

## At a glance

|                                |    |
|--------------------------------|----|
| System description System SLIO | 14 |
| Clamp modules                  | 16 |
| Power modules                  | 20 |
| Signal modules digital         | 26 |
| Signal modules analog          | 50 |
| Communication processors       | 74 |
| Function modules               | 80 |
| Interface modules              | 90 |
| System SLIO accessories        | 98 |



# System SLIO

the fine-granular I/O system

# System description SLIO

## Structure and Concept

SLIO stands for Slice I/O. The system is very compact and can be adapted piecemeal exactly to the requirements of the application.

The system is designed for decentralized automation tasks.

With the help of the power module (PM), color contrasted from the signal modules (SM) and functional modules (FM), these are supplied with power and separate potential groups can be defined as required. The terminal module (TM) combines clamp, seating for the electronic module (EM) and mechanical bus connector. The electronic modules are connected to the terminal module in a secure sliding mechanism. In the case of service, only the electronic module is replaced by simply pulling out of the terminal module – wiring and mounting remain on the 35 mm profile rail. The step-formed spring-type terminals on the terminal module enable a quick, clear and secure wiring. Through integrated status LEDs and the label strip on the front a channel-specific, unambiguous allocation, and readability of the channel conditions of the electronic module is ensured.

All interface modules (IM) for PROFIBUS-DP, CANopen, PROFINET, EtherCAT, DeviceNet and Modbus support up to 64 electronic modules.

The space-saving assembly size allows use in any automation environment.

Assembly is very easy: First the terminal modules are connected, then the electronic modules are inserted into the slot designated for the terminal module until the connection between both module parts is established by an audible click.

The system SLIO is one of the most highly efficient decentral systems worldwide and is evolving daily.





### Performance and Application

The system SLIO is designed for large decentralized automation tasks in the manufacturing and process industries. The system SLIO expands key solutions and is integrated with the help of the device master files into existing fieldbus infrastructure. Through the new backplane bus concept the interface modules (fieldbus slave) in the system SLIO enable very short response times for signal processing.

### Functions

A variety of signal modules are available for the connection of sensors and actuators for acquiring digital and analog signals to and from the process.

For positioning, path measurement, counting tasks and other functions further functional modules are continuously being developed.

### Communication

The system SLIO includes interface modules (fieldbus slave modules) with different fieldbus protocols by which the system, manufacturer-independent, can be integrated into most automation concepts.

# Clamp modules



## Assembly and function

Terminal modules are passive modules for 2- or 3-wire installations, whose contacts are vertical electrical connected internal. Within the module the backplane bus feed-through. The module does not have any module identification, but is considered at the maximum number of the modules.

Through the application of the terminal modules, distributors for power supply could be realized easily and enables so the connection of active supplied sensors like proximity switch. The wiring is done via timesaving and secure cage clamp technique.

The terminal modules are fixed on the mounting surface by means of a 35mm DIN rail.

### Features

- › Maintenance-free cage clamp technique
- › Backplane bus feed-through
- › Max. terminal voltage 10A
- › Potential separation 500Veff (field voltage to bus)
- › Mounting on a 35mm DIN rail
- › 24 month guarantee

# Overview

| Order no.     | Name/Description   | Page      |
|---------------|--|-----------|
| Clamp modules |  |           |
| 001-1BA00     | <b>CM 001 - Potential distributor module</b><br>‣ 8xDC 24V Clamps          | <b>18</b> |
| 001-1BA10     | <b>CM 001 - Potential distributor module</b><br>‣ 8xDC 0V Clamps           | <b>18</b> |
| 001-1BA20     | <b>CM 001 - Potential distributor module</b><br>‣ 4xDC 24V, 4xDC 0V Clamps | <b>18</b> |

# Clamp modules

| Clamp modules   Clamp modules |  |  |  |  |  |  |
|-------------------------------|--|--|--|--|--|--|
| 001-1BA00                     |  |  |  |  |  |  |
| 001-1BA10                     |  |  |  |  |  |  |
| 001-1BA20                     |  |  |  |  |  |  |

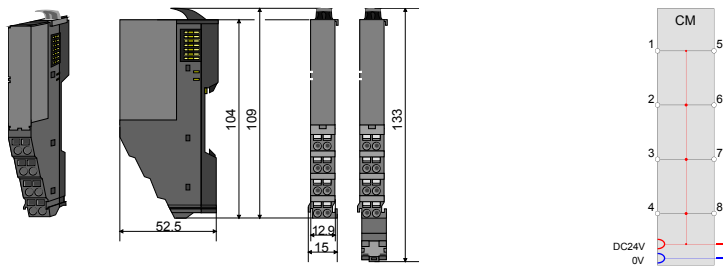
| Order number                    | 001-1BA00   | 001-1BA10   | 001-1BA20   |  |
|---------------------------------|---|---|---|--|
| Figure                          |  |  |  |  |
| Type                            | CM 001  | CM 001  | CM 001  |  |
| Module ID                       | -   | -   | -   |  |
| <b>General information</b>      |   |   |   |  |
| Note                            | -   | -   | -   |  |
| Features                        | ▸ 8xDC 24V Clamps   | ▸ 8xDC 0V Clamps  | ▸ 4xDC 24V, 4xDC 0V Clamps  |  |
| <b>Clamp parameter</b>          |   |   |   |  |
| Terminal voltage max.           | DC 30 V   | DC 0 V  | DC 30 V   |  |
| Terminal current max.           | 10 A  | 10 A  | 10 A  |  |
| <b>Mechanical data</b>          |   |   |   |  |
| Dimensions (WxHxD)              | 12.9 mm x 109 mm x 52.5 mm  | 12.9 mm x 109 mm x 52.5 mm  | 12.9 mm x 109 mm x 52.5 mm  |  |
| Weight                          | 50 g  | 50 g  | 50 g  |  |
| <b>Environmental conditions</b> |   |   |   |  |
| Operating temperature           | 0 °C to 60 °C   | 0 °C to 60 °C   | 0 °C to 60 °C   |  |
| Storage temperature             | -25 °C to 70 °C   | -25 °C to 70 °C   | -25 °C to 70 °C   |  |
| <b>Certifications</b>           |   |   |   |  |
| UL508 certification             | in preparation  | in preparation  | in preparation  |  |

# Connections, Interfaces

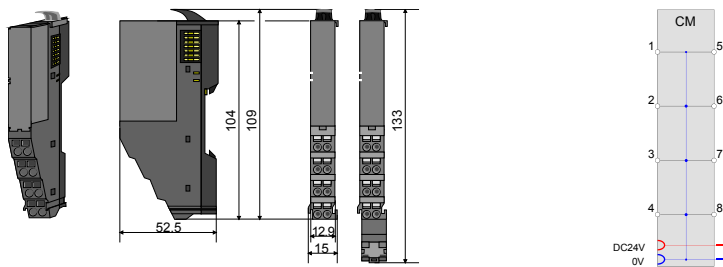
## Clamp modules | Clamp modules

001-1BA00  
001-1BA10  
001-1BA20

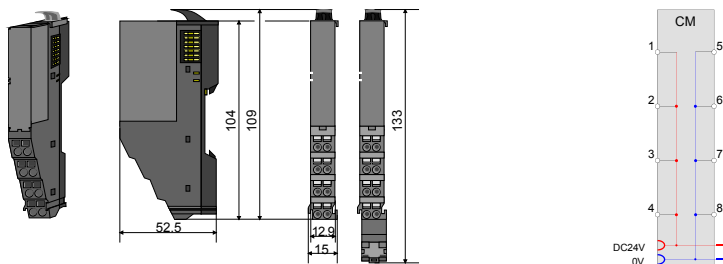
### 001-1BA00



### 001-1BA10

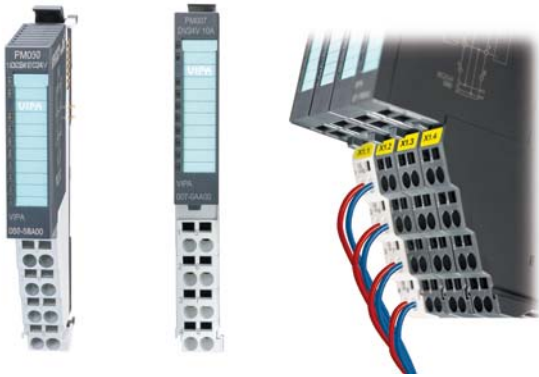


### 001-1BA20





# Power modules



## Structure and Function

In the system SLIO the power supply is provided via power modules.

Both the bus interface as well as the electronics of the connected peripheral modules are supplied with power via the power module (PM) integrated in interface module (IM). The DC 24 V load power supply for the connected peripheral modules is provided via a further connection in the PM.

With the help of color-contrasted power modules within the system further potential areas for the DC 24 V load power supply can be defined.

The two-component design allows for the easiest of service by separating the electronics from the terminal module.

### Characteristics



- › Power supply of the sensor/actuator-level
- › Nominal input voltage DC 24 V
- › Output current max. 10 A
- › Isolation from potential groups
- › Front integrated status LEDs
- › Mounting security by reverse polarity and overvoltage protection
- › 24 months warranty

# Overview

| Order no.     | Name/Description   | Page      |
|---------------|--|-----------|
| Power modules |  |           |
| 007-1AB00     | <b>PM 007 - Power module</b> <ul style="list-style-type: none"><li>› Power supply DC 24 V, 10 A</li><li>› Reverse polarity protection</li><li>› Overvoltage protection</li></ul>   | <b>22</b> |
| 007-1AB10     | <b>PM 007 - Power module</b> <ul style="list-style-type: none"><li>› Power supply DC 24 V, 4 A</li><li>› Power supply DC 24 V for bus supply 5 V, 2 A</li><li>› Reverse polarity protection</li><li>› Overvoltage protection</li></ul> | <b>22</b> |

# Power modules

| Power modules   Power modules |  |  |  |  |  |  |
|-------------------------------|--|--|--|--|--|--|
| 007-1AB00<br>007-1AB10        |  |  |  |  |  |  |

| Order number                                   | 007-1AB00   | 007-1AB10  |  |  |
|--|---|--|--|--|
| Figure   |    |   |  |  |
| Type   | PM 007  | PM 007   |  |  |
| Module ID                                      | -   | -  |  |  |
| <b>General information</b>                     |   |  |  |  |
| Note   | -   | -  |  |  |
| Features                                       | <ul style="list-style-type: none"> <li>▸ Power supply DC 24 V, 10 A</li> <li>▸ Reverse polarity protection</li> <li>▸ Overvoltage protection</li> </ul> | <ul style="list-style-type: none"> <li>▸ Power supply DC 24 V, 4 A</li> <li>▸ Power supply DC 24 V for bus supply 5 V, 2 A</li> <li>▸ Reverse polarity protection</li> <li>▸ Overvoltage protection</li> </ul> |  |  |
| <b>Technical data power supply</b>             |   |  |  |  |
| Input voltage (rated value)                    | DC 24 V   | DC 24 V  |  |  |
| Input voltage (permitted range)                | DC 20.4...28.8 V  | DC 20.4...28.8 V   |  |  |
| Mains frequency (rated value)                  | -   | -  |  |  |
| Mains frequency (permitted range)              | -   | -  |  |  |
| Input voltage (at 120 V)                       | -   | -  |  |  |
| Input voltage (at 230 V)                       | -   | -  |  |  |
| Inrush current                                 | -   | -  |  |  |
| Power consumption                              | -   | -  |  |  |
| Output voltage (rated value)                   | 24 V  | 24 V   |  |  |
| Output current (rated value)                   | 10 A  | 4 A  |  |  |
| Power supply parallel switchable               | -   | -  |  |  |
| Reverse polarity protection                    | yes   | yes  |  |  |
| Overvoltage protection                         | 36 V  | 36 V   |  |  |
| Ripple of output voltage (max.)                | -   | -  |  |  |
| Efficiency                                     | -   | 89 %   |  |  |
| Power loss                                     | -   | 1.4 W  |  |  |
| <b>Status information, alarms, diagnostics</b> |   |  |  |  |
| Status display                                 | yes   | yes  |  |  |
| Interrupts                                     | no  | no   |  |  |
| Process alarm                                  | no  | no   |  |  |
| Diagnostic interrupt                           | no  | no   |  |  |
| Diagnostic functions                           | no  | no   |  |  |
| Diagnostics information read-out               | none  | none   |  |  |
| Supply voltage display                         | green LED   | green LED  |  |  |

| Power modules   Power modules |  |  |  |  |  |  |
|-------------------------------|--|--|--|--|--|--|
| 007-1AB00<br>007-1AB10        |  |  |  |  |  |  |

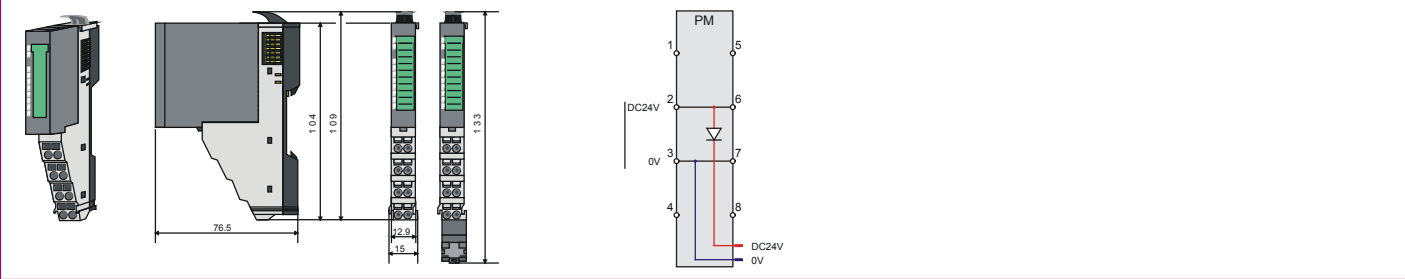
| Order number                    | 007-1AB00                  | 007-1AB10                  |  |  |
|---------------------------------|----------------------------|----------------------------|--|--|
| Group error display             | red LED                    | red LED                    |  |  |
| Channel error display           | none                       | none                       |  |  |
| <b>Mechanical data</b>          |                            |                            |  |  |
| Dimensions (WxHxD)              | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |  |  |
| Weight                          | 60 g                       | 75 g                       |  |  |
| <b>Environmental conditions</b> |                            |                            |  |  |
| Operating temperature           | 0 °C to 60 °C              | 0 °C to 60 °C              |  |  |
| Storage temperature             | -25 °C to 70 °C            | -25 °C to 70 °C            |  |  |
| <b>Certifications</b>           |                            |                            |  |  |
| UL508 certification             | in preparation             | in preparation             |  |  |

# Connections, Interfaces

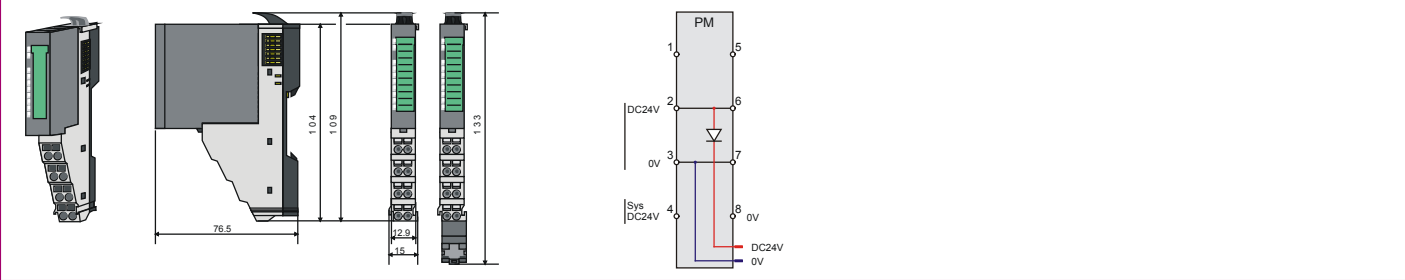
## Power modules | Power modules

007-1AB00  
007-1AB10

### 007-1AB00



### 007-1AB10







System SLIO

System 100V

System 200V

System 300S

System 500S

HMI

Software

Accessories

Appendix

# Signal modules digital



## Structure and Function

Signal modules (SM) to connect sensors and actuators are the interfaces of the system to the process. Digital signal modules acquire the binary control signals to and from the process level.

