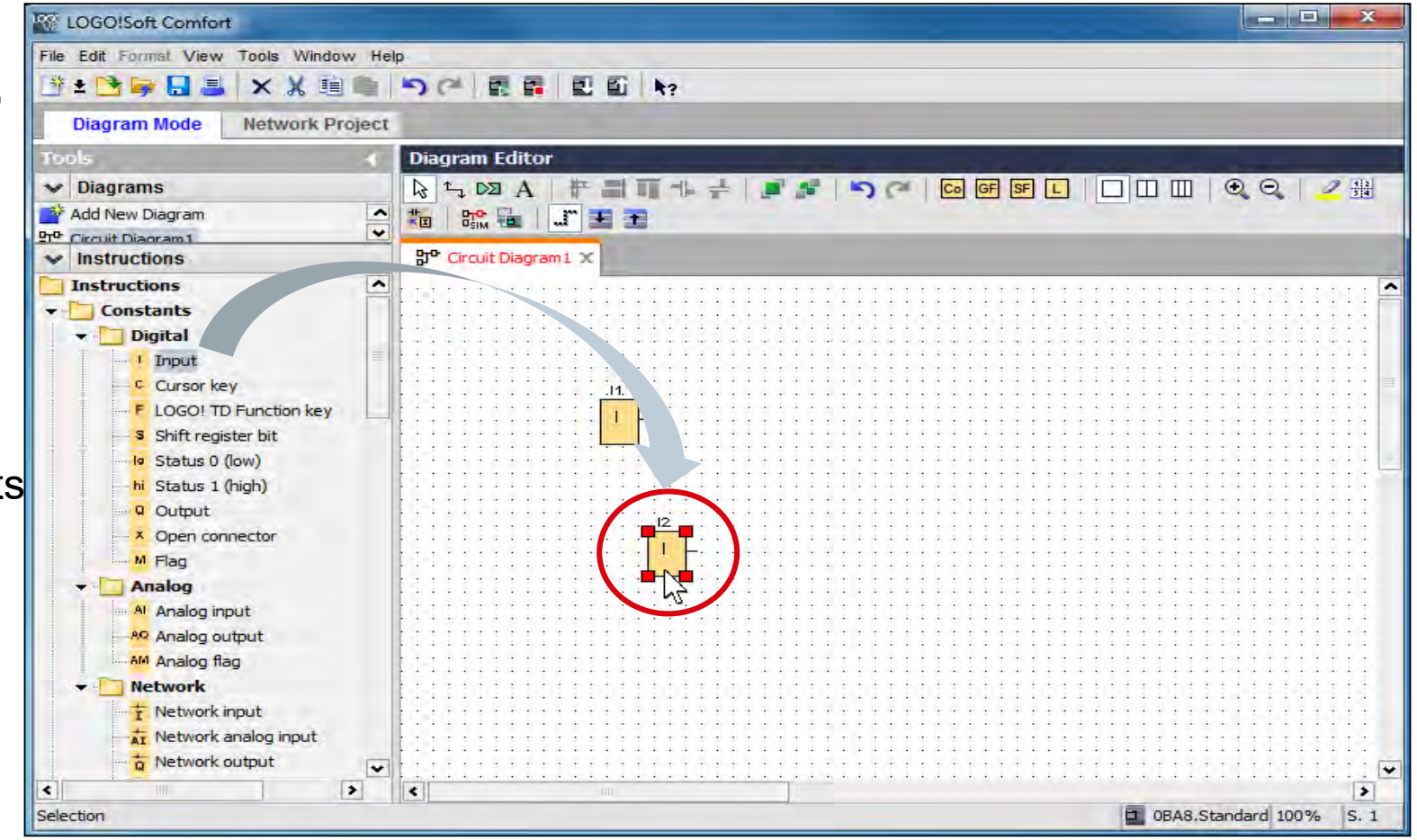
The schematic diagram (slide 5) shows clearly how many inputs and outputs are necessary to solve the task.

All necessary input, output, marker, constant (high, low) blocks, and all basic and special functions can be chosen via the instructions tree structure on the left side of the software surface.

Drag and drop all required constants into the Diagram Editor.



Cistern Control – Insert constants, basic functions, and special functions

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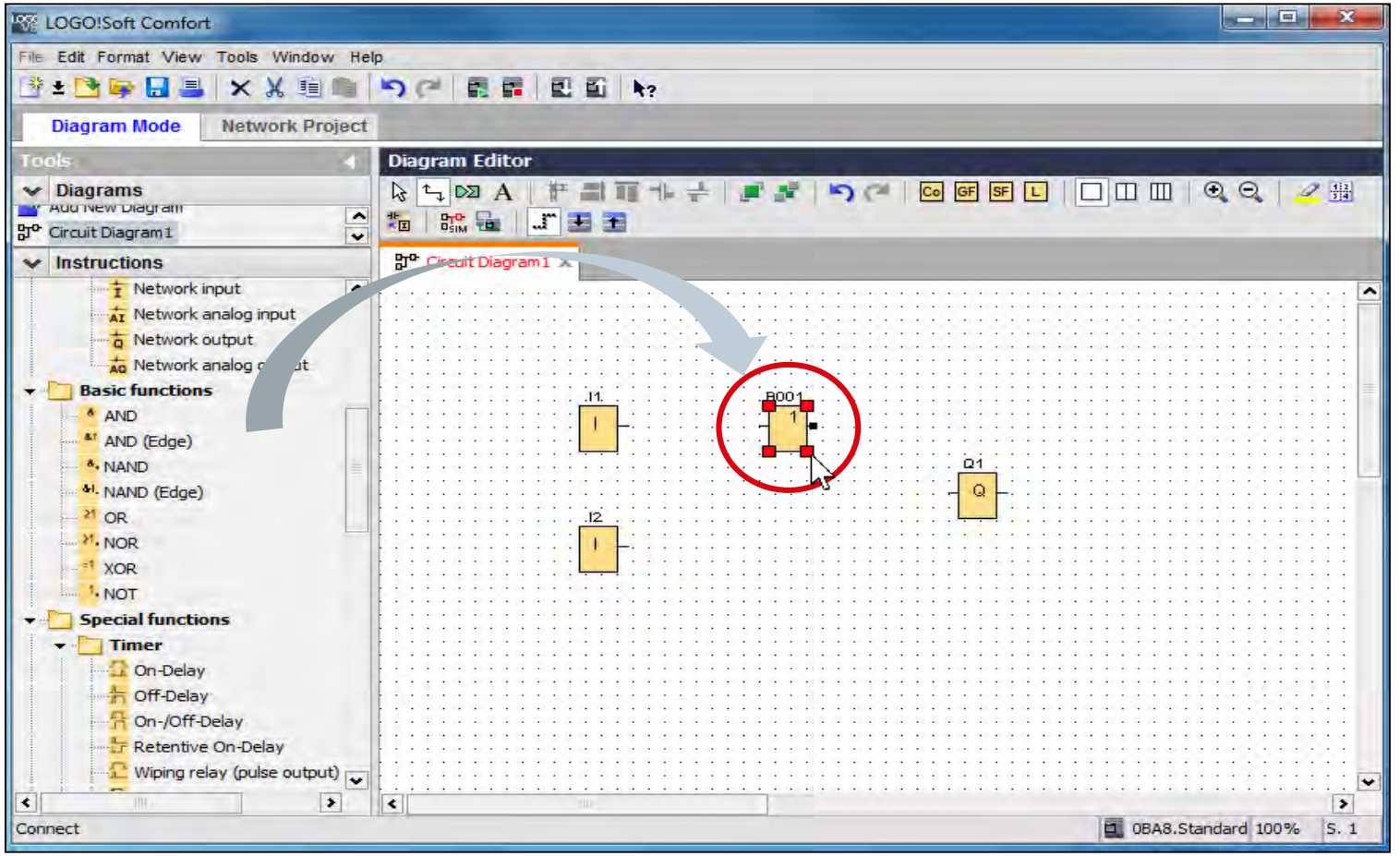
Which basic functions are necessary to solve the task?

After placing both inputs I1 and I2 and the output Q1 on the Diagram Editor a basic function (NOT) is necessary. Like in the first step, the basic functions can be added via drag and drop.



Cistern Control – Insert constants, basic functions, and special functions

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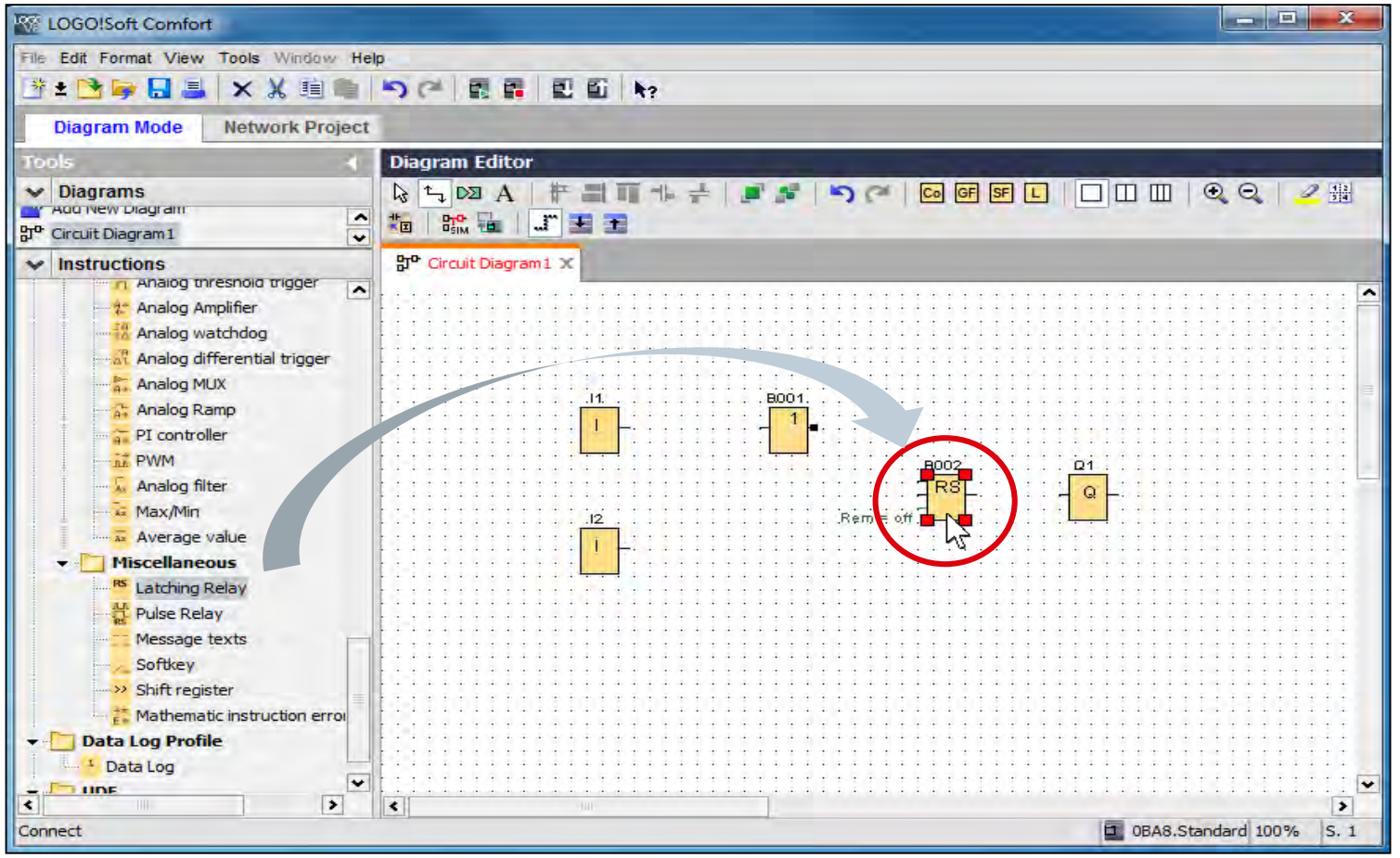
Which special functions are necessary to solve the task?

A latching relay is necessary to set the value Q1 (open) till the water reaches the I2.



Cistern Control – Insert constants, basic functions, and special functions

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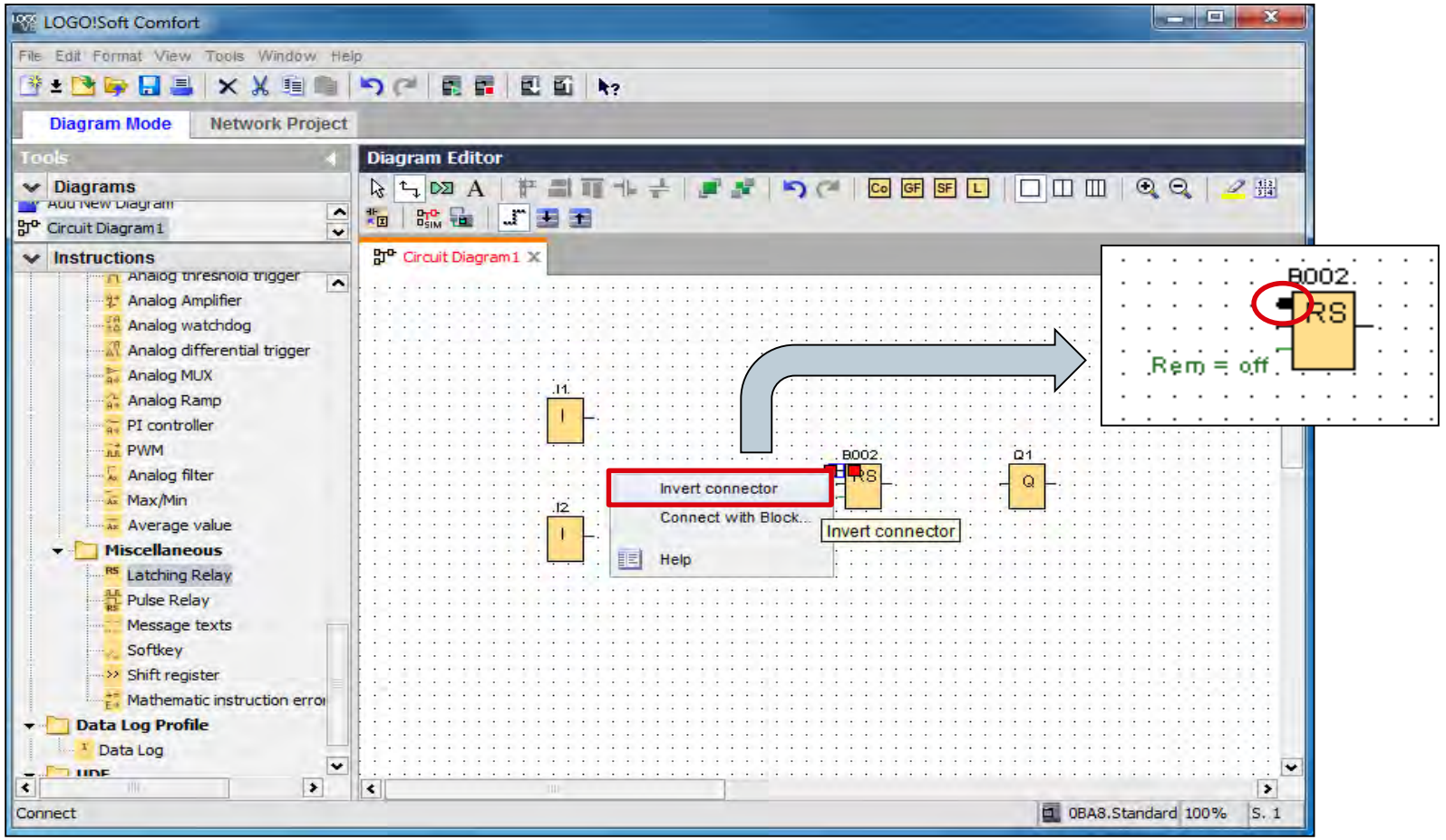
Alternatively the NOT function can be replaced by negating the S input of self-holding relay.

This can be done via the content menu of the digital input (right mouse click – Invert connector) or via double click.



Cistern Control – Connecting function blocks

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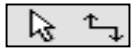
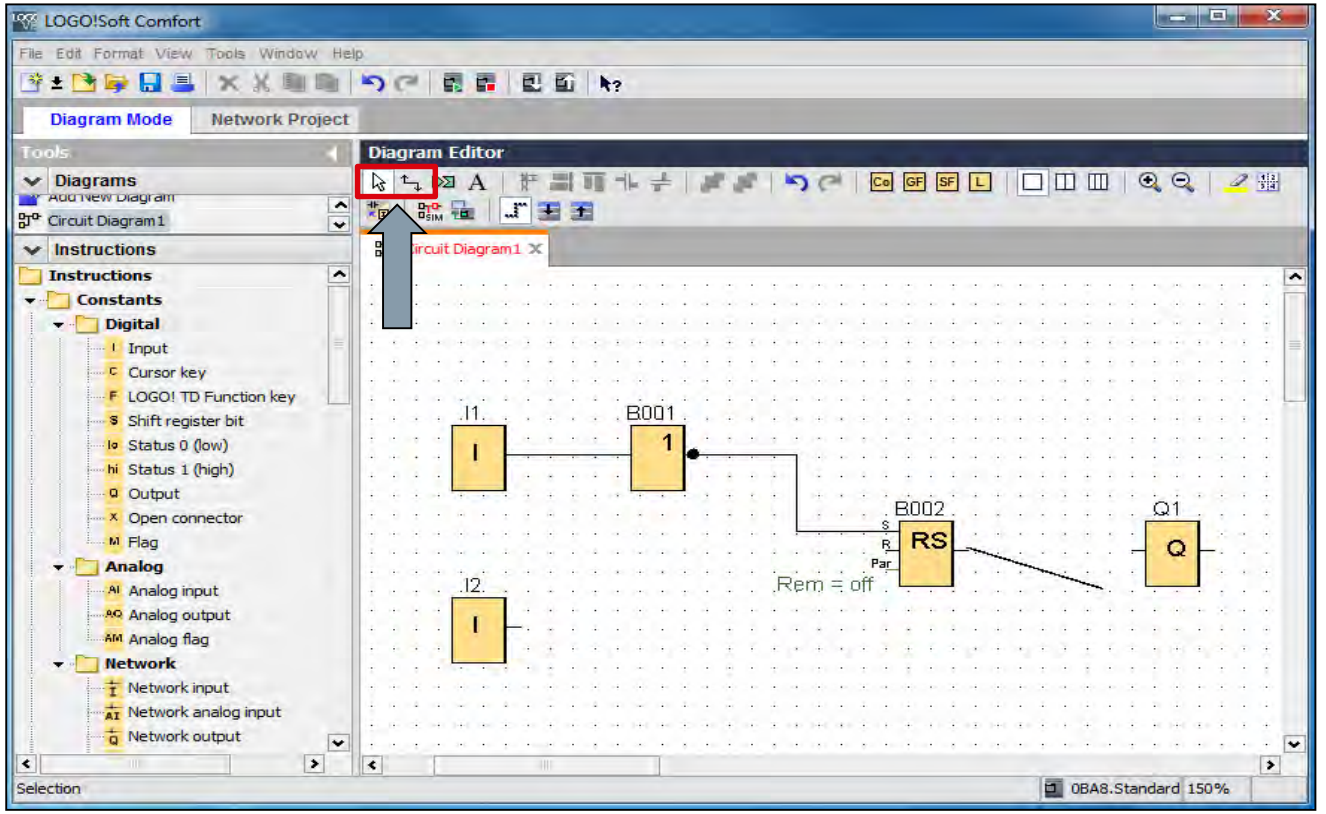
To complete the control circuit, it is necessary to connect the bocks with each other.

Usually after placing a block, it is possible to draw the connection line with the cursor. If a different mode is selected, change the mode to the selection mode or connect mode. 

To draw a connection line move the cursor on the connection pin of a block (a small blue box will be shown) and click the left mouse key. While holding move the cursor to the next pin.



Cistern Control – Insert text fields

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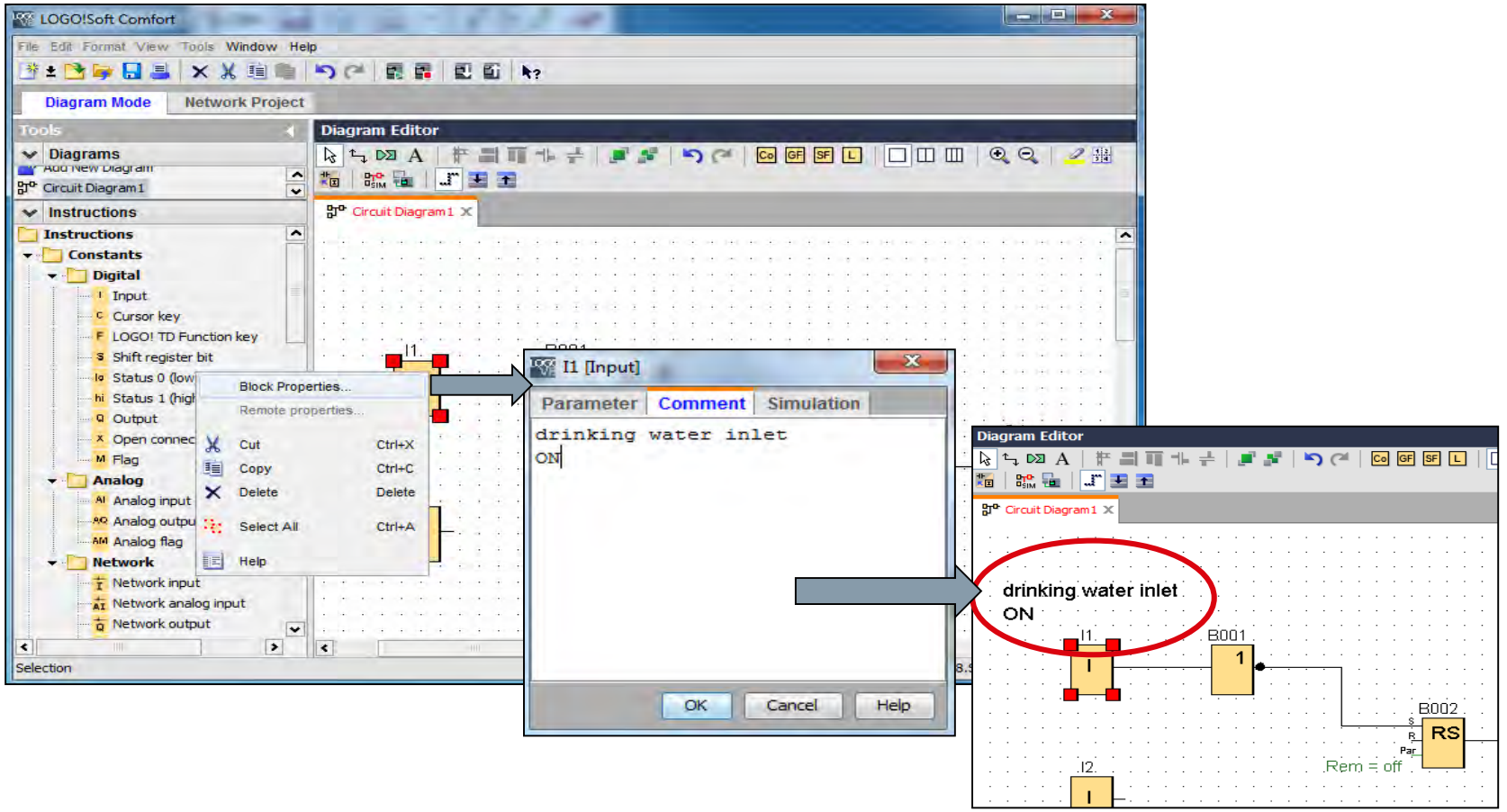
To obtain a better overview of the circuit diagram, LOGO! Soft Comfort offers several ways of embedding text.

Add a comment to each block in the program via *Block Properties…*(right click) or double click.

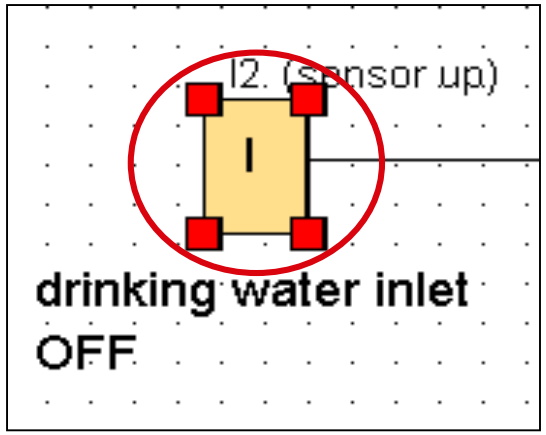
(All ways of embedding text are described in Detail in LOGO! in detail Part 3)

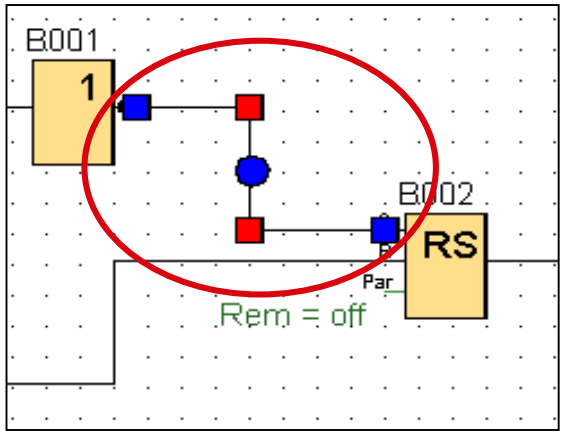


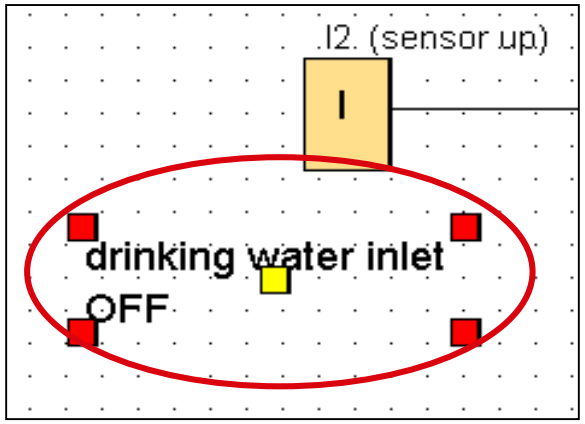
Cistern Control – Moving elements

The program is completed with insertion of function blocks and their connections. To get a clear view of the program, it is possible to replace or move the function blocks, lines, and text fields.

