SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 8
Original

Content

1. About this document

1.1 Function

These operating instructions provide all the information required for mounting, commissioning, safe operation and also disassembly of the device. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used

Information, hint, note:
This symbol is used for identifying useful additional information.

Caution: Failure to comply with this warning notice could lead to failures or malfunctions.
Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The passive distribution module may only be used in accordance with the following versions or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: www.schmersal.net.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

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1.6 Warning about misuse

In the event of improper or unintended use or tampering, use of the passive distribution module could expose persons to danger or cause damage to the machine or system components.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

PDM-IOP-4CC-IOP

Option	Description
PDM	Passive distribution module
IOP	Evaluation side: IO parallel
4CC	4 device connections with cage clamps
IOP	Device connection: IO parallel

2.2 Destination and use

The PDM-IOP-4CC-IOP passive distribution module is designed for the connection of 4 electronic safety switchgear units with parallel IO signals manufactured by SCHMERSAL. It serves to connect up to 4 safety switchgear units in series.
To increase the safety functionality, more passive distribution modules can also be connected in series.

With the PDM-IOP-4CC-IOP passive distribution module, the secure OSSD outputs of the connected safety switchgear units are connected in series and wired to a relevant safety-monitoring module.

The non-secure IO signals of the devices are wired in parallel to a control system.

The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level.

2.3 Technical data

Standards:	IEC 60947-1
Material of housing:	Plastic, polyamide 66
Mounting:	35 mm standard rail in accordance with EN 60715
Mechanical data	
Type of connection:	Clips, cage clamps
Cable section:	min. 0.25 mm², max. 1.5 mm² (including conductor ferrules)
De-insulation length:	5 … 6 mm
Actuator tool blade:	3.5 x 0.5 mm
Ambient conditions	
Ambient temperature:	−25 °C … +65 °C
Storage and transport temperature:	−40 °C … +85 °C
Relative humidity:	5 % … 95 %, non condensing
Resistance to shock:	30 g / 11 ms
Resistance to vibration:	10 ... 55 Hz, amplitude 1 mm
Protection class:	IP00 to IEC 60529
Protection class:	III
Insulation values to IEC 60664-1:	
- Rated insulation voltage Ui:	32 VDC
- Rated impulse withstand voltage U_{imp}:	0.8 kV
- Over-voltage category:	III
- Degree of pollution:	2
Electrical data	
Supply voltage U_B:	24 VDC -15% / +10% (stabilised PELV mains unit)
Rated operating voltage U_e:	24 VDC
Operating current I_e:	
- Distribution module (external fuse needed):	10 A
- Device connection (internal fuse fitted):	1.5 A
- Safety outputs Y1 and Y2:	0.1 A
Device connection line fuse:	Automatically resetting fuse element 1.5 A
LED indications	
Green “Power” LED:	Distribution module supply voltage
Green “F4” LED:	Device connection 4 fuse element
Green “F3” LED:	Device connection 3 fuse element
Green “F2” LED:	Device connection 2 fuse element
Green “F1” LED:	Device connection 1 fuse element

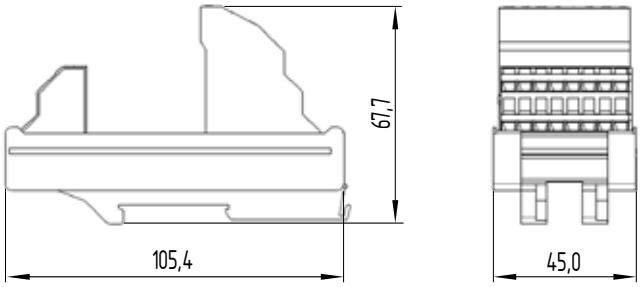
3. Mounting

3.1 General mounting instructions

The distribution module is designed to be mounted in a switch cabinet. The module can be attached to a standard 35 mm rail in accordance with EN 60715. Any mounting position.