A variety of different digital signal modules provides exactly the I/O modules, which are required for each task. The digital modules differ in the number of channels, voltage and current ranges, isolation, and diagnostic and alarm capability.

Each signal module consists of a terminal and an electronic module.

The terminal module (TM) contains the receptacle for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

The functionality of the signal module is defined via the electronics module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

### Characteristics

- ▶ Electrically isolated digital inputs and outputs to the backplane bus
- ▶ 2, 4 or 8 channel
- ▶ Various modules, suitable for switches and proximity switches as well as for measuring transducers
- ▶ Direct mapping and readability of the channel conditions via status LEDs
- ▶ Safe and time-saving installation by the terminal assignment mounted on the module
- ▶ When changing the module equipment identification (BMK) is retained on the TM
- ▶ Individual single-channel lettering on insertion strip
- ▶ 24 month warranty

# Overview

| Order no.              | Name/Description  | Page |
|------------------------|---|------|
| Digital input modules  |   |      |
| 021-1BB00              | <b>SM 021 - Digital input</b><br>‣ 2 inputs   | 29   |
| 021-1BB10              | <b>SM 021 - Digital input</b><br>‣ 2 fast inputs<br>‣ Input filter time delay parameterizable 2 µs...4 ms | 29   |
| 021-1BB50              | <b>SM 021 - Digital input</b><br>‣ 2 inputs<br>‣ Active low input   | 29   |
| 021-1BB70              | <b>SM 021 - Digital input</b><br>‣ 2 inputs<br>‣ Time stamp   | 29   |
| 021-1BD00              | <b>SM 021 - Digital input</b><br>‣ 4 inputs   | 32   |
| 021-1BD10              | <b>SM 021 - Digital input</b><br>‣ 4 fast inputs<br>‣ Input filter time delay parameterizable 2 µs...4 ms | 32   |
| 021-1BD40              | <b>SM 021 - Digital input</b><br>‣ 4 digital inputs<br>‣ Connect 2/3-wire                                 | 32   |
| 021-1BD50              | <b>SM 021 - Digital input</b><br>‣ 4 inputs<br>‣ Active low input   | 32   |
| 021-1BD70              | <b>SM 021 - Digital input</b><br>‣ 4 inputs<br>‣ Time stamp   | 35   |
| 021-1BF00              | <b>SM 021 - Digital input</b><br>‣ 8 inputs   | 35   |
| 021-1BF50              | <b>SM 021 - Digital input</b><br>‣ 8 inputs<br>‣ Active low input   | 35   |
| 021-1SD00              | <b>SM 021 - Digital input</b><br>‣ 4 inputs<br>‣ Safety   | 35   |
| Digital output modules |   |      |
| 022-1BB00              | <b>SM 022 - Digital output</b><br>‣ 2 outputs<br>‣ Output current 0.5 A                                   | 38   |
| 022-1BB20              | <b>SM 022 - Digital output</b><br>‣ 2 outputs<br>‣ Output current 2 A                                     | 38   |
| 022-1BB50              | <b>SM 022 - Digital output</b><br>‣ 2 Low-Side outputs<br>‣ Output current 0.5 A                          | 38   |
| 022-1BB70              | <b>SM 022 - Digital output</b><br>‣ 2 outputs<br>‣ Time stamp<br>‣ Output current 0.5 A                   | 38   |
| 022-1BB90              | <b>SM 022 - Digital output</b><br>‣ 2 outputs<br>‣ PWM  | 41   |
| 022-1BD00              | <b>SM 022 - Digital output</b><br>‣ 4 outputs<br>‣ Output current 0.5 A                                   | 41   |
| 022-1BD20              | <b>SM 022 - Digital output</b><br>‣ 4 outputs<br>‣ Output current 2 A                                     | 41   |
| 022-1BD50              | <b>SM 022 - Digital output</b><br>‣ 4 Low-Side outputs<br>‣ Output current 0.5 A                          | 41   |
| 022-1BD70              | <b>SM 022 - Digital output</b><br>‣ 4 outputs<br>‣ Time stamp<br>‣ Output current 0.5 A                   | 44   |
| 022-1BF00              | <b>SM 022 - Digital output</b><br>‣ 8 outputs<br>‣ Output current 0.5 A                                   | 44   |



# Overview





| Order no. | Name/Description  | Page |
|-----------|---|------|
| 022-1BF50 | <b>SM 022 - Digital output</b> <ul style="list-style-type: none"><li>› 8 Low-Side outputs</li><li>› Output current 0.5 A</li></ul>                        | 44   |
| 022-1HB10 | <b>SM 022 - Digital output</b> <ul style="list-style-type: none"><li>› 2 relay outputs</li><li>› DC 30 V/ AC 230 V</li><li>› Output current 3 A</li></ul> | 44   |
| 022-1SD00 | <b>SM 022 - Digital output</b> <ul style="list-style-type: none"><li>› 4 outputs</li><li>› Safety</li><li>› Output current 0.5 A</li></ul>                | 47   |



# Digital input modules

## Signal modules digital | Digital input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 021-1BB00 | 021-1BD00 | 021-1BD70 |  |  |  |
| 021-1BB10 | 021-1BD10 | 021-1BF00 |  |  |  |
| 021-1BB50 | 021-1BD40 | 021-1BF50 |  |  |  |
| 021-1BB70 | 021-1BD50 | 021-1SD00 |  |  |  |

| Order number  | 021-1BB00   | 021-1BB10  | 021-1BB50  | 021-1BB70   |
|---|---|--|--|---|
| Figure  |  |   |       |  |
| Type  | SM 021  | SM 021   | SM 021   | SM 021  |
| Module ID   | 0001 9F82   | 000A 1F02  | 0002 9F82  | 0F01 47C1   |
| <b>General information</b>  |   |  |  |   |
| Note  | -   | -  | -  | -   |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 inputs</li> </ul>                      | <ul style="list-style-type: none"> <li>▸ 2 fast inputs</li> <li>▸ Input filter time delay parameterizable 2 μs...4 ms</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 inputs</li> <li>▸ Active low input</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 inputs</li> <li>▸ Time stamp</li> </ul>  |
| <b>Current consumption/power loss</b>                               |   |  |  |   |
| Current consumption from backplane bus                              | 55 mA   | 95 mA  | 60 mA  | 85 mA   |
| Power loss  | 0.5 W   | 0.9 W  | 0.5 W  | 0.9 W   |
| <b>Technical data digital inputs</b>                                |   |  |  |   |
| Number of inputs  | 2   | 2  | 2  | 2   |
| Cable length, shielded  | 1000 m  | 1000 m   | 1000 m   | 1000 m  |
| Cable length, unshielded  | 600 m   | 600 m  | 600 m  | 600 m   |
| Rated load voltage  | -   | DC 20.4...28.8 V   | -  | DC 24 V   |
| Current consumption from load voltage L+ (without load)             | -   | 12 mA  | -  | 10 mA   |
| Rated value   | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 20.4...28.8 V   | DC 20.4...28.8 V  |
| Input voltage for signal "0"  | DC 0...5 V  | DC 0...5 V   | DC 15...28.8 V   | DC 0...5 V  |
| Input voltage for signal "1"  | DC 15...28.8 V  | DC 15...28.8 V   | DC 0...5 V   | DC 15...28.8 V  |
| Input voltage hysteresis  | -   | -  | -  | -   |
| Frequency range   | -   | -  | -  | -   |
| Input resistance  | -   | -  | -  | -   |
| Input current for signal "1"  | 3 mA  | 3 mA   | 3 mA   | 3 mA  |
| Connection of Two-Wire-BEROs possible                               | ✓   | ✓  | ✓  | ✓   |
| Max. permissible BERO quiescent current                             | 0.5 mA  | 0.5 mA   | 0.5 mA   | 0.5 mA  |
| Input delay of "0" to "1"   | 3 ms  | parameterizable 2 μs - 3ms   | 3 ms   | parameterizable 2 μs - 3ms  |
| Input delay of "1" to "0"   | 3 ms  | parameterizable 2 μs - 3ms   | 3 ms   | parameterizable 2 μs - 3ms  |
| Number of simultaneously utilizable inputs horizontal configuration | 2   | 2  | 2  | 2   |
| Number of simultaneously utilizable inputs vertical configuration   | 2   | 2  | 2  | 2   |
| Input characteristic curve  | IEC 61131, type 1   | IEC 61131, type 1  | -  | IEC 61131, type 1   |
| Initial data size   | 2 Bit   | 2 Bit  | 2 Bit  | 60 Byte   |



| Signal modules digital   Digital input modules |           |           |  |  |  |  |
|--|-----------|-----------|--|--|--|--|
| 021-1BB00                                      | 021-1BD00 | 021-1BD70 |  |  |  |  |
| 021-1BB10                                      | 021-1BD10 | 021-1BF00 |  |  |  |  |
| 021-1BB50                                      | 021-1BD40 | 021-1BF50 |  |  |  |  |
| 021-1BB70                                      | 021-1BD50 | 021-1SD00 |  |  |  |  |

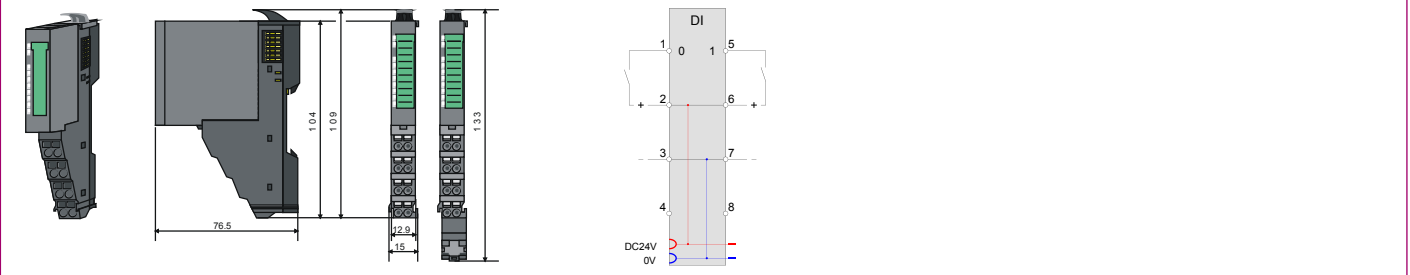
| Order number                                   | 021-1BB00                  | 021-1BB10                  | 021-1BB50                  | 021-1BB70                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Status information, alarms, diagnostics</b> |                            |                            |                            |                            |
| Status display                                 | green LED per channel      | green LED per channel      | green LED per channel      | green LED per channel      |
| Interrupts                                     | no                         | yes, parameterizable       | no                         | no                         |
| Process alarm                                  | no                         | yes, parameterizable       | no                         | no                         |
| Diagnostic interrupt                           | no                         | yes, parameterizable       | no                         | no                         |
| Diagnostic functions                           | no                         | yes                        | no                         | no                         |
| Diagnostics information read-out               | none                       | possible                   | none                       | possible                   |
| Module state                                   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display                           | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display                          | none                       | none                       | none                       | none                       |
| <b>Isolation</b>                               |                            |                            |                            |                            |
| Between channels                               | -                          | -                          | -                          | -                          |
| Between channels of groups to                  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus             | ✓                          | ✓                          | ✓                          | ✓                          |
| Insulation tested with                         | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Safety</b>                                  |                            |                            |                            |                            |
| Safety protocol                                | -                          | -                          | -                          | -                          |
| Safety requirements                            | -                          | -                          | -                          | -                          |
| Secure user address                            | -                          | -                          | -                          | -                          |
| Watchdog                                       | -                          | -                          | -                          | -                          |
| Two channels                                   | -                          | -                          | -                          | -                          |
| Test pulse outputs                             | -                          | -                          | -                          | -                          |
| <b>Mechanical data</b>                         |                            |                            |                            |                            |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                |                            |                            |                            |                            |
| Operating temperature                          | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature                            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                          |                            |                            |                            |                            |
| UL508 certification                            | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

