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LOGO! 8 TDE-Central control for roller blinds

LOGO! 8
LOGO! Soft Comfort V8.2

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1 Introduction

This application example offers a ready-made circuit for LOGO! 8 for the control of up to 8 roller blinds in a building via the function keys of the external LOGO! text display.

The integrated functions of a LOGO! 8 offer many additional possibilities to solve tasks in building management quickly, simply and automatically.

With LOGO!, prefabricated function blocks support project creation, e.g. weekly time switch, pulse generator, astro timer, seasonal time switch, stopwatch and simple logic gates.

The LOGO! text display (TDE) and the integrated web server of the LOGO! 8 offer additional options for operation and monitoring using function keys and message texts. This enables you to call up and control functions via the Internet; please refer to the individual security requirements "Security Notes".

Task

With the LOGO! the blinds installed in or on the house are raised and lowered.

The selection of the roller blinds should be made via the LOGO! TDE.

This central control system for roller blinds is intended to enable connection to a network in order to switch functions on and off, e.g. via a smartphone/tablet, as shown by [Figure 1-1](#).

Figure 1-1: Central control with the LOGO! TDE in building automation



Advantages of LOGO! over a conventional electrical installation

The simple integration of LOGO! 8 offers you the following benefits:

- Extensibility of the software program to include further tasks (room lighting, staircase lighting, safety and monitoring functions, etc.)
- Straightforward, star-shaped wiring of the components.
- Use of simple switches (circuit breakers) or pushbuttons instead of complex toggle or two-way switches.
- Integration of LOGO! inputs and outputs into a KNX system

Target group

This application example is intended for specialist staff for electronics engineering.

2 Structure and description

2.1 Components used

This application example includes two extension levels for your project.

The basic example uses only the LOGO! basic unit, with 4 switchable outputs, and is preferably used to illustrate the switching program. The simulation function of LOGO! Soft Comfort is available for this purpose. You can expand this switching program.

For the expanded example the maximum configuration with 20 switchable outputs was configured for LOGO!. The advantage for you is that you shorten the switching program according to your application in line with Chapter [4.2.3](#).

The Application Example was created with the components from [Table 2-1](#).

Table 2-1: Hardware and software components for the application example

Component	Number	Article number	Note
LOGO! Soft Comfort V8.2 DVD	1	6ED1058-0BA08-0YA1	You will find an upgrade to V8.2 at: https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html
LOGO! 230RCE	1	6ED1052-1FB08-0BA0	230V version with 4 relay outputs
LOGO! TDE	1	6ED1055-4MH08-0BA0	Optional components
Expansions	Number	Note concerning the maximum extension of LOGO!	
LOGO DM8 230R	2 ⁽¹⁾	6ED1055-1FB00-0BA2	4 relay outputs
LOGO DM16 230R	1 ⁽¹⁾	6ED1055-1FB10-0BA2	8 relay outputs

⁽¹⁾ You can replace two identical DM8 expansion modules with one DM16 expansion module of the same type (and vice versa) without changing the circuit program.

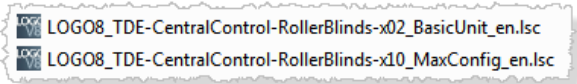
The components used are LOGO! 8 for 230V with the corresponding expansion modules for 230V. The connection diagram and further indications can be seen in Chapter [3.3](#).

Note

However, you have the possibility to create other configurations, e.g. with 24V devices. Mixed operation, as described in Chapter [3.4](#), is also possible.

This application example consists of these instructions and two LOGO! switching programs for 4 (basic device) and 20 (maximum configuration) digital outputs.

Table 2-2: Connectors for our application example

Component	File name	Note
Documentation	109755865_LOGO8_TDE-CentralControl-RollerBlinds_en.docx	-
LOGO! 8 Programs	109755865_LOGO8_TDE-CentralControl-RollerBlinds_en.zip 	Requirement: LOGO! Soft Comfort V8.2

2.2 LOGO! Expansions

A wide range of expansion modules is available for the LOGO! to individually expand your configuration. In this application example only digital expansion modules are used on a LOGO! 8.

The maximum expansion of a LOGO! 8 depends on the basic device; a network configuration enables more comprehensive configurations.

This is the quantities structure for the maximum possible expansion, [Table 2-3](#).

