

Micro Application Example



applications & TOOLS

Quick and Safe Error Diagnostics for
24V Load Feeders

Micro Automation Set 24

SIEMENS

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Foreword

Micro Automation Sets are fully functional and tested automation configurations based on A&D standard products for easy, fast and inexpensive implementation of automation tasks in small-scale automation. Each of these Micro Automatic Sets covers a frequently occurring subtask of a typical customer problem in the low-end range.

The sets help you to obtain answers with regard to required products and the question how they function when combined.

However, depending on the system requirements, a variety of other components (e.g. other CPUs, power supplies, etc.) can be used to implement the functionality on which this set is based. Please refer to the respective SIEMENS A&D catalogs for these components.

The Micro Automation Sets are also available by clicking the following link:

<http://www.siemens.de/microset>

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1 Application Areas and Usage

Application Areas

This configuration is suitable for the following tasks:

- Monitoring of DC 24V load feeders
- Detecting overload and short circuit

In the preferred fields of application of the configuration, the following tasks have to be solved:

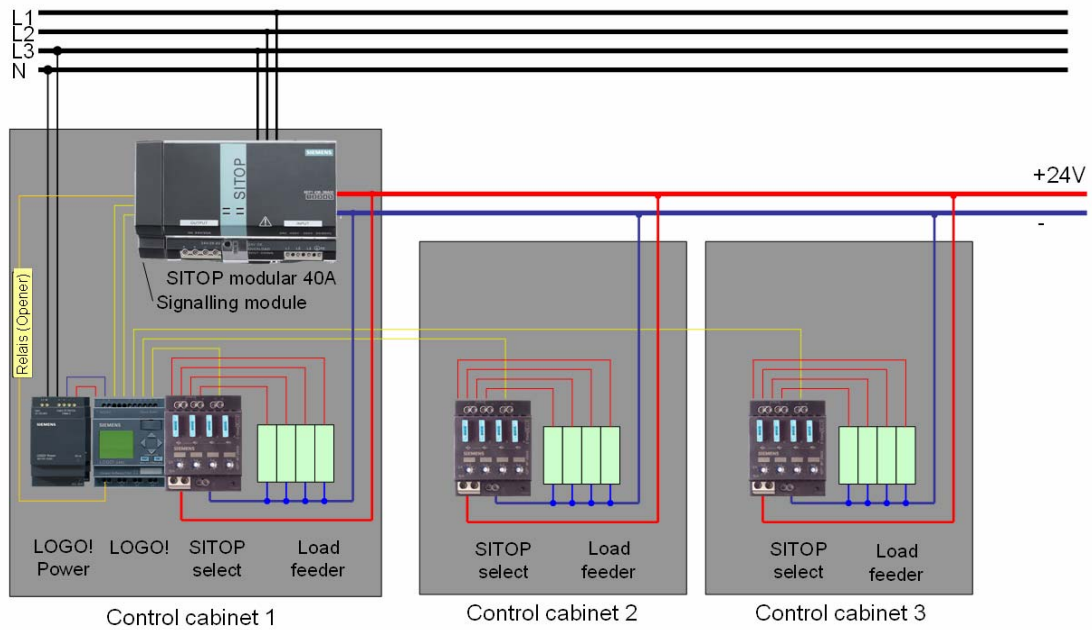
- Several DC 24V load feeders are operated at one power supply (used to divide the load current).
- Individual load feeders are to be secured selectively, in order to prevent a total system failure in case of a fault
- The selective protection is also to be achieved in widely distributed plant parts and in remote loads (distributed configuration).
- Connecting users which cannot be secured via quick circuit breakers and with high switch-on power consumption.
- Quick error localization

Benefits

- Preventing complete system failure if a DC 24V power supply failure occurs in case of a fault.
- Only the faulty line is switched off.
- Minimizing the downtimes by localizing the faulty line on LOGO!) Display
- Commissioning of the system/maintenance can be performed modular by simple plugging and pulling the blade-type fuses.
- Configuration can be expanded later.
- A central overview of the status of all load feeders is enabled by message texts on LOGO!.