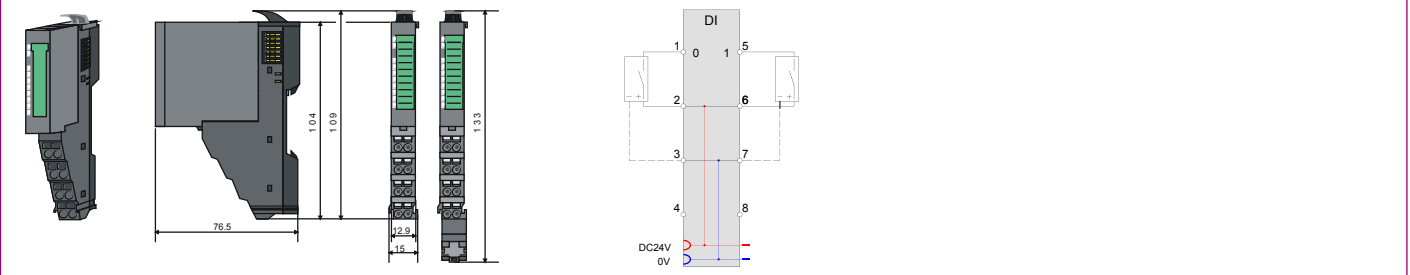
## Signal modules digital | Digital input modules

|           |           |           |
|-----------|-----------|-----------|
| 021-1BB00 | 021-1BD00 | 021-1BD70 |
| 021-1BB10 | 021-1BD10 | 021-1BF00 |
| 021-1BB50 | 021-1BD40 | 021-1BF50 |
| 021-1BB70 | 021-1BD50 | 021-1SD00 |

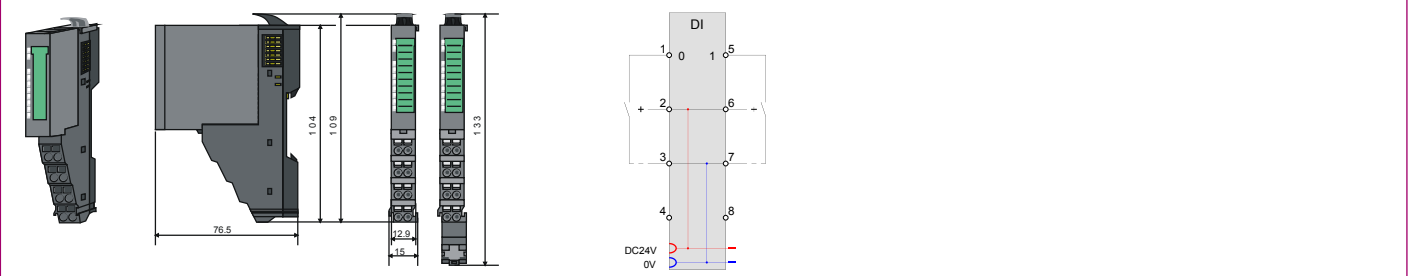
### 021-1BB00



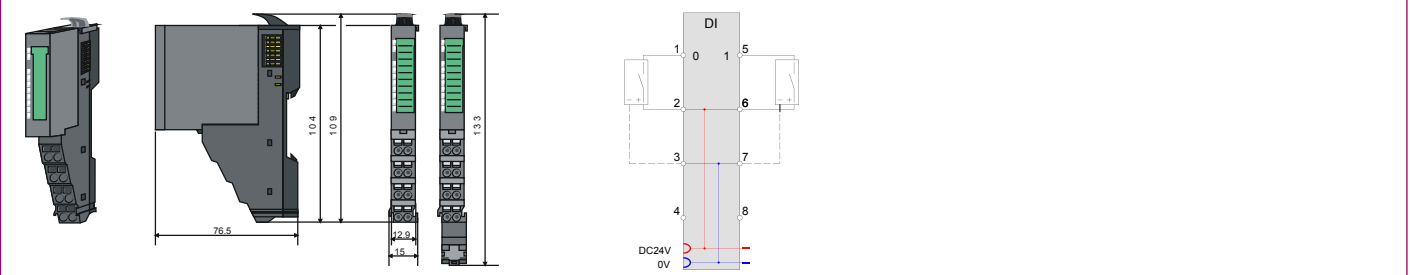
### 021-1BB10



### 021-1BB50







### 021-1BB70



# Digital input modules

| Signal modules digital   Digital input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 021-1BB00                                      | 021-1BD00 | 021-1BD70 |  |  |  |
| 021-1BB10                                      | 021-1BD10 | 021-1BF00 |  |  |  |
| 021-1BB50                                      | 021-1BD40 | 021-1BF50 |  |  |  |
| 021-1BB70                                      | 021-1BD50 | 021-1SD00 |  |  |  |

| Order number  | 021-1BD00   | 021-1BD10  | 021-1BD40  | 021-1BD50  |
|---|---|--|--|--|
| Figure  |  |   |               |       |
| Type  | SM 021  | SM 021   | SM 021   | SM 021   |
| Module ID   | 0003 9F84   | 0009 1F04  | 0008 9F84  | 0004 9F84  |
| <b>General information</b>  |   |  |  |  |
| Note  | -   | -  | -  | -  |
| Features  | <ul style="list-style-type: none"> <li>▸ 4 inputs</li> </ul>                      | <ul style="list-style-type: none"> <li>▸ 4 fast inputs</li> <li>▸ Input filter time delay parameterizable 2 μs...4 ms</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 digital inputs</li> <li>▸ Connect 2/3-wire</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 inputs</li> <li>▸ Active low input</li> </ul> |
| <b>Current consumption/power loss</b>                               |   |  |  |  |
| Current consumption from backplane bus                              | 55 mA   | 95 mA  | 55 mA  | 65 mA  |
| Power loss  | 0.6 W   | 0.95 W   | 0.6 W  | 0.6 W  |
| <b>Technical data digital inputs</b>                                |   |  |  |  |
| Number of inputs  | 4   | 4  | 4  | 4  |
| Cable length, shielded  | 1000 m  | 1000 m   | 1000 m   | 1000 m   |
| Cable length, unshielded  | 600 m   | 600 m  | 600 m  | 600 m  |
| Rated load voltage  | -   | DC 20.4...28.8 V   | -  | -  |
| Current consumption from load voltage L+ (without load)             | -   | 15 mA  | -  | -  |
| Rated value   | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 20.4...28.8 V   | DC 20.4...28.8 V   |
| Input voltage for signal "0"  | DC 0...5 V  | DC 0...5 V   | DC 0...5 V   | DC 15...28.8 V   |
| Input voltage for signal "1"  | DC 15...28.8 V  | DC 15...28.8 V   | DC 15...28.8 V   | DC 0...5 V   |
| Input voltage hysteresis  | -   | -  | -  | -  |
| Frequency range   | -   | -  | -  | -  |
| Input resistance  | -   | -  | -  | -  |
| Input current for signal "1"  | 3 mA  | 3 mA   | 3 mA   | 3 mA   |
| Connection of Two-Wire-BEROs possible                               | ✓   | ✓  | ✓  | ✓  |
| Max. permissible BERO quiescent current                             | 0.5 mA  | 0.5 mA   | 0.5 mA   | 0.5 mA   |
| Input delay of "0" to "1"   | 3 ms  | parameterizable 2 μs - 3ms   | 3 ms   | 3 ms   |
| Input delay of "1" to "0"   | 3 ms  | parameterizable 2 μs - 3ms   | 3 ms   | 3 ms   |
| Number of simultaneously utilizable inputs horizontal configuration | 4   | 4  | 4  | 4  |
| Number of simultaneously utilizable inputs vertical configuration   | 4   | 4  | 4  | 4  |
| Input characteristic curve  | IEC 61131, type 1   | IEC 61131, type 1  | IEC 61131, type 1  | -  |
| Initial data size   | 4 Bit   | 4 Bit  | 4 Bit  | 4 Bit  |

| Signal modules digital   Digital input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 021-1BB00                                      | 021-1BD00 | 021-1BD70 |  |  |  |
| 021-1BB10                                      | 021-1BD10 | 021-1BF00 |  |  |  |
| 021-1BB50                                      | 021-1BD40 | 021-1BF50 |  |  |  |
| 021-1BB70                                      | 021-1BD50 | 021-1SD00 |  |  |  |

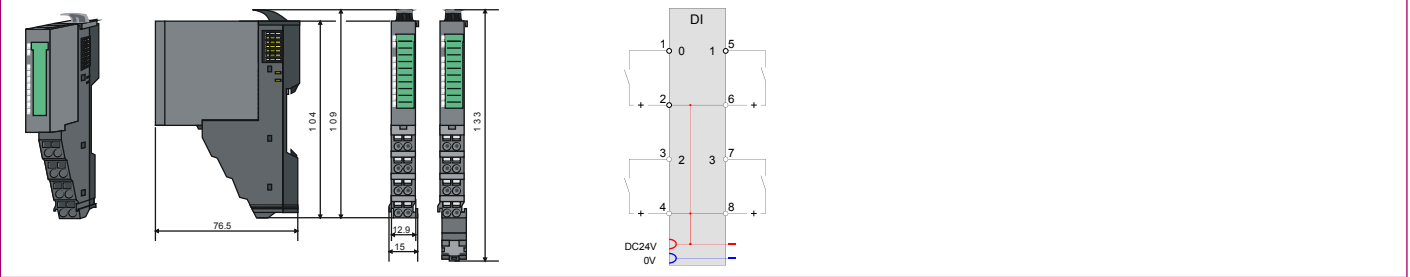
| Order number                                   | 021-1BD00                  | 021-1BD10                  | 021-1BD40                  | 021-1BD50                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Status information, alarms, diagnostics</b> |                            |                            |                            |                            |
| Status display                                 | green LED per channel      | green LED per channel      | green LED per channel      | green LED per channel      |
| Interrupts                                     | no                         | yes, parameterizable       | no                         | no                         |
| Process alarm                                  | no                         | yes, parameterizable       | no                         | no                         |
| Diagnostic interrupt                           | no                         | yes, parameterizable       | no                         | no                         |
| Diagnostic functions                           | no                         | yes                        | no                         | no                         |
| Diagnostics information read-out               | none                       | possible                   | none                       | none                       |
| Module state                                   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display                           | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display                          | none                       | none                       | none                       | none                       |
| <b>Isolation</b>                               |                            |                            |                            |                            |
| Between channels                               | -                          | -                          | -                          | -                          |
| Between channels of groups to                  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus             | ✓                          | ✓                          | ✓                          | ✓                          |
| Insulation tested with                         | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Safety</b>                                  |                            |                            |                            |                            |
| Safety protocol                                | -                          | -                          | -                          | -                          |
| Safety requirements                            | -                          | -                          | -                          | -                          |
| Secure user address                            | -                          | -                          | -                          | -                          |
| Watchdog                                       | -                          | -                          | -                          | -                          |
| Two channels                                   | -                          | -                          | -                          | -                          |
| Test pulse outputs                             | -                          | -                          | -                          | -                          |
| <b>Mechanical data</b>                         |                            |                            |                            |                            |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                |                            |                            |                            |                            |
| Operating temperature                          | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature                            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                          |                            |                            |                            |                            |
| UL508 certification                            | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

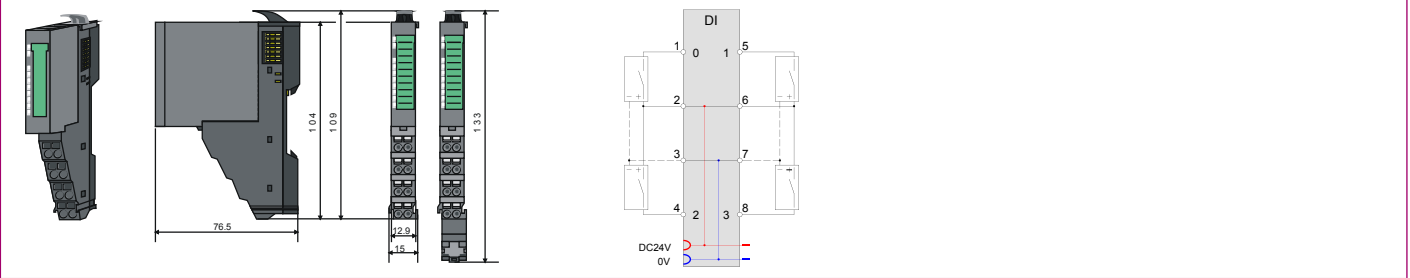
## Signal modules digital | Digital input modules

|           |           |           |
|-----------|-----------|-----------|
| 021-1BB00 | 021-1BD00 | 021-1BD70 |
| 021-1BB10 | 021-1BD10 | 021-1BF00 |
| 021-1BB50 | 021-1BD40 | 021-1BF50 |
| 021-1BB70 | 021-1BD50 | 021-1SD00 |

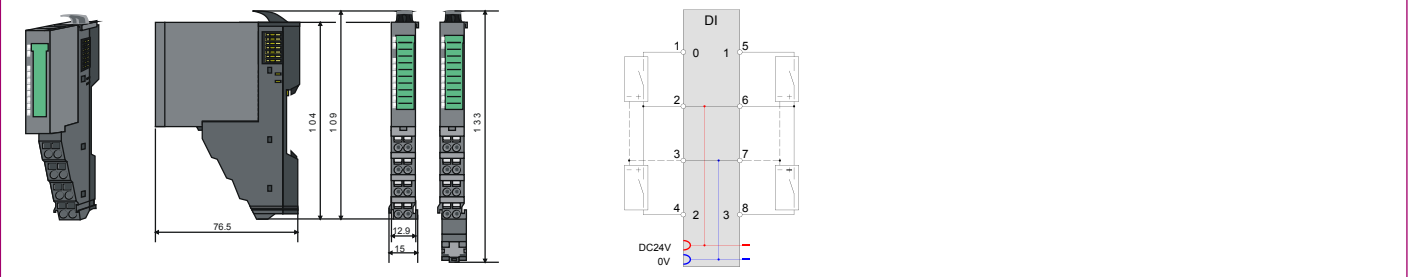
### 021-1BD00



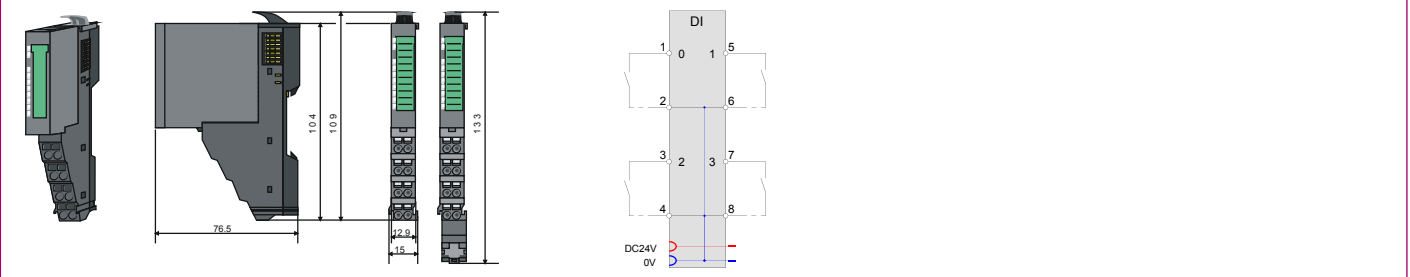
### 021-1BD10



### 021-1BD40



### 021-1BD50









# Digital input modules

## Signal modules digital | Digital input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 021-1BB00 | 021-1BD00 | 021-1BD70 |  |  |  |
| 021-1BB10 | 021-1BD10 | 021-1BF00 |  |  |  |
| 021-1BB50 | 021-1BD40 | 021-1BF50 |  |  |  |
| 021-1BB70 | 021-1BD50 | 021-1SD00 |  |  |  |