Table 2-3: Maximum Configuration of LOGO! 8 control

Number For a (LOGO!)	Number of LOGOS!s in the network	Abbr.	Designation	Description
24	88 ⁽¹⁾	I	Input	Digital inputs
20	80 ⁽¹⁾	Q	Output	Digital outputs
8 ⁽²⁾	40 ⁽¹⁾⁽²⁾	AI	Analog input	Analog inputs
8 ⁽²⁾	24 ⁽¹⁾⁽²⁾	AQ	Analog output	Analog outputs

(1) If your requirement includes further in- and outputs, you can join together several LOGO! 8 or LOGO! 7 in a network. Via a master/slave configuration, you can combine up to (88 DI, 80 DQ, 40 AI and 24 AQ) in one circuit program.

(2) In this application example no analog modules are used!

For specific information about LOGO! output modules, please refer to the LOGO! manual or the following website:

- <https://w3.siemens.com/mcms/programmable-logic-controller/en/logic-module-logo/modular-expansion-modules/Pages/Default.aspx>

2.2.1 LOGO! TDE

The LOGO! TDE external text display for LOGO! 8 provides you with an inexpensive and central user interface for your applications. You have the possibility to adjust parameters and use the LOGO! TDE for troubleshooting.

The configuration of LOGO! TDE is done using the same function block as for the internal display.

The use of the TDE allows the display of all messages via the integrated web server and thus also the control of applications via a smartphone.

3 Commissioning

This Chapter includes basic information on the commissioning of the LOGO! 8 applied here. For further information on mounting and wiring, use the LOGO! 8 manual and follow the connection instructions in the product information supplied with your device.

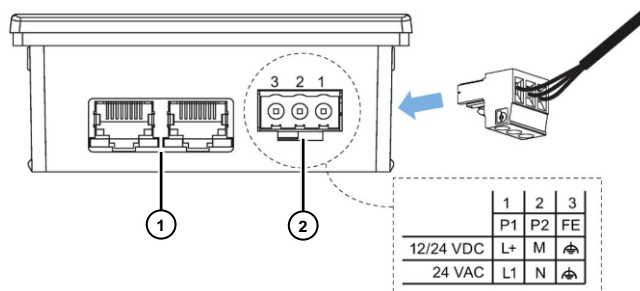
3.1 Connecting LOGO! TDE

The LOGO! TDE must be operated with a voltage of 12V DC or 24V AC/V DC and is installed separately. Siemens recommends protecting the LOGO! TDE by means of an 0.5 A fuse at the power supply.

The voltage connection is not polar. If you connect a DC power supply to the LOGO! TDE, you can connect the positive supply line or the negative supply line according to [Figure 3-1](#) (2) either to pin 1 or to pin 2. Pin 3 must be connected to earth.

Communication to LOGO! takes place via the Ethernet interface (1).

Figure 3-1: Hardware structure for application example



3.2 Wiring the LOGO!

When wiring up LOGO!, use a screwdriver with a blade 3 mm in width. Wire-end ferrules are not required for the terminals.

You may use conductors that fulfill the following requirements:


- Cross sections of up to $(1 \times 2.5 \text{ mm}^2)$ or $(2 \times 1.5 \text{ mm}^2)$ for every other terminal chamber
- Wiring material: Cu
- Nominal insulation temperature: 75 °C
- Tightening torque: From 0.5 Nm to 0.6 Nm or 4.5 in.lbf to 5.3 in.lbf.

Notes

1. LOGO! is a switching device with protective insulation. You must connect the FE terminal to earth.
2. After installation, the terminals must be covered. To protect LOGO! sufficiently against inadmissible contact with live parts, the country-specific standards must be observed.
3. A metal oxide varistor (MOV) can be used for voltage peaks on the supply line. Make sure that the operating voltage of the varistor is at least 20 % higher than the nominal voltage (e.g. S10K275).

3.3 Connecting LOGO! and the digital modules to 230 V

Multi-phase operation



CAUTION

Not observing the following instructions can lead to injury!

The expansion modules DM8 230R and DM16 230R must be operated with the same type of power supply (DC or AC) as the connected 230V version of the LOGO! basic module!

The same supply output "+/-" (direct voltage) or "N/L" (alternating voltage) must be connected to the same phase on both the DM8/16 230R expansion module and the connected LOGO! basic unit!

The LOGO! 230RCE features 8 digital inputs in two groups.