The cursor tool has to be selected to move elements like function blocks, lines, and text fields.







Cistern Control – Aligning elements

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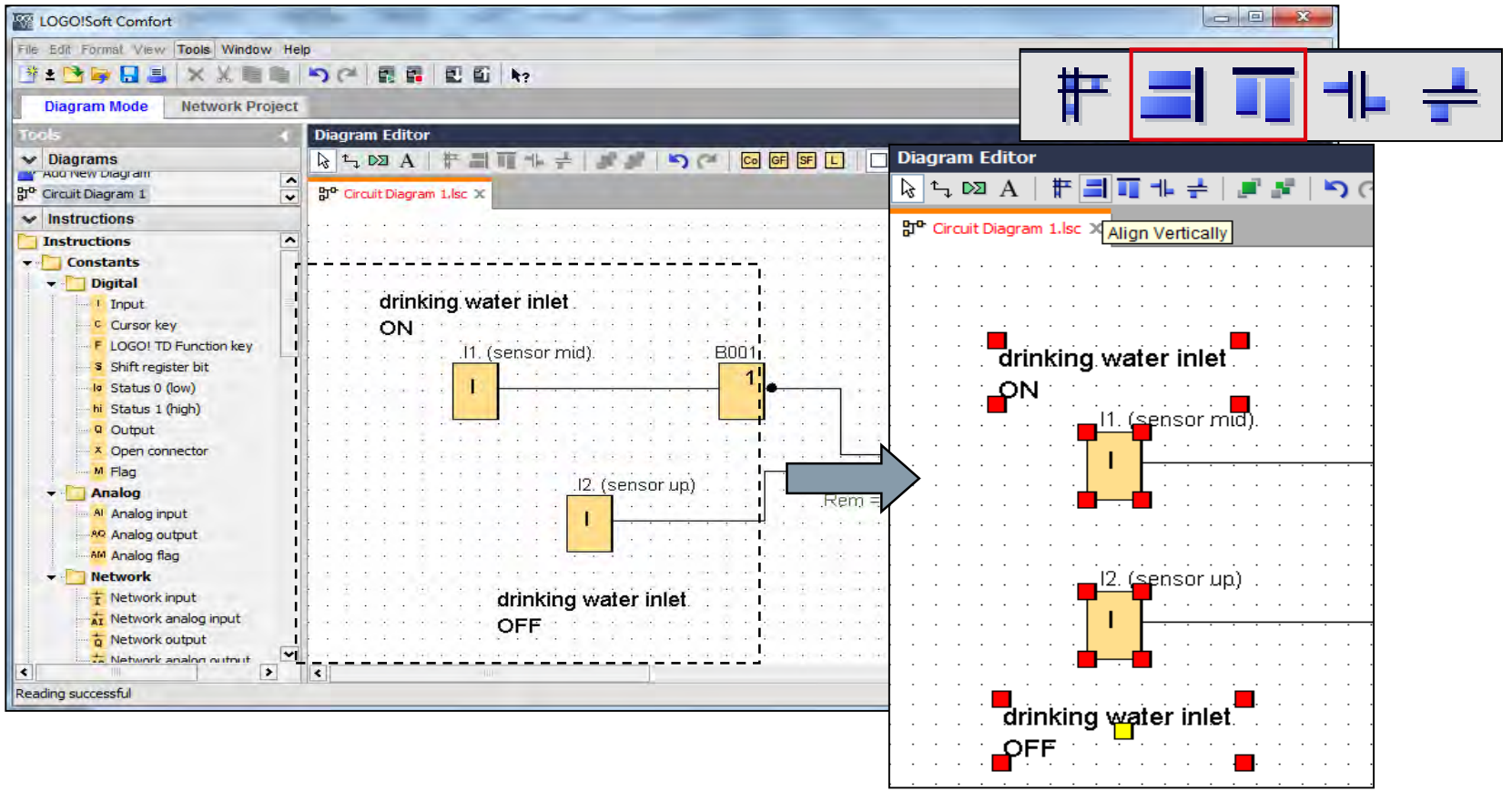
To design everything more neatly and more clearly, the individual function blocks can be aligned vertically or horizontally.

First the elements have to be selected to align them. Via the buttons  or  the selected elements will be aligned vertically or horizontally.



Cistern Control – Parameterization of blocks

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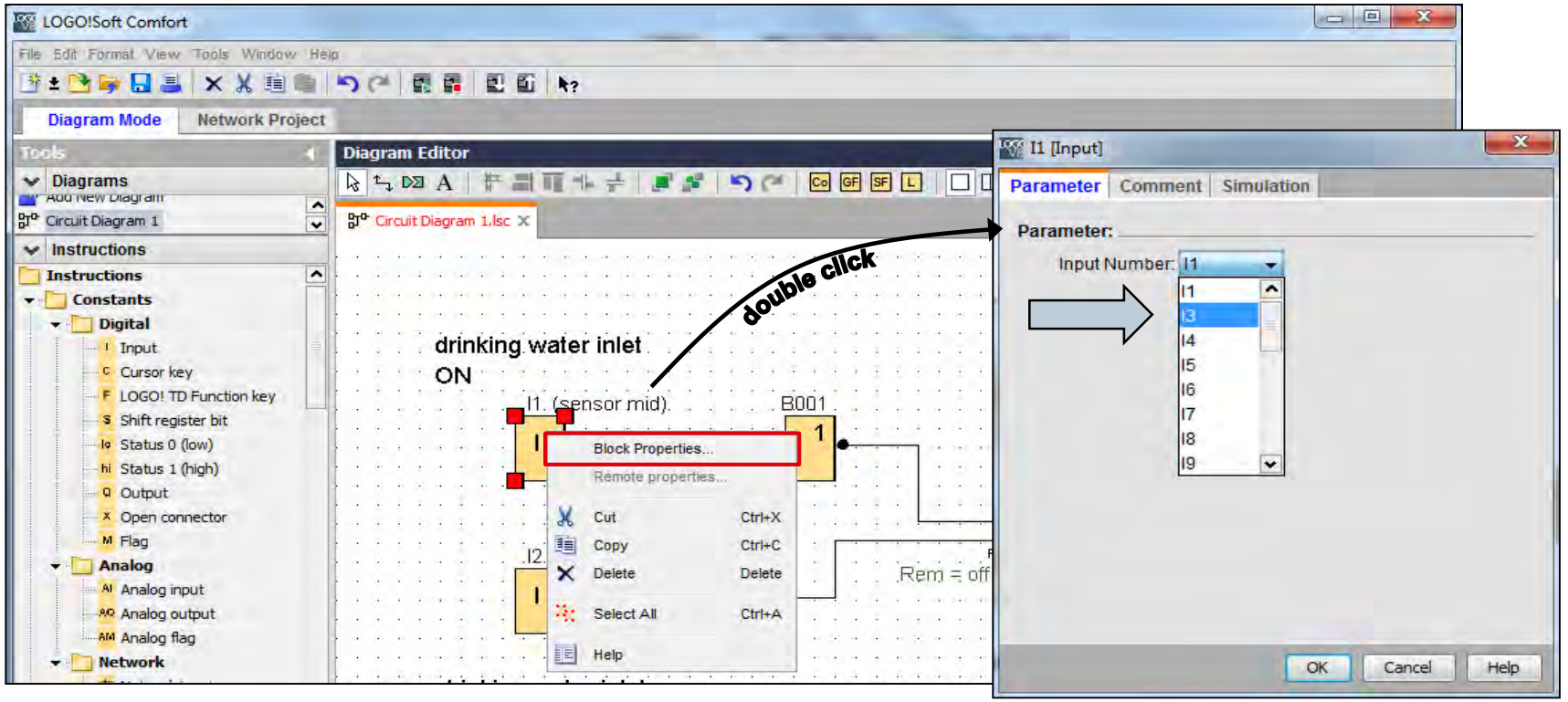
Beside comment dialogues, there are also parameters dialogues. Here the user is able to preset parameters of each function block.

Right click on a function block and select *Block Properties…* Alternatively double click on The function block.

In the parameter dialogue, addresses can be allocated. Only addresses which are available are displayed.



Cistern Control – Parameterization of blocks

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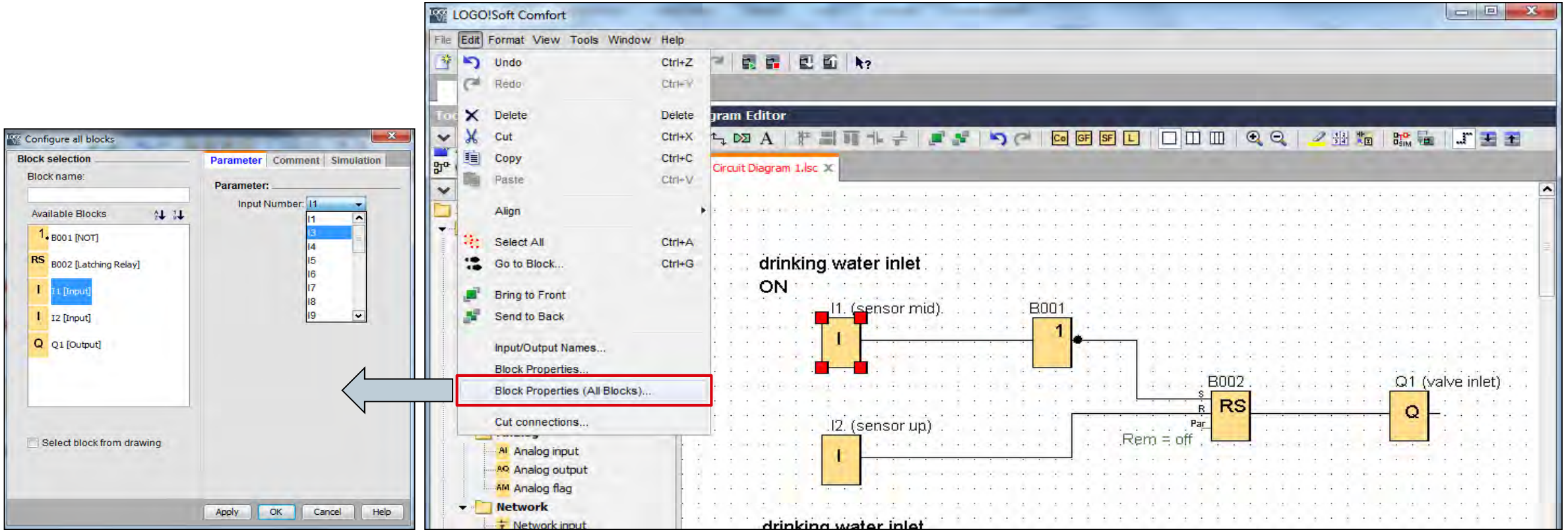
Additionally there is the possibility to change and check all block attributes centrally.

Edit – Block Properties (All Blocks)…



Cistern Control – Formatting texts

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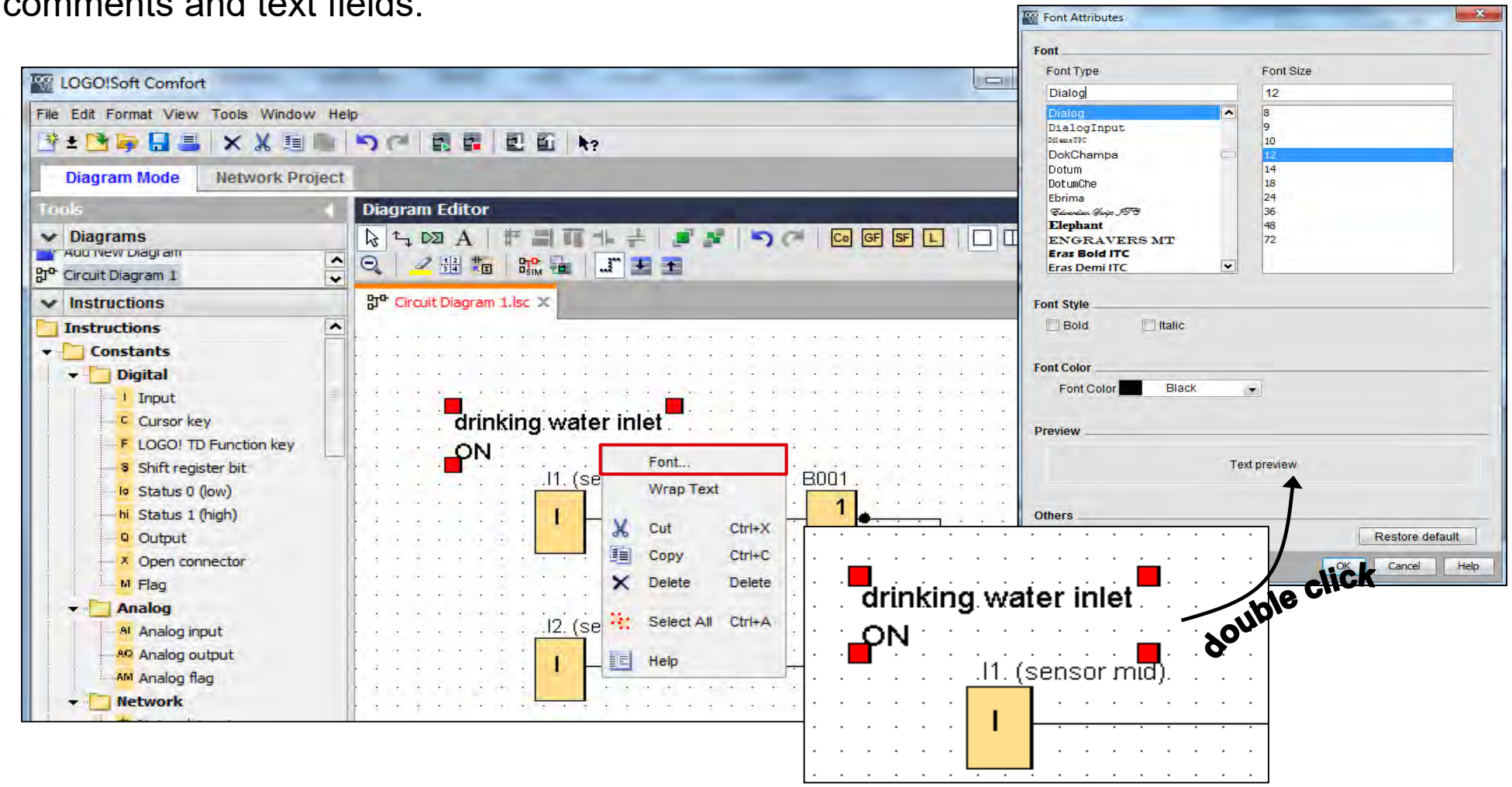
Users can format comments and text fields.

Right click on text and select *Font…*
Or double click



Cistern Control – Documentation

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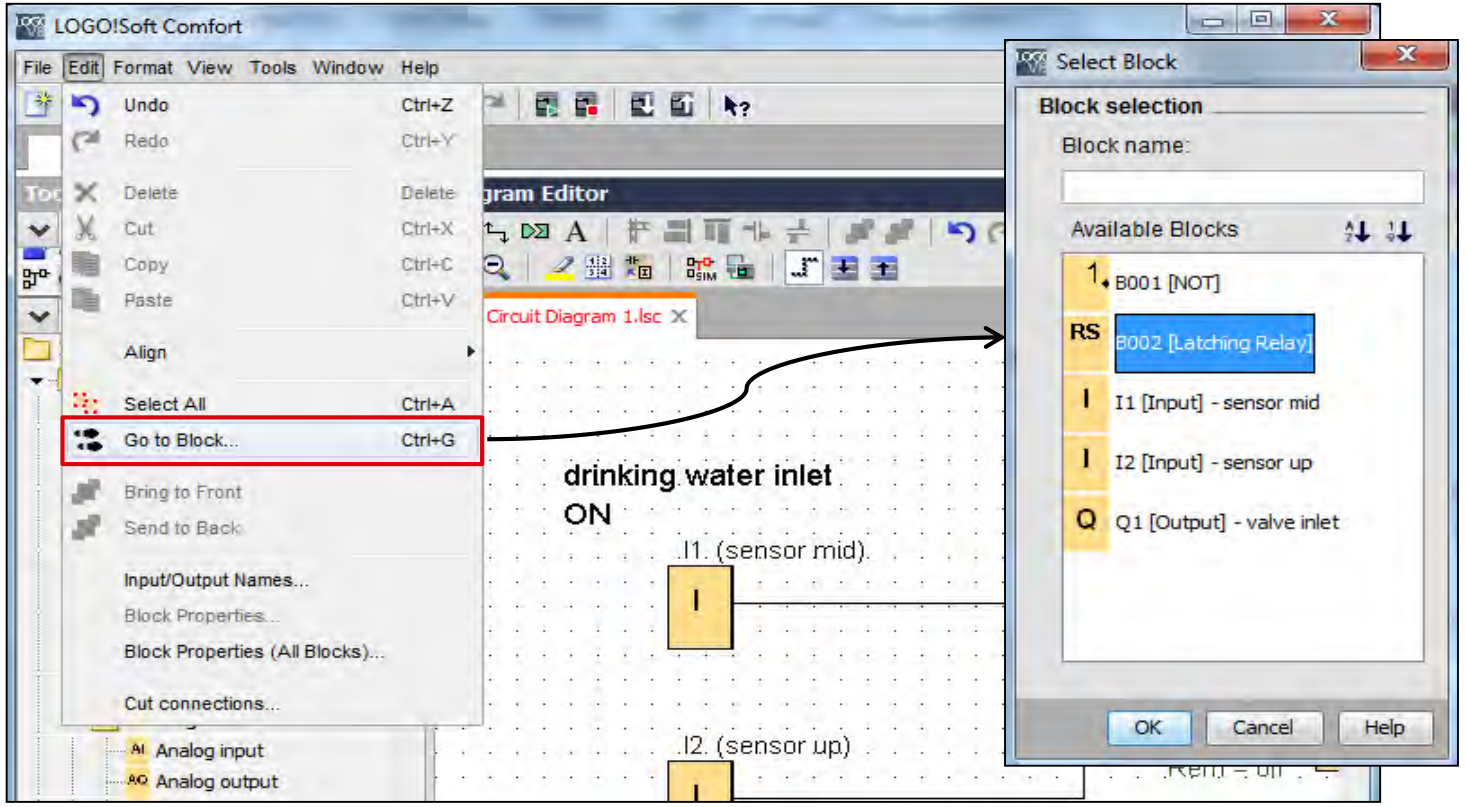
For the documentation all used constants, basic functions and special functions can be displayed.

Via *Edit – Go to block* all used blocks can be displayed. The window shows the information about block number and block type and their comments. Blocks can be located by searching for their names or clicking on their icon in the list. The selected block will be highlighted in the diagram editor.



Cistern Control – Documentation

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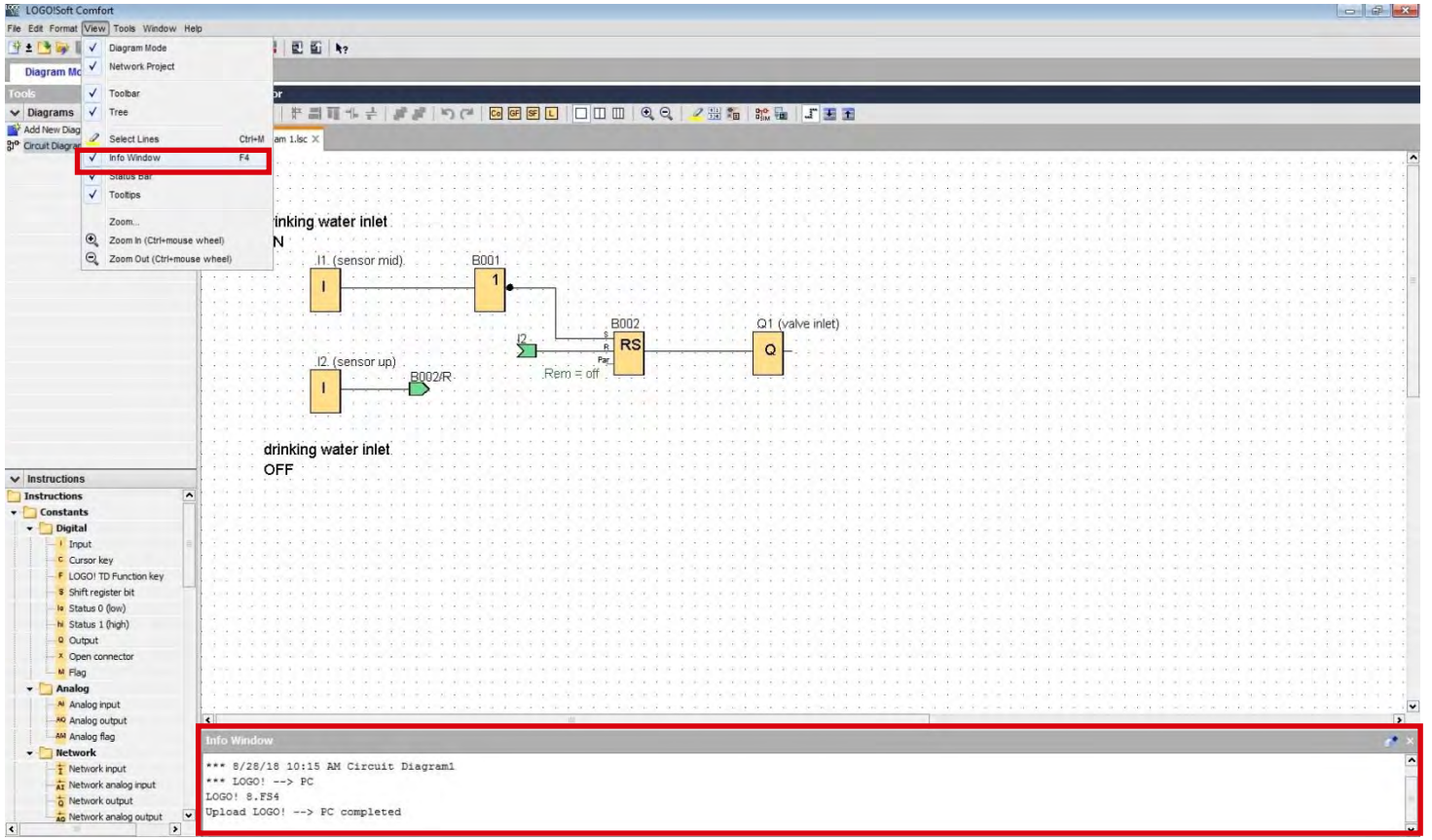
Further information about the program can be viewed via the information window. It is located at the bottom window frame by default.

The information window can be added via *View – Info Window* or alternatively via *F4 key*. In the information window the used resources are displayed with current date and time.
LOGO! has to be connected to the PC.



Cistern Control – Documentation

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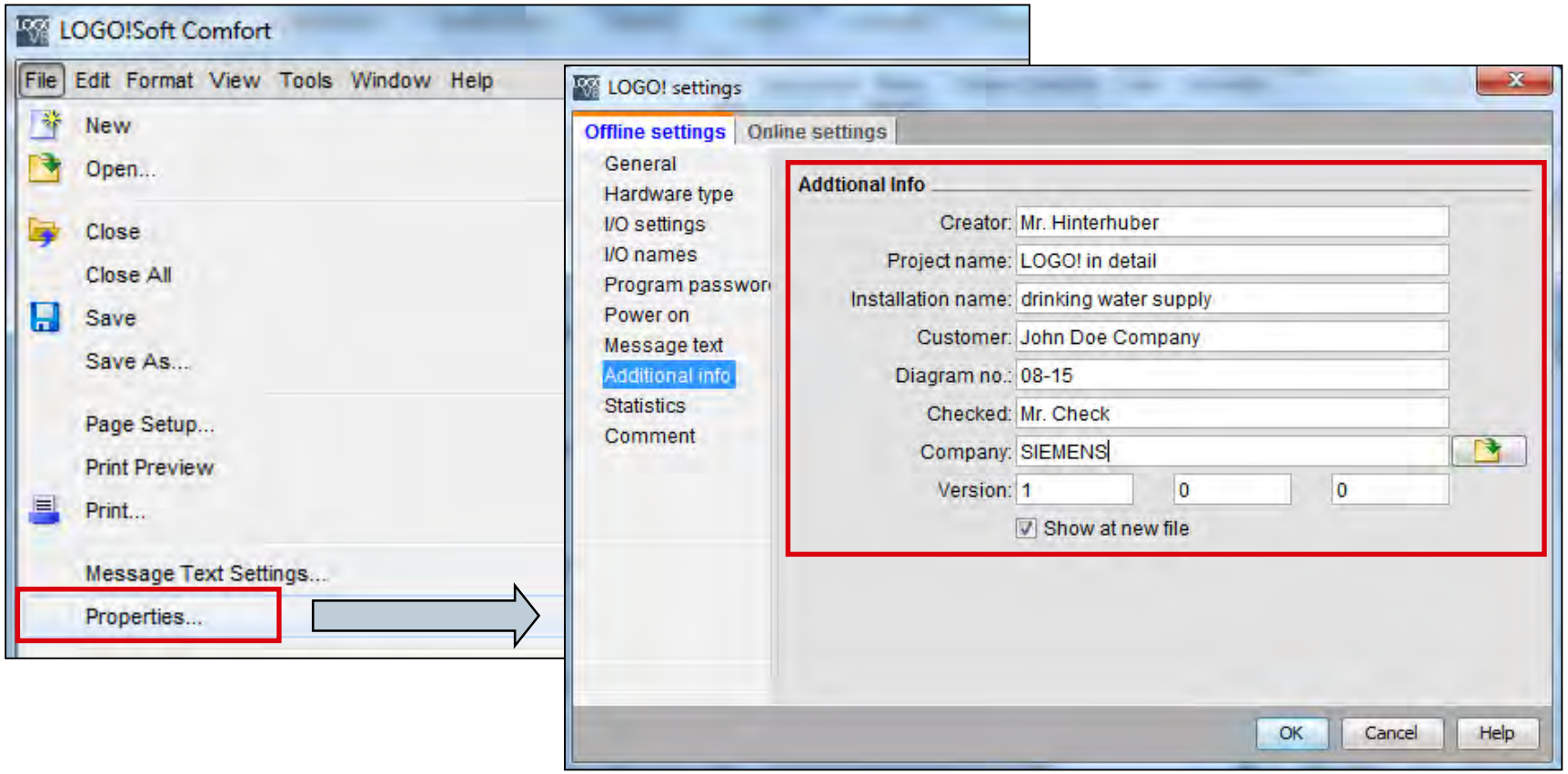
Program information can be entered via *File – Properties* in the *LOGO! Setting dialogue – Additional Info*. They appear in the program printout in the footer.