3.2 Dimensions

All measurements in mm.



3.3 Accessories

Pre-wired cable M12, 8 pole

2.5 m	103011415
5.0 m	103007358
10 m	103007359

Pre-wired cable M8, 8 pin

2.0 m	103003638
5.0 m	103003639
10 m	103003640

4. Electrical connection

4.1 General information for electrical connection

The electrical connection may only be carried out by authorised personnel in a de-energised condition.

It is possible to connect wires with and without conductor ferrules with a wire cross section of 0.25 mm² to 1.5 mm² to the terminals of the passive distribution module.

The supply voltage of the module is to be protected with a fuse with a 10 A rating.

4.2 LED indicators and fuse elements

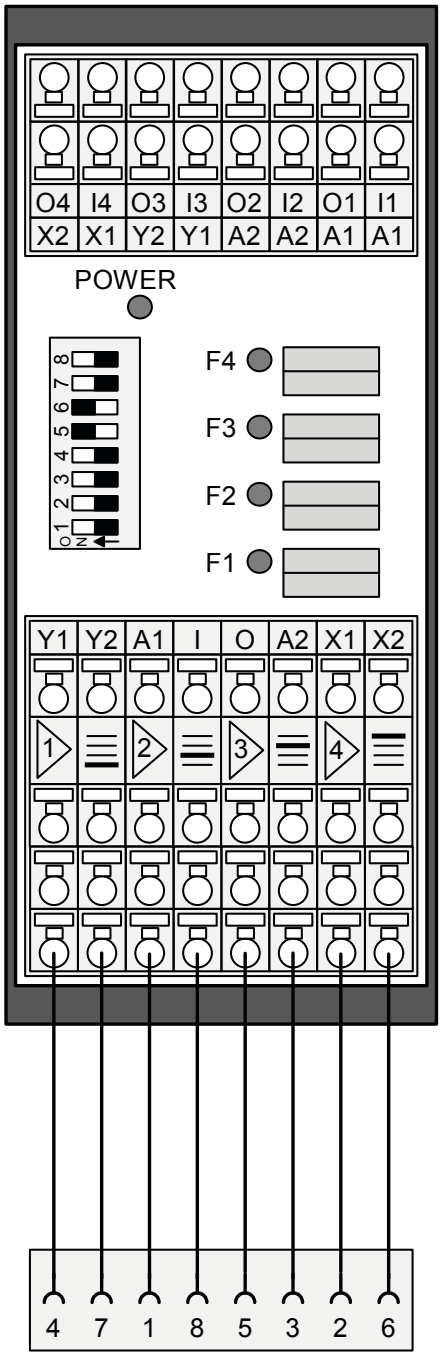
The distribution module features 5 green LED indicators.

“POWER” LED	Distribution module supply voltage status
“F4” LED	Device connection 4 fuse element status
“F3” LED	Device connection 3 fuse element status
“F2” LED	Device connection 2 fuse element status
“F1” LED	Device connection 1 fuse element status

The 4 device connections are each equipped with an automatically resetting 1.5 A fuse for wiring protection.
If the fuse element triggers, the corresponding green LED goes out.

F1, F2, F3 and F4 fuse elements on the circuit board could become hot in the event of excess current.

4.3 Pin assignment of module connection



2 level terminal

Input and output signals of safety switchgear

Safety signals and supply voltage

4 level terminal

Safety switchgear connection 4

Safety switchgear connection 3

Safety switchgear connection 2

Safety switchgear connection 1

M23 / M12 / M8 8-pin device connection

Pin assignment of safety switchgear connection

	Function safety switchgear		Pin assignment of connector plug or conductor numbers	Colour code of the Schmersal connector to DIN 47100	Colour code of the Schmersal connector	Possible colour code of other commercially available connectors, also refer to IEC 60947-5-2
	with conventional diagnostic output	with serial diagnostic function				
				from part no. 103007xxx	**to** part no. 103007xxx	
A1	U_e		1	WH	BN	BN
X1	Safety input 1		2	BN	WH	WH
A2	GND		3	GN	BU	BU
Y1	Safety output 1		4	YE	BK	BK
OUT	Diagnostic output	SD output	5	GY	GY	GY
X2	Safety input 2		6	PK	VT	PK
Y2	Safety output 2		7	BU	RD	VT
IN	Solenoid control	SD input	8	RD	PK	or
	without function		9			