2 Setup

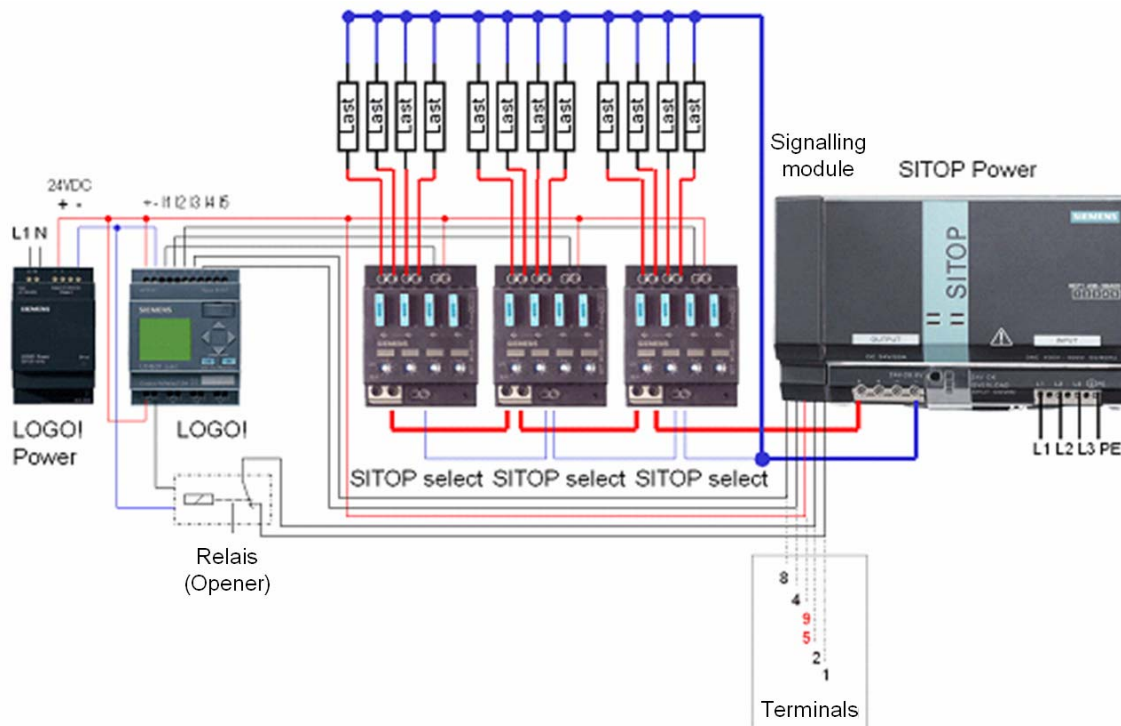
2.1 Overview



2.2 Wiring

Wiring plan

Figure 1



Input and output definitions of LOGO!

No.	Type	Designation	Wiring to
1	Inputs	I1	Collective error SITOP select control cabinet 1
2		I2	Group error SITOP select control cabinet 2
3		I3	Group error SITOP select control cabinet 3
4		I4	Ready status SITOP modular via signalling module
5		I5	DC 24V OK SITOP modular via signalling module
6	Outputs	Q1	Output interface relay (break-contact) for switching on the SITOP modular power supply via the signalling module
7		Q2	If 1, then control cabinet 1 OK
8		Q3	If 1, then control cabinet 2 OK
9		Q4	If 1, then control cabinet 3 OK

Input and output definitions of SITOP Power signalling module

No.	Type	Designation	Wiring to
1	Inputs	1, Remote ON/OFF	Output interface relay (break contact)
2		2, Remote ON/OFF	Output interface relay (break contact)
3	Outputs	4, OK, DC output	LOGO! input 5
4		5, OK, DC output, 24V	LOGO! Power DC 24V connection
5		8, OK, Operation	LOGO! input 4
6		9, OK, Operation, 24V	LOGO! Power DC 24V connection

3 Hardware and Software Components

Products

Component	Type	MLFB / Order information	No.	Manufacturer
Logic module	LOGO! modular 12/24	6ED1052-1MD00-0BA5 [*]	1	SIEMENS A&D
Power supply for logic module	LOGO!Power	6EP1331-1SH02 [*]	1	
Load current supply DC 24V	SITOP modular 40 Ampere	6EP1437-3BA00 [*]	1	
Signalling module for load current supply	SITOP modular signalling module	6EP1961-3BA10	1	
Diagnostics module for 4 load feeders	SITOP select	6EP1961-2BA00	3	
Front panel installation LOGO! (optional)		6AG1057-1AA00-0AA2 [*]	1	

Accessories

Component	Type	MLFB / Order information	No.	Manufacturer
Relay (break-contact)	Output interface relay	3TX7005-1LB00	1	SIEMENS A&D

Configuration software/tools

Component	Type	MLFB / Order information	No.	Manufacturer
LOGO! Configuration software	LOGO! Soft Comfort from V5.0	6ED1058-0BA01-0YA0	1	SIEMENS A&D
Connection cable	LOGO! PC cable	6ED1057-1AA00-0BA0	1	

Note

A SIMATIC PG or a standard PC is required to use the configuration software/tools!

^{*} available in other services / versions

4 Function Principle

The control of the configuration consists of a LOGO! Logic module with separate power supply.

On the power supply side, the configuration consists of a central SITOP modular 40A power supply with signaling module. For distribution of the current to the individual load feeders one SITOP select diagnostics module is used for each of the three control cabinets.

If the SITOP select electronic diagnostics module detects overload or short circuit in one of the individual load feeders, it selectively switches off the faulty feeder. The other, faultless loads continue to be supplied with DC 24V. Each load feeder has a multicolored LED on the diagnostics module and signals the status. (Green = OK, Red = error, overcurrent)

Each SITOP select features an electrically isolated common signalling contact. Via this contact, SITOP signals an error to the assigned digital input of LOGO!.