Cistern Control – Documentation

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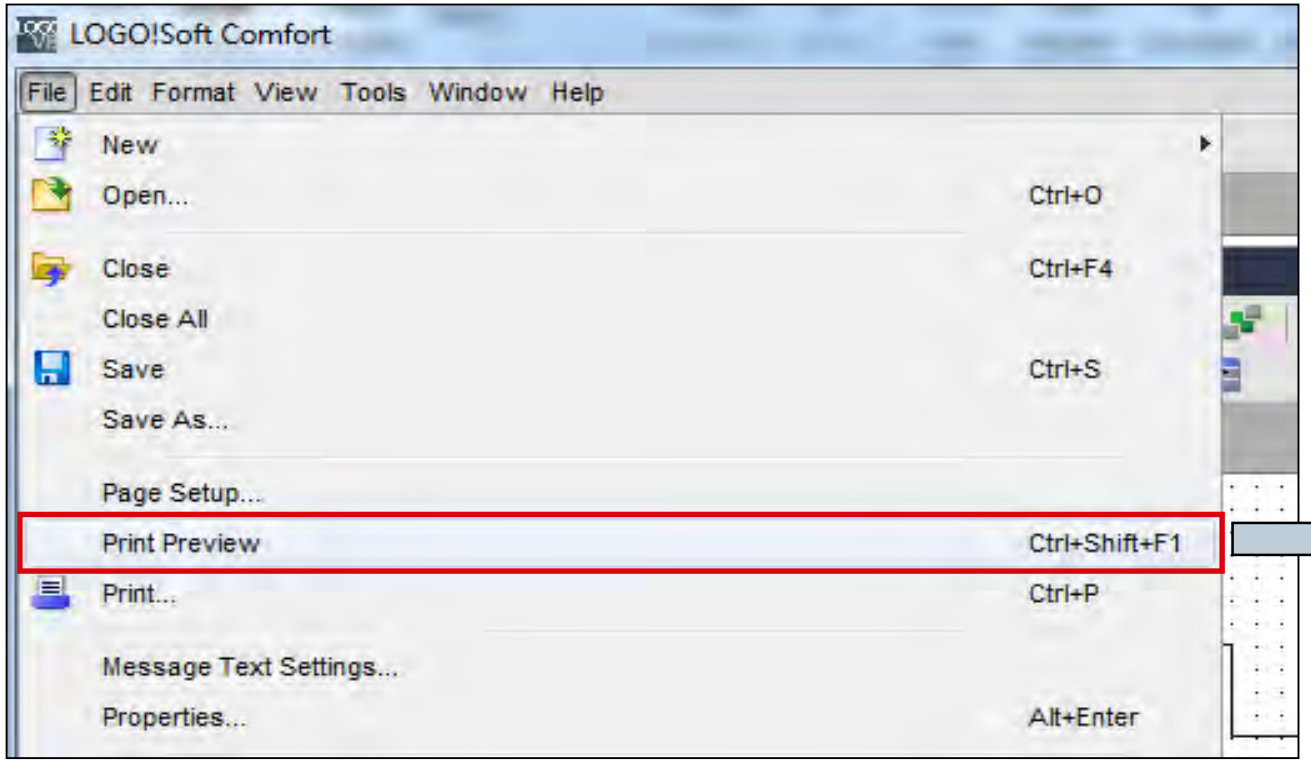
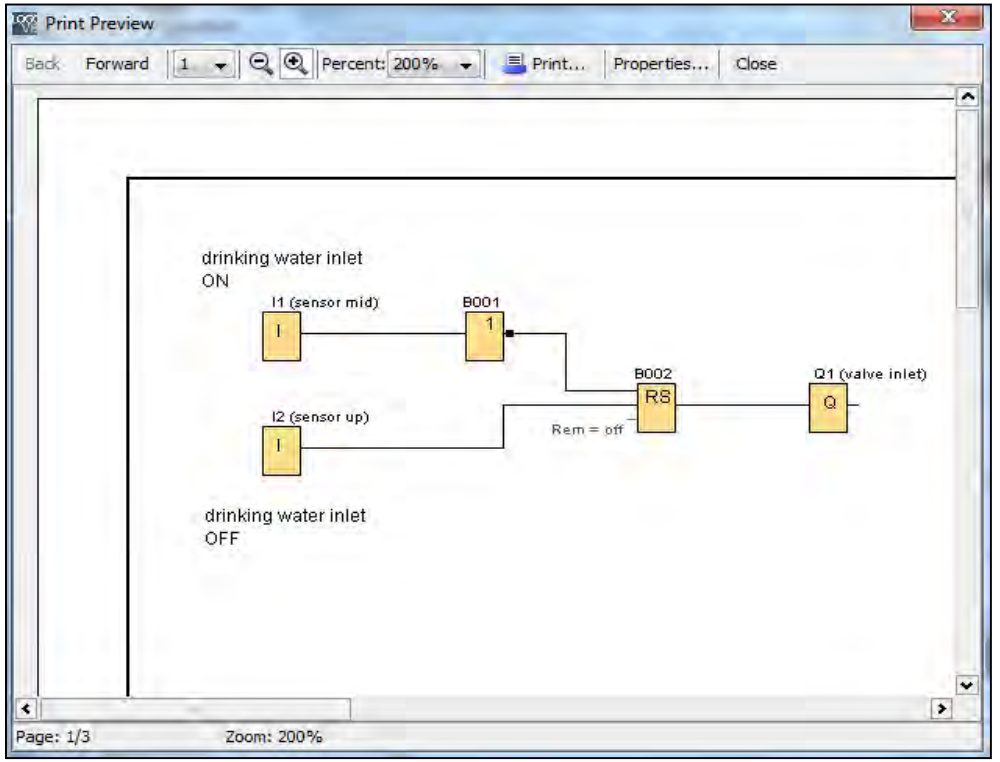
The program including the entered plant data can be viewed via *File – Print Preview*.





Cistern Control – Documentation

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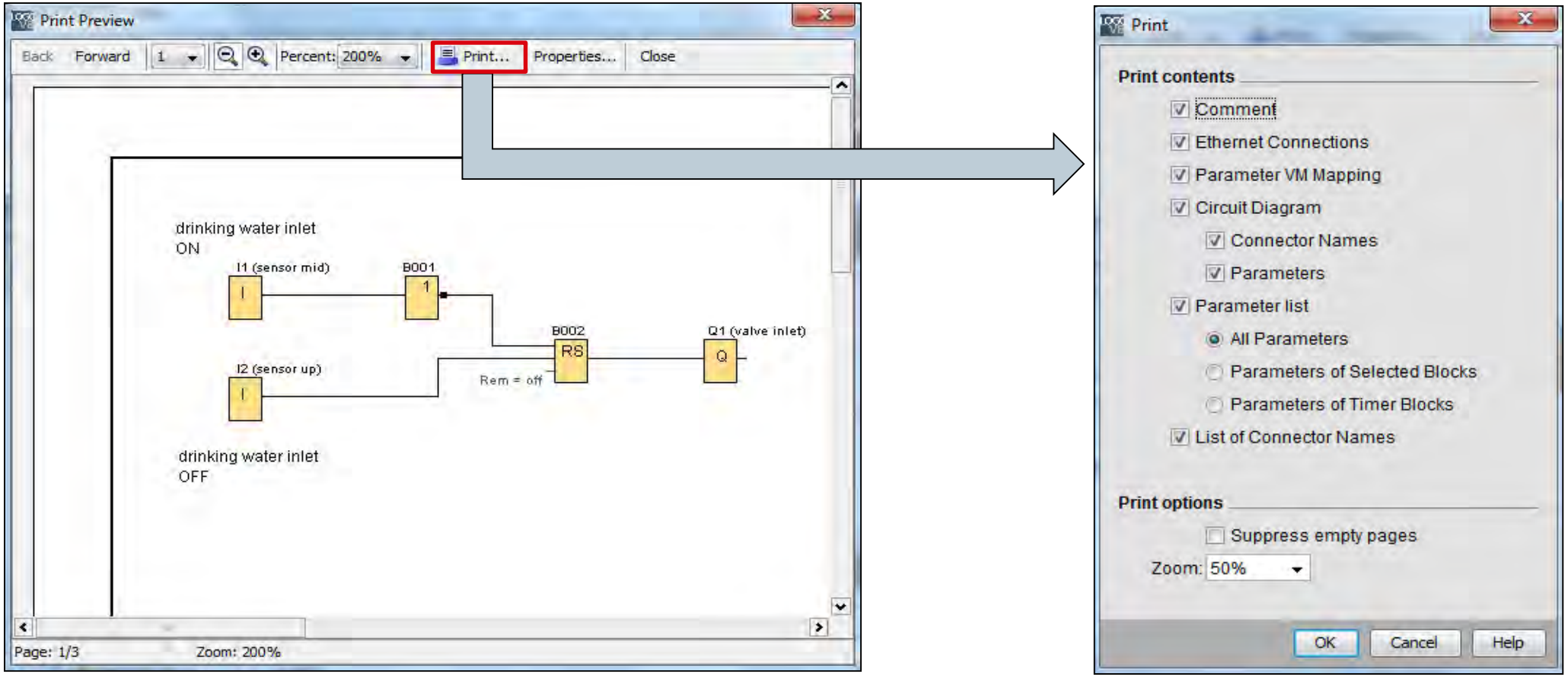
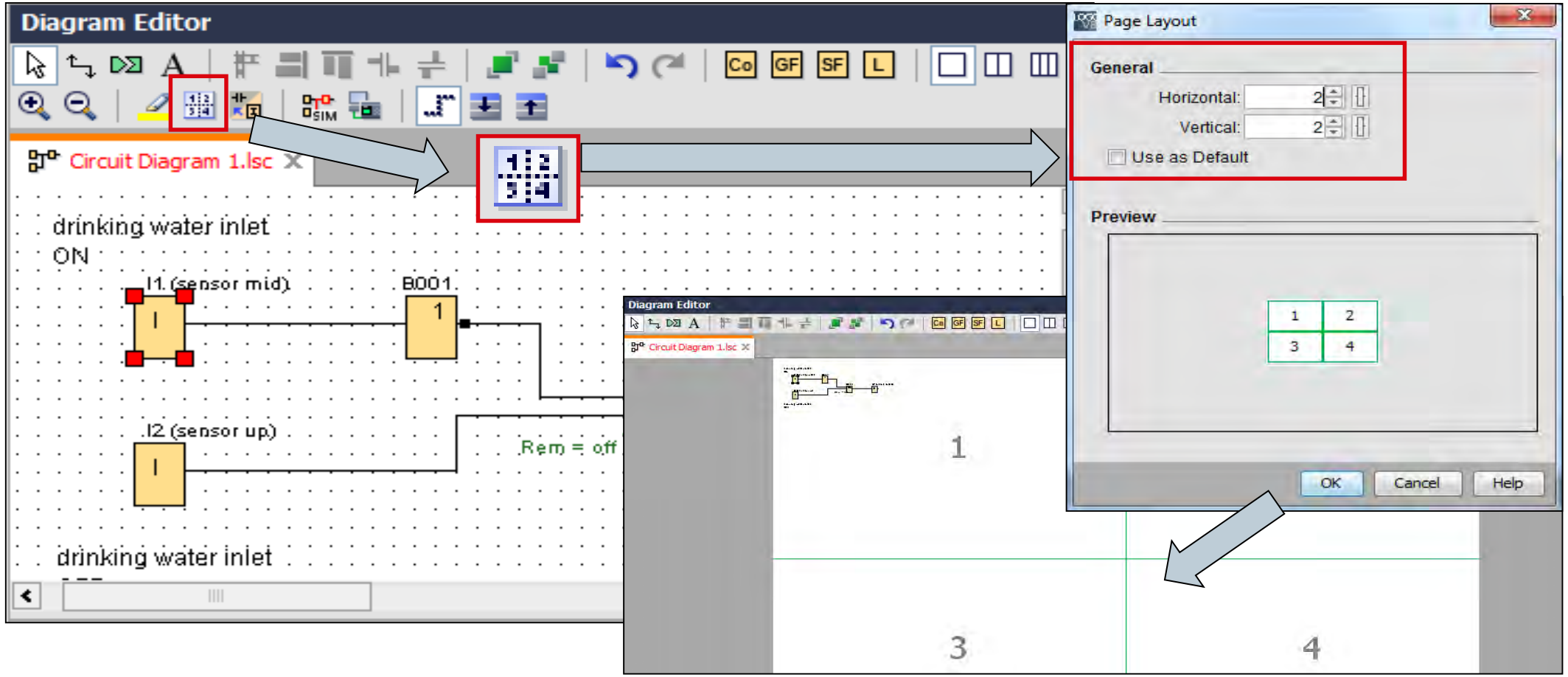
Via *Properties…* in the print preview window documents which shall be printed can be selected. By default the circuit diagram, the parameter list and the list of connection names are selected.



Cistern Control – Documentation

If the program becomes bigger or more complex, it makes sense to divide the circuit diagram onto more pages.



Cistern Control – Program testing

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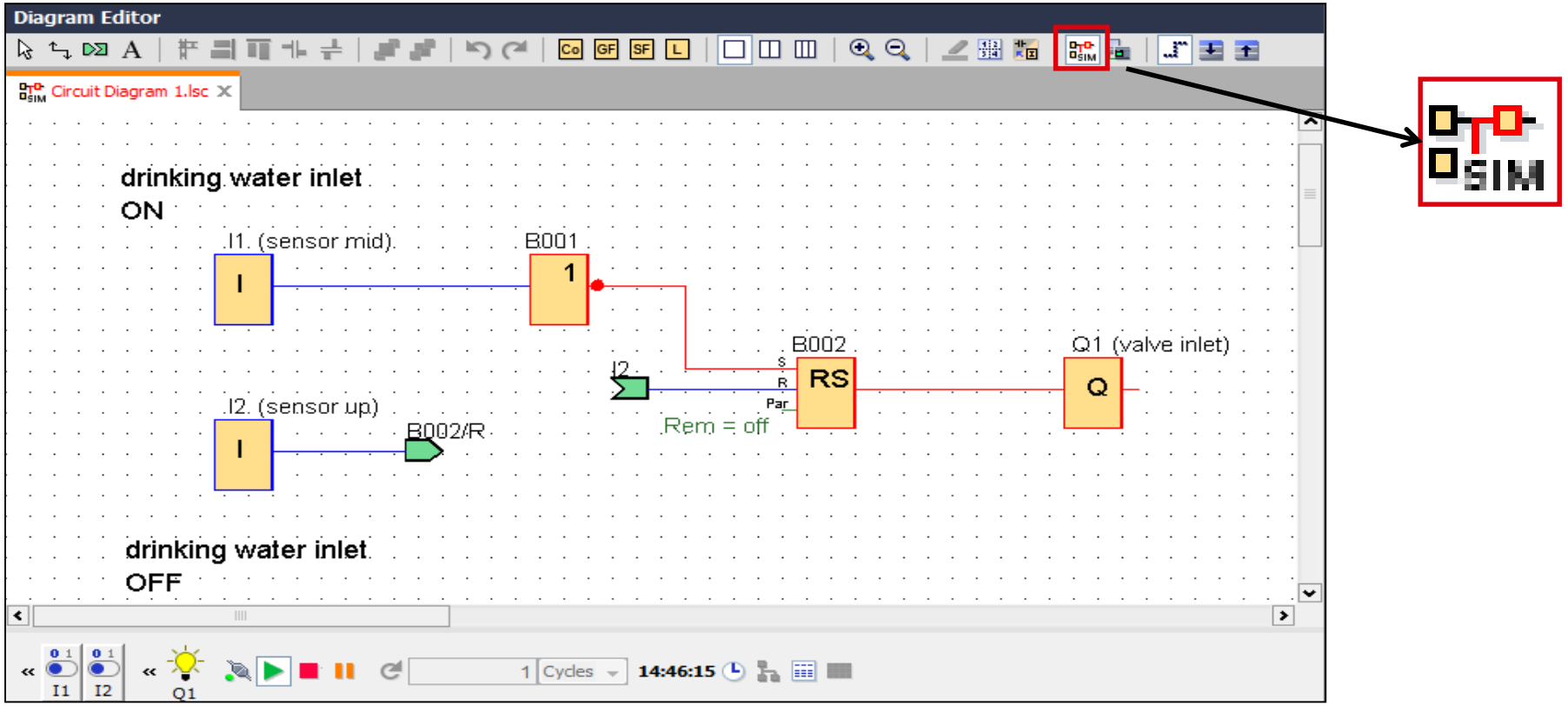
After configuration and documentation, the program testing via offline simulation is the next step.



Cistern Control – Program testing

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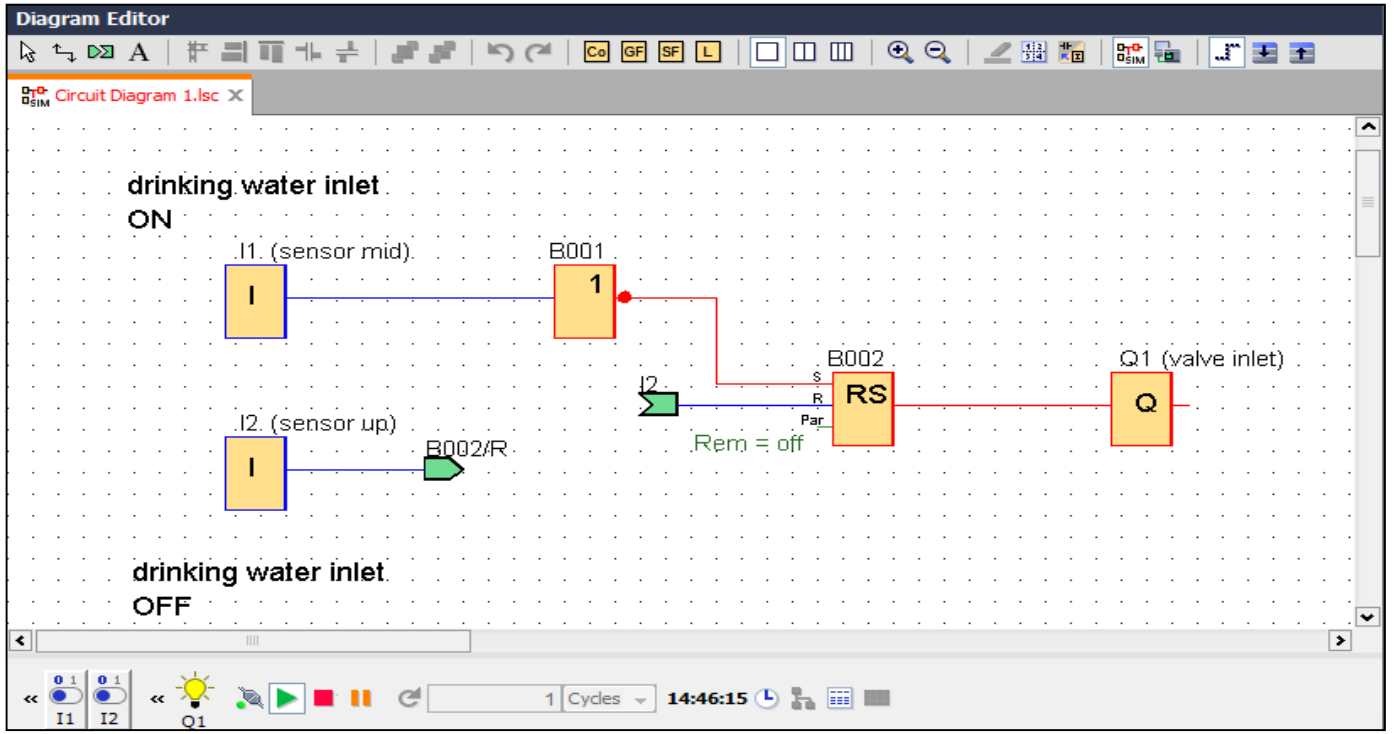
The simulation tool allows to test the program even without using a LOGO!

To test the program the SIM button has to be selected. In this offline simulation mode a tool bar for monitoring and controlling (like I1, I2 and Q1) will be located at the bottom of the window frame. By clicking on the buttons (like I1 or I2) at the tool bar, it is possible to change the status of the inputs. the signal run can be tracked via the color change from blue (low) to red (high signal).

If a LOGO! is connected to the PC, a online simulation is also possible via the offline button . So a download of the program to the LOGO! is not necessary.



Cistern Control – Program testing

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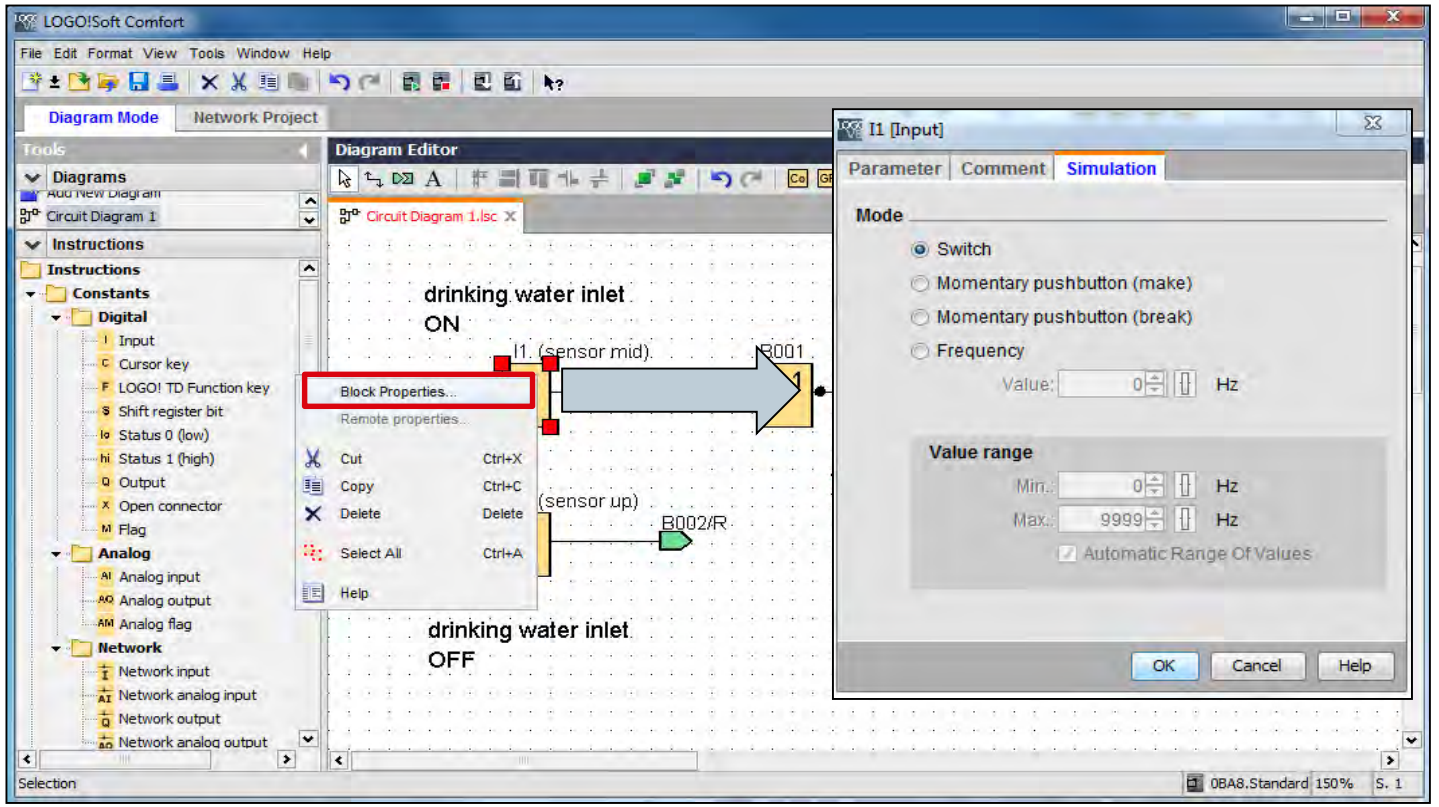
As an additional program testing feature, each input can be allocated to a certain switch function. Via the context menu (right mouse key) of an input block, it is possible to change the input mode. Choosing frequency mode inputs can be adjusted in Hz.

The value range for each analog inputs can be preset as well. These parameters can centrally be changed and reviewed via *Tools – Simulation parameters*.