| Order number  | 021-1BD70  | 021-1BF00   | 021-1BF50  | 021-1SD00   |
|---|--|---|--|---|
| Figure  |   |  |       |  |
| Type  | SM 021   | SM 021  | SM 021   | SM 021  |
| Module ID   | 0F03 47C2  | 0005 9FC1   | 0007 9FC1  | 0C81 2E00   |
| <b>General information</b>  |  |   |  |   |
| Note  | -  | -   | -  | Coming soon   |
| Features  | <ul style="list-style-type: none"> <li>▸ 4 inputs</li> <li>▸ Time stamp</li> </ul> | <ul style="list-style-type: none"> <li>▸ 8 inputs</li> </ul>                      | <ul style="list-style-type: none"> <li>▸ 8 inputs</li> <li>▸ Active low input</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 inputs</li> <li>▸ Safety</li> </ul>      |
| <b>Current consumption/power loss</b>                               |  |   |  |   |
| Current consumption from backplane bus                              | 85 mA  | 60 mA   | 65 mA  | 80 mA   |
| Power loss  | 0.95 W   | 0.9 W   | 0.9 W  | 0.8 W   |
| <b>Technical data digital inputs</b>                                |  |   |  |   |
| Number of inputs  | 4  | 8   | 8  | 4   |
| Cable length, shielded  | 1000 m   | 1000 m  | 1000 m   | 1000 m  |
| Cable length, unshielded  | 600 m  | 600 m   | 600 m  | 600 m   |
| Rated load voltage  | DC 24 V  | -   | -  | -   |
| Current consumption from load voltage L+ (without load)             | 15 mA  | -   | -  | -   |
| Rated value   | DC 20.4...28.8 V   | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 20.4...28.8 V  |
| Input voltage for signal "0"  | DC 0...5 V   | DC 0...5 V  | DC 15...28.8 V   | DC 0...5 V  |
| Input voltage for signal "1"  | DC 15...28.8 V   | DC 15...28.8 V  | DC 0...5 V   | DC 15...28.8 V  |
| Input voltage hysteresis  | -  | -   | -  | -   |
| Frequency range   | -  | -   | -  | -   |
| Input resistance  | -  | -   | -  | -   |
| Input current for signal "1"  | 3 mA   | 3 mA  | 3 mA   | 3 mA  |
| Connection of Two-Wire-BEROs possible                               | ✓  | ✓   | ✓  | ✓   |
| Max. permissible BERO quiescent current                             | 0.5 mA   | 0.5 mA  | 0.5 mA   | 0.5 mA  |
| Input delay of "0" to "1"   | parameterizable 2µs<br>- 3ms   | 3 ms  | 3 ms   | parameterizable 3ms<br>- 1s   |
| Input delay of "1" to "0"   | parameterizable 2µs<br>- 3ms   | 3 ms  | 3 ms   | parameterizable 3ms<br>- 1s   |
| Number of simultaneously utilizable inputs horizontal configuration | 4  | 8   | 8  | 4   |
| Number of simultaneously utilizable inputs vertical configuration   | 4  | 8   | 8  | 4   |
| Input characteristic curve  | IEC 61131, type 1  | IEC 61131, type 1   | -  | IEC 61131, type 1   |
| Initial data size   | 60 Byte  | 8 Bit   | 8 Bit  | 4 Bit   |
| <b>Status information, alarms, diagnostics</b>                      |  |   |  |   |

| Signal modules digital   Digital input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 021-1BB00                                      | 021-1BD00 | 021-1BD70 |  |  |  |
| 021-1BB10                                      | 021-1BD10 | 021-1BF00 |  |  |  |
| 021-1BB50                                      | 021-1BD40 | 021-1BF50 |  |  |  |
| 021-1BB70                                      | 021-1BD50 | 021-1SD00 |  |  |  |

| Order number                       | 021-1BD70                  | 021-1BF00                  | 021-1BF50                  | 021-1SD00                     |
|------------------------------------|----------------------------|----------------------------|----------------------------|-------------------------------|
| Status display                     | green LED per channel      | green LED per channel      | green LED per channel      | green LED per channel         |
| Interrupts                         | no                         | no                         | no                         | yes, parameterizable          |
| Process alarm                      | no                         | no                         | no                         | no                            |
| Diagnostic interrupt               | no                         | no                         | no                         | yes, parameterizable          |
| Diagnostic functions               | no                         | no                         | no                         | yes, parameterizable          |
| Diagnostics information read-out   | possible                   | none                       | none                       | possible                      |
| Module state                       | green LED                  | green LED                  | green LED                  | green LED                     |
| Module error display               | red LED                    | red LED                    | red LED                    | red LED                       |
| Channel error display              | none                       | none                       | none                       | none                          |
| <b>Isolation</b>                   |                            |                            |                            |                               |
| Between channels                   | -                          | -                          | -                          | -                             |
| Between channels of groups to      | -                          | -                          | -                          | -                             |
| Between channels and backplane bus | ✓                          | ✓                          | ✓                          | ✓                             |
| Insulation tested with             | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                      |
| <b>Safety</b>                      |                            |                            |                            |                               |
| Safety protocol                    | -                          | -                          | -                          | PROFIsafe V1 and PROFIsafe V2 |
| Safety requirements                | -                          | -                          | -                          | SIL CL 3 and PL e             |
| Secure user address                | -                          | -                          | -                          | 1 - 4095                      |
| Watchdog                           | -                          | -                          | -                          | parameterizable 10ms - 1s     |
| Two channels                       | -                          | -                          | -                          | Each 2 of 4 inputs switchable |
| Test pulse outputs                 | -                          | -                          | -                          | 4                             |
| <b>Mechanical data</b>             |                            |                            |                            |                               |
| Dimensions (WxHxD)                 | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm    |
| Weight                             | 60 g                       | 60 g                       | 60 g                       | 60 g                          |
| <b>Environmental conditions</b>    |                            |                            |                            |                               |
| Operating temperature              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C                 |
| Storage temperature                | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C               |
| <b>Certifications</b>              |                            |                            |                            |                               |
| UL508 certification                | in preparation             | in preparation             | in preparation             | in preparation                |

# Connections, Interfaces

## Signal modules digital | Digital input modules

|           |           |           |
|-----------|-----------|-----------|
| 021-1BB00 | 021-1BD00 | 021-1BD70 |
| 021-1BB10 | 021-1BD10 | 021-1BF00 |
| 021-1BB50 | 021-1BD40 | 021-1BF50 |
| 021-1BB70 | 021-1BD50 | 021-1SD00 |

### 021-1BD70





### 021-1BF00

### 021-1BF50

### 021-1SD00

# Digital output modules

| Signal modules digital   Digital output modules |           |           |           |  |  |
|---|-----------|-----------|-----------|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |

| Order number  | 022-1BB00   | 022-1BB20   | 022-1BB50  | 022-1BB70   |
|---|---|---|--|---|
| Figure  |              |            |                     |                                  |
| Type  | SM 022  | SM 022  | SM 022   | SM 022  |
| Module ID   | 0101 AF90   | 0102 AF90   | 0103 AF90  | 0F41 57E1   |
| <b>General information</b>                                    |   |   |  |   |
| Note  | -   | -   | -  | -   |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 outputs</li> <li>▸ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs</li> <li>▸ Output current 2 A</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 Low-Side outputs</li> <li>▸ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs</li> <li>▸ Time stamp</li> <li>▸ Output current 0.5 A</li> </ul> |
| <b>Current consumption/power loss</b>                         |   |   |  |   |
| Current consumption from backplane bus                        | 55 mA   | 60 mA   | 60 mA  | 85 mA   |
| Power loss  | 0.4 W   | 0.55 W  | 0.4 W  | 0.95 W  |
| <b>Technical data digital outputs</b>                         |   |   |  |   |
| Number of outputs   | 2   | 2   | 2  | 2   |
| Cable length, shielded  | 1000 m  | 1000 m  | 1000 m   | 1000 m  |
| Cable length, unshielded                                      | 600 m   | 600 m   | 600 m  | 600 m   |
| Rated load voltage  | DC 20.4...28.8 V  | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 20.4...28.8 V  |
| Current consumption from load voltage L+ (without load)       | 5 mA  | 10 mA   | 2.5 mA   | 15 mA   |
| Output current at signal "1", rated value                     | 0.5 A   | 2 A   | 0.5 A  | 0.5 A   |
| Output delay of "0" to "1"                                    | 30 µs   | 100 µs  | 30 µs  | max. 100 ns   |
| Output delay of "1" to "0"                                    | 175 µs  | 175 µs  | 100 µs   | max. 100 ns   |
| Minimum load current  | -   | -   | -  | -   |
| Lamp load   | 10 W  | 10 W  | 10 W   | 10 W  |
| Parallel switching of outputs for redundant control of a load | not possible  | not possible  | not possible   | not possible  |
| Parallel switching of outputs for increased power             | not possible  | not possible  | not possible   | not possible  |
| Actuation of digital input                                    | ✓   | ✓   | ✓  | ✓   |
| Switching frequency with resistive load                       | max. 1000 Hz  | max. 1000 Hz  | max. 1000 Hz   | max. 40 kHz   |
| Switching frequency with inductive load                       | max. 0.5 Hz   | max. 0.5 Hz   | max. 0.5 Hz  | max. 40 kHz   |
| Switching frequency on lamp load                              | max. 10 Hz  | max. 10 Hz  | max. 10 Hz   | max. 40 kHz   |
| Internal limitation of inductive shut-off voltage             | L+ (-52 V)  | L+ (-52 V)  | +45 V  | L+ (-52 V)  |
| Short-circuit protection of output                            | yes, electronic   | yes, electronic   | yes, electronic  | yes, electronic, and only highside  |
| Trigger level   | 1 A   | 4 A   | 1.7 A  | 2.5 A   |
| Number of operating cycle of relay outputs                    | -   | -   | -  | -   |
| Switching capacity of contacts                                | -   | -   | -  | -   |

| Signal modules digital   Digital output modules |           |           |           |  |  |  |
|---|-----------|-----------|-----------|--|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |  |

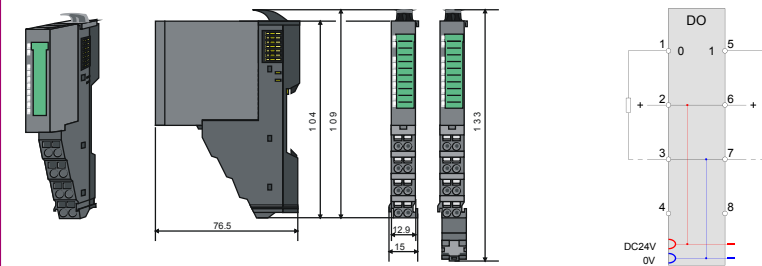
| Order number                                   | 022-1BB00                  | 022-1BB20                  | 022-1BB50                  | 022-1BB70                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Output data size                               | 2 Bit                      | 2 Bit                      | 2 Bit                      | 60 Byte                    |
| <b>Status information, alarms, diagnostics</b> |                            |                            |                            |                            |
| Status display                                 | green LED per channel      | green LED per channel      | green LED per channel      | green LED per channel      |
| Interrupts                                     | no                         | no                         | no                         | no                         |
| Process alarm                                  | no                         | no                         | no                         | no                         |
| Diagnostic interrupt                           | no                         | no                         | no                         | no                         |
| Diagnostic functions                           | no                         | no                         | no                         | no                         |
| Diagnostics information read-out               | none                       | none                       | none                       | possible                   |
| Module state                                   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display                           | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display                          | none                       | none                       | none                       | none                       |
| <b>Isolation</b>                               |                            |                            |                            |                            |
| Between channels                               | -                          | -                          | -                          | -                          |
| Between channels of groups to                  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus             | ✓                          | ✓                          | ✓                          | ✓                          |
| Insulation tested with                         | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Safety</b>                                  |                            |                            |                            |                            |
| Safety protocol                                | -                          | -                          | -                          | -                          |
| Safety requirements                            | -                          | -                          | -                          | -                          |
| Secure user address                            | -                          | -                          | -                          | -                          |
| Watchdog                                       | -                          | -                          | -                          | -                          |
| Two channels                                   | -                          | -                          | -                          | -                          |
| Test pulse length                              | -                          | -                          | -                          | -                          |
| Circuit monitoring                             | -                          | -                          | -                          | -                          |
| <b>Mechanical data</b>                         |                            |                            |                            |                            |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                |                            |                            |                            |                            |
| Operating temperature                          | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature                            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                          |                            |                            |                            |                            |
| UL508 certification                            | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

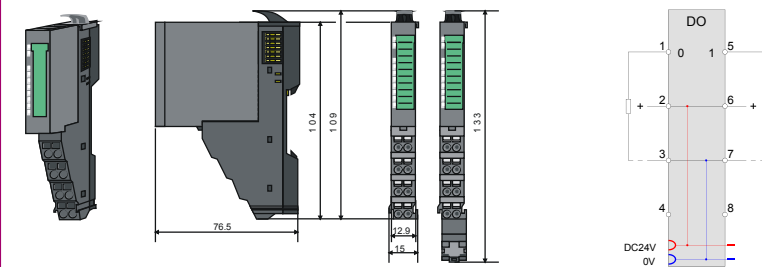
## Signal modules digital | Digital output modules

|           |           |           |           |  |  |
|-----------|-----------|-----------|-----------|--|--|
| 022-1BB00 | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20 | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50 | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70 | 022-1BD50 | 022-1HB10 |           |  |  |