LOGO! evaluates the digital inputs and outputs a configured message text on the display in case of a pending error. Each error appears in the display with control cabinet number of the faulty load feeder. A message is displayed for as long as the fault is pending, and only disappears if the fault has been manually acknowledged by the operator.

Via a digital output, LOGO! can transfer the command to switch the SITOP modular load current supply to >on< or to >stand-by< to the signalling module. The message module signals to LOGO! via a digital output "Ready for operation" and "DC 24V is OK".

Note

In order to comfortably read the messages on the LOGO! display outside of a control cabinet, the front panel installation (see chapter "Hardware and software components") can be used. This also enables the application of LOGO! e.g. at front panels in harsh environments.

5 Configuring the Startup Software

Preliminary remark

For the startup we offer you software examples with test code and test parameters as download. The software examples support you during the first steps and tests with your Micro Automation Sets. They enable quick testing of hardware and software interfaces between the products described in the Micro Automation Sets.

The software examples are always assigned to the components used in the set and show their basic interaction. However, they are not real applications in the sense of technological problem solving with definable properties.

Download of the startup code

The software example is available on the HTML page from which you downloaded this document.

A download zip.-file is provided which can be extracted with any zip-program. The zip.-file contains the following files:

Table 5-1

File name	Content
Set24_LOGO_V1d0_en.lsc	LOGO! Program code ¹

¹ Click the file when working with "LOGO! Soft Comfort V5.0" or later.

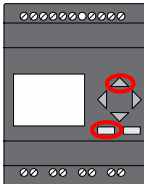
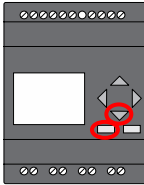
6 Live Demo

6.1 Functionality

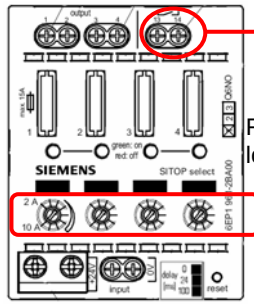
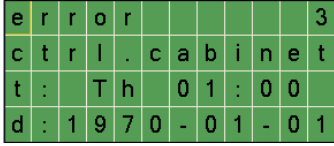
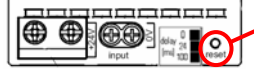
LOGO! monitors all three SITOP select load feeders and reports a possibly pending failure on the display.

The cursor keys can be used for switching the ready status of the SITOP Power supply unit Online/Standby.

Controlling the SITOP modular 40A power supply

No.	Instructions	Note
1.	The ESC + UP buttons at LOGO! switch the SITOP modular 40A power supply to "Online" mode.	
2.	The ESC + Down buttons at LOGO! switch the SITOP modular 40A power supply to "Standby" mode.	

Display faulty load feeder at LOGO!

No.	Instructions	Note
3.	If a load is connected to a SITOP load circuit whose nominal current is above the value set at the potentiometer (2A to 10A) the message contact is activated.	 Signalling contacte Rated current limiter for load circuit 1-4
4.	On the LOGO! display a message with information on the faulty load feeder appears.	
5.	The Reset button enables acknowledging and resetting the switched off load feeder after 20 seconds.	 Reset-Taster
6.	The message at the LOGO! display can now be acknowledged with OK.	

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Entry ID: 21064023

7 Technical Data

LOGO! 12/24

Parameter	Number/Size/Range	Remarks
Supply voltage	24 V DC	
Inputs	8 (of which 2 analog 0-10V)	
Outputs	4	
Dimensions (W x H x D) in mm	72 (4 width modules) 7 90 7 55	

LOGO! Power

Parameter	Number/Size/Range	Remarks
Supply voltage	AC 100-240V	
Output voltage	DC 24V	
Output current	1.3A	
Dimensions (W x H x D) in mm	54 (3 width modules) 7 90 7 55	

SITOP modular 40 with signalling module

Parameter	Number/Size/Range	Remarks
Supply voltage in V	3 AC 400-500 V wide range	Voltage range: 340 to 550 V
Output voltage	24 V DC	Settable range 24 to 28.8 V
Nominal current value I _a nominal	40 A	To +60 °C ambient temperature
Parallel connection for increased power output	Yes, 2 ea.(switchable curve)	
Dimensions (W x H x D) in mm	240 x 125 x 125	
Signaling module output voltage O.K.	electrically isolated relay contact	Contact load ability 6 A/ 240 A VAC
Signaling module ready status	electrically isolated relay contact	Contact load ability 6 A/ 240 A VAC
Signaling module control input	Not electrically isolated input	for remote switching ON/OFF
Signalling module mounting	directly laterally snap-on	

SITOP select

Parameter	Number/Size/Range	Remarks
Nominal voltage U _e nominal	24 V DC	
Rated current value I _a nominal up to +60°C	10 A per channel	
Adjustment range	2 to 10 A per channel	
Power protection	FK2 blade-type fuse 15 A per channel	exchangeable (when using weaker lines)
Signal contact	Common signal contact (make contact)	
Dimensions (W x H x D) in mm	72 x 90 x 90	