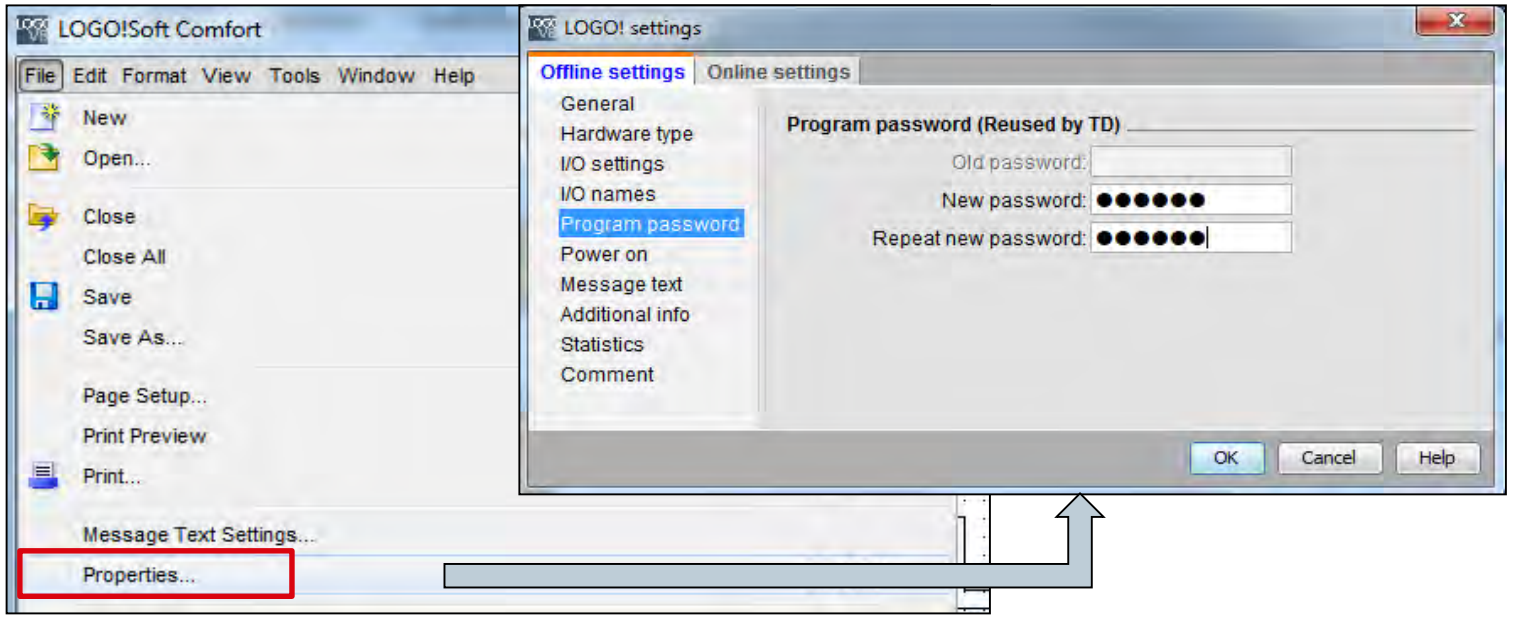


Cistern Control – Assign program password

To protect the program and the user's know how, a valid 10-digit password can be set for the program. This password protects the program only on LOGO!. The program is not deletable, changeable or viewable without the password. To upload a password protected program on the PC, the password is necessary as well. To delete an assigned password, enter the *Old password* and leave the *New password* empty.

If the password has been lost and the user wants to reuse this LOGO!, the password has to be entered incorrectly three time and the program is automatically deleted.

Alternatively *Tool – Transfer – Clear User Program and Password* (the LOGO! has to be connected to the PC)



Cistern Control – Select LOGO! version

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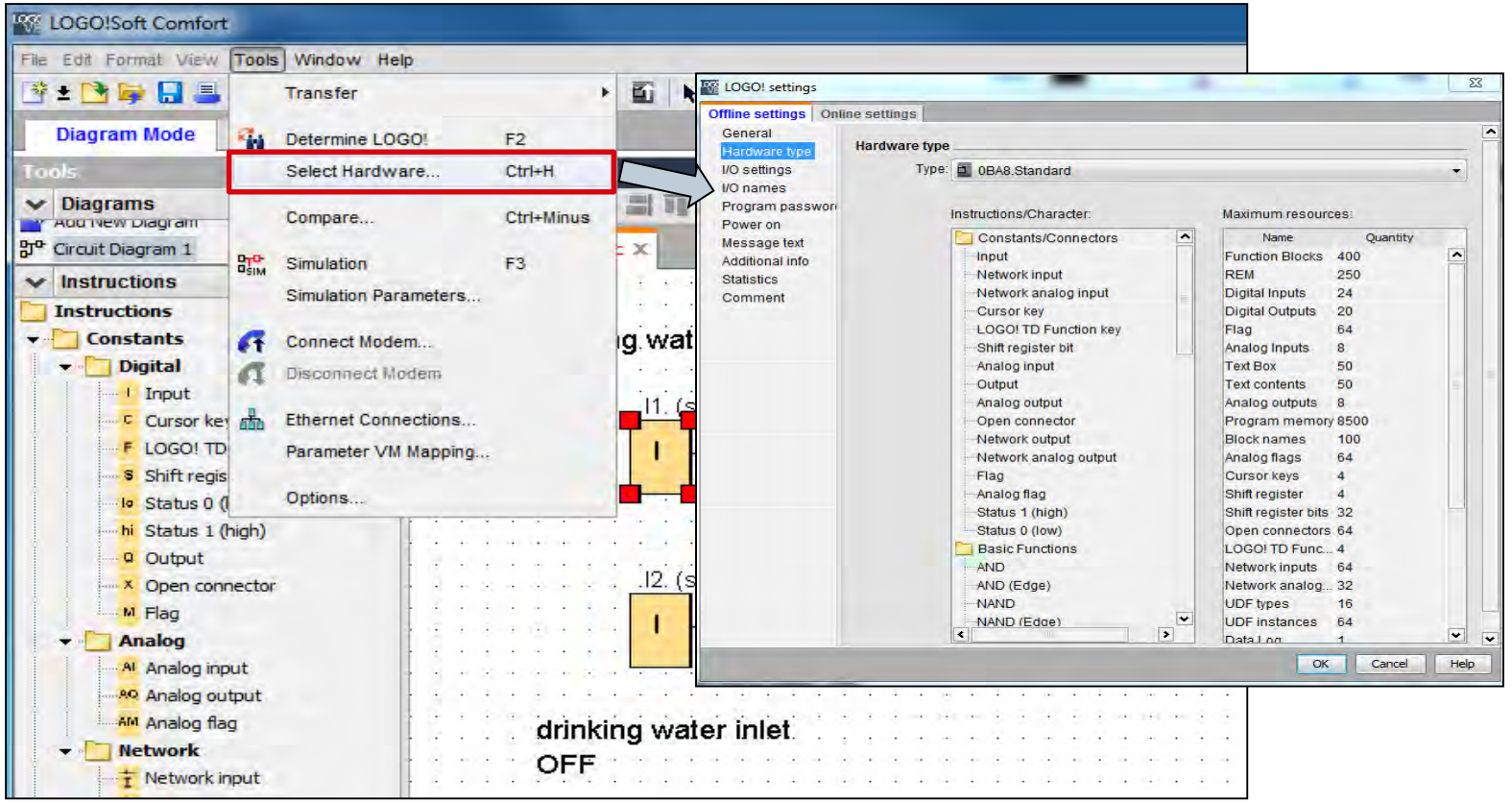
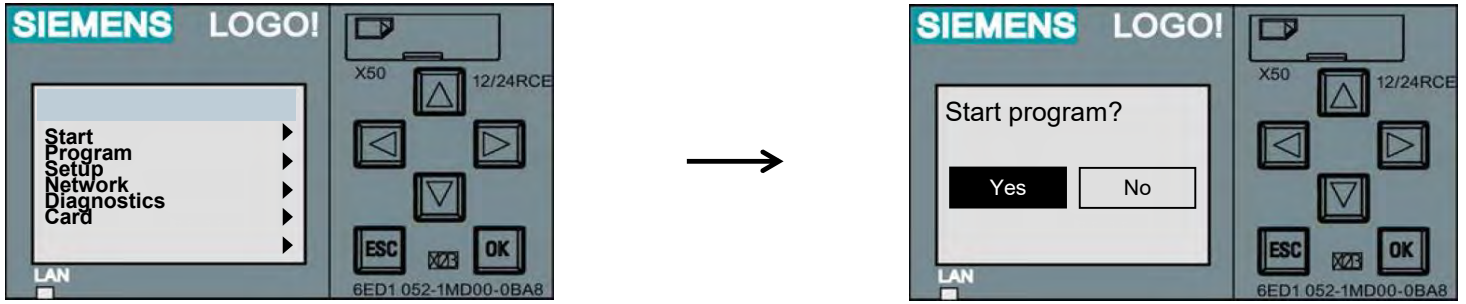
To use a program for previous LOGO!s, the used LOGO! has to be selected via *Tools – Select Hardware…*

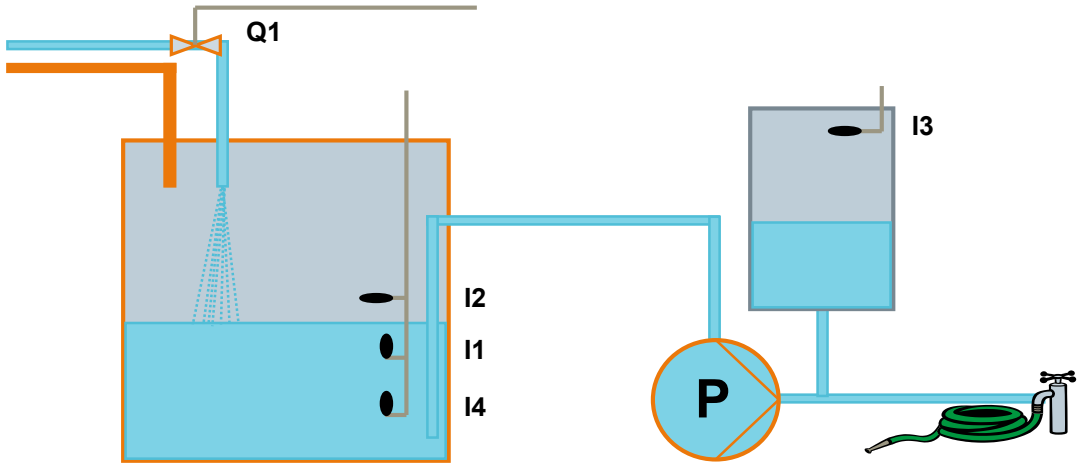
Every LOGO! generation can be selected via *Hardware type – Type.* Choosing a *Type*, all resources of the selected LOGO! version are displayed.



Cistern Control – Starting LOGO!

After transferring the program, LOGO! has to be set to RUN-mode. Now the program can be tested in real life.





Typical tasks for LOGO! – Conveyor control

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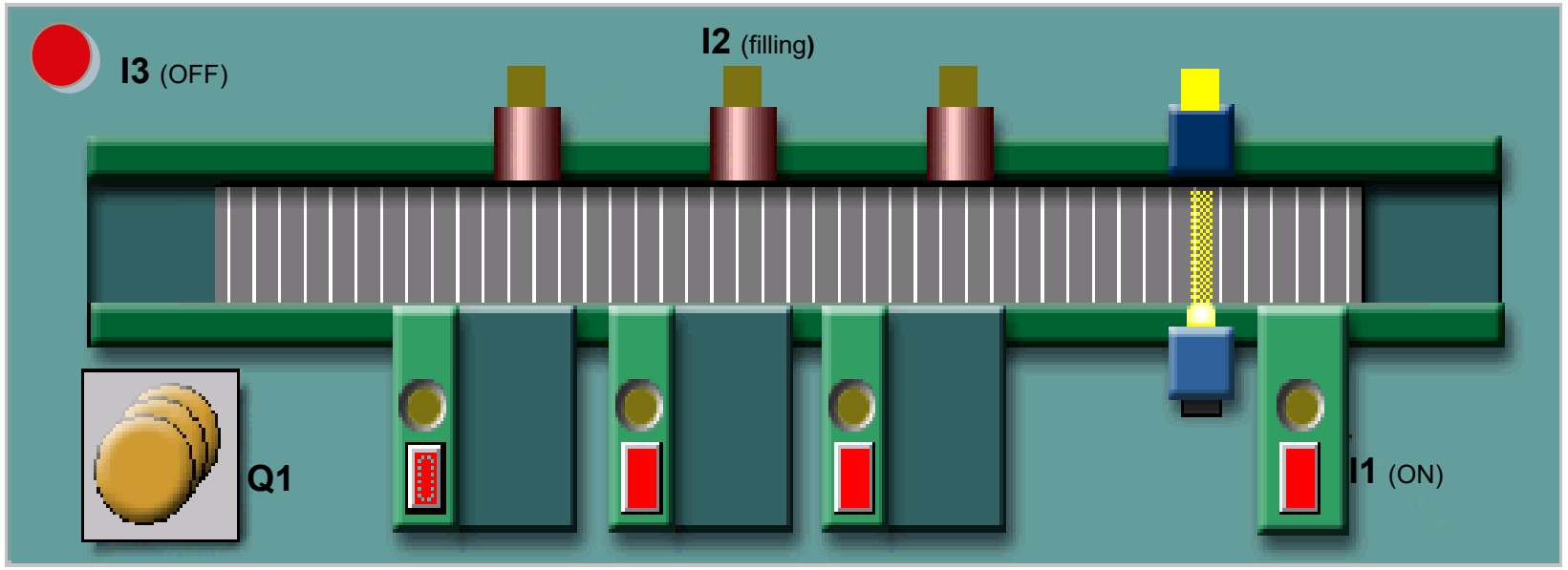
Function description:

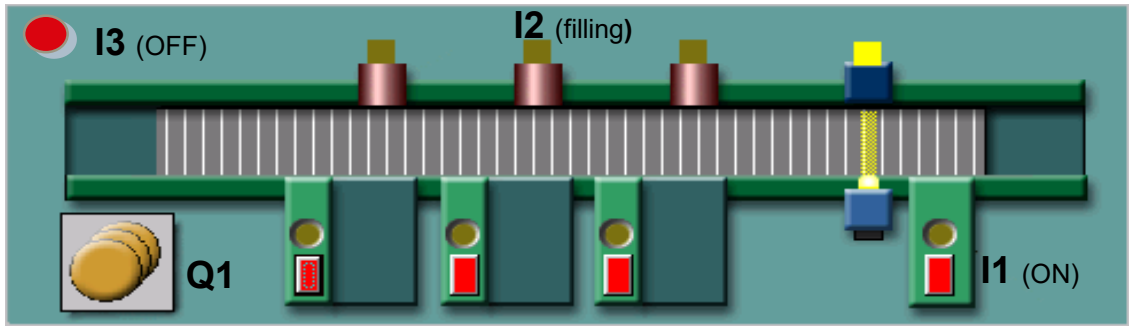
A bottle filling conveyor shall be controlled. The conveyor control is able to switch on and off via I1. When the conveyor control is switched on, the conveyor motor Q1 runs. The motor can be switched off via I3 at any time. When the sensor I2 detects a bottle, the motor has to be switched off for 3 seconds (filling time). After filling the motor shall run again.

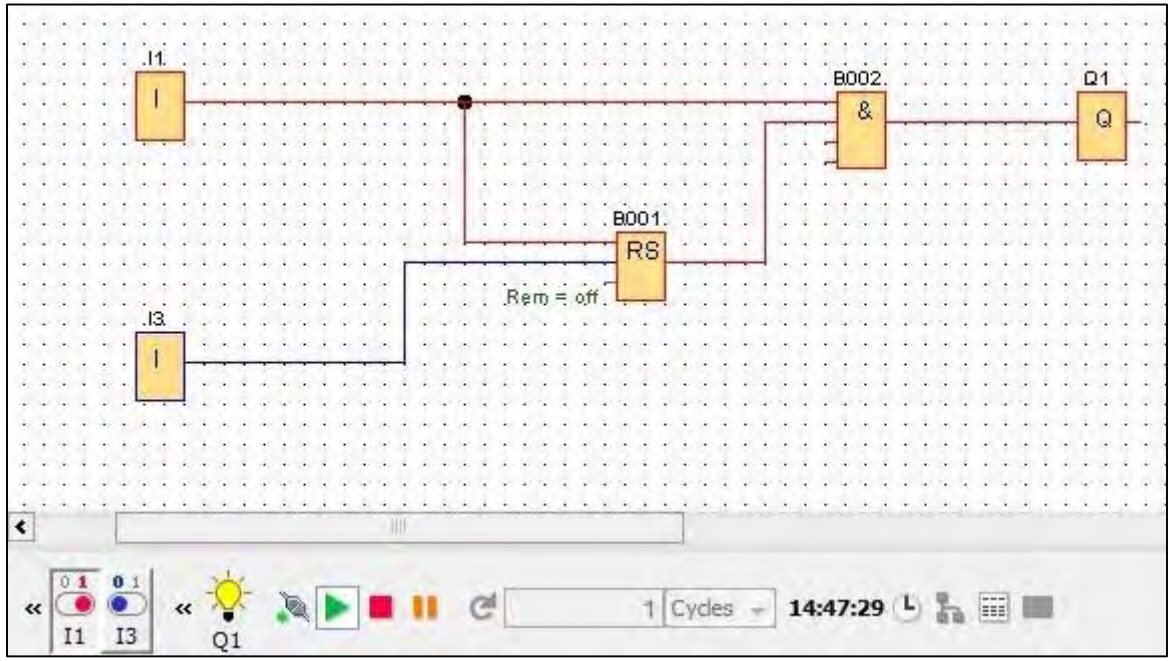


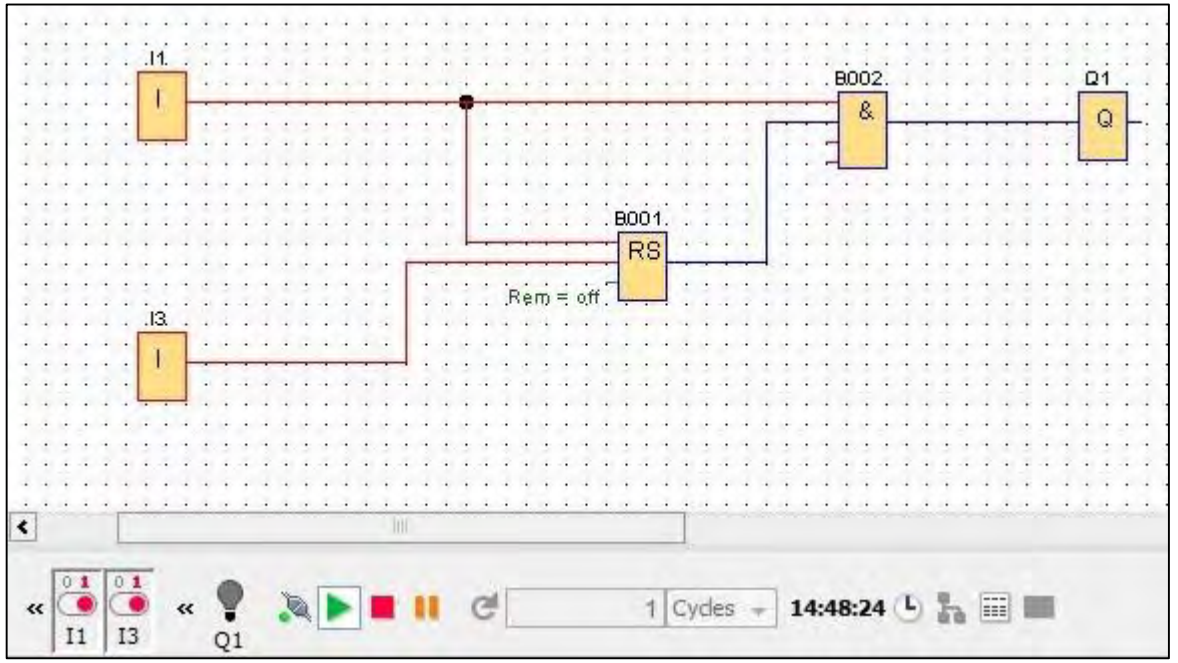
Typical tasks for LOGO! – Conveyor control

Step 1:

The conveyor control is able to switch on and off via I1. When the conveyor control is switched on, the conveyor motor Q1 runs. The motor can be switched off via I3 at any time.







Typical tasks for LOGO! – Conveyor control

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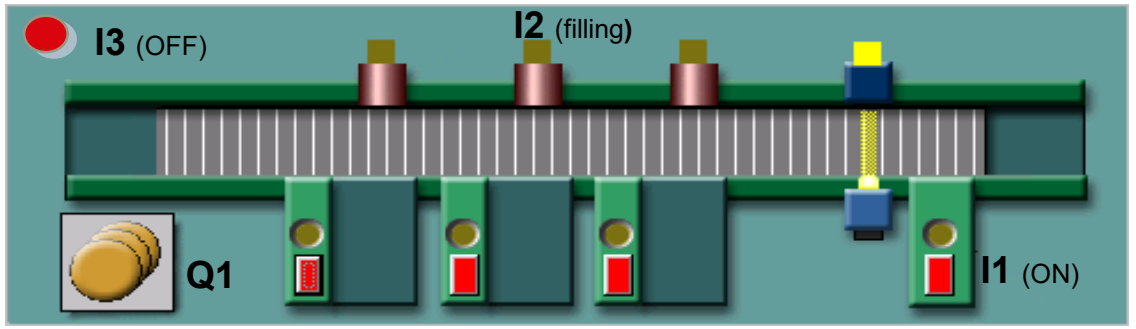
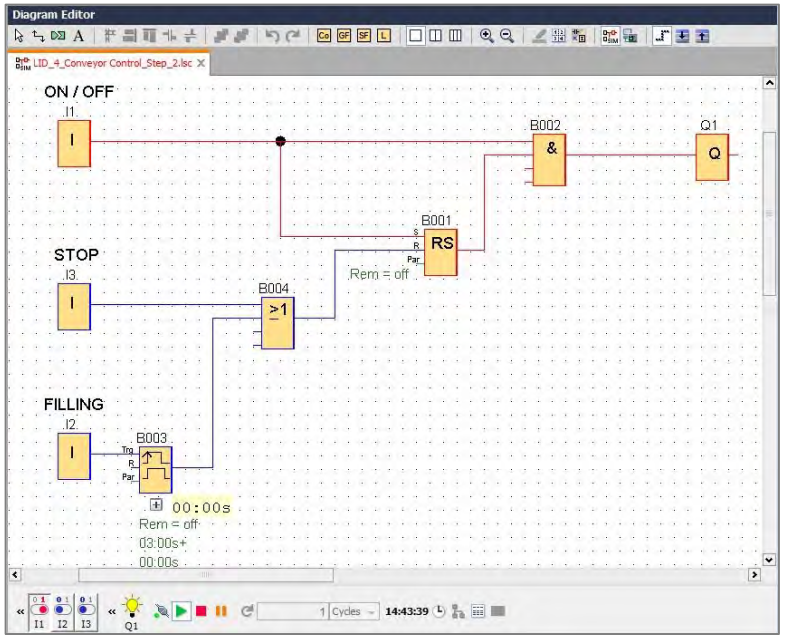
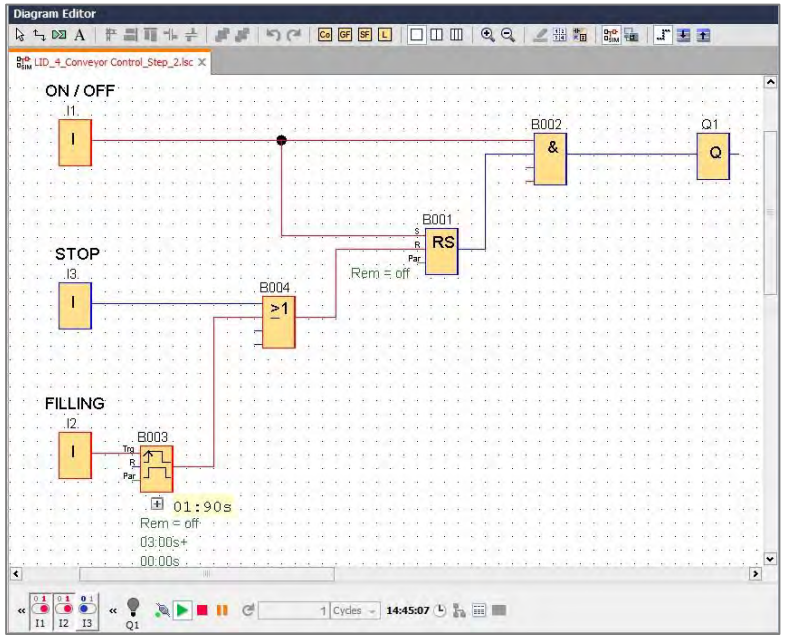
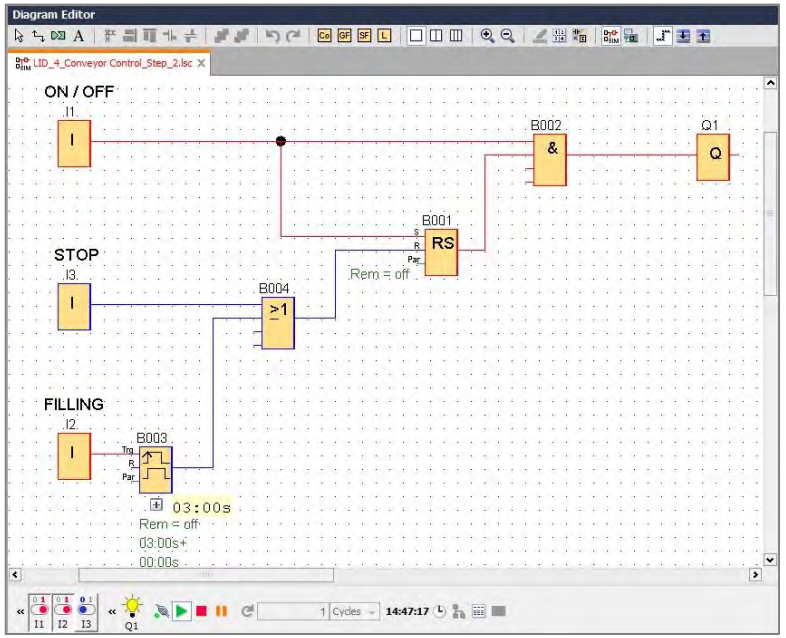
Step 2:

When the sensor (I2) detects a bottle, the motor has to be switched off for 3 seconds (filling time). After filling the motor shall run again.