4.4 Pin assignment of 2 level terminal

Input and output signals of safety switchgear

O4	Diagnostic output device 4
I4	Solenoid control device 4
O3	Diagnostic output device 3
I3	Solenoid control device 3
O2	Diagnostic output device 2
I2	Solenoid control device 2
O1	Diagnostic output device 1
I1	Solenoid control device 1

Safety signals and supply voltage

X2	Input safety channel 2
X1	Input safety channel 1
Y2	Output safety channel 2
Y1	Output safety channel 1
A2	0 VDC module supply
A2	0 VDC module supply
A1	+24 VDC module supply
A1	+24 VDC module supply

4.5 Pin assignment of 4 level terminal

Pin assignment of safety switchgear 4

Y1	Safety output 1
Y2	Safety output 2
A1	+24 VDC device supplied
I	Solenoid control
O	Diagnostic output
A2	0 VDC device supplied
X1	Safety input 1
X2	Safety input 2

Pin assignment of safety switchgear 3

Y1	Safety output 1
Y2	Safety output 2
A1	+24 VDC device supplied
I	Solenoid control
O	Diagnostic output
A2	0 VDC device supplied
X1	Safety input 1
X2	Safety input 2

Pin assignment of safety switchgear 2

Y1	Safety output 1
Y2	Safety output 2
A1	+24 VDC device supplied
I	Solenoid control
O	Diagnostic output
A2	0 VDC device supplied
X1	Safety input 1
X2	Safety input 2

Pin assignment of safety switchgear 1

Y1	Safety output 1
Y2	Safety output 2
A1	+24 VDC device supplied
I	Solenoid control
O	Diagnostic output
A2	0 VDC device supplied
X1	Safety input 1
X2	Safety input 2

4.6 DIP switch configuration

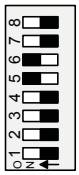
The position of the DIP switch is shown in black.