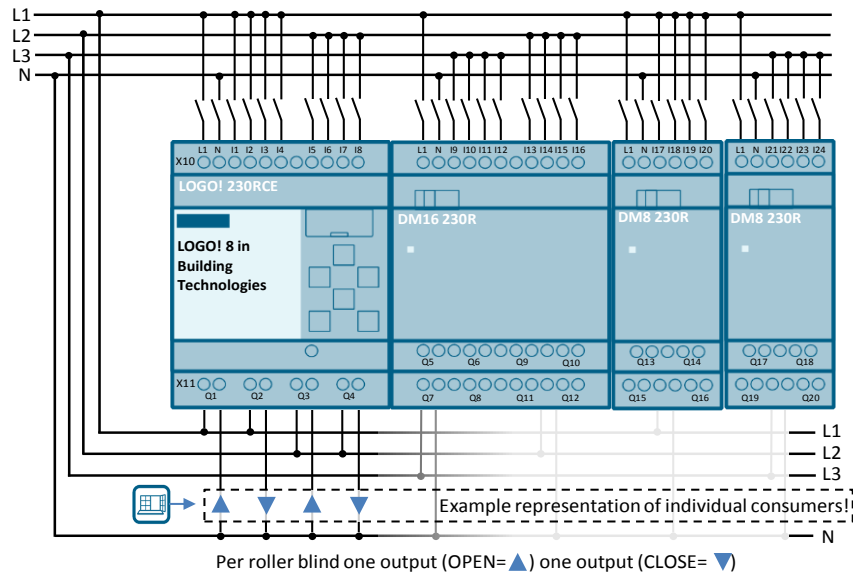
Within a group, the same phase must be used at all inputs. Different phases are only possible between the groups!

This means that you use the four inputs [I1-I4] on phase L1 and the four inputs [I5-I8] on phase L2 according to [Figure 3-2](#), for example.

The digital module DM16 230R is also divided into two groups.

Digital modules can only be connected to devices with the same voltage class, here 230V for the LOGO! 230RCE.

Figure 3-2: Multi-phase operation with one basic device and four digital modules



Note This application example provides the maximum configuration for a LOGO! 8 with 20 outputs and 24 inputs.

3.4 LOGO! Extensions in 24V and 230V mixed operation

Digital modules can only be connected to devices with the same voltage class.

If you want to use different voltage levels 230V/24V in a LOGO! configuration, the base unit must be a 230V variant.

Initially, 230V modules come in the expansion. After these modules, it is imperative to use an analog module (to be chosen freely) in order to effect the galvanic isolation. After the galvanic isolation has been made by the analog module, you can use further analog modules or 12/24V digital modules. You can find additional information in the LOGO! manual.

3.4.1 Commissioning the Application Example

Proceed as follows:

1. Start the LOGO! Soft Comfort V8.2
2. Open the supplied LOGO! example program *.lsc
3. Transfer the program to LOGO!

Note

In the application example, the IP address 192.168.0.1 has been preset for LOGO!

You will find a description of the general procedure for assigning the IP address of a LOGO! 8 in Chapter: [3.8.1 "Configuring Network settings"](#).

4 Mode of operation

This application example provides two versions of a LOGO! switching program with the same function for the LOGO! Soft Comfort software.

In the basic switching program, only the four LOGO! integrated outputs are used and navigated via the TDE. This reduced switching program simplifies the understanding of the operating principle.

Up to 20 digital outputs are used in the extended switching program. This corresponds to the maximum configuration of the control system, which allows up to 20 functions to be switched in the building.

If you want to switch fewer functions, delete the unnecessary program parts from the switching program, in line with Chapter [4.2.3](#)

Note

You will find a function description of the corresponding circuit as a comment on the switching program under LOGO! Soft Comfort:

> "File" > "Properties" > "Comment"

Hint: Select "Extras" > "Options" > "Print" and check the "Comment" box to print the function description together with the program.

4.1 Basic switching functions (LOGO! basic device)

The basic switching program illustrates how the circuit works, clearly arranged on one page, as shown in [Figure 4-1](#).

Use the LOGO! Soft Comfort simulation function and follow the course of the red switching signals when actuating the corresponding buttons in the LOGO! switching program.

The four function keys of the LOGO! TDE are parameterized in the LOGO! switching program. You scroll through the functions and select the respective output [Q] to switch a function on or off.