Typical tasks for LOGO! – Astronomical clock with time offset
Example 1: Automatic lighting with shaded space

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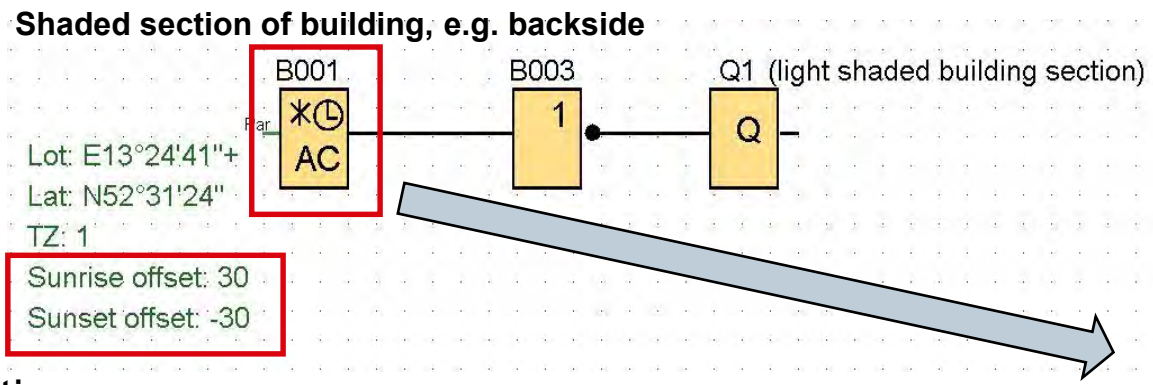
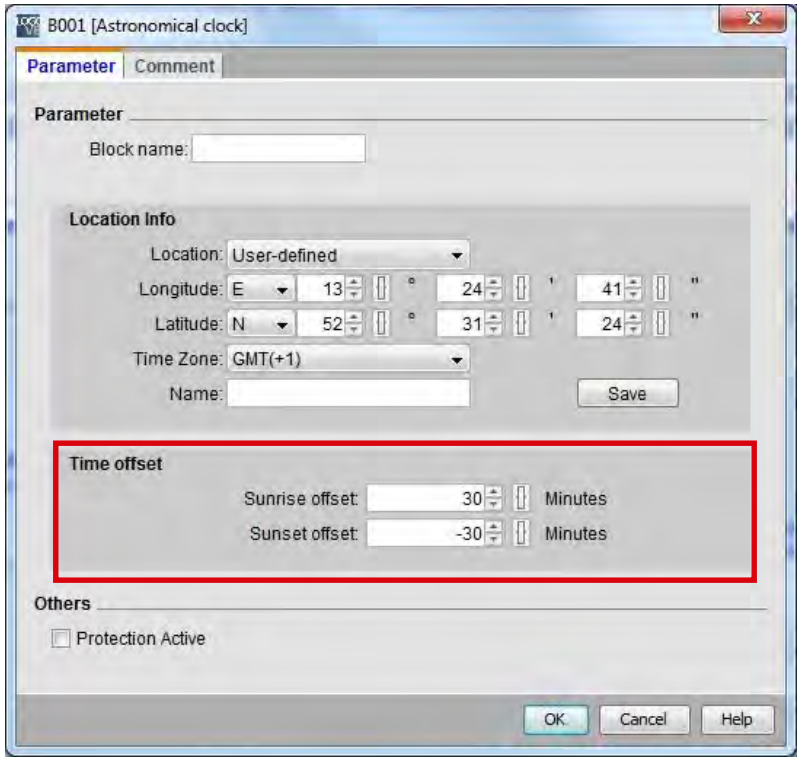
Ingenuity for life

Automatic lightings are often used in buildings. At the sunset some parts of a building are getting shaded earlier than others. Therefore these parts need to light up earlier. Additionally at sunrise the lighting needs to switch off later.
The astronomical clock in LOGO! Soft Comfort offers a new function, called ‘time offset’, to solve this task.





Time offset properties:
Sunrise offset ‘+30 minutes’ means that the section will be light up till 30 minutes after sunrise.
Sunset offset ‘-30 minutes’ means that the section will be light up 30 minutes before sunset.

Typical tasks for LOGO! – Astronomical clock with time offset
Example 2: Animal breeding

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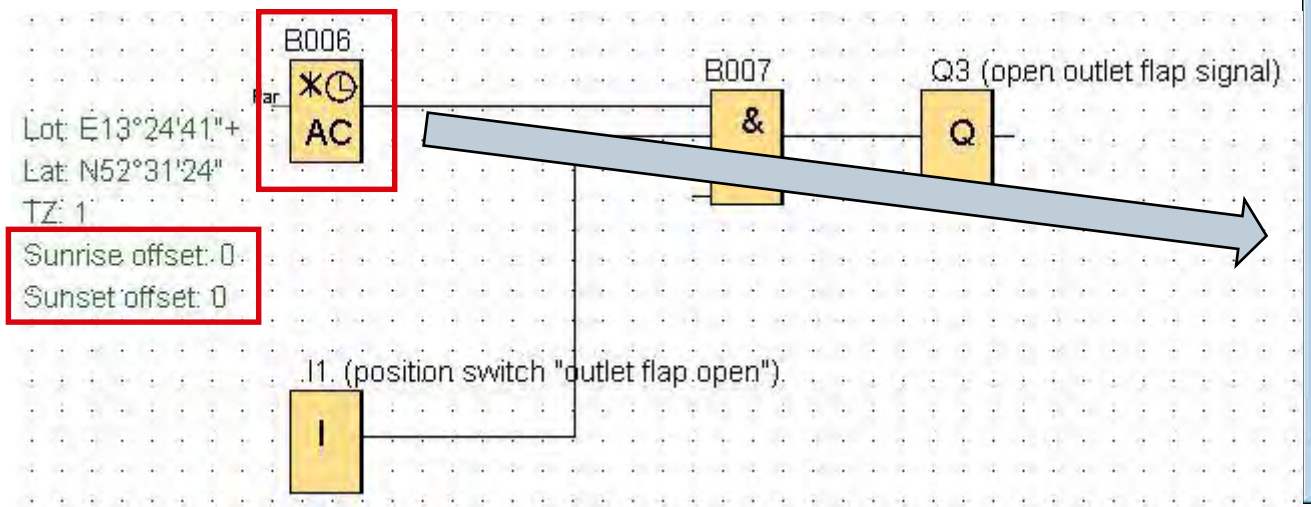
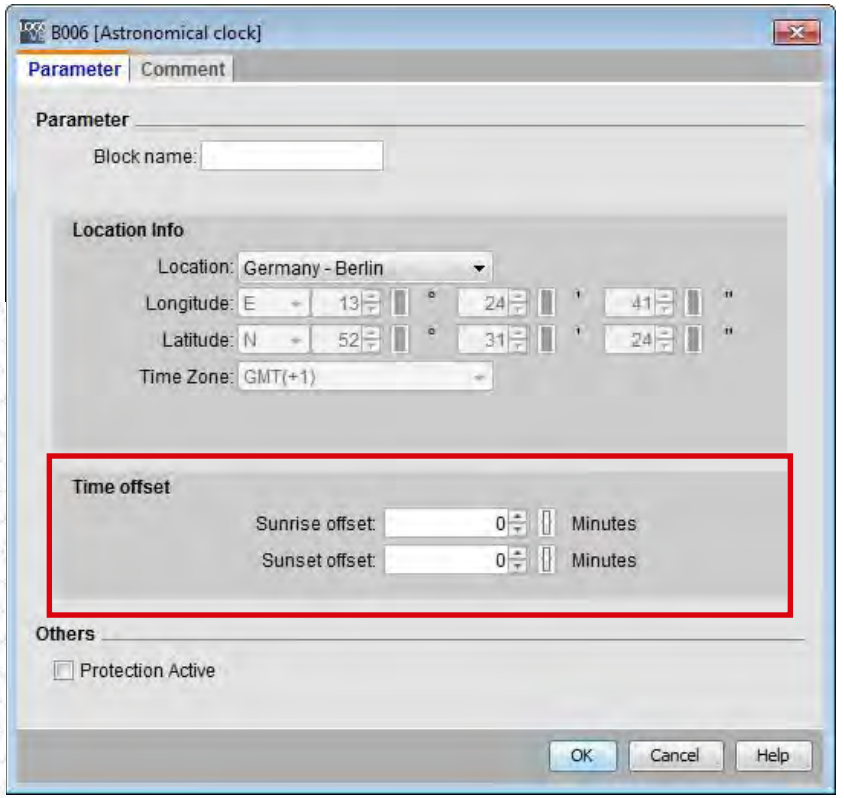
At an animal breeding, the animal outlet flap shall automatically open at sunrise and close after sunset. Before closing, there has to be a sound to signal the animal that the closing process starts soon.

The opening process shall start at sunrise. Therefore a time delay is not necessary and the time offset has to be set to 0 minutes.

the outlet flap opening process of the stable at sunrise





Typical tasks for LOGO! – Astronomical clock with time offset
Example 2: Animal breeding

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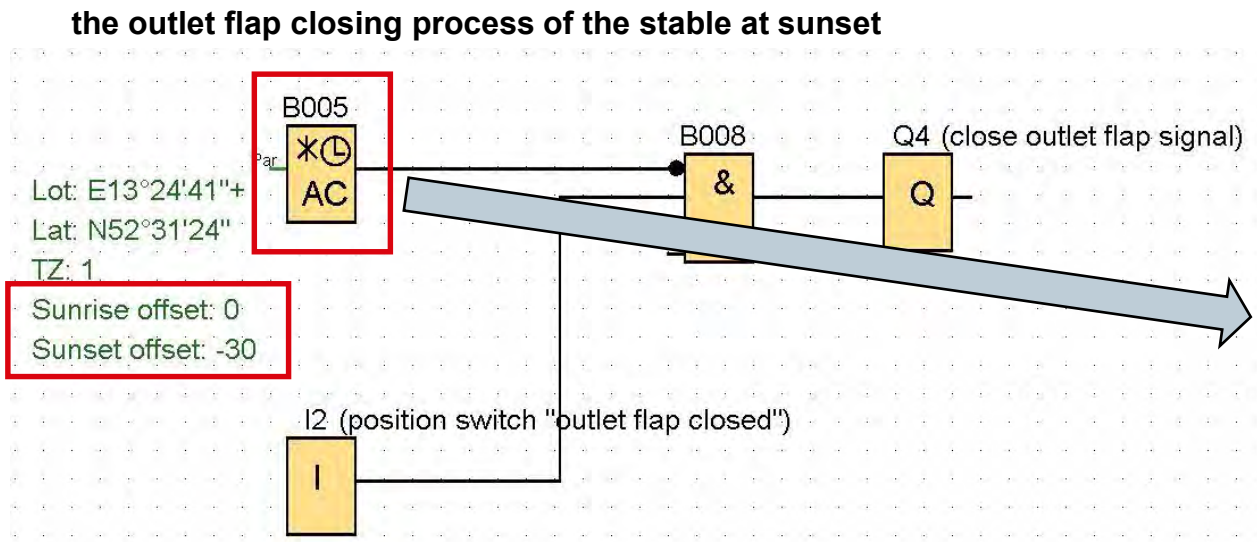
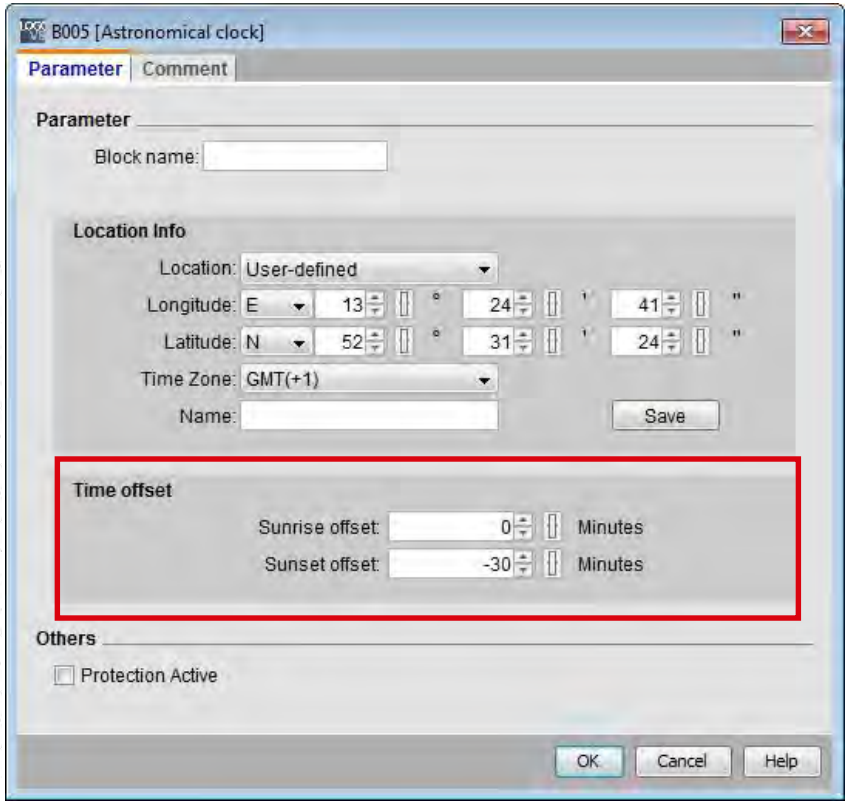
Ingenuity for life

At an animal breeding, the animal outlet flap shall automatically open at sunrise and close after sunset. Before closing, there has to be a sound to signal the animal that the closing process starts soon.

30 minutes after the signal sound, the closing shall start. Therefore a time delay has to be set via time offset (-30).





Features – Setting the LOGO! clock

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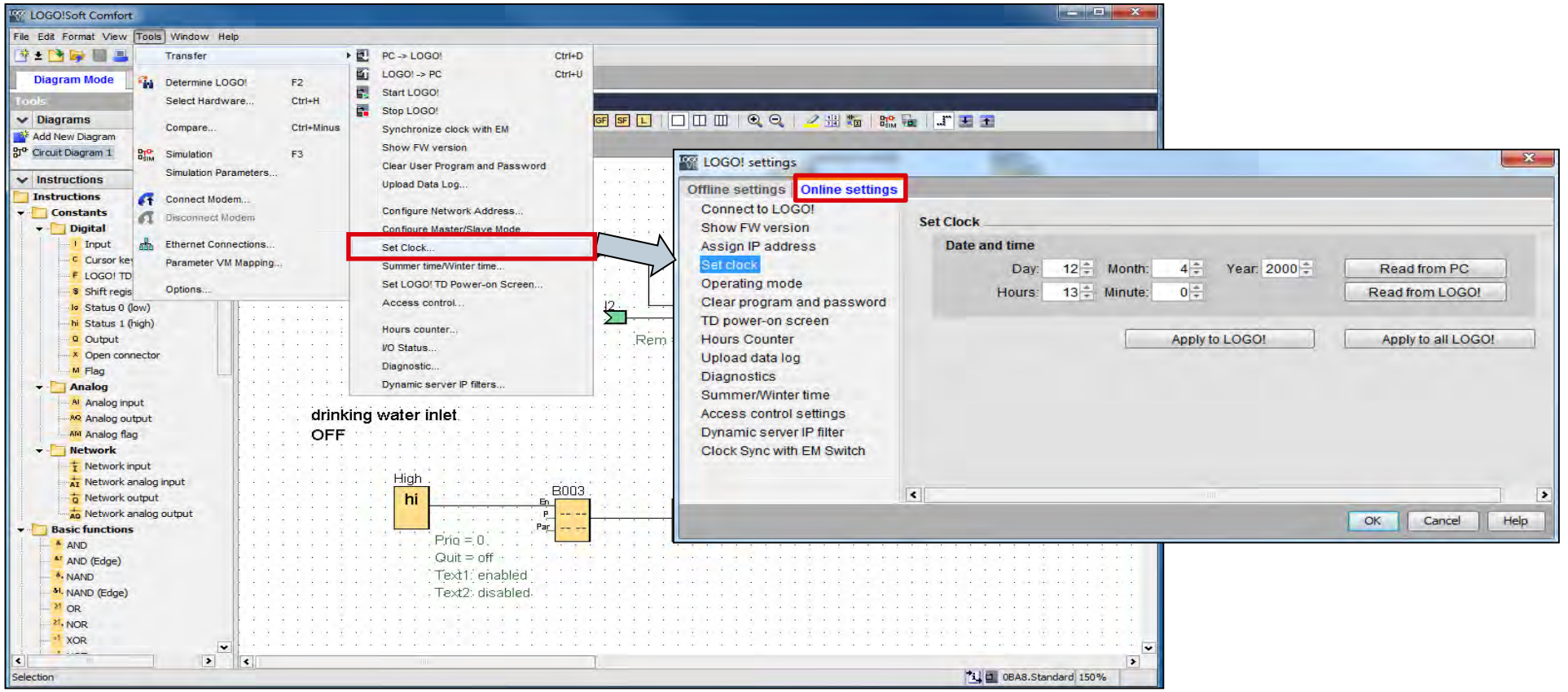
Ingenuity for life

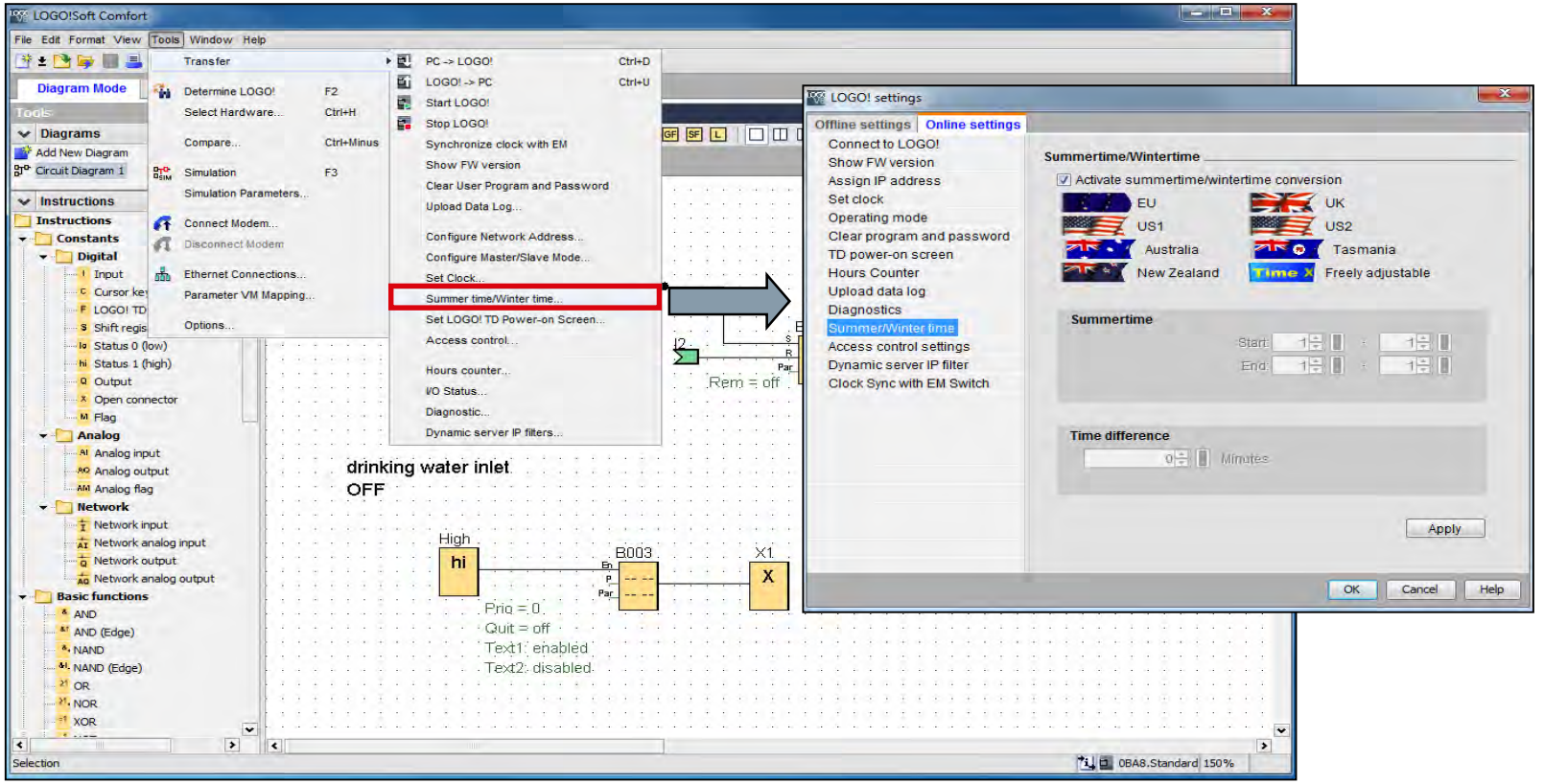
The system clock of LOGO! can also be set via the software. The LOGO! has to be connected to the PC. Alternatively it is possible to set the time directly on the device.



Features – Setting the LOGO! clock

There is also the possibility to configure an automatic summer / winter clock change via the software or directly on the device. As well the LOGO! has to be connected to the PC to set the time via the software.

Depending on the chosen region, the time will change automatically.



Features – Enable analog inputs (AI)

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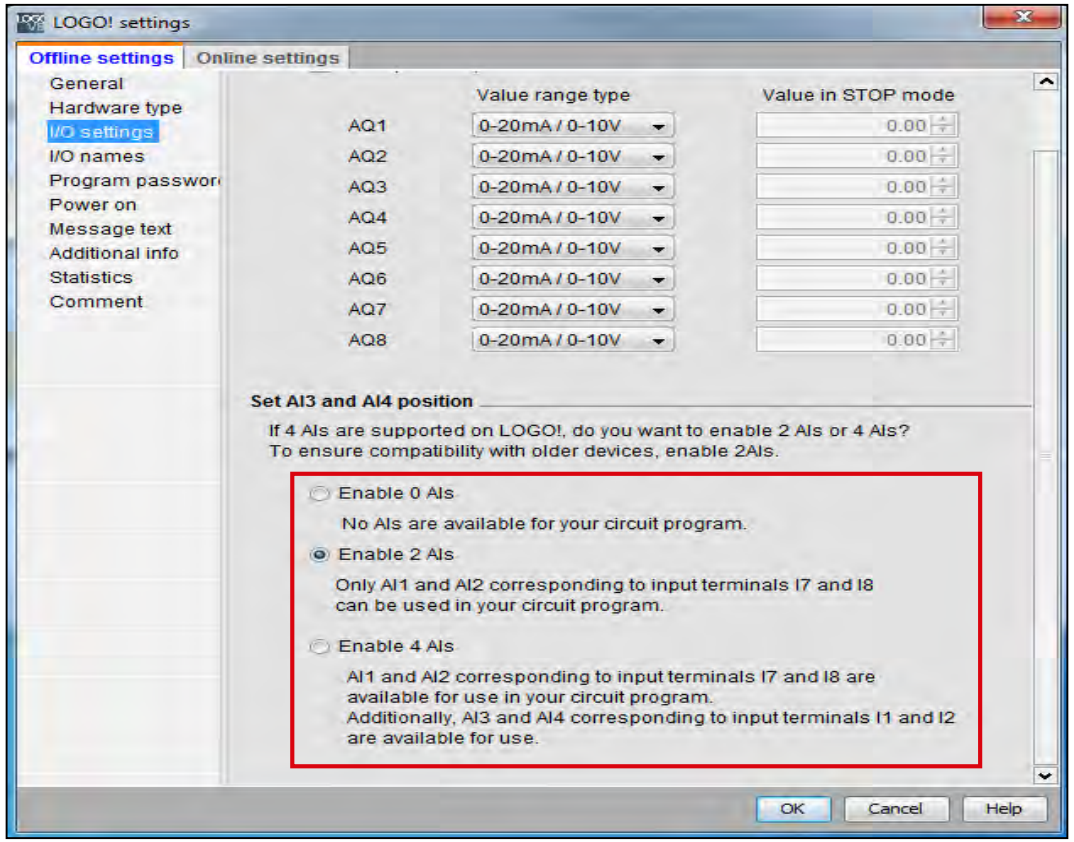
The AI position can be enabled via *File – Properties… - I/O settings*.

Enable none, 2 or 4 AIs:

2 AIs: Only AI1 and AI2 corresponding to input terminals I7 and I8 are available for use in the circuit program.

4 AIs: Additionally, AI3 and AI4 corresponding to input I1 and I2 are available for use.

To ensure compatibility with older devices, enable 2 AIs.



Features – Setting Power-on Screen for LOGO! TDE

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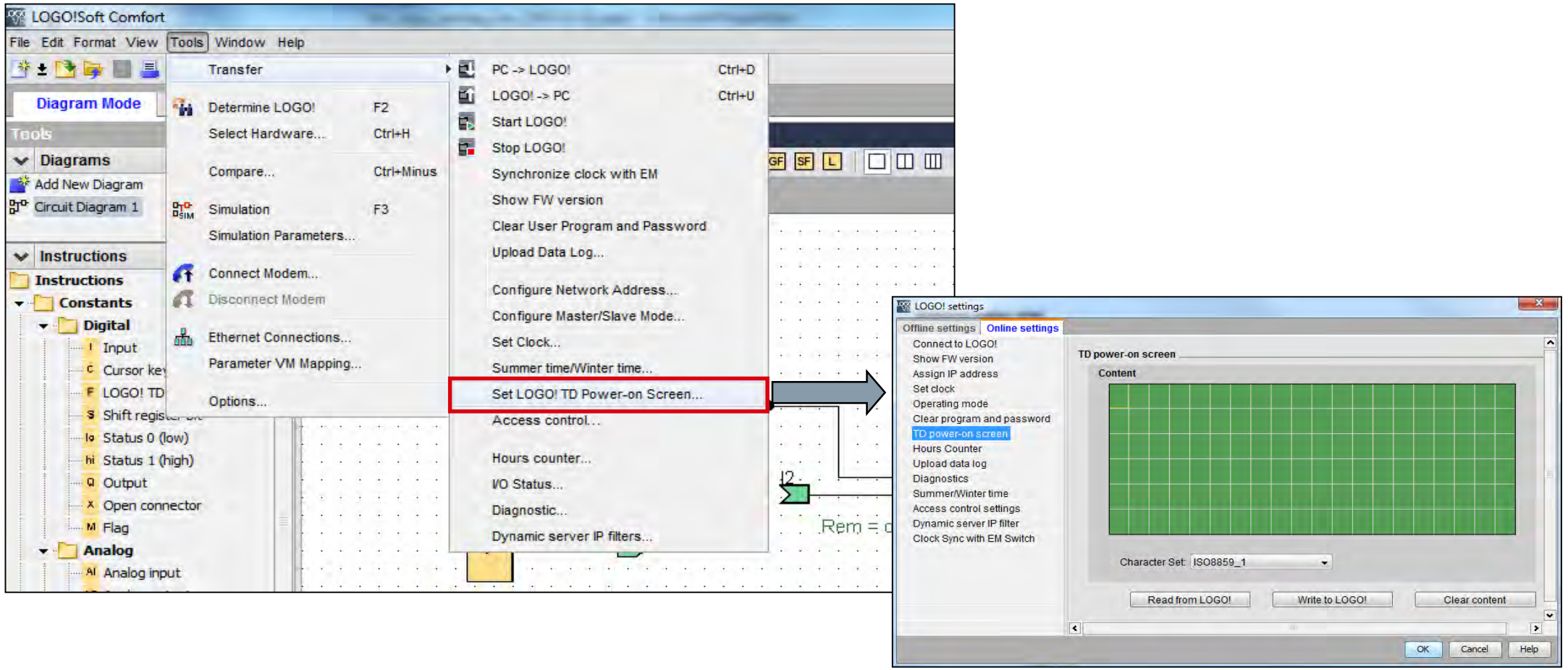
Ingenuity for life

Use *Tools – Transfer – Set LOGO! TD Power-on Screen…* to configure a power-on screen for the LOGO! TDE.