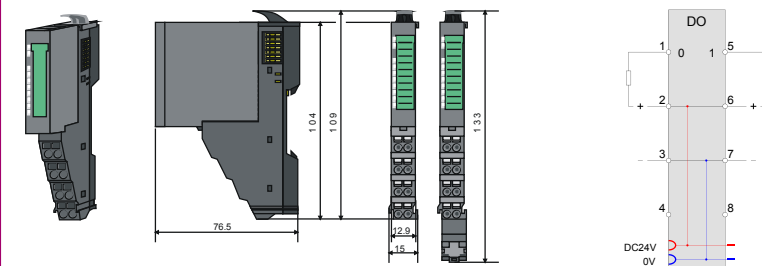
### 022-1BB00



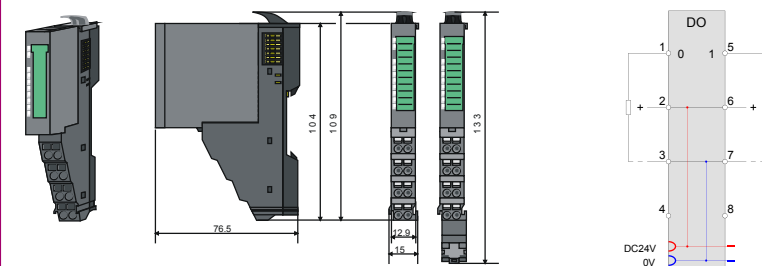
### 022-1BB20



### 022-1BB50







### 022-1BB70



# Digital output modules

## Signal modules digital | Digital output modules

|  |  |  |           |  |  |
|--|--|--|-----------|--|--|
| 022-1BB00<br>022-1BB20<br>022-1BB50<br>022-1BB70 | 022-1BB90<br>022-1BD00<br>022-1BD20<br>022-1BD50 | 022-1BD70<br>022-1BF00<br>022-1BF50<br>022-1HB10 | 022-1SD00 |  |  |
|--|--|--|-----------|--|--|

| Order number  | 022-1BB90   | 022-1BD00   | 022-1BD20   | 022-1BD50  |
|---|---|---|---|--|
| Figure  |  |              |          |                     |
| Type  | SM 022  | SM 022  | SM 022  | SM 022   |
| Module ID   | 0901 4880   | 0104 AFA0   | 0108 AFA0   | 0105 AFA0  |
| <b>General information</b>                                    |   |   |   |  |
| Note  | -   | -   | -   | -  |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 outputs</li> <li>▸ PWM</li> </ul>      | <ul style="list-style-type: none"> <li>▸ 4 outputs</li> <li>▸ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 outputs</li> <li>▸ Output current 2 A</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 Low-Side outputs</li> <li>▸ Output current 0.5 A</li> </ul> |
| <b>Current consumption/power loss</b>                         |   |   |   |  |
| Current consumption from backplane bus                        | 85 mA   | 55 mA   | 65 mA   | 65 mA  |
| Power loss  | 0.95 W  | 0.5 W   | 0.8 W   | 0.5 W  |
| <b>Technical data digital outputs</b>                         |   |   |   |  |
| Number of outputs   | 2   | 4   | 4   | 4  |
| Cable length, shielded  | 1000 m  | 1000 m  | 1000 m  | 1000 m   |
| Cable length, unshielded                                      | 600 m   | 600 m   | 600 m   | 600 m  |
| Rated load voltage  | DC 20.4...28.8 V  | DC 20.4...28.8 V  | DC 20.4...28.8 V  | DC 20.4...28.8 V   |
| Current consumption from load voltage L+ (without load)       | 15 mA   | 10 mA   | 20 mA   | 5 mA   |
| Output current at signal "1", rated value                     | 0.5 A   | 0.5 A   | 2 A   | 0.5 A  |
| Output delay of "0" to "1"                                    | max. 100 ns   | 30 µs   | 100 µs  | 30 µs  |
| Output delay of "1" to "0"                                    | max. 100 ns   | 175 µs  | 175 µs  | 100 µs   |
| Minimum load current  | -   | -   | -   | -  |
| Lamp load   | 10 W  | 10 W  | 10 W  | 10 W   |
| Parallel switching of outputs for redundant control of a load | not possible  | not possible  | not possible  | not possible   |
| Parallel switching of outputs for increased power             | not possible  | not possible  | not possible  | not possible   |
| Actuation of digital input                                    | ✓   | ✓   | ✓   | ✓  |
| Switching frequency with resistive load                       | max. 40 kHz   | max. 1000 Hz  | max. 1000 Hz  | max. 1000 Hz   |
| Switching frequency with inductive load                       | max. 40 kHz   | max. 0.5 Hz   | max. 0.5 Hz   | max. 0.5 Hz  |
| Switching frequency on lamp load                              | max. 40 kHz   | max. 10 Hz  | max. 10 Hz  | max. 10 Hz   |
| Internal limitation of inductive shut-off voltage             | L+ (-52 V)  | L+ (-52 V)  | L+ (-52 V)  | +45 V  |
| Short-circuit protection of output                            | yes, electronic, and only highside  | yes, electronic   | yes, electronic   | yes, electronic  |
| Trigger level   | 2.5 A   | 1 A   | 2.7 A   | 1.7 A  |
| Number of operating cycle of relay outputs                    | -   | -   | -   | -  |
| Switching capacity of contacts                                | -   | -   | -   | -  |



| Signal modules digital   Digital output modules |           |           |           |  |  |  |
|---|-----------|-----------|-----------|--|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |  |

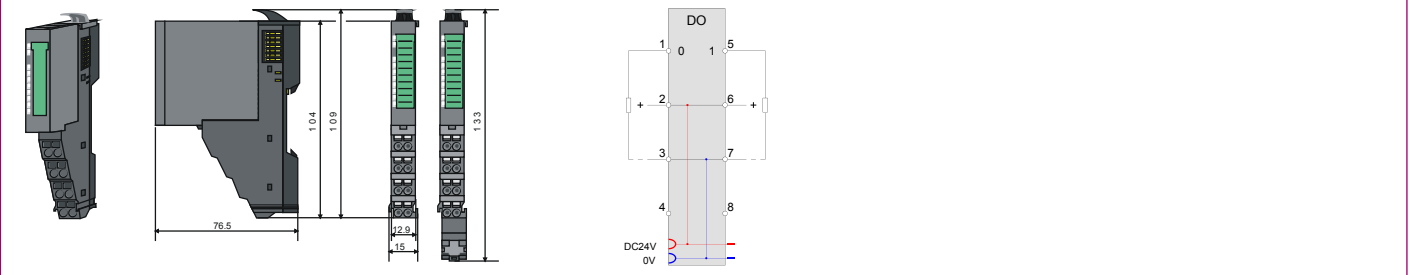
| Order number                                   | 022-1BB90                  | 022-1BD00                  | 022-1BD20                  | 022-1BD50                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Output data size                               | 12 Byte                    | 4 Bit                      | 4 Bit                      | 4 Bit                      |
| <b>Status information, alarms, diagnostics</b> |                            |                            |                            |                            |
| Status display                                 | green LED per channel      | green LED per channel      | green LED per channel      | green LED per channel      |
| Interrupts                                     | no                         | no                         | no                         | no                         |
| Process alarm                                  | no                         | no                         | no                         | no                         |
| Diagnostic interrupt                           | no                         | no                         | no                         | no                         |
| Diagnostic functions                           | no                         | no                         | no                         | no                         |
| Diagnostics information read-out               | possible                   | none                       | none                       | none                       |
| Module state                                   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display                           | red LED                    | red SF LED                 | red SF LED                 | red SF LED                 |
| Channel error display                          | none                       | none                       | none                       | none                       |
| <b>Isolation</b>                               |                            |                            |                            |                            |
| Between channels                               | -                          | -                          | -                          | -                          |
| Between channels of groups to                  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus             | ✓                          | ✓                          | ✓                          | ✓                          |
| Insulation tested with                         | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Safety</b>                                  |                            |                            |                            |                            |
| Safety protocol                                | -                          | -                          | -                          | -                          |
| Safety requirements                            | -                          | -                          | -                          | -                          |
| Secure user address                            | -                          | -                          | -                          | -                          |
| Watchdog                                       | -                          | -                          | -                          | -                          |
| Two channels                                   | -                          | -                          | -                          | -                          |
| Test pulse length                              | -                          | -                          | -                          | -                          |
| Circuit monitoring                             | -                          | -                          | -                          | -                          |
| <b>Mechanical data</b>                         |                            |                            |                            |                            |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                |                            |                            |                            |                            |
| Operating temperature                          | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature                            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                          |                            |                            |                            |                            |
| UL508 certification                            | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

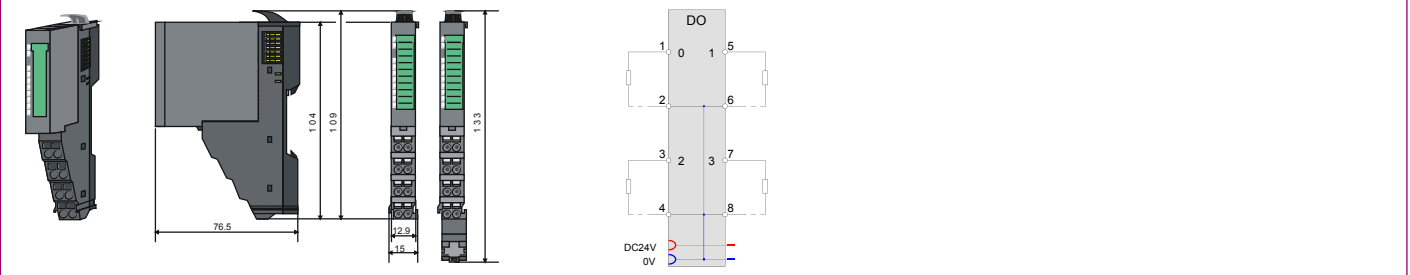
## Signal modules digital | Digital output modules

|           |           |           |           |  |  |
|-----------|-----------|-----------|-----------|--|--|
| 022-1BB00 | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20 | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50 | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70 | 022-1BD50 | 022-1HB10 |           |  |  |

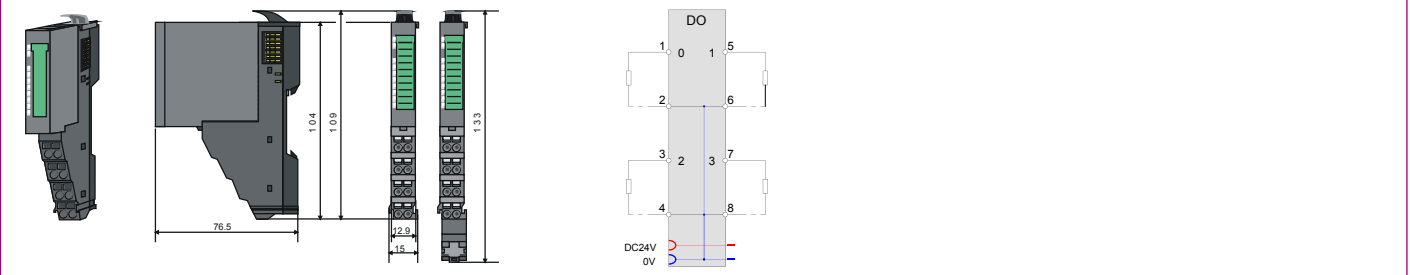
### 022-1BB90



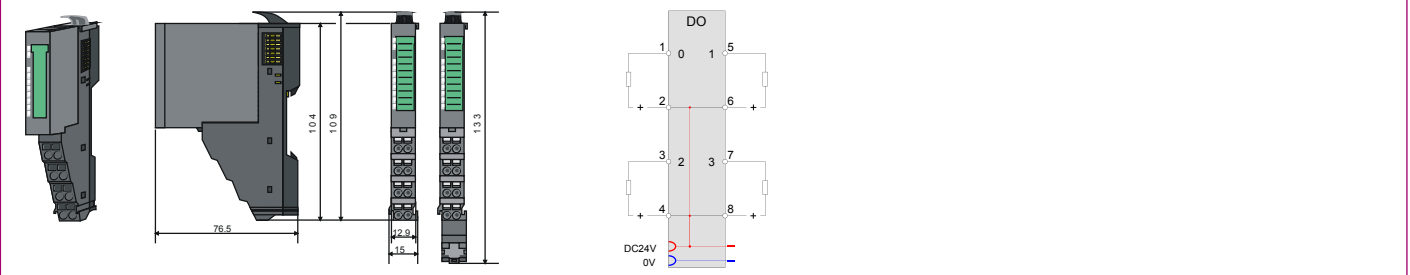
### 022-1BD00



### 022-1BD20







### 022-1BD50



# Digital output modules

| Signal modules digital   Digital output modules |           |           |           |  |  |
|---|-----------|-----------|-----------|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |

| Order number  | 022-1BD70   | 022-1BF00   | 022-1BF50  | 022-1HB10  |
|---|---|---|--|--|
| Figure  |                                    |              |                     |   |
| Type  | SM 022  | SM 022  | SM 022   | SM 022   |
| Module ID   | 0F43 57E2   | 0106 AFC8   | 0107 AFC8  | 0109 AF90  |
| <b>General information</b>                                    |   |   |  |  |
| Note  | -   | -   | -  | -  |
| Features  | <ul style="list-style-type: none"> <li>▶ 4 outputs</li> <li>▶ Time stamp</li> <li>▶ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▶ 8 outputs</li> <li>▶ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▶ 8 Low-Side outputs</li> <li>▶ Output current 0.5 A</li> </ul> | <ul style="list-style-type: none"> <li>▶ 2 relay outputs</li> <li>▶ DC 30 V/ AC 230 V</li> <li>▶ Output current 3 A</li> </ul> |
| <b>Current consumption/power loss</b>                         |   |   |  |  |
| Current consumption from backplane bus                        | 90 mA   | 65 mA   | 70 mA  | 130 mA   |
| Power loss  | 0.95 W  | 0.7 W   | 0.6 W  | 0.7 W  |
| <b>Technical data digital outputs</b>                         |   |   |  |  |
| Number of outputs   | 4   | 8   | 8  | 2  |
| Cable length, shielded  | 1000 m  | 1000 m  | 1000 m   | -  |
| Cable length, unshielded                                      | 600 m   | 600 m   | 600 m  | -  |
| Rated load voltage  | DC 20.4...28.8 V  | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 30 V/ AC 230 V  |
| Current consumption from load voltage L+ (without load)       | 25 mA   | 15 mA   | 10 mA  | -  |
| Output current at signal "1", rated value                     | 0.5 A   | 0.5 A   | 0.5 A  | 3 A  |
| Output delay of "0" to "1"                                    | max. 100 ns   | 30 µs   | 30 µs  | -  |
| Output delay of "1" to "0"                                    | max. 100 ns   | 175 µs  | 100 µs   | -  |
| Minimum load current  | -   | -   | -  | -  |
| Lamp load   | 10 W  | 10 W  | 10 W   | -  |
| Parallel switching of outputs for redundant control of a load | not possible  | not possible  | not possible   | -  |
| Parallel switching of outputs for increased power             | not possible  | not possible  | not possible   | -  |
| Actuation of digital input                                    | ✓   | ✓   | ✓  | -  |
| Switching frequency with resistive load                       | max. 40 kHz   | max. 1000 Hz  | max. 1000 Hz   | max. 100 Hz  |
| Switching frequency with inductive load                       | max. 40 kHz   | max. 0.5 Hz   | max. 0.5 Hz  | -  |
| Switching frequency on lamp load                              | max. 40 kHz   | max. 10 Hz  | max. 10 Hz   | -  |
| Internal limitation of inductive shut-off voltage             | L+ (-52 V)  | L+ (-52 V)  | +45 V  | -  |
| Short-circuit protection of output                            | yes, electronic, and only highside  | yes, electronic   | yes, electronic  | -  |
| Trigger level   | 2.5 A   | 1 A   | 1.7 A  | -  |
| Number of operating cycle of relay outputs                    | -   | -   | -  | -  |
| Switching capacity of contacts                                | -   | -   | -  | -  |