Module in centre of series wiring

4 devices connected

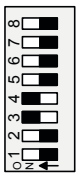
All switches OFF

3 devices connected



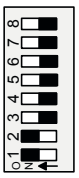
Switch 5+6 ON

2 devices connected



Switch 3+4 ON

1 device connected



Switch 1+2 ON

Last module in series-wiring

4 devices connected

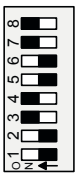
Switch 7+8 ON

3 devices connected

Switch 7+8 ON

Switch 5+6 ON

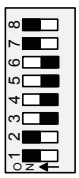
2 devices connected



Switch 7+8 ON

Switch 3+4 ON

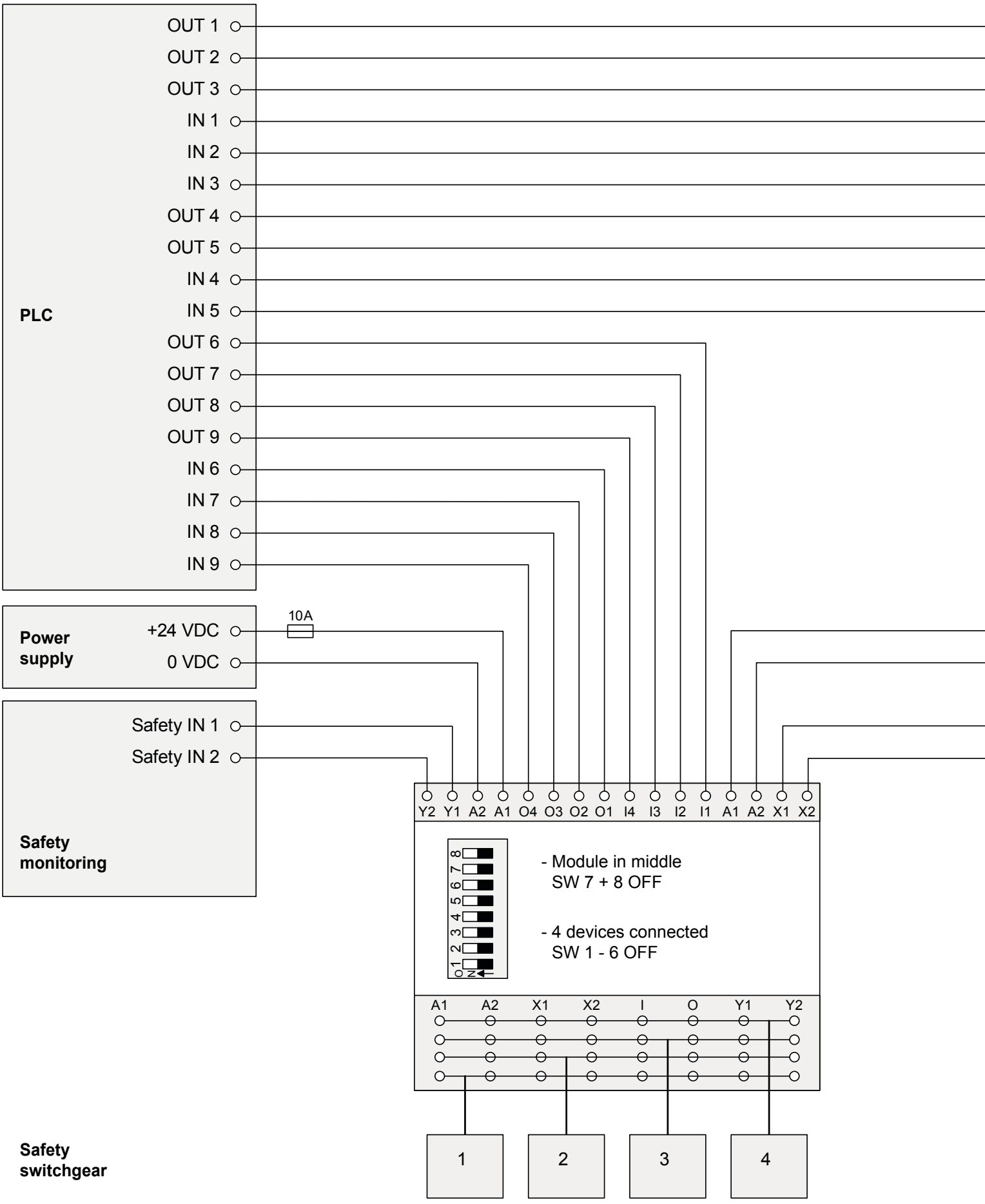