Features – LOGO! Access control

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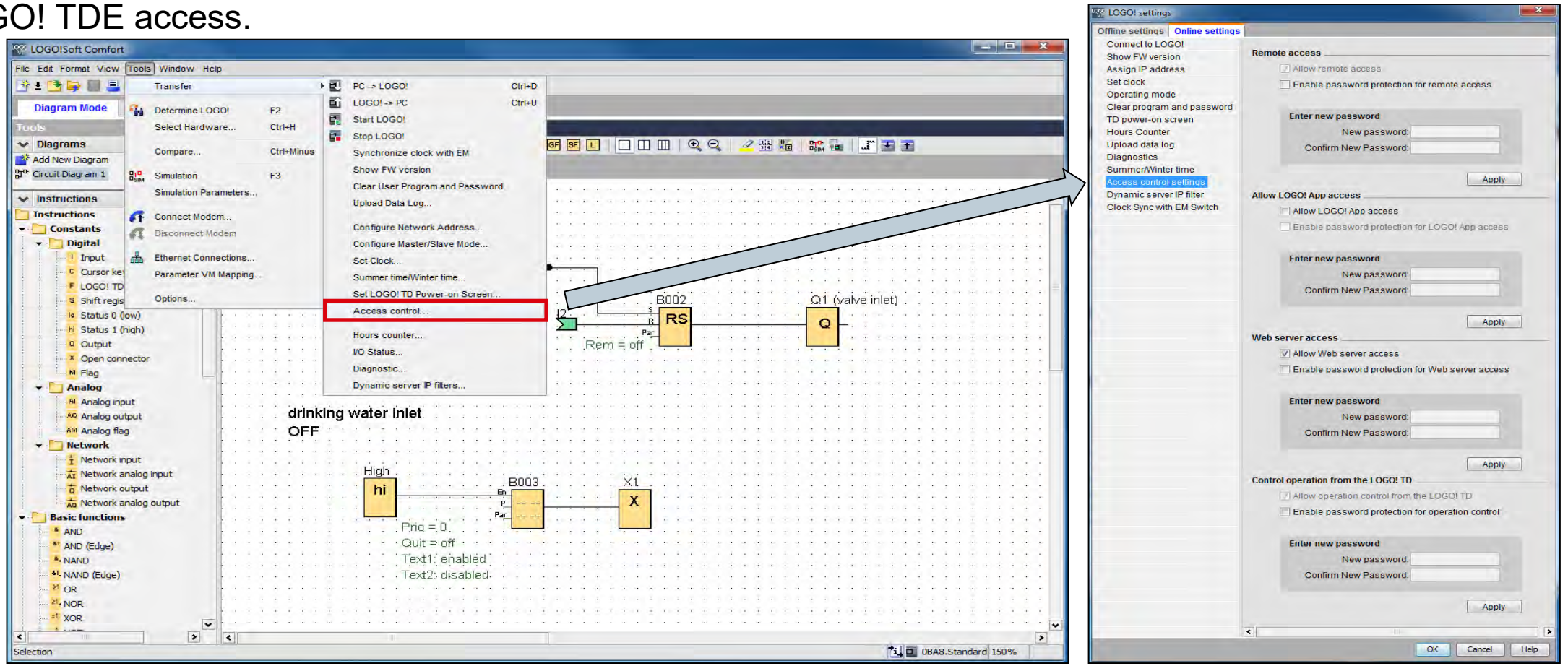
Ingenuity for life

Use Tools – Transfer – Access control for assigning a password for Remote -, LOGO! App -, Web server - and LOGO! TDE access.



Features – LOGO! network view

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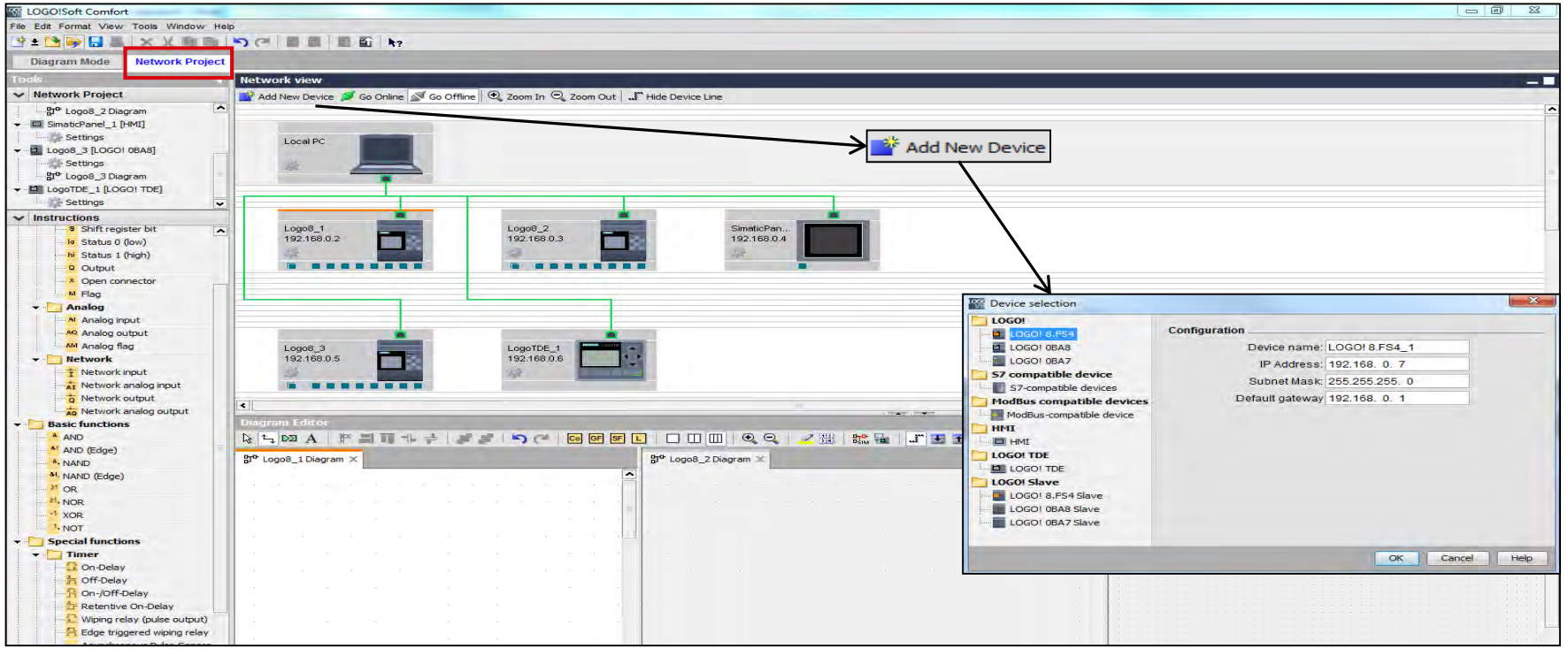
Ingenuity for life

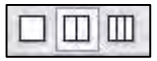
Via the *Network Project*, devices can be connected to a network. Devices can be added via *Add New Device*. Up to 16 participants are able to display and configure.

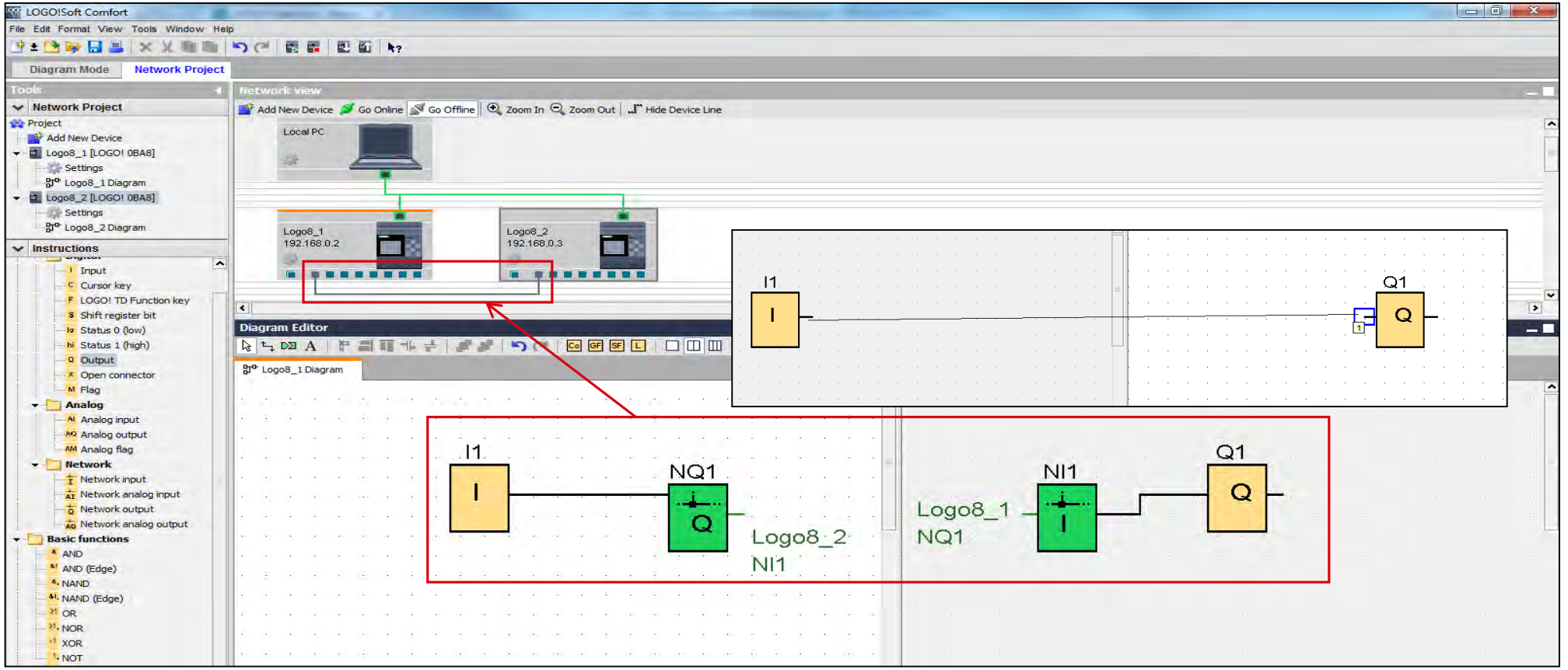
Addable devices:
LOGO! (also as Slave)
(8.FS4, 0BA8, 0BA7)
S7 compatible device
ModBus compatible device
HMI
LOGO! TDE



Features – LOGO! network view

SIEMENS
Ingenuity for life

Direct connecting of inputs and outputs between multiple devices via drag and drop. It is possible to display up to 3 programs at the same time via the buttons  .

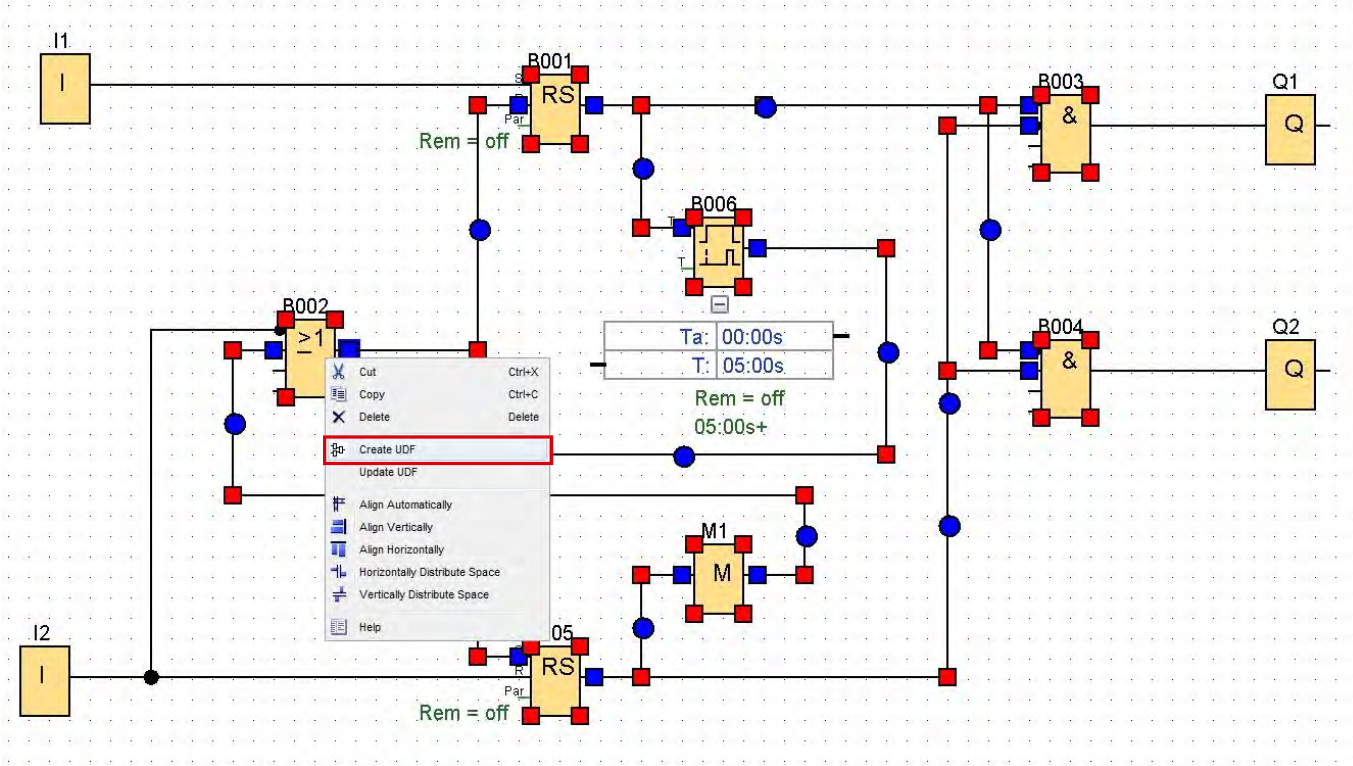


Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

Using LOGO! Soft Comfort V8, User-Defined functions (UDF) can be created and saved to a library. Program sections that are repeated can easily be inserted with a UDF as a function block into the circuit program, which significantly simplifies programming. It is possible to create a UDF from an existing circuit program or design a completely new with the UDF editor.

To create an UDF from an existing circuit program, select the requested section, click right anywhere and choose *create UDF*.

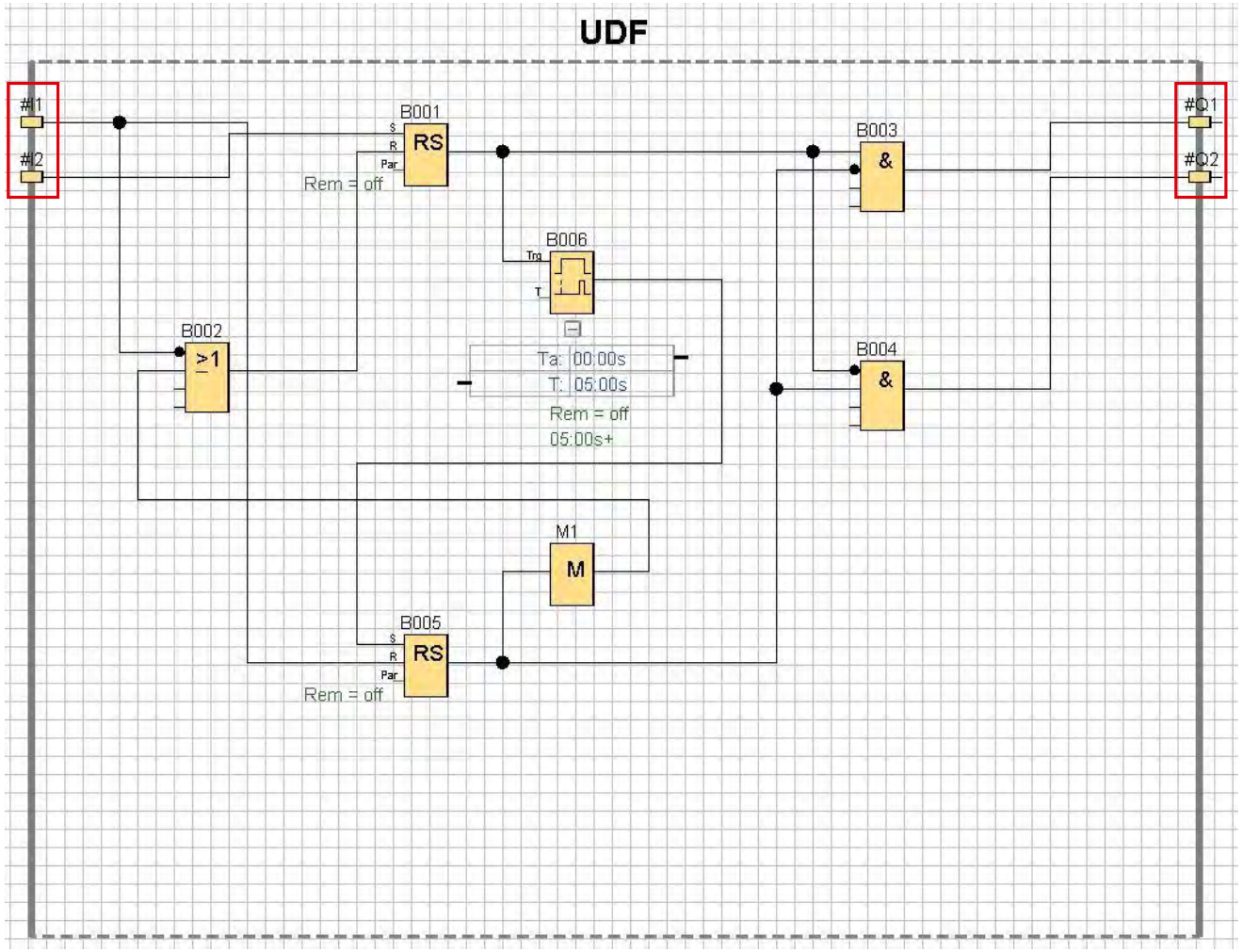


Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

The UDF editor is opened now with the selected selected section of the circuit program. LOGO! Soft Comfort V8 creates at the left and right edit area of the UDF editor automatically an input and output.

After creating, save as an UDF.

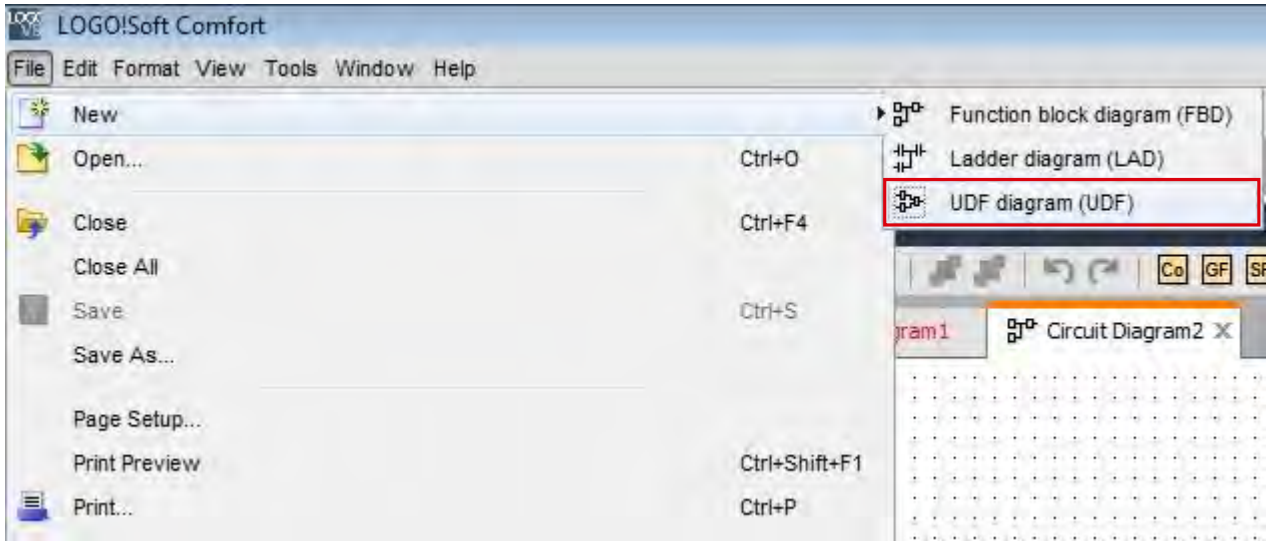


Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

To create a new User-Define function, select in the menu of LOGO! Soft Comfort V8 *File – New – UDF diagram (UDF)*.

Programming in the UDF editor is the same as in the function block diagram editor.

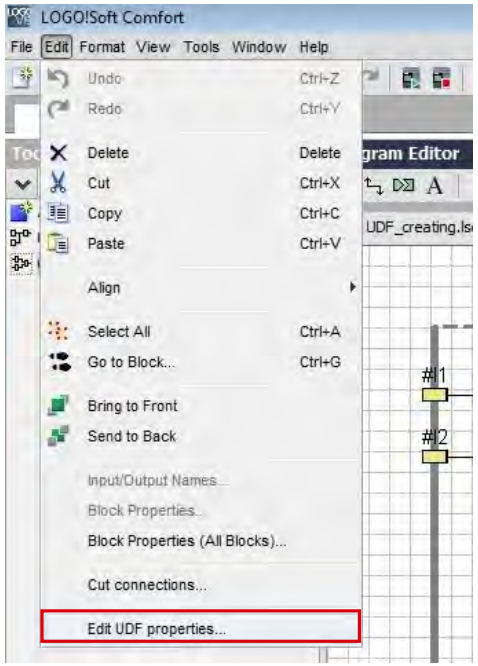


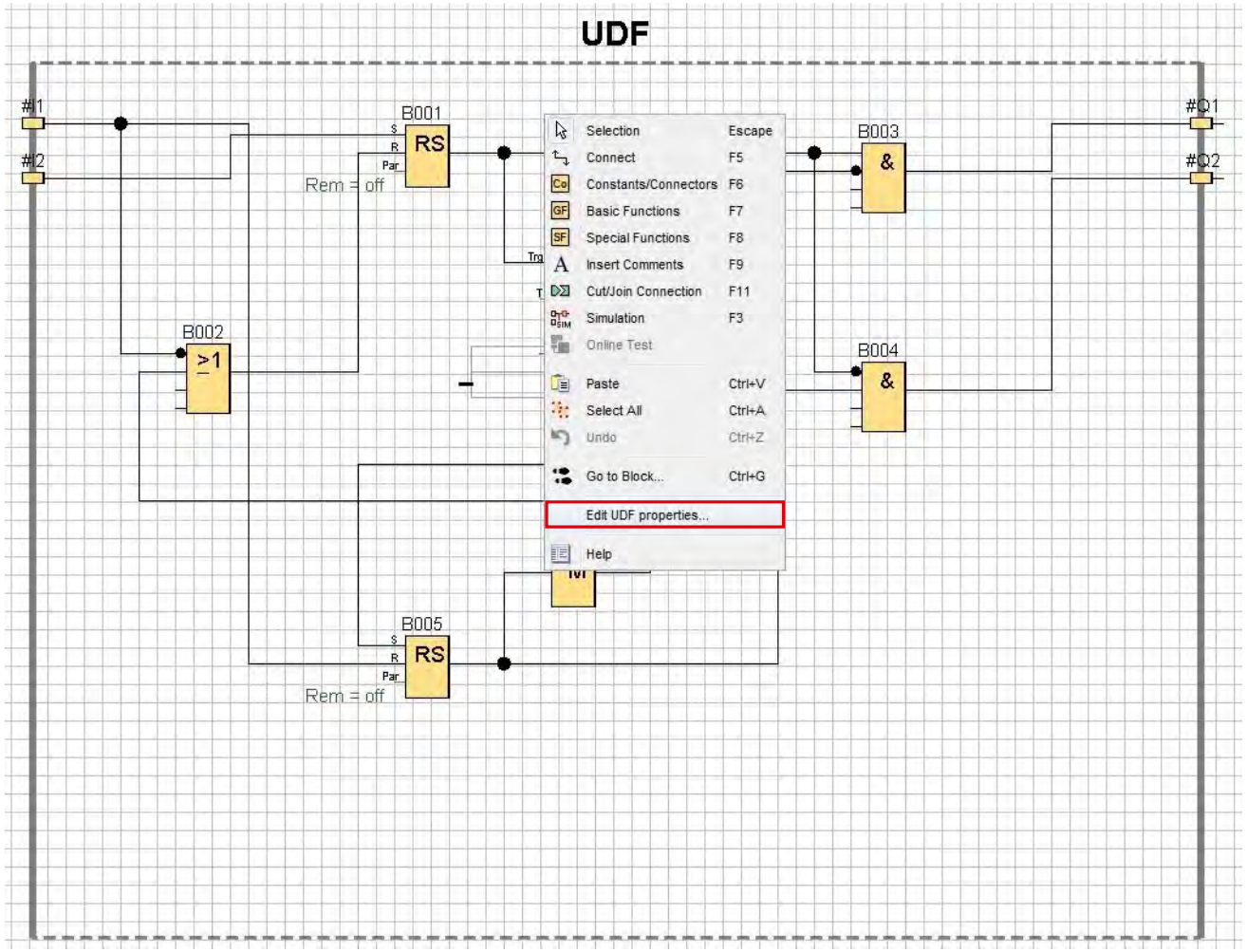
Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

To edit UDF properties, open via right-click in the UDF editor the shortcut menu and select the item *Edit UDF properties…*

Alternatively via *Edit – Edit UDF properties…*

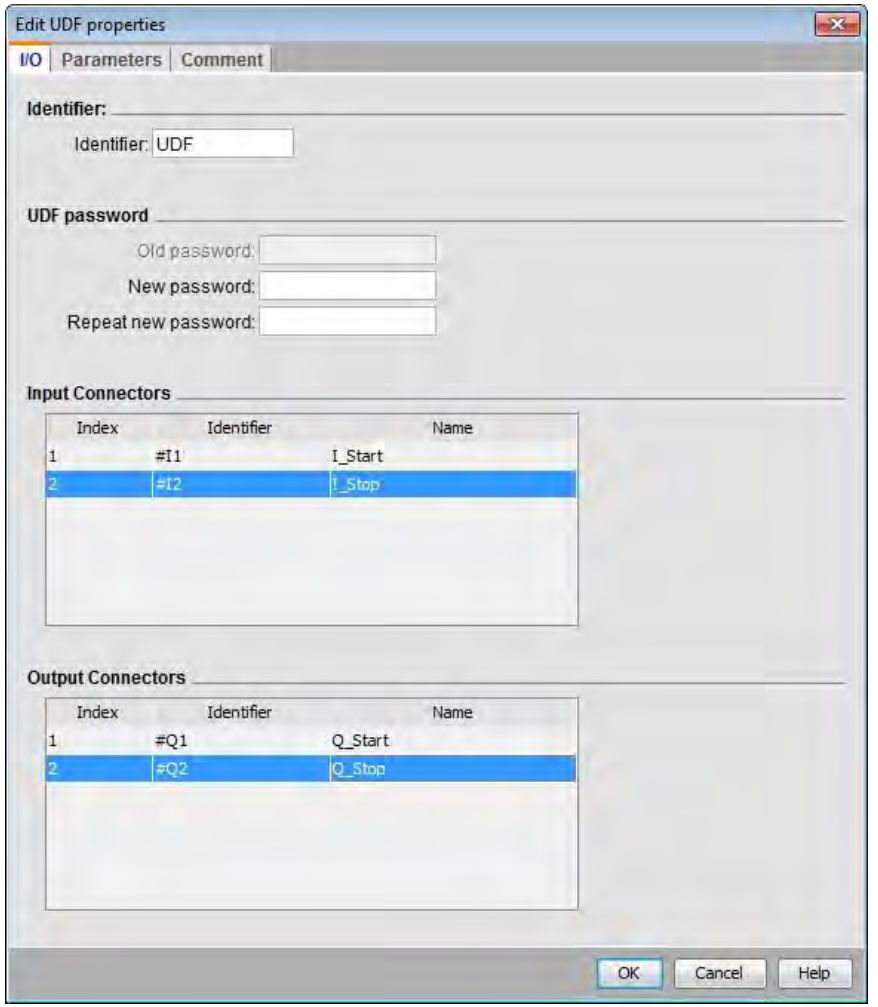




Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

In the dialog window that opens, can be assigned in the “I/O-specific” tab for the UDF a name, a password , as well as connector names For the inputs and outputs.