| Signal modules digital   Digital output modules |           |           |           |  |  |
|---|-----------|-----------|-----------|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |

| Order number                                   | 022-1BD70                  | 022-1BF00                  | 022-1BF50                  | 022-1HB10                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Output data size                               | 60 Byte                    | 8 Bit                      | 8 Bit                      | 2 Bit                      |
| <b>Status information, alarms, diagnostics</b> |                            |                            |                            |                            |
| Status display                                 | green LED per channel      | green LED per channel      | red LED per channel        | red LED per channel        |
| Interrupts                                     | no                         | no                         | no                         | no                         |
| Process alarm                                  | no                         | no                         | no                         | no                         |
| Diagnostic interrupt                           | no                         | no                         | no                         | no                         |
| Diagnostic functions                           | no                         | no                         | no                         | no                         |
| Diagnostics information read-out               | possible                   | none                       | none                       | none                       |
| Module state                                   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display                           | red SF LED                 | red SF LED                 | red LED                    | red LED                    |
| Channel error display                          | none                       | none                       | none                       | none                       |
| <b>Isolation</b>                               |                            |                            |                            |                            |
| Between channels                               | -                          | -                          | -                          | ✓                          |
| Between channels of groups to                  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus             | ✓                          | ✓                          | ✓                          | ✓                          |
| Insulation tested with                         | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Safety</b>                                  |                            |                            |                            |                            |
| Safety protocol                                | -                          | -                          | -                          | -                          |
| Safety requirements                            | -                          | -                          | -                          | -                          |
| Secure user address                            | -                          | -                          | -                          | -                          |
| Watchdog                                       | -                          | -                          | -                          | -                          |
| Two channels                                   | -                          | -                          | -                          | -                          |
| Test pulse length                              | -                          | -                          | -                          | -                          |
| Circuit monitoring                             | -                          | -                          | -                          | -                          |
| <b>Mechanical data</b>                         |                            |                            |                            |                            |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                |                            |                            |                            |                            |
| Operating temperature                          | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature                            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                          |                            |                            |                            |                            |
| UL508 certification                            | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

| Signal modules digital   Digital output modules |           |           |           |  |  |
|---|-----------|-----------|-----------|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |

**022-1BD70**

Technical drawing of the 022-1BD70 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 1.5, 1.33. A terminal block diagram shows 8 channels with DC24V and 0V connections.

**022-1BF00**

Technical drawing of the 022-1BF00 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 1.5, 1.33. A terminal block diagram shows 8 channels with 0V and DC24V connections.

**022-1BF50**


Technical drawing of the 022-1BF50 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 1.5, 1.33. A terminal block diagram shows 8 channels with DC24V and 0V connections.

**022-1HB10**

Technical drawing of the 022-1HB10 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 1.5, 1.33. A terminal block diagram shows 8 channels with AC 230 V and DC 24 V connections.

# Digital output modules

| Signal modules digital   Digital output modules |           |           |           |  |  |
|---|-----------|-----------|-----------|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |

| Order number  | 022-1SD00   |  |  |  |
|---|---|--|--|--|
| Figure  |                                |  |  |  |
| Type  | SM 022  |  |  |  |
| Module ID   | 0C41 1E00   |  |  |  |
| <b>General information</b>                                    |   |  |  |  |
| Note  | Coming soon   |  |  |  |
| Features  | <ul style="list-style-type: none"> <li>▸ 4 outputs</li> <li>▸ Safety</li> <li>▸ Output current 0.5 A</li> </ul> |  |  |  |
| <b>Current consumption/power loss</b>                         |   |  |  |  |
| Current consumption from backplane bus                        | 80 mA   |  |  |  |
| Power loss  | 1.2 W   |  |  |  |
| <b>Technical data digital outputs</b>                         |   |  |  |  |
| Number of outputs   | 4   |  |  |  |
| Cable length, shielded  | 1000 m  |  |  |  |
| Cable length, unshielded                                      | 600 m   |  |  |  |
| Rated load voltage  | DC 20.4...28.8 V  |  |  |  |
| Current consumption from load voltage L+ (without load)       | 10 mA   |  |  |  |
| Output current at signal "1", rated value                     | 0.5 A   |  |  |  |
| Output delay of "0" to "1"                                    | 100 µs  |  |  |  |
| Output delay of "1" to "0"                                    | 175 µs  |  |  |  |
| Minimum load current  | -   |  |  |  |
| Lamp load   | 5 W   |  |  |  |
| Parallel switching of outputs for redundant control of a load | not possible  |  |  |  |
| Parallel switching of outputs for increased power             | not possible  |  |  |  |
| Actuation of digital input                                    | ✓   |  |  |  |
| Switching frequency with resistive load                       | max. 100 Hz   |  |  |  |
| Switching frequency with inductive load                       | max. 0.5 Hz   |  |  |  |
| Switching frequency on lamp load                              | max. 10 Hz  |  |  |  |
| Internal limitation of inductive shut-off voltage             | L+ (-52 V)  |  |  |  |
| Short-circuit protection of output                            | yes, electronic   |  |  |  |
| Trigger level   | 1.7 A   |  |  |  |
| Number of operating cycle of relay outputs                    | -   |  |  |  |
| Switching capacity of contacts                                | -   |  |  |  |

| Signal modules digital   Digital output modules |           |           |           |  |  |  |
|---|-----------|-----------|-----------|--|--|--|
| 022-1BB00                                       | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |  |
| 022-1BB20                                       | 022-1BD00 | 022-1BF00 |           |  |  |  |
| 022-1BB50                                       | 022-1BD20 | 022-1BF50 |           |  |  |  |
| 022-1BB70                                       | 022-1BD50 | 022-1HB10 |           |  |  |  |

| Order number                                   | 022-1SD00                      |  |  |  |
|--|--------------------------------|--|--|--|
| Output data size                               | 4 Bit                          |  |  |  |
| <b>Status information, alarms, diagnostics</b> |                                |  |  |  |
| Status display                                 | green LED per channel          |  |  |  |
| Interrupts                                     | yes, parameterizable           |  |  |  |
| Process alarm                                  | no                             |  |  |  |
| Diagnostic interrupt                           | yes, parameterizable           |  |  |  |
| Diagnostic functions                           | yes, parameterizable           |  |  |  |
| Diagnostics information read-out               | possible                       |  |  |  |
| Module state                                   | green LED                      |  |  |  |
| Module error display                           | red SF LED                     |  |  |  |
| Channel error display                          | none                           |  |  |  |
| <b>Isolation</b>                               |                                |  |  |  |
| Between channels                               | -                              |  |  |  |
| Between channels of groups to                  | -                              |  |  |  |
| Between channels and backplane bus             | ✓                              |  |  |  |
| Insulation tested with                         | DC 500 V                       |  |  |  |
| <b>Safety</b>                                  |                                |  |  |  |
| Safety protocoll                               | PROFIsafe V1 and PROFIsafe V2  |  |  |  |
| Safety requirements                            | SIL CL 3 and PL e              |  |  |  |
| Secure user address                            | 1 - 4095                       |  |  |  |
| Watchdog                                       | parameterizable 10ms - 1s      |  |  |  |
| Two channels                                   | Each 2 of 4 outputs switchable |  |  |  |
| Test pulse length                              | parameterizable 500µs - 16ms   |  |  |  |
| Circuit monitoring                             | ✓                              |  |  |  |
| <b>Mechanical data</b>                         |                                |  |  |  |
| Dimensions (WxHxD)                             | 12.9 mm x 109 mm x 76.5 mm     |  |  |  |
| Weight   | 60 g                           |  |  |  |
| <b>Environmental conditions</b>                |                                |  |  |  |
| Operating temperature                          | 0 °C to 60 °C                  |  |  |  |
| Storage temperature                            | -25 °C to 70 °C                |  |  |  |
| <b>Certifications</b>                          |                                |  |  |  |
| UL508 certification                            | in preparation                 |  |  |  |

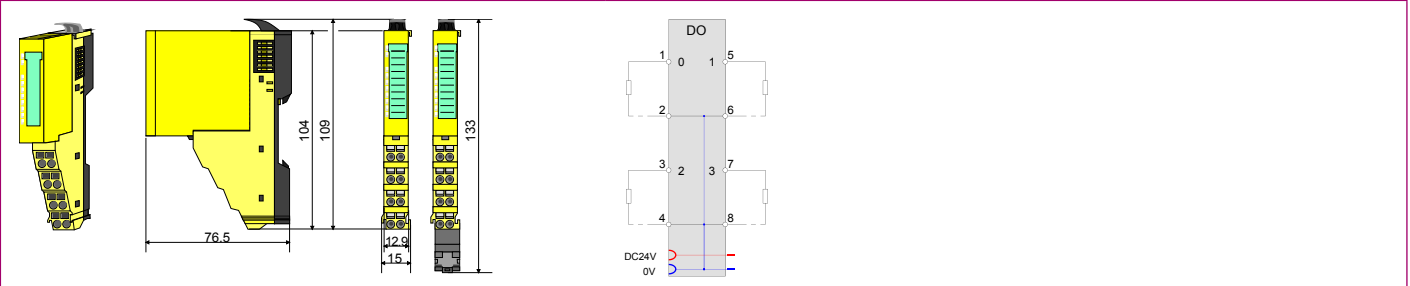


# Connections, Interfaces

## Signal modules digital | Digital output modules

|           |           |           |           |  |  |
|-----------|-----------|-----------|-----------|--|--|
| 022-1BB00 | 022-1BB90 | 022-1BD70 | 022-1SD00 |  |  |
| 022-1BB20 | 022-1BD00 | 022-1BF00 |           |  |  |
| 022-1BB50 | 022-1BD20 | 022-1BF50 |           |  |  |
| 022-1BB70 | 022-1BD50 | 022-1HB10 |           |  |  |

### 022-1SD00



# Signal modules analog



## Structure and Function

Signal modules (SM) to connect sensors and actuators are the interfaces of the system to the process. Analog signal modules acquire the analog control signals (e.g. measurement data) to and out of the process level. Depending on the application and type the control signals are acquired from the process level and converted into interpretable signals for controlling. Analog output modules convert the internal control signals into signals suitable for the process level.

A variety of different analog signal modules accurately provide the inputs and outputs that are required for each task. The analog modules differ in the number of channels, voltage and current ranges, isolation, and diagnostic and alarm capability.

Each signal module consists of a terminal and an electronics module.

The terminal module (TM) contains the retainer for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for the wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

The functionality of the signal module is defined via the electronics module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

## Characteristics

- › 2 or 4 channel
- › 12 bit or 16 bit resolution
- › Functions of the inputs / outputs programmable
- › Most various assemblies, suitable for measuring transducers (current/voltage, resistance or temperature sensors)
- › Direct mapping and readability of the channel conditions via status LEDs
- › Safe and time-saving installation by the terminal assignment mounted on the module
- › When changing the module equipment identification (BMK) is retained on the TM
- › Individual single-channel lettering on insertion strip
- › 24 month warranty





# Overview

| Order no.             | Name/Description   | Page |
|-----------------------|--|------|
| Analog input modules  |  |      |
| 031-1BB30             | <b>SM 031 - Analog input</b><br>‣ 2 inputs 12Bit<br>‣ Voltage 0...10 V   | 52   |
| 031-1BB40             | <b>SM 031 - Analog input</b><br>‣ 2 inputs 12Bit<br>‣ Current 0(4)...20 mA   | 52   |
| 031-1BB60             | <b>SM 031 - Analog input</b><br>‣ 2 inputs 12Bit<br>‣ Current 4...20 mA<br>‣ 2 wire  | 52   |
| 031-1BB70             | <b>SM 031 - Analog input</b><br>‣ 2 inputs 12Bit<br>‣ Voltage -10 V...+10 V  | 52   |
| 031-1BB90             | <b>SM 031 - Analog input</b><br>‣ 2 inputs 16Bit<br>‣ Thermocouple<br>‣ Voltage -80mV...+80mV                                    | 56   |
| 031-1BD30             | <b>SM 031 - Analog input</b><br>‣ 4 inputs 12Bit<br>‣ Voltage 0...10 V   | 56   |
| 031-1BD40             | <b>SM 031 - Analog input</b><br>‣ 4 inputs 12Bit<br>‣ Current 0(4)...20 mA   | 56   |
| 031-1BD70             | <b>SM 031 - Analog input</b><br>‣ 4 inputs 12Bit<br>‣ Voltage -10 V...+10 V  | 56   |
| 031-1BD80             | <b>SM 031 - Analog input</b><br>‣ 4 inputs 16Bit<br>‣ Resistance 0...3000 Ohm<br>‣ Resistance measurement with 2, 3, and 4-wires | 60   |
| Analog output modules |  |      |
| 032-1BB30             | <b>SM 032 - Analog output</b><br>‣ 2 outputs 12Bit<br>‣ Voltage 0...10 V   | 64   |
| 032-1BB40             | <b>SM 032 - Analog output</b><br>‣ 2 outputs 12Bit<br>‣ Current 0(4)...20 mA   | 64   |
| 032-1BB70             | <b>SM 032 - Analog output</b><br>‣ 2 outputs 12Bit<br>‣ Voltage -10 V...+10 V  | 64   |
| 032-1BD30             | <b>SM 032 - Analog output</b><br>‣ 4 outputs 12Bit<br>‣ Voltage 0...10 V   | 64   |
| 032-1BD40             | <b>SM 032 - Analog output</b><br>‣ 4 outputs 12Bit<br>‣ Current 0(4)...20mA  | 67   |
| 032-1BD70             | <b>SM 032 - Analog output</b><br>‣ 4 outputs 12Bit<br>‣ Voltage -10 V...+10 V  | 67   |
| 032-1CB30             | <b>SM 032 - Analog output</b><br>‣ 2 outputs 16Bit<br>‣ Voltage 0...10 V   | 67   |
| 032-1CB70             | <b>SM 032 - Analog output</b><br>‣ 2 outputs 16Bit<br>‣ Voltage -10 V...+10 V  | 67   |
| 032-1CD30             | <b>SM 032 - Analog output</b><br>‣ 4 outputs 16Bit<br>‣ Voltage 0...10 V   | 70   |
| 032-1CD70             | <b>SM 032 - Analog output</b><br>‣ 4 outputs 16Bit<br>‣ Voltage -10 V...+10 V  | 70   |