1 device connected

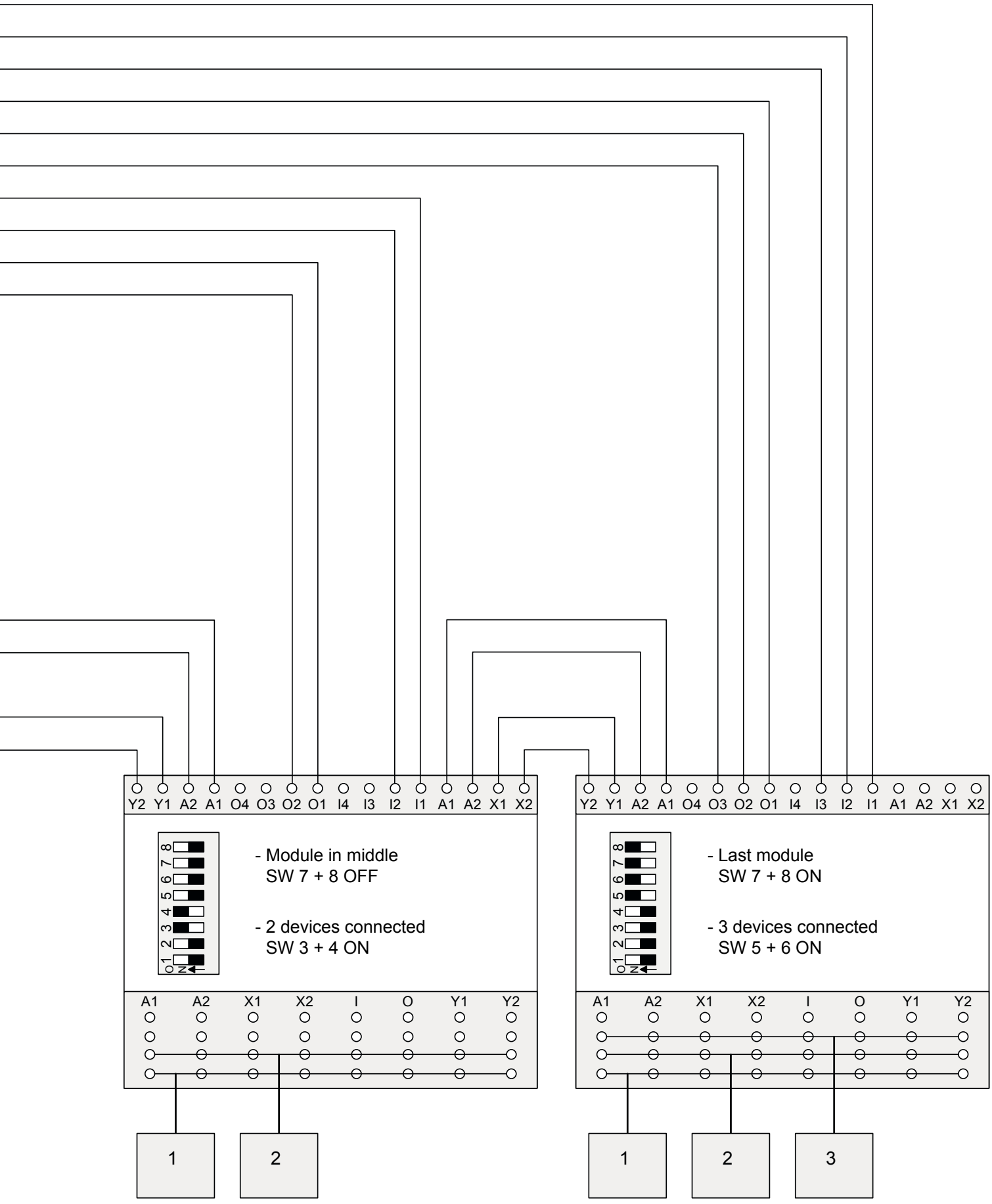


Switch 7+8 ON

Switch 1+2 ON

4.7 Wiring example




Y2 Y1 A2 A1 O4 O3 O2 O1 I4 I3 I2 I1 A1 A2 X1 X2
- Module in middle
SW 7 + 8 OFF
- 2 devices connected
SW 3 + 4 ON
A1 A2 X1 X2 I O Y1 Y2
1
2
Y2 Y1 A2 A1 O4 O3 O2 O1 I4 I3 I2 I1 A1 A2 X1 X2
- Last module
SW 7 + 8 ON
- 3 devices connected
SW 5 + 6 ON
A1 A2 X1 X2 I O Y1 Y2
1
2
3

5. Set-up and maintenance

5.1 Functional testing

A check must be carried out to ensure that the projected safety function is effective.