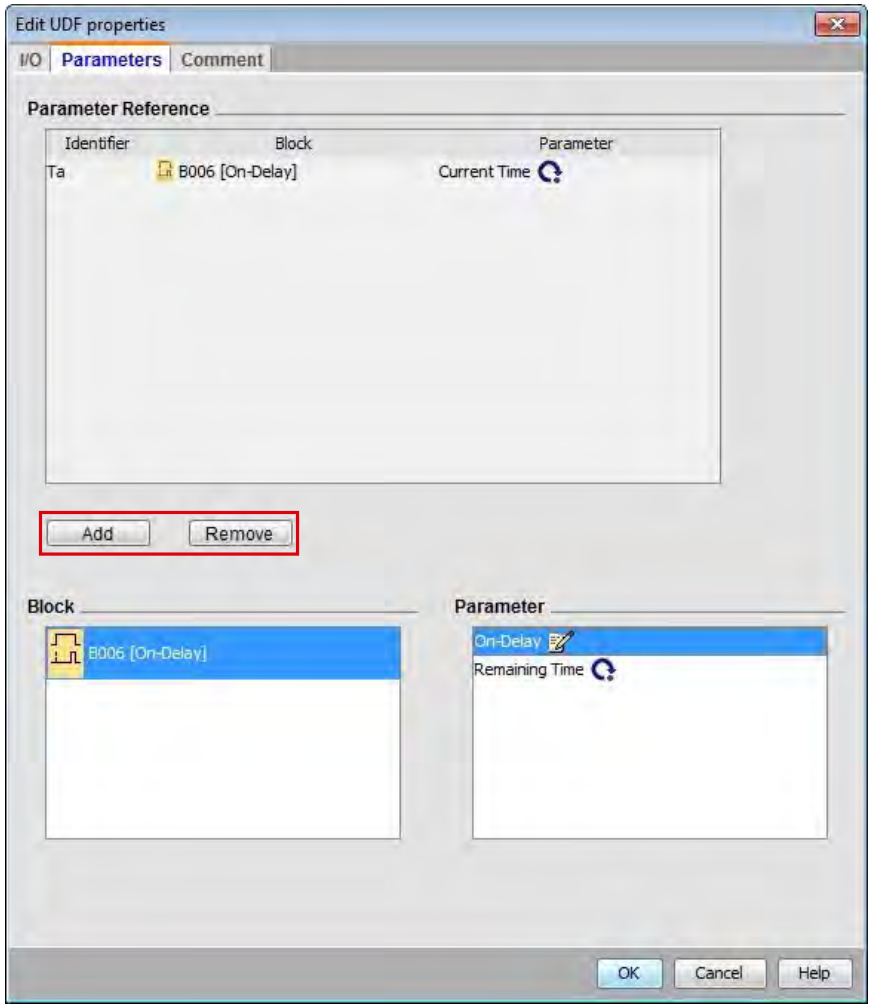


Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

In the “parameter-specific” tab it is possible to specify the parameters of the function blocks used in the UDF.
If the UDF is used afterwards in a program, the specified parameters of the UDF can be accessed for example as a parameter that is Displayed in a text message which can be edited.

To insert a new parameter, clock on a block, choose the parameter and click on *Add*. With the button *Remove* inserted parameters can be removed at any time. For each specified parameter additionally a name can be assigned in the *Identifier* tab.

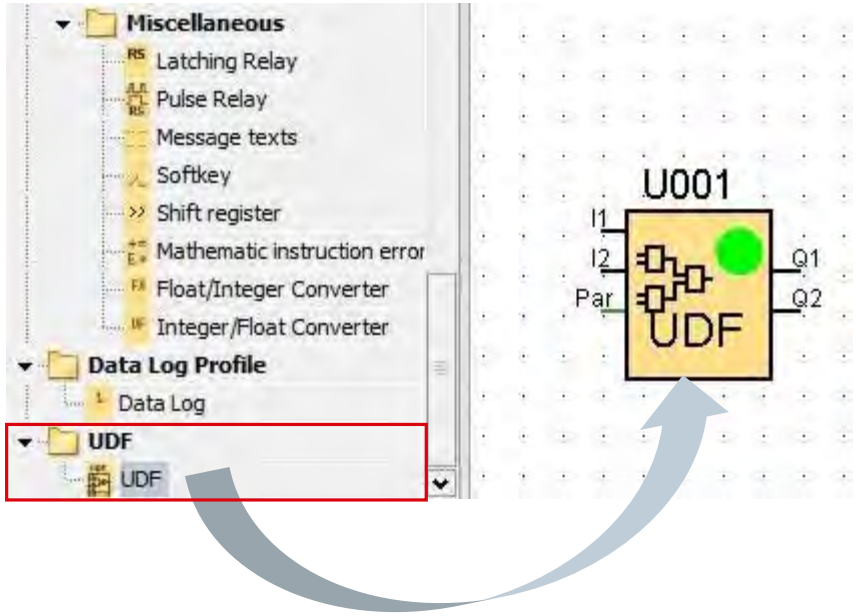


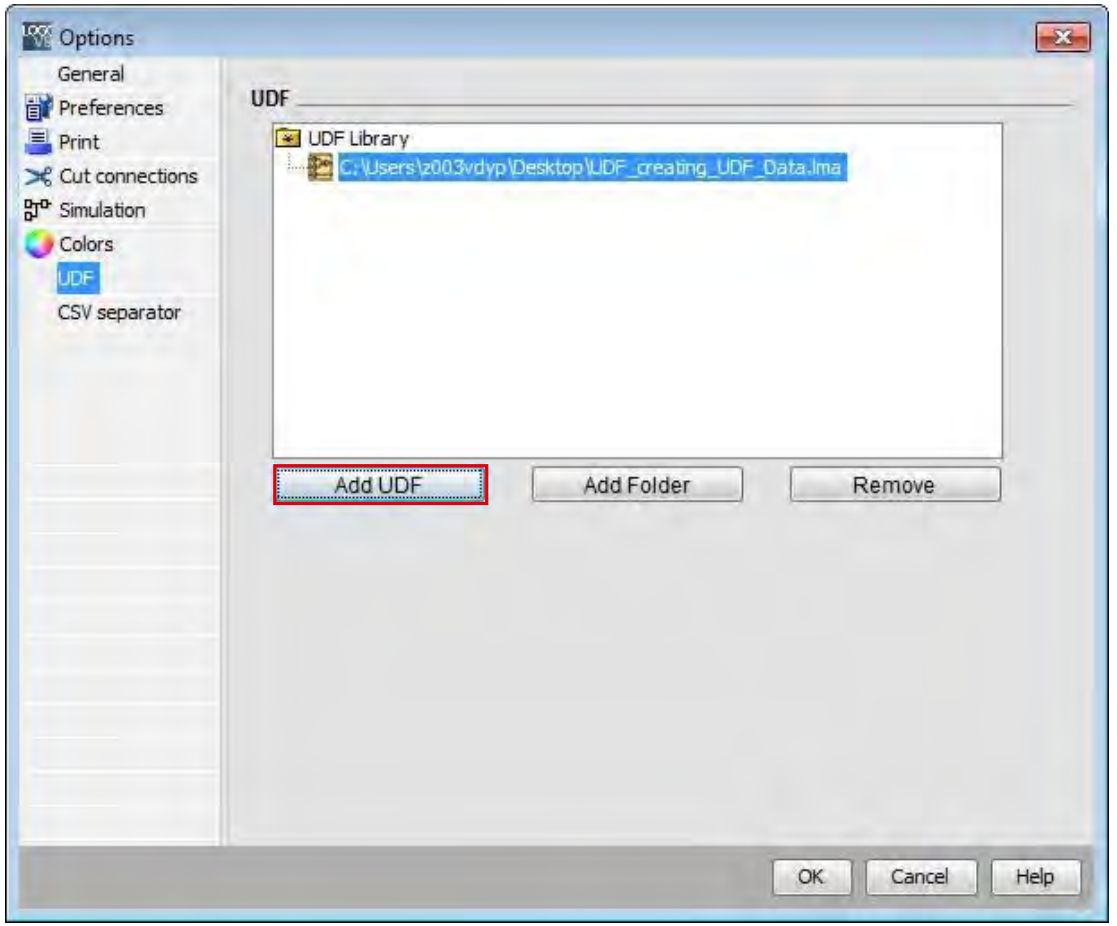
Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

To add the UDF to the library, navigate in the menu to *Tools – Options* and select the item *UDF*. Via the button *Add UDF*, the UDF can be added to the library.

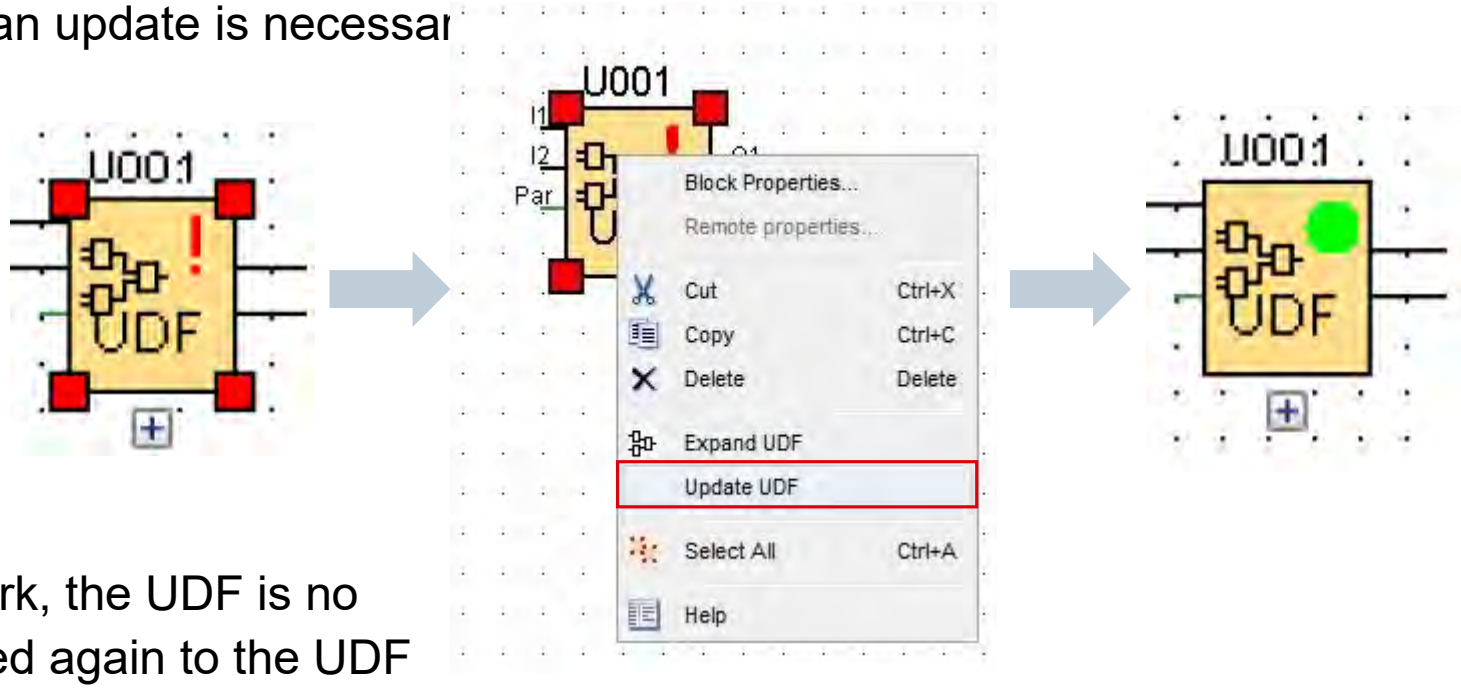
As soon as the UDF have been added to the library, the UDF block is immediately displayed in the instructions tree and can be used in the circuit program.



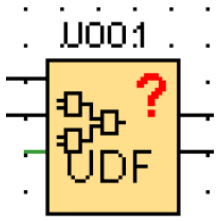


Features – Creating and managing User-Defined functions (UDF) with LOGO!8

If the UDF displays in the program a green mark, the UDF is up-to-date. If the UDF displays a red warning signal, the UDF has been edited and an update is necessar



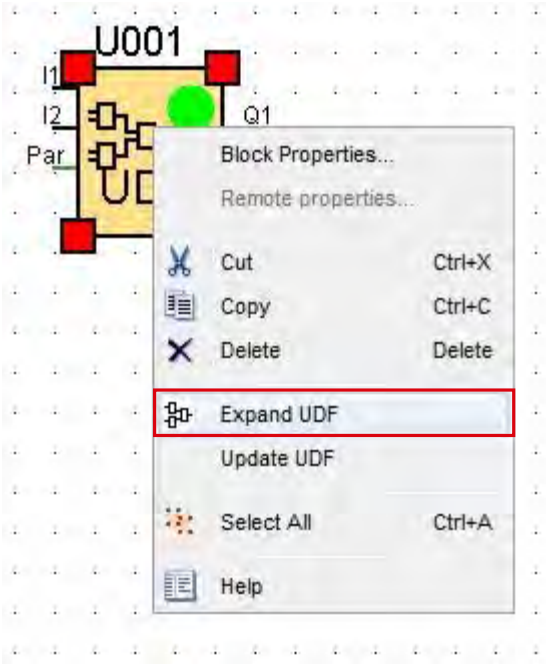
If the UDF displays a red question mark, the UDF is no longer available and has to be imported again to the UDF library.



Features – Creating and managing User-Defined functions (UDF) with LOGO!8

SIEMENS
Ingenuity for life

To insert or remove constants and function blocks in a UDF, open with right-click on the UDF block the shortcut menu and select the item *Expand UDF* to display the details of the UDF.



Alternatively the UDF file (with the ending .lma) can also be opened in the menu via *File – Open…*

Features – Master / master communication

SIEMENS
Ingenuity for life

This example uses two LOGO! Basic devices which are both configured as master. One master functions as server, the other as client.

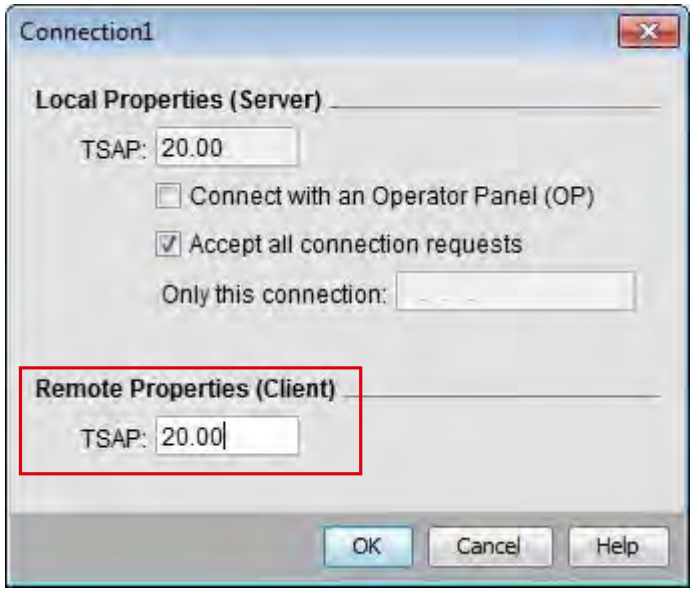
Start by opening a new program. Select *Tools – Ethernet connections…* to create a connection. After creating a new program, click on *Tools – Ethernet Connections…*

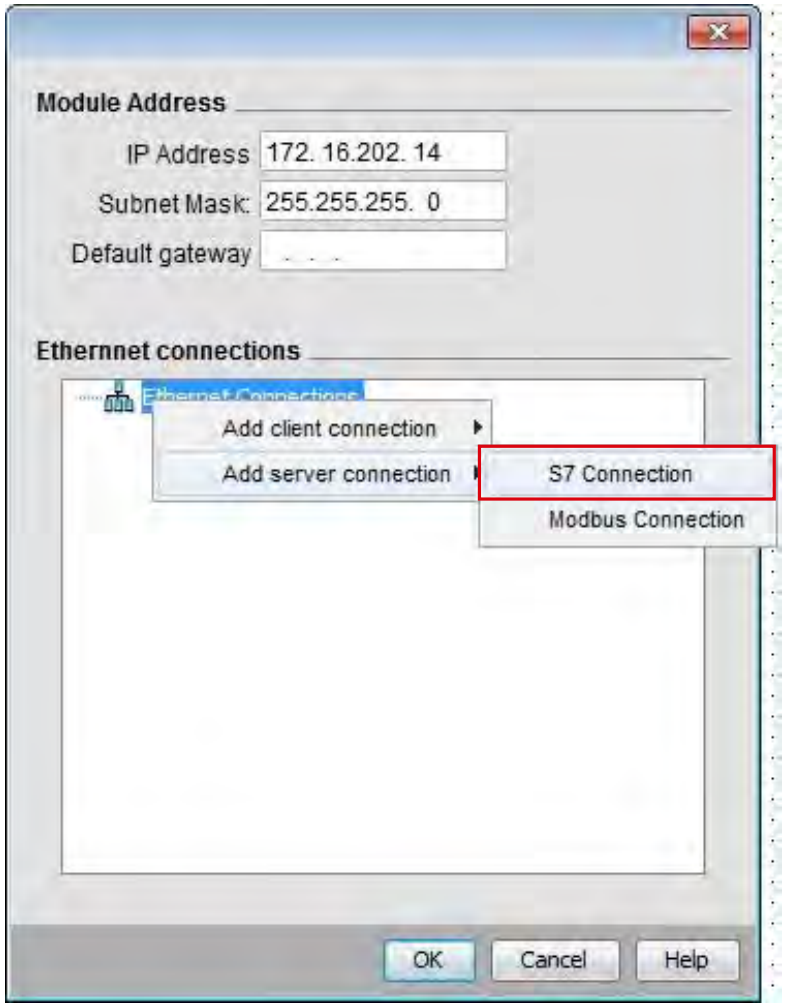
Features – Master / master communication

SIEMENS
Ingenuity for life

Assign the IP address and the subnet mask of the server. Afterwards create a new connection with a right-click on *Ethernet Connections* and add a connection *via Add server connection – S7 Connection*.

Configure the properties of the connection via double-click on the created connection. The new connection displays as a new tab.



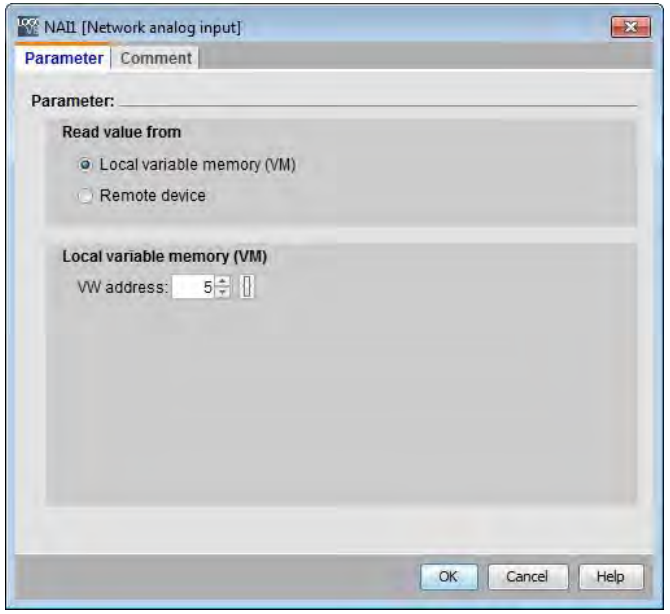


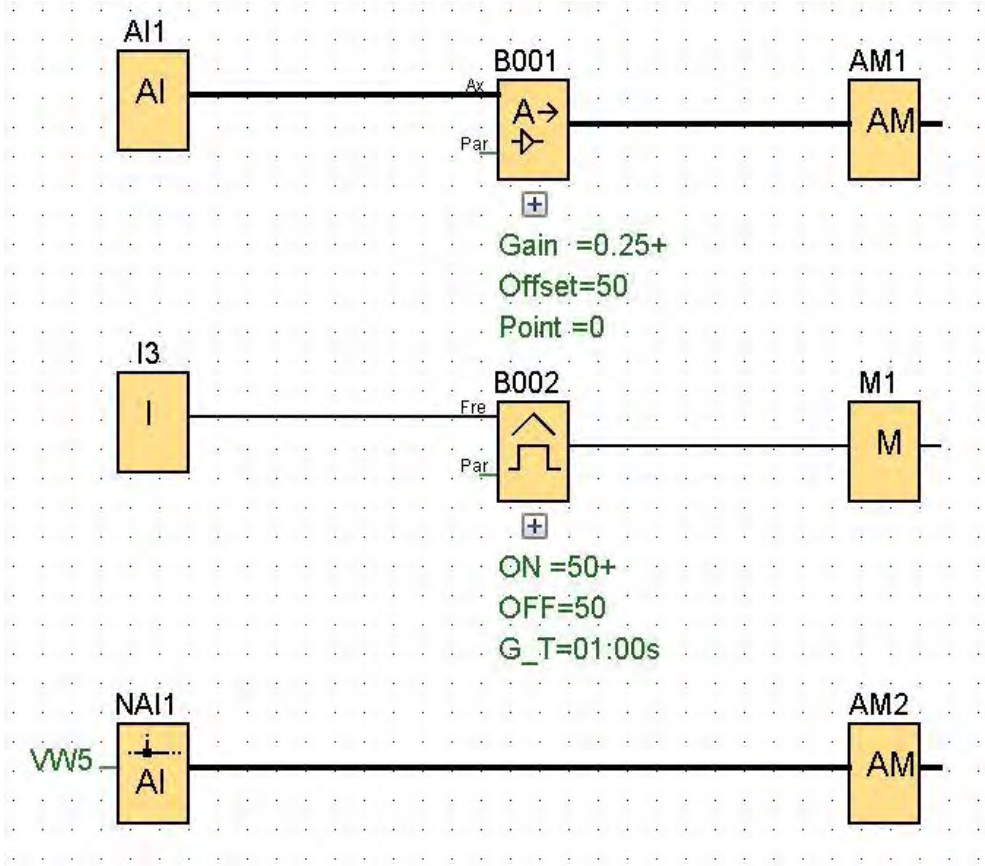
Features – Master / master communication

SIEMENS
Ingenuity for life

Then create the program. In this example the value of analog input AI1 and the frequency at I3 is written to the client. An input frequency is read by the client at the same time.