# Analog input modules

## Signal modules analog | Analog input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |

| Order number  | 031-1BB30  | 031-1BB40  | 031-1BB60   | 031-1BB70   |
|---|--|--|---|---|
| Figure  |               |                   |                                |                  |
| Type  | SM 031   | SM 031   | SM 031  | SM 031  |
| Module ID   | 0401 15C3  | 0402 15C3  | 0407 15C3   | 0408 15C3   |
| <b>General information</b>                              |  |  |   |   |
| Note  | -  | -  | -   | -   |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 inputs 12Bit</li> <li>▸ Voltage 0...10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 inputs 12Bit</li> <li>▸ Current 0(4)...20 mA</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 inputs 12Bit</li> <li>▸ Current 4...20 mA</li> <li>▸ 2 wire</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 inputs 12Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> |
| <b>Current consumption/power loss</b>                   |  |  |   |   |
| Current consumption from backplane bus                  | 70 mA  | 70 mA  | 70 mA   | 70 mA   |
| Power loss  | 0.7 W  | 0.7 W  | 0.7 W   | 0.7 W   |
| <b>Technical data analog inputs</b>                     |  |  |   |   |
| Number of inputs  | 2  | 2  | 2   | 2   |
| Cable length, shielded                                  | 200 m  | 200 m  | 200 m   | 200 m   |
| Rated load voltage                                      | DC 24 V  | DC 24 V  | DC 24 V   | DC 24 V   |
| Current consumption from load voltage L+ (without load) | 15 mA  | 15 mA  | 15 mA   | 15 mA   |
| Voltage inputs  | ✓  | -  | -   | ✓   |
| Min. input resistance (voltage range)                   | 100 kΩ   | -  | -   | 100 kΩ  |
| Input voltage ranges                                    | 0 V ... +10 V  | -  | -   | -10 V ... +10 V   |
| Operational limit of voltage ranges                     | +/-0.3%  | -  | -   | +/-0.3%   |
| Operational limit of voltage ranges with SFU            | -  | -  | -   | -   |
| Basic error limit voltage ranges                        | +/-0.2%  | -  | -   | +/-0.2%   |
| Basic error limit voltage ranges with SFU               | -  | -  | -   | -   |
| Current inputs  | -  | ✓  | ✓   | -   |
| Min. input resistance (current range)                   | -  | 110 Ω  | 110 Ω   | -   |
| Input current ranges                                    | -  | 0 mA ... +20 mA<br>+4 mA ... +20 mA  | +4 mA ... +20 mA  | -   |
| Operational limit of current ranges                     | -  | +/-0.3% ... +/-0.5%  | +/-0.5%   | -   |
| Operational limit of current ranges with SFU            | -  | -  | -   | -   |
| Basic error limit current ranges                        | -  | +/-0.2% ... +/-0.3%  | +/-0.3%   | -   |
| Basic error limit current ranges with SFU               | -  | -  | -   | -   |
| Resistance inputs                                       | -  | -  | -   | -   |
| Resistance ranges                                       | -  | -  | -   | -   |
| Operational limit of resistor ranges                    | -  | -  | -   | -   |

| Signal modules analog   Analog input modules |           |           |  |  |  |  |
|--|-----------|-----------|--|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |  |

| Order number                                       | 031-1BB30                | 031-1BB40                | 031-1BB60                | 031-1BB70                |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Basic error limit                                  | -                        | -                        | -                        | -                        |
| Resistance thermometer inputs                      | -                        | -                        | -                        | -                        |
| Resistance thermometer ranges                      | -                        | -                        | -                        | -                        |
| Operational limit of resistance thermometer ranges | -                        | -                        | -                        | -                        |
| Operational limit of resistor ranges with SFU      | -                        | -                        | -                        | -                        |
| Basic error limit thermoresistor ranges            | -                        | -                        | -                        | -                        |
| Operational limit of resistor ranges with SFU      | -                        | -                        | -                        | -                        |
| Thermocouple inputs                                | -                        | -                        | -                        | -                        |
| Thermocouple ranges                                | -                        | -                        | -                        | -                        |
| Operational limit of thermocouple ranges           | -                        | -                        | -                        | -                        |
| Operational limit of thermocouple ranges with SFU  | -                        | -                        | -                        | -                        |
| Basic error limit thermoelement ranges             | -                        | -                        | -                        | -                        |
| Basic error limit thermoelement ranges with SFU    | -                        | -                        | -                        | -                        |
| Programmable temperature compensation              | -                        | -                        | -                        | -                        |
| External temperature compensation                  | -                        | -                        | -                        | -                        |
| Internal temperature compensation                  | -                        | -                        | -                        | -                        |
| Resolution in bit                                  | 12                       | 12                       | 12                       | 12                       |
| Measurement principle                              | successive approximation | successive approximation | successive approximation | successive approximation |
| Basic conversion time                              | 2 ms all channels        | 2 ms all channels        | 2 ms all channels        | 2 ms all channels        |
| Noise suppression for frequency                    | >50dB at 50Hz (UCM<2V)   | >50dB at 50Hz (UCM<2V)   | >50dB at 50Hz (UCM<2V)   | >50dB at 50Hz (UCM<2V)   |
| Initial data size                                  | 4 Byte                   | 4 Byte                   | 4 Byte                   | 4 Byte                   |
| <b>Status information, alarms, diagnostics</b>     |                          |                          |                          |                          |
| Status display                                     | yes                      | yes                      | yes                      | yes                      |
| Interrupts   | no                       | no                       | no                       | no                       |
| Process alarm                                      | no                       | no                       | no                       | no                       |
| Diagnostic interrupt                               | no                       | no                       | no                       | no                       |
| Diagnostic functions                               | yes                      | yes                      | yes                      | yes                      |
| Diagnostics information read-out                   | possible                 | possible                 | possible                 | possible                 |
| Module state                                       | green LED                | green LED                | green LED                | green LED                |
| Module error display                               | red LED                  | red LED                  | red LED                  | red LED                  |
| Channel error display                              | red LED per channel      | red LED per channel      | red LED per channel      | red LED per channel      |
| <b>Isolation</b>                                   |                          |                          |                          |                          |
| Between channels                                   | -                        | -                        | -                        | -                        |
| Between channels of groups to                      | -                        | -                        | -                        | -                        |
| Between channels and backplane bus                 | ✓                        | ✓                        | ✓                        | ✓                        |

| Signal modules analog   Analog input modules |           |           |  |  |  |  |
|--|-----------|-----------|--|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |  |

| Order number  | 031-1BB30                  | 031-1BB40                  | 031-1BB60                  | 031-1BB70                  |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Between channels and power supply                           | ✓                          | ✓                          | ✓                          | ✓                          |
| Max. potential difference between circuits                  | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs (Ucm)              | DC 2 V                     | DC 2 V                     | DC 2 V                     | DC 2 V                     |
| Max. potential difference between Mana and Mintern (Uiso)   | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mana (Ucm)     | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mintern (Uiso) | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           |
| Max. potential difference between Mintern and outputs       | -                          | -                          | -                          | -                          |
| Insulation tested with                                      | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Mechanical data</b>                                      |                            |                            |                            |                            |
| Dimensions (WxHxD)  | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight  | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                             |                            |                            |                            |                            |
| Operating temperature                                       | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature   | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                                       |                            |                            |                            |                            |
| UL508 certification   | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

Signal modules analog | Analog input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |

031-1BB30

Technical drawing of the 031-1BB30 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows connections for AI (1-8), DC24V, and 0V.

031-1BB40

Technical drawing of the 031-1BB40 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows connections for AI (1-8), DC24V, and 0V.

031-1BB60

Technical drawing of the 031-1BB60 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows connections for AI (1-8), DC24V, and 0V.

031-1BB70





Technical drawing of the 031-1BB70 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows connections for AI (1-8), DC24V, and 0V.



# Analog input modules

## Signal modules analog | Analog input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |

| Order number  | 031-1BB90   | 031-1BD30  | 031-1BD40  | 031-1BD70   |
|---|---|--|--|---|
| Figure  |    |               |                 |                  |
| Type  | SM 031  | SM 031   | SM 031   | SM 031  |
| Module ID   | 0403 1543   | 0404 15C4  | 0405 15C4  | 0409 15C4   |
| <b>General information</b>                              |   |  |  |   |
| Note  | -   | -  | -  | -   |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 inputs 16Bit</li> <li>▸ Thermocouple</li> <li>▸ Voltage -80mV...+80mV</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 inputs 12Bit</li> <li>▸ Voltage 0...10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 inputs 12Bit</li> <li>▸ Current 0(4)...20 mA</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 inputs 12Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> |
| <b>Current consumption/power loss</b>                   |   |  |  |   |
| Current consumption from backplane bus                  | 75 mA   | 70 mA  | 70 mA  | 70 mA   |
| Power loss  | 1 W   | 0.7 W  | 0.7 W  | 0.7 W   |
| <b>Technical data analog inputs</b>                     |   |  |  |   |
| Number of inputs  | 2   | 4  | 4  | 4   |
| Cable length, shielded                                  | 200 m   | 200 m  | 200 m  | 200 m   |
| Rated load voltage                                      | DC 24 V   | DC 24 V  | DC 24 V  | DC 24 V   |
| Current consumption from load voltage L+ (without load) | 30 mA   | 15 mA  | 15 mA  | 15 mA   |
| Voltage inputs  | -   | ✓  | -  | ✓   |
| Min. input resistance (voltage range)                   | 10 MΩ   | 100 kΩ   | -  | 100 kΩ  |
| Input voltage ranges                                    | -80 mV ... +80 mV   | 0 V ... +10 V  | -  | -10 V ... +10 V   |
| Operational limit of voltage ranges                     | ±0.3%   | +/-0.3%  | -  | +/-0.3%   |
| Operational limit of voltage ranges with SFU            | ±0.1%   | -  | -  | -   |
| Basic error limit voltage ranges                        | ±0.25%  | +/-0.2%  | -  | +/-0.2%   |
| Basic error limit voltage ranges with SFU               | ±0.05%  | -  | -  | -   |
| Current inputs  | -   | -  | ✓  | -   |
| Min. input resistance (current range)                   | -   | -  | 110 Ω  | -   |
| Input current ranges                                    | -   | -  | 0 mA ... +20 mA<br>+4 mA ... +20 mA  | -   |
| Operational limit of current ranges                     | -   | -  | +/-0.3% ... +/-0.5%  | -   |
| Operational limit of current ranges with SFU            | -   | -  | -  | -   |
| Basic error limit current ranges                        | -   | -  | +/-0.2% ... +/-0.3%  | -   |
| Basic error limit current ranges with SFU               | -   | -  | -  | -   |
| Resistance inputs                                       | -   | -  | -  | -   |
| Resistance ranges                                       | -   | -  | -  | -   |
| Operational limit of resistor ranges                    | -   | -  | -  | -   |

| Signal modules analog   Analog input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |

| Order number                                       | 031-1BB90  | 031-1BD30                 | 031-1BD40                 | 031-1BD70                 |
|--|--|---------------------------|---------------------------|---------------------------|
| Basic error limit                                  | -  | -                         | -                         | -                         |
| Resistance thermometer inputs                      | -  | -                         | -                         | -                         |
| Resistance thermometer ranges                      | -  | -                         | -                         | -                         |
| Operational limit of resistance thermometer ranges | -  | -                         | -                         | -                         |
| Operational limit of resistor ranges with SFU      | -  | -                         | -                         | -                         |
| Basic error limit thermoresistor ranges            | -  | -                         | -                         | -                         |
| Operational limit of resistor ranges with SFU      | -  | -                         | -                         | -                         |
| Thermocouple inputs                                | ✓  | -                         | -                         | -                         |
| Thermocouple ranges                                | type B<br>type C<br>type E<br>type J<br>type K<br>type L<br>type N<br>type R<br>type S<br>type T | -                         | -                         | -                         |
| Operational limit of thermocouple ranges           | Type E, L, T, J, K, N:<br>±2.5K / Type B, C, R,<br>S: ±8.0K                                      | -                         | -                         | -                         |
| Operational limit of thermocouple ranges with SFU  | Type E, L, T, J, K, N:<br>±1.5K / Type B, C, R,<br>S: ±4.0K                                      | -                         | -                         | -                         |
| Basic error limit thermoelement ranges             | Type E, L, T, J, K, N:<br>±2.0K / Type B, C, R,<br>S: ±7.0K                                      | -                         | -                         | -                         |
| Basic error limit thermoelement ranges with SFU    | Type E, L, T, J, K, N:<br>±1.0K / Type B, C, R,<br>S: ±3.0K                                      | -                         | -                         | -                         |
| Programmable temperature compensation              | ✓  | -                         | -                         | -                         |
| External temperature compensation                  | ✓  | -                         | -                         | -                         |
| Internal temperature compensation                  | ✓  | -                         | -                         | -                         |
| Resolution in bit                                  | 16   | 12                        | 12                        | 12                        |
| Measurement principle                              | Sigma-Delta  | successive approximation  | successive approximation  | successive approximation  |
| Basic conversion time                              | 4.2...324.1 ms (50 Hz)<br>3.8...270.5 ms (60 Hz)<br>per channel                                  | 4 ms all channels         | 4 ms all channels         | 4 ms all channels         |
| Noise suppression for frequency                    | >90dB at 50Hz<br>(UCM<10V)   | >50dB at 50Hz<br>(UCM<2V) | >50dB at 50Hz<br>(UCM<2V) | >50dB at 50Hz<br>(UCM<2V) |
| Initial data size                                  | 4 Byte   | 8 Byte                    | 8 Byte                    | 8 Byte                    |
| <b>Status information, alarms, diagnostics</b>     |  |                           |                           |                           |
| Status display                                     | yes  | yes                       | yes                       | yes                       |
| Interrupts   | yes  | no                        | no                        | no                        |

| Signal modules analog   Analog input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |

| Order number   | 031-1BB90                  | 031-1BD30                  | 031-1BD40                  | 031-1BD70                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Process alarm  | yes, parameterizable       | no                         | no                         | no                         |
| Diagnostic interrupt   | yes, parameterizable       | no                         | no                         | no                         |
| Diagnostic functions   | yes                        | yes                        | yes                        | yes                        |
| Diagnostics information read-out   | possible                   | possible                   | possible                   | possible                   |
| Module state   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display   | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display  | red LED per channel        | red LED per channel        | red LED per channel        | red LED per channel        |
| <b>Isolation</b>   |                            |                            |                            |                            |
| Between channels   | -                          | -                          | -                          | -                          |
| Between channels of groups to  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus                                       | ✓                          | ✓                          | ✓                          | ✓                          |
| Between channels and power supply  | -                          | ✓                          | ✓                          | ✓                          |
| Max. potential difference between circuits                               | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs (U <sub>cm</sub> )              | DC 140 V/ AC 60 V          | DC 2 V                     | DC 2 V                     | DC 2 V                     |
| Max. potential difference between Mana and Mintern (U <sub>iso</sub> )   | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mana (U <sub>cm</sub> )     | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mintern (U <sub>iso</sub> ) | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           |
| Max. potential difference between Mintern and outputs                    | -                          | -                          | -                          | -                          |
| Insulation tested with   | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Mechanical data</b>   |                            |                            |                            |                            |
| Dimensions (WxHxD)   | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>  |                            |                            |                            |                            |
| Operating temperature  | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature  | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>  |                            |                            |                            |                            |
| UL508 certification  | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

## Signal modules analog | Analog input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |

### 031-1BB90

Technical drawing of the 031-1BB90 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows 8 channels with terminals 1-8 and a DC24V/0V connection.