[F1] and [F2] function keys (Function ON / OFF)

With the [F1] and [F2] function keys you roll a blind in the house up (=OPEN) or down (=CLOSED). You can customize the message texts so that a message (e.g. living room, bedroom, etc.) is displayed.

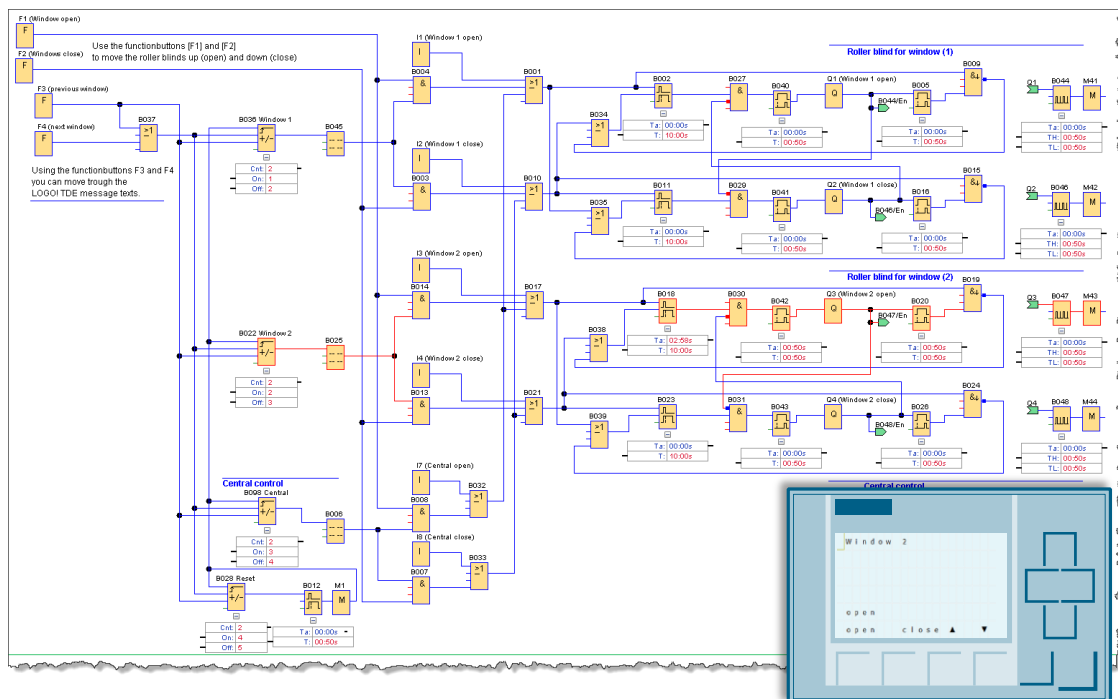
[F3] and [F4] function keys (back / next)

With the [F4] function key you scroll forward to the next function and with [F3] you scroll back one function.

When you have scrolled to the last menu item (message text), if you press [F4] again the display jumps back to the start display.

If no key is pressed within 10s, the display also returns to the start display.