Configure the properties of the analog network input via double click on it. The value is read in from the variables. The VW Address is 5 as defined in the client connection





Features – Master / master communication

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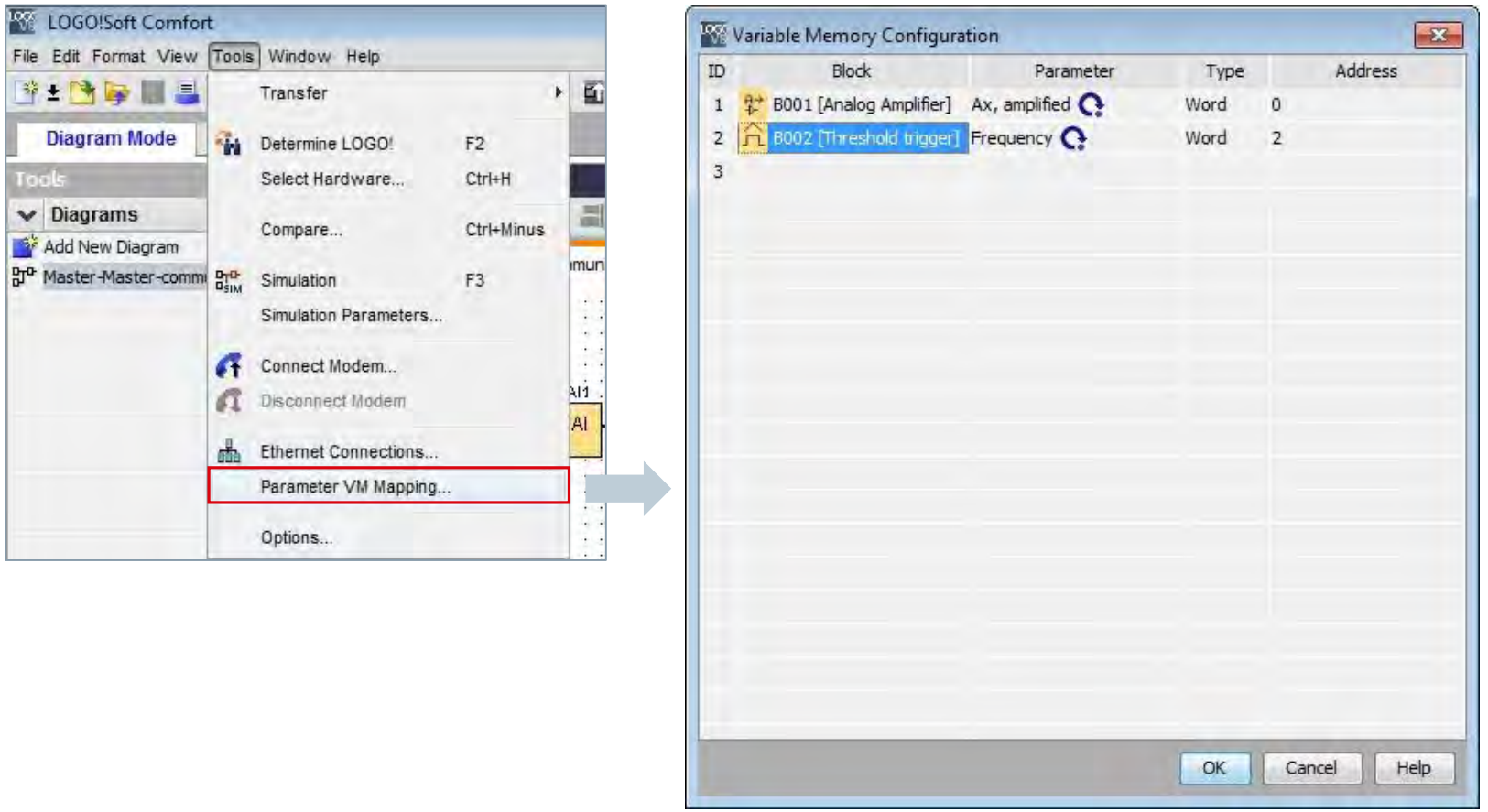
Ingenuity for life

Now edit the VW assignment. Select *Tools – Parameter VM Mapping…* and enter the parameters in the table.



Features – Master / master communication

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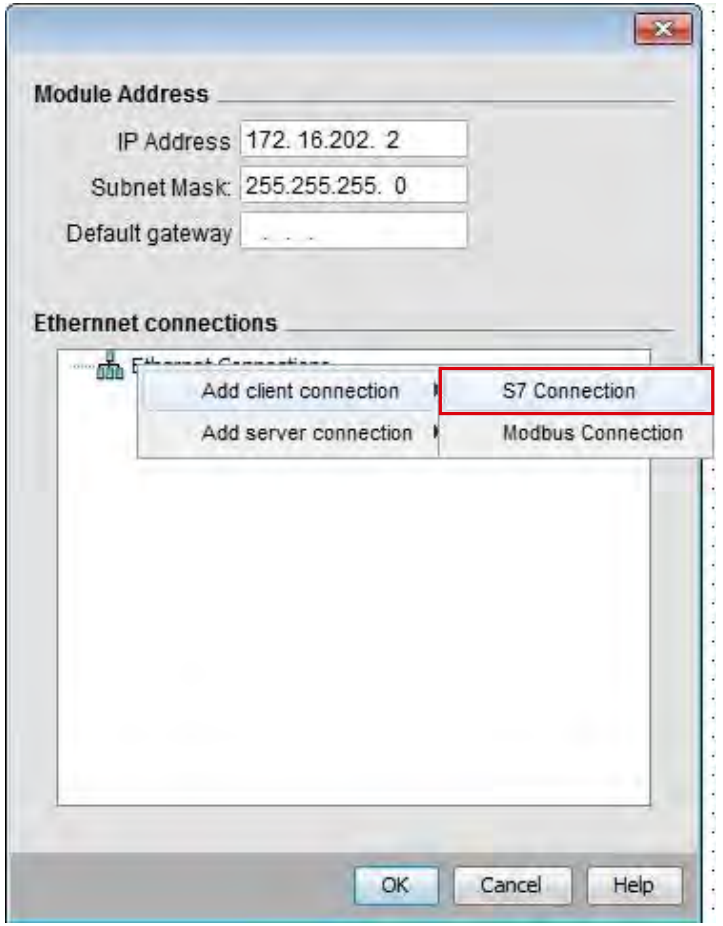
Ingenuity for life

Create a new program for the client device. After opening a new one, select *Tools – Ethernet Connections…* and assign the IP address and subnet mask of the client.

To create a new client connection, click right on *Ethernet Connections* and select *add client connection – S7 Connection*.



Features – Master / master communication

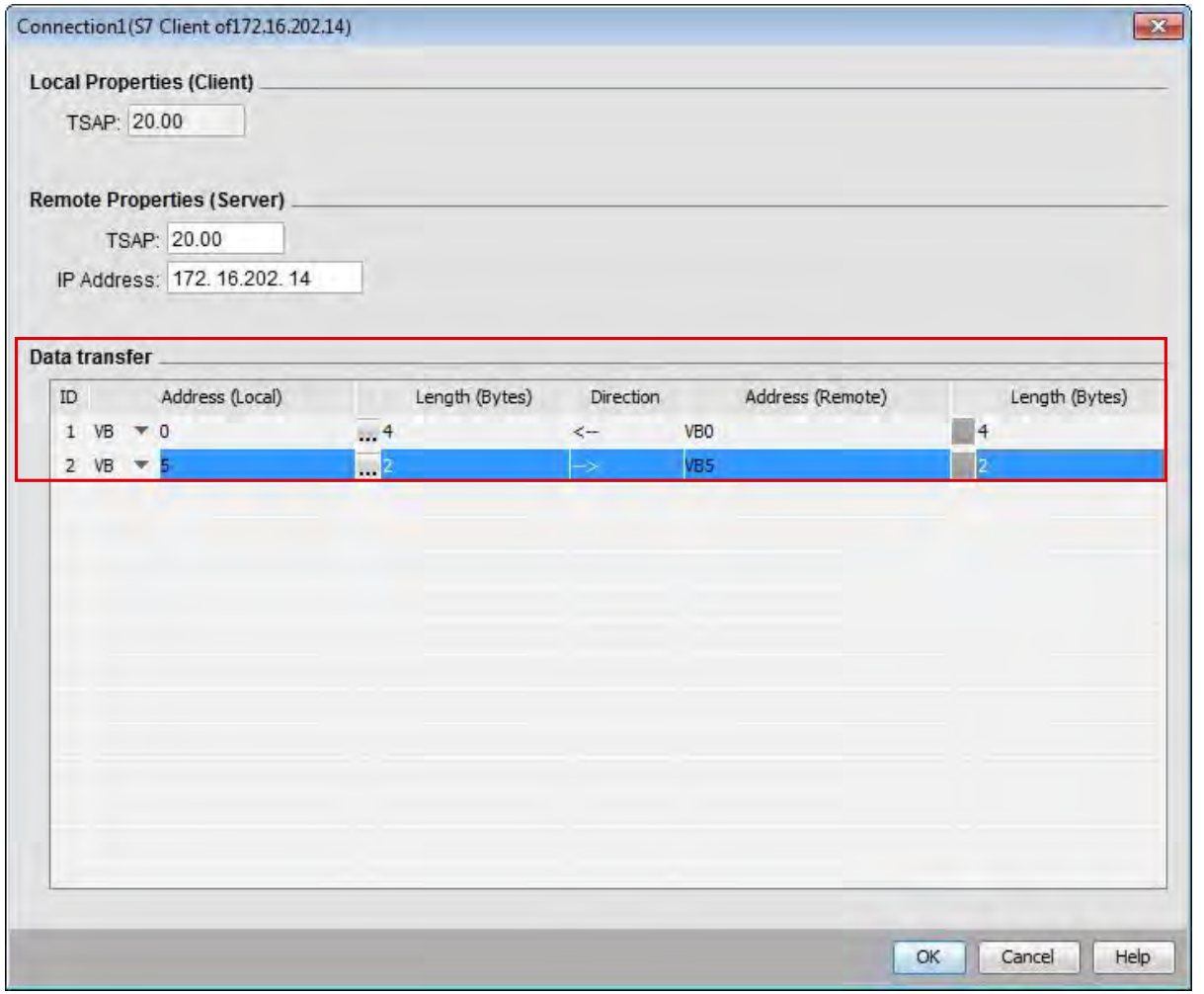
SIEMENS
Ingenuity for life

Configure the properties of the client connection.

In the table for data transfer, it is possible to specify how many data (length) are to be sent or received from the server, and which local and remote addresses they should have.
In this example 4 bytes (2 words, VW 0 and VW 2) are read by the server and 2 bytes (1 word, VW 5) is written to the server.

Data Transfer direction:

Read: Local ← Remote
Write: Local → Remote



Features – Master / master communication

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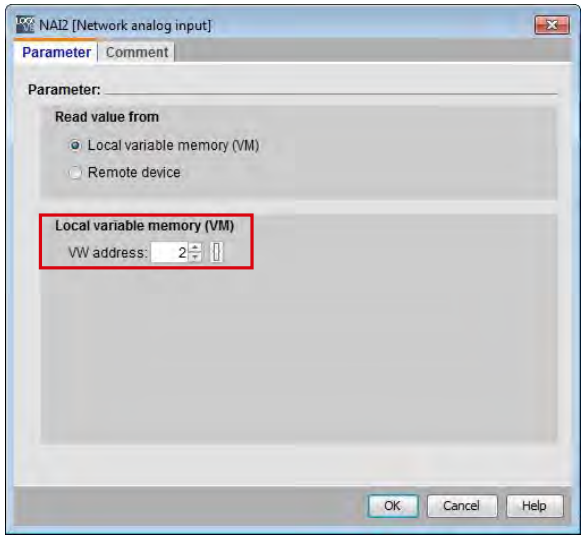
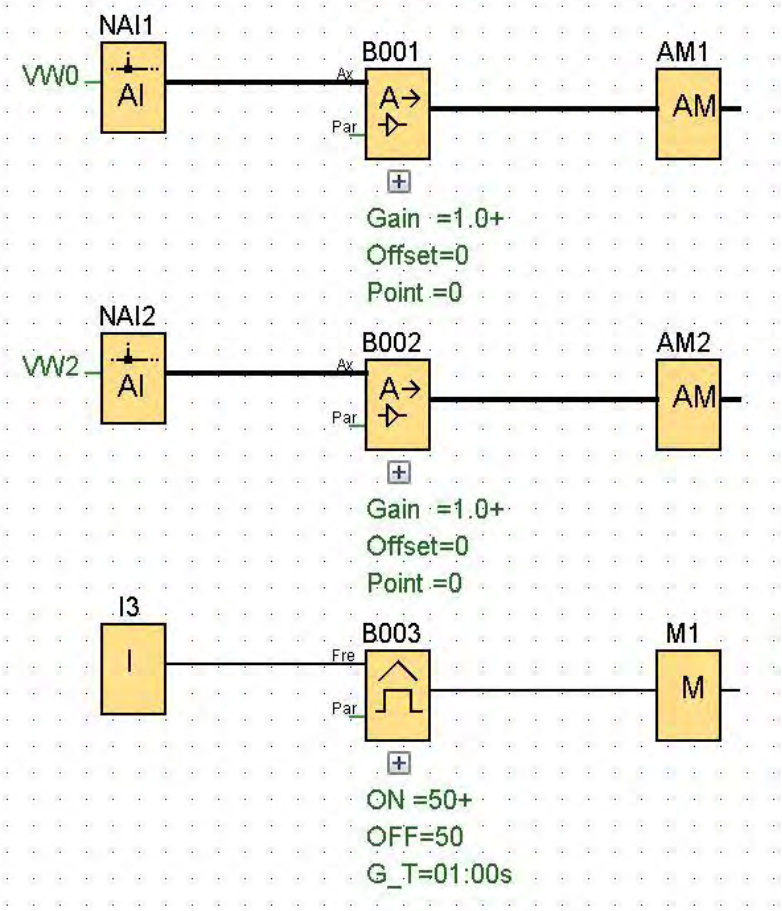
Ingenuity for life

Create the program by receiving the analog value and the input frequency from the server and by sending an input frequency to the server.

Parameterize the analog network inputs to receive the values. Enter the local addresses which are assigned in the table for data transfer.





Receive analog value from server

Receive frequency from server

Send frequency to server

Features – Master / master communication

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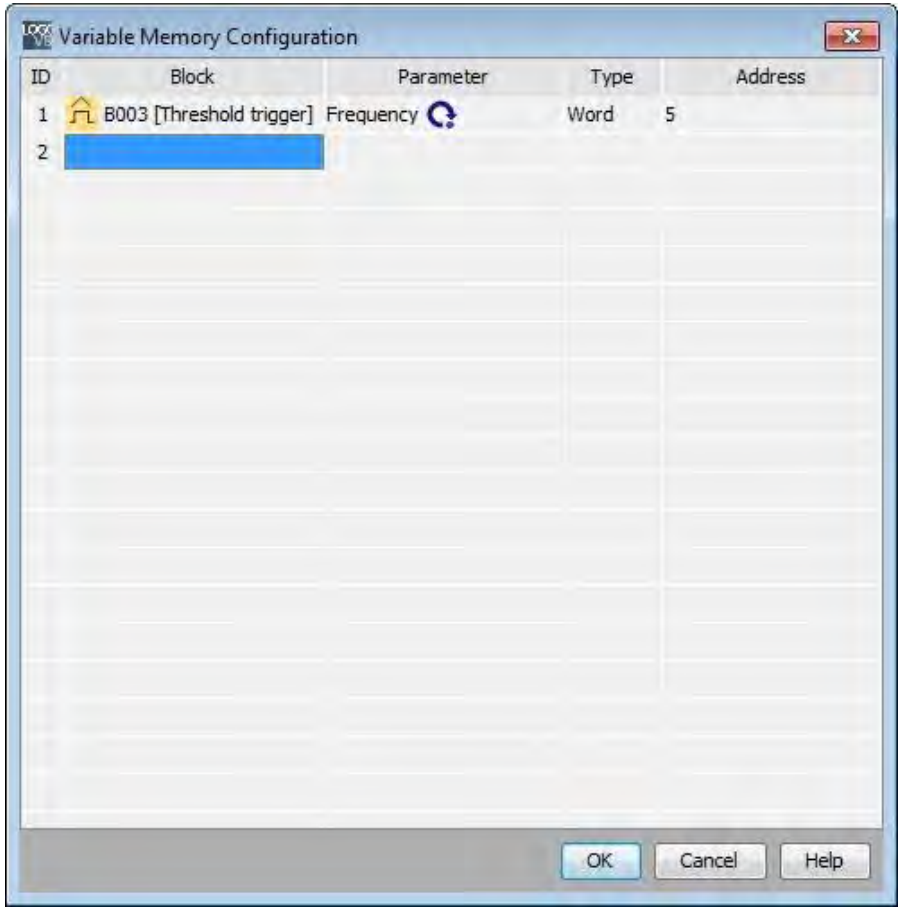
Ingenuity for life

At the end create the parameter VM assignment and specify in the table for data transfer that the input frequency is written to VW 5 of the server.

The settings for a master / master communication have now been preset and the functions are available.



Features – Master / slave communication

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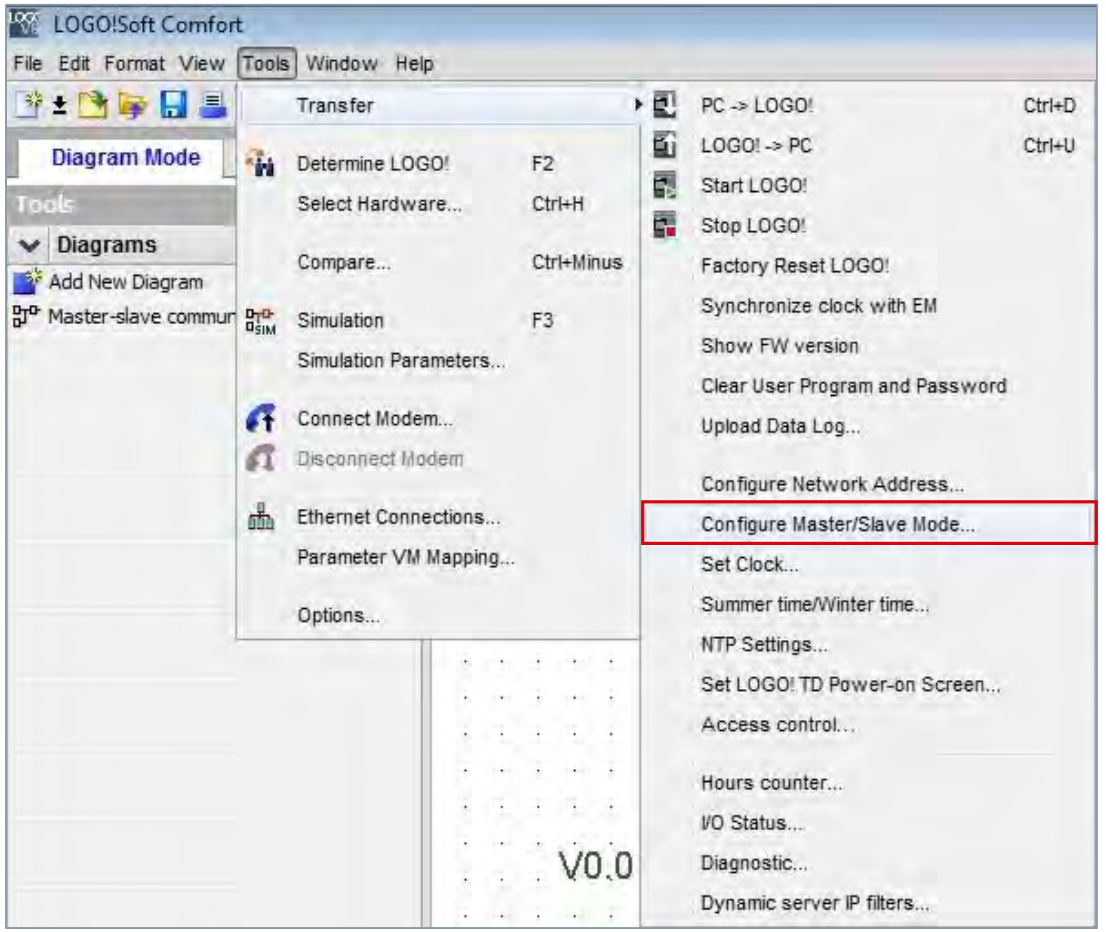
Ingenuity for life

This example uses two LOGO! Basic devices of which one functions as master and the other as slave.

Select *Tools – Transfer – Configure Master/Slave Mode* and set the addresses and the mode of the devices.

(The LOGO! Basic devices have to be connected to the computer)



Features – Master / slave communication

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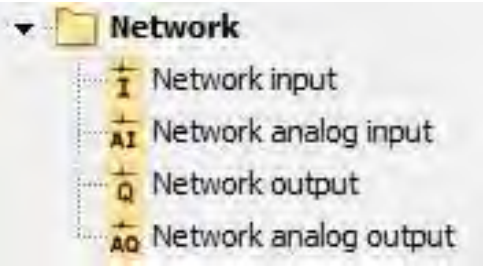
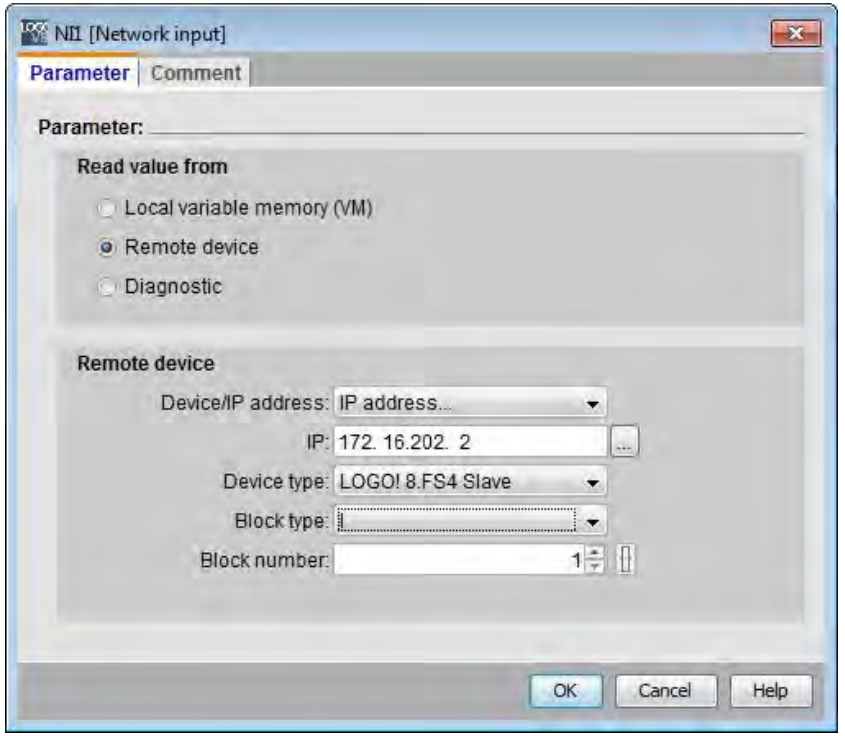
Ingenuity for life

Now create a program. To use inputs and outputs (analog or digital) form the basic device that has been defined as slave, select the functions under *Network* in the instruction tree.



Select a network input or output (analog or digital) and parameterize as follows
For example a digital network input:

Select *Remote device* and enter the IP address of the slave. Depending on the used device, the *Device type* has to be set to the <device version> Slave



Features – Master / slave communication

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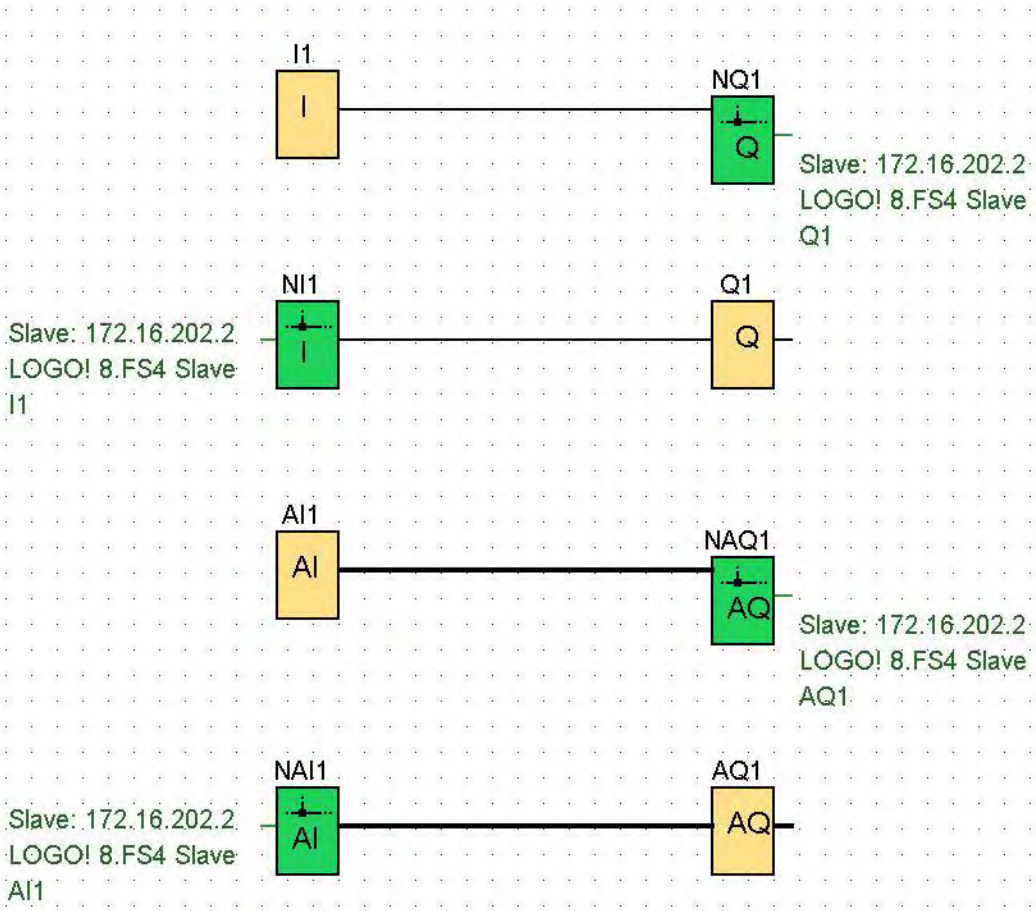
After setting all inputs and outputs of the slave device, the inputs or outputs are displayed in green. Additionally, the IP addresses and used device versions are displayed near to the input or output block.



LOGO! 8 in detail part 4 - Tasks and features
Thank you for your attention!

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