⚠ The safety function, the DIP switch configuration and correct installation must be checked by the responsible safety specialist / safety representative.

5.2 Maintenance

If installed correctly and used as intended, the passive distribution module requires no maintenance.

6. Disassembly and disposal

6.1 Disassembly

The passive distribution module may only be removed when de-energised.

6.2 Disposal

The passive distribution module is to be disposed of in the correct manner as per the national regulations and legislation.

7. Configuration

7.1 Configuration examples

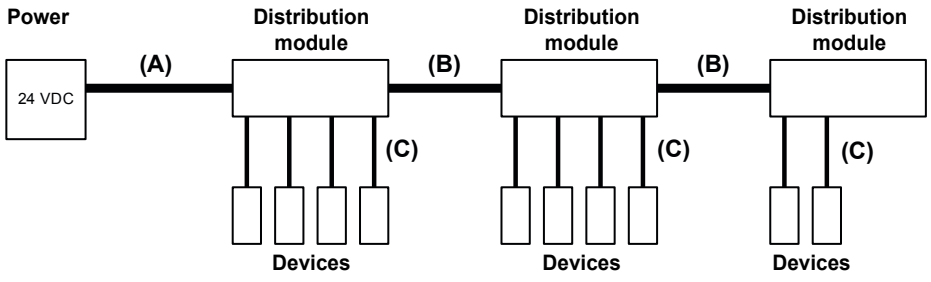
3 configurations are shown respectively for the different SCHMERSAL devices. One configuration with long cable lengths (maximum), one configuration with medium cable lengths (medium) and one configuration with shorter cable lengths (small).

The following assumptions are made for the configuration examples listed in the table:

- The examples represent maximum configurations. If individual cable lengths are shortened, larger systems are possible
- 1.5 mm² power supply wiring and 10 A fuse protection
- Use of SCHMERSAL cables
- The cable lengths listed in the table between power supply and the 1st module as well as between the modules are maximum lengths. Reducing the individual cable lengths is not critical.

Device / configuration version	Max. number of devices	Equals number of modules	Length of cable (A) until 1st module	Length of cables (B) between the modules	Length of stub cables (C) for device connection
AZM 200 / Maximum	10	2.5	10.0 m	10.0 m	7.5 m
AZM 200 / Medium	12	3	7.5 m	7.5 m	5.0 m
AZM 200 / Small	16	4	7.5 m	5.0 m	3.5 m
MZM 100 / Maximum	12	3	10.0 m	10.0 m	7.5 m
MZM 100 / Medium	16	4	7.5 m	7.5 m	5.0 m
MZM 100 / Small	18	4.5	7.5 m	5.0 m	3.5 m
AZM 300 / Maximum	16	4	10.0 m	10.0 m	7.5 m
AZM 300 / Medium	20	5	7.5 m	7.5 m	5.0 m
AZM 300 / Small	24	6	7.5 m	5.0 m	3.5 m
RSS & CSS / Maximum	28	7	10.0 m	10.0 m	7.5 m
RSS & CSS / Medium	32	8	7.5 m	7.5 m	5.0 m
RSS & CSS / Small	36	9	7.5 m	5.0 m	3.5 m
Mixed / Maximum	16	4	10.0 m	10.0 m	7.5 m
Mixed / Medium	18	4.5	7.5 m	7.5 m	5.0 m
Mixed / Small	22	5.5	7.5 m	5.0 m	3.5 m

Mixed fitting of module: 2 x MZM 100, 1 x AZM 300 and 1 x RSS / CSS



K. A. Schmersal GmbH & Co. KG
Möddinghofe 30, D - 42279 Wuppertal
Postfach 24 02 63, D - 42232 Wuppertal

Phone: +49 - (0)2 02 - 64 74 - 0
Telefax: +49 - (0)2 02 - 64 74 - 1 00
E-Mail: info@schmersal.com
Internet: http://www.schmersal.com