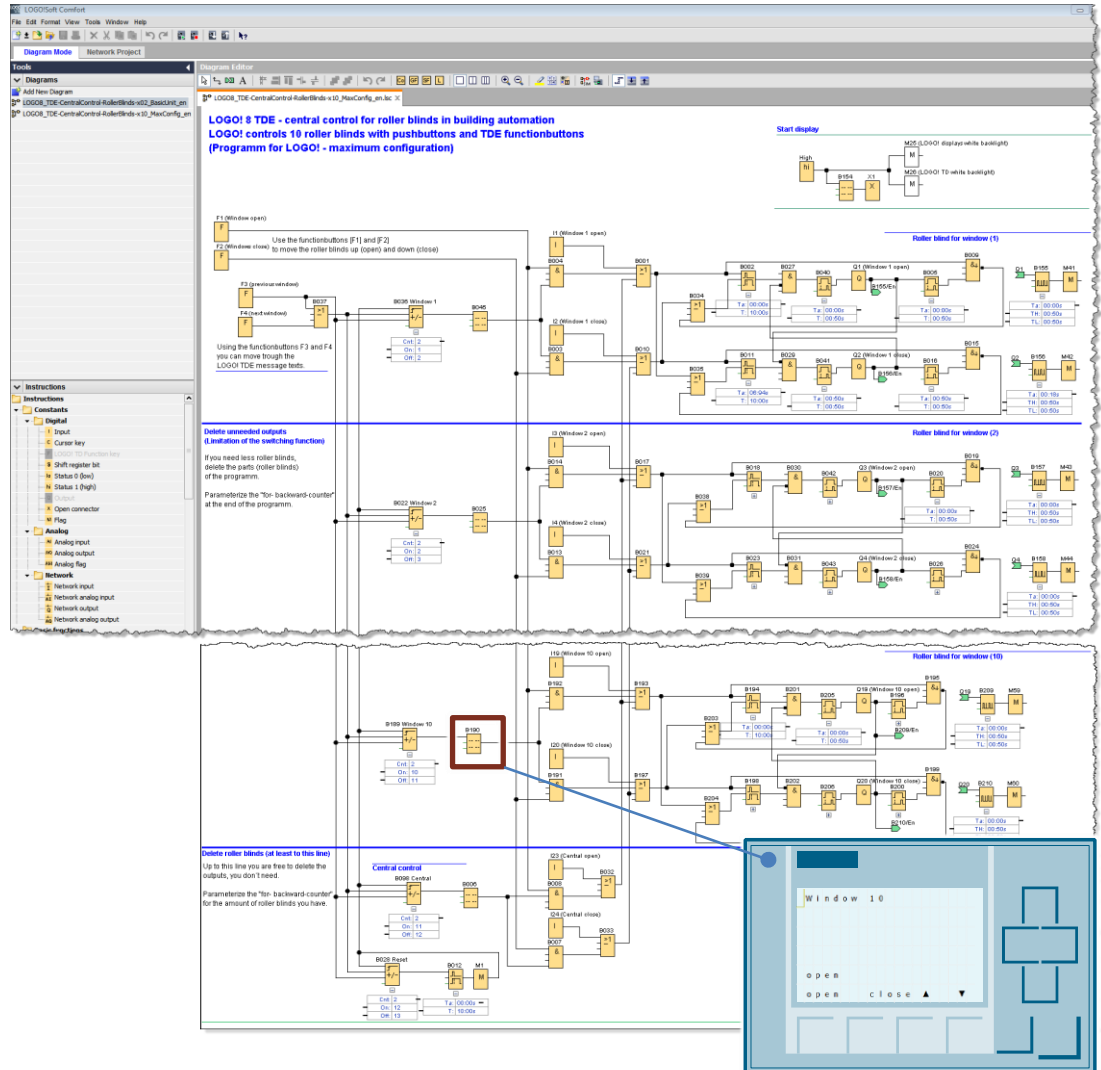
Figure 4-1: Selection of functions via the function keys on the LOGO! TDE



4.2 Expanded circuit structure (Maximum configuration)

The expanded circuit program from [Figure 4-2](#) shows how you can control individually up to 10 roller blinds in the TDE menu sequence with the message text function. In the circuit program itself, you will find a brief explanation of the functions of the respective sub-functions.

Figure 4-2: Selection of up to 10 blinds via the LOGO! TDE function keys



4.2.1 Switching the message texts and operating the roller blinds

In the switching program, 2 outputs each are used for raising and lowering each roller blind (OPEN and CLOSED). Each roller blind is indicated by a message text in which it is assigned to the respective room or window.

The message texts are in turn activated by a forward and backward counter connected upstream.

In [Figure 4-3](#) [B171, window 9] at the 9th pulse of key [F4] the counter switches (=counter value On: 9) on and at (counter value Off: 10) switches off again.

If you press the [F1] key or the key on [I17] to raise the roller blind, the switch-off delay [B176] is activated for 10s via the AND block [B174] and the OR block behind.

Via the AND block [B183], the high signal of the switch-off delay is applied to the self-latching relay for 10s. The self-latching relay switches the output [Q9] with a time lag of 500 ms and the roller blind is raised.

The switch-on delay of the self-latching relay ensures that when switching between raising and lowering, the roller blind first comes to a standstill from movement and only then a change in direction takes place.

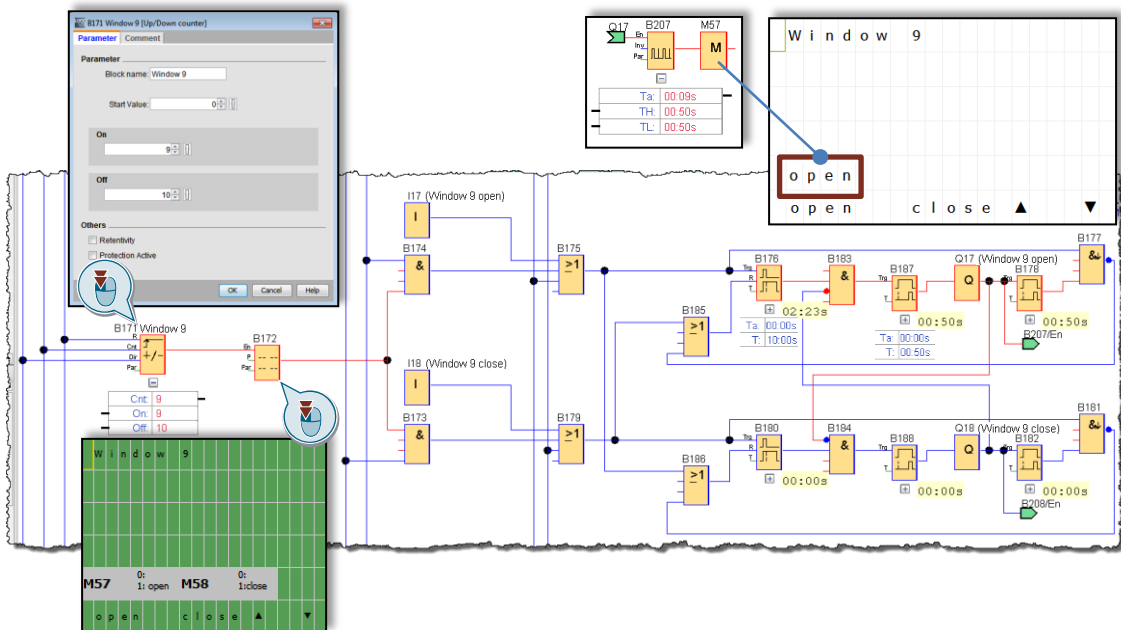
To move the roller blind a little, press and hold [F1] or [I17] for more than 500 ms (setting [B178]). If you release the key, a reset pulse is sent via the NAND flank [B177] to the block [B176] and thus to output [Q17], causing the roller blind to remain in its position.

If you continue to the next roller blind with the [F4] key, the last action (raising or lowering) remains active until its completion. Lowering (CLOSE) works in the same way, whereby the simultaneous switching of both outputs is blocked via the AND block [B183] and [B184].

You can access the windows for parameterizing the blocks by double-clicking on the respective block.

At the bottom of the switching ([Figure 4-4](#)) there is a link to centrally control all the roller blinds by pressing [F1/F2] or [I23/I24].

Figure 4-3: Switching function of the message texts

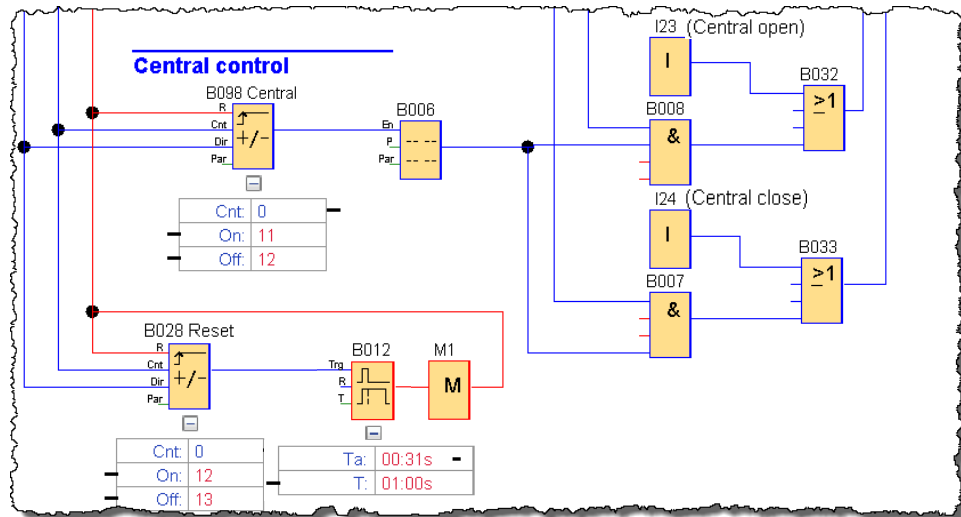


4.2.2 Menu – Jumping back to the start display of the message texts

If you reach the final message text (output) with the [F4] function key and press the [F4] key again, the [B028] counter is set (Figure 4-4) and the signal is forwarded to the switch-off delay [B012], which has been preset to one second here.

The subsequent marker [M1] is required to return the signal of a string to an input of the same string, here the reset input of counter [B098], as well as all counters in the circuit.

Figure 4-4: End of message texts and jump to the start display



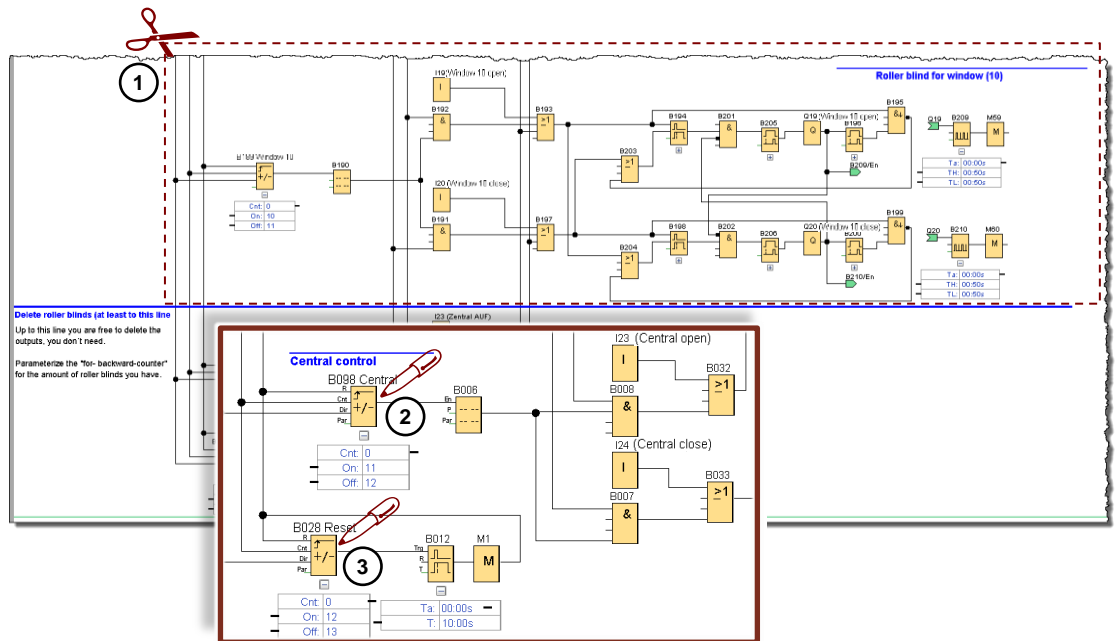
4.2.3 Adjustments to the switching program

If you want to project fewer roller blinds, remove irrelevant program parts from the LOGO! switching program [Figure 4-5](#) (1) and adjust the parameters of the concluding function blocks (2).

In the following example, the switching program is to be adapted to 8 roller blinds.

1. Remove the program parts for blinds [10] and [9].
2. Parameterize the counter for the central control [B098] with:
(On:9) and (Off:10).
General rule: (On: last output + 1; Off: last output + +2)
3. Parameterize the final reset counter [B028] with:
(On:11) and (Off:12).
General rule: (On: last output + 3; Off: last output +4)

Figure 4-5: Reduction of the roller blinds in the LOGO! switching program



Note

It is recommended that the program parts be removed in descending order of the blinds, i.e. first roller blind [10], then [9] and so on. If you want to remove only certain blinds in the middle, it is necessary to parameterize the corresponding forward and reverse counters.

5 Appendix

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5.2 Links and Literature

Table 5-1: Links and Literature

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	This article https://support.industry.siemens.com/cs/ww/en/view/109755865
\3\	LOGO! 8 user manual https://support.industry.siemens.com/cs/ww/en/view/109755864
\4\	LOGO! logic module (Application examples, expansion modules) https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html

5.3 Change documentation

Table 5-2: Change documentation

Version	Date	Change
V1.0	04/2018	First edition