### 031-1BD30

Technical drawing of the 031-1BD30 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows 8 channels with terminals 1-8 and a DC24V/0V connection, with voltage measurement points.

### 031-1BD40

Technical drawing of the 031-1BD40 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows 8 channels with terminals 1-8 and a DC24V/0V connection, with current measurement points.


### 031-1BD70

Technical drawing of the 031-1BD70 module showing front, side, and rear views with dimensions: 76.5, 10.4, 10.9, 12.9, 15, and 13.3. A terminal block diagram shows 8 channels with terminals 1-8 and a DC24V/0V connection, with voltage measurement points.

# Analog input modules

## Signal modules analog | Analog input modules

|           |           |           |  |  |  |  |
|-----------|-----------|-----------|--|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |  |

| Order number  | 031-1BD80  |  |  |  |
|---|--|--|--|--|
| Figure  |   |  |  |  |
| Type  | SM 031   |  |  |  |
| Module ID   | 0406 1544  |  |  |  |
| <b>General information</b>                              |  |  |  |  |
| Note  | -  |  |  |  |
| Features  | <ul style="list-style-type: none"> <li>▷ 4 inputs 16Bit</li> <li>▷ Resistance 0...3000 Ohm</li> <li>▷ Resistance measurement with 2, 3, and 4-wires</li> </ul> |  |  |  |
| <b>Current consumption/power loss</b>                   |  |  |  |  |
| Current consumption from backplane bus                  | 75 mA  |  |  |  |
| Power loss  | 1 W  |  |  |  |
| <b>Technical data analog inputs</b>                     |  |  |  |  |
| Number of inputs  | 4  |  |  |  |
| Cable length, shielded                                  | 200 m  |  |  |  |
| Rated load voltage                                      | DC 24 V  |  |  |  |
| Current consumption from load voltage L+ (without load) | 30 mA  |  |  |  |
| Voltage inputs  | -  |  |  |  |
| Min. input resistance (voltage range)                   | -  |  |  |  |
| Input voltage ranges                                    | -  |  |  |  |
| Operational limit of voltage ranges                     | -  |  |  |  |
| Operational limit of voltage ranges with SFU            | -  |  |  |  |
| Basic error limit voltage ranges                        | -  |  |  |  |
| Basic error limit voltage ranges with SFU               | -  |  |  |  |
| Current inputs  | -  |  |  |  |
| Min. input resistance (current range)                   | -  |  |  |  |
| Input current ranges                                    | -  |  |  |  |
| Operational limit of current ranges                     | -  |  |  |  |
| Operational limit of current ranges with SFU            | -  |  |  |  |
| Basic error limit current ranges                        | -  |  |  |  |
| Basic error limit current ranges with SFU               | -  |  |  |  |
| Resistance inputs                                       | ✓  |  |  |  |

| Signal modules analog   Analog input modules |           |           |  |  |  |
|--|-----------|-----------|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |

| Order number                                       | 031-1BD80   |  |  |  |
|--|---|--|--|--|
| Resistance ranges                                  | 0 ... 60 Ohm<br>0 ... 600 Ohm<br>0 ... 3000 Ohm                 |  |  |  |
| Operational limit of resistor ranges               | +/- 0.4 %   |  |  |  |
| Basic error limit                                  | +/- 0.2 %   |  |  |  |
| Resistance thermometer inputs                      | ✓   |  |  |  |
| Resistance thermometer ranges                      | Pt100<br>Pt1000<br>Ni100<br>Ni1000                              |  |  |  |
| Operational limit of resistance thermometer ranges | +/- 0.4 %   |  |  |  |
| Operational limit of resistor ranges with SFU      | -   |  |  |  |
| Basic error limit thermoresistor ranges            | +/- 0.2 %   |  |  |  |
| Operational limit of resistor ranges with SFU      | -   |  |  |  |
| Thermocouple inputs                                | -   |  |  |  |
| Thermocouple ranges                                | -   |  |  |  |
| Operational limit of thermocouple ranges           | -   |  |  |  |
| Operational limit of thermocouple ranges with SFU  | -   |  |  |  |
| Basic error limit thermoelement ranges             | -   |  |  |  |
| Basic error limit thermoelement ranges with SFU    | -   |  |  |  |
| Programmable temperature compensation              | -   |  |  |  |
| External temperature compensation                  | -   |  |  |  |
| Internal temperature compensation                  | -   |  |  |  |
| Resolution in bit                                  | 16  |  |  |  |
| Measurement principle                              | Sigma-Delta   |  |  |  |
| Basic conversion time                              | 4.2...324.1 ms (50 Hz)<br>3.8...270.5 ms (60 Hz)<br>per channel |  |  |  |
| Noise suppression for frequency                    | >80dB at 50Hz<br>(UCM<6V)                                       |  |  |  |
| Initial data size                                  | 8 Byte  |  |  |  |
| <b>Status information, alarms, diagnostics</b>     |   |  |  |  |
| Status display                                     | yes   |  |  |  |
| Interrupts   | yes, parameterizable  |  |  |  |
| Process alarm                                      | yes, parameterizable  |  |  |  |
| Diagnostic interrupt                               | yes, parameterizable  |  |  |  |
| Diagnostic functions                               | yes   |  |  |  |
| Diagnostics information read-out                   | possible  |  |  |  |
| Module state                                       | green LED   |  |  |  |



| Signal modules analog   Analog input modules |           |           |  |  |  |  |
|--|-----------|-----------|--|--|--|--|
| 031-1BB30                                    | 031-1BB90 | 031-1BD80 |  |  |  |  |
| 031-1BB40                                    | 031-1BD30 |           |  |  |  |  |
| 031-1BB60                                    | 031-1BD40 |           |  |  |  |  |
| 031-1BB70                                    | 031-1BD70 |           |  |  |  |  |

| Order number  | 031-1BD80                  |  |  |  |
|---|----------------------------|--|--|--|
| Module error display  | red LED                    |  |  |  |
| Channel error display                                       | red LED per channel        |  |  |  |
| <b>Isolation</b>  |                            |  |  |  |
| Between channels  | -                          |  |  |  |
| Between channels of groups to                               | -                          |  |  |  |
| Between channels and backplane bus                          | ✓                          |  |  |  |
| Between channels and power supply                           | -                          |  |  |  |
| Max. potential difference between circuits                  | -                          |  |  |  |
| Max. potential difference between inputs (Ucm)              | DC 6 V                     |  |  |  |
| Max. potential difference between Mana and Mintern (Uiso)   | -                          |  |  |  |
| Max. potential difference between inputs and Mana (Ucm)     | -                          |  |  |  |
| Max. potential difference between inputs and Mintern (Uiso) | DC 75 V/ AC 60 V           |  |  |  |
| Max. potential difference between Mintern and outputs       | -                          |  |  |  |
| Insulation tested with                                      | DC 500 V                   |  |  |  |
| <b>Mechanical data</b>                                      |                            |  |  |  |
| Dimensions (WxHxD)  | 12.9 mm x 109 mm x 76.5 mm |  |  |  |
| Weight  | 60 g                       |  |  |  |
| <b>Environmental conditions</b>                             |                            |  |  |  |
| Operating temperature                                       | 0 °C to 60 °C              |  |  |  |
| Storage temperature   | -25 °C to 70 °C            |  |  |  |
| <b>Certifications</b>                                       |                            |  |  |  |
| UL508 certification   | in preparation             |  |  |  |

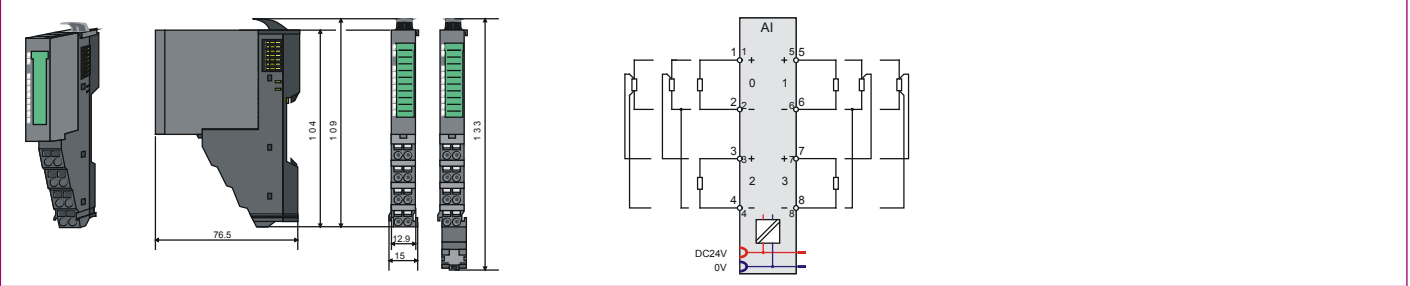


# Connections, Interfaces

## Signal modules analog | Analog input modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 031-1BB30 | 031-1BB90 | 031-1BD80 |  |  |  |
| 031-1BB40 | 031-1BD30 |           |  |  |  |
| 031-1BB60 | 031-1BD40 |           |  |  |  |
| 031-1BB70 | 031-1BD70 |           |  |  |  |





### 031-1BD80



# Analog output modules

## Signal modules analog | Analog output modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

| Order number  | 032-1BB30   | 032-1BB40   | 032-1BB70  | 032-1BD30   |
|---|---|---|--|---|
| Figure  |                |                    |                   |              |
| Type  | SM 032  | SM 032  | SM 032   | SM 032  |
| Module ID   | 0501 25D8   | 0502 25D8   | 0505 25D8  | 0503 25E0   |
| <b>General information</b>                              |   |   |  |   |
| Note  | -   | -   | Coming soon  | -   |
| Features  | <ul style="list-style-type: none"> <li>▸ 2 outputs 12Bit</li> <li>▸ Voltage 0...10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs 12Bit</li> <li>▸ Current 0(4)...20 mA</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs 12Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 outputs 12Bit</li> <li>▸ Voltage 0...10 V</li> </ul> |
| <b>Current consumption/power loss</b>                   |   |   |  |   |
| Current consumption from backplane bus                  | 80 mA   | 80 mA   | 80 mA  | 80 mA   |
| Power loss  | 1.2 W   | 0.8 W   | 1.2 W  | 1.2 W   |
| <b>Technical data analog outputs</b>                    |   |   |  |   |
| Number of outputs                                       | 2   | 2   | 2  | 4   |
| Cable length, shielded                                  | 200 m   | 200 m   | 200 m  | 200 m   |
| Rated load voltage                                      | DC 24 V   | DC 24 V   | DC 24 V  | DC 24 V   |
| Current consumption from load voltage L+ (without load) | 35 mA   | 15 mA   | 35 mA  | 35 mA   |
| Voltage output short-circuit protection                 | ✓   | -   | ✓  | ✓   |
| Voltage outputs   | ✓   | -   | ✓  | ✓   |
| Min. load resistance (voltage range)                    | 5 kΩ  | -   | 5 kΩ   | 5 kΩ  |
| Max. capacitive load (current range)                    | 1 μF  | -   | 1 μF   | 1 μF  |
| Output voltage ranges                                   | 0 V ... +10 V   | -   | -10 V ... +10 V  | 0 V ... +10 V   |
| Operational limit of voltage ranges                     | +/-0.3%   | -   | +/-0.3%  | +/-0.3%   |
| Basic error limit voltage ranges with SFU               | +/-0.2%   | -   | +/-0.2%  | +/-0.2%   |
| Current outputs   | -   | ✓   | -  | -   |
| Max. in load resistance (current range)                 | -   | 350 Ω   | -  | -   |
| Max. inductive load (current range)                     | -   | 10 mH   | -  | -   |
| Output current ranges                                   | -   | 0 mA ... +20 mA<br>+4 mA ... +20 mA   | -  | -   |
| Operational limit of current ranges                     | -   | +/-0.4% ... +/-0.5%   | -  | -   |
| Basic error limit current ranges with SFU               | -   | +/-0.2% ... +/-0.3%   | -  | -   |
| Settling time for ohmic load                            | 1.5 ms  | 0.25 ms   | 1.5 ms   | 1.5 ms  |
| Settling time for capacitive load                       | 2 ms  | -   | 2 ms   | 2 ms  |
| Settling time for inductive load                        | -   | 1.5 ms  | -  | -   |
| Resolution in bit                                       | 12  | 12  | 12   | 12  |
| Conversion time   | 2 ms all channels   | 2 ms all channels   | 2 ms all channels  | 2 ms all channels   |
| Substitute value can be applied                         | yes   | yes   | yes  | yes   |

## Signal modules analog | Analog output modules

|           |           |           |  |  |  |  |
|-----------|-----------|-----------|--|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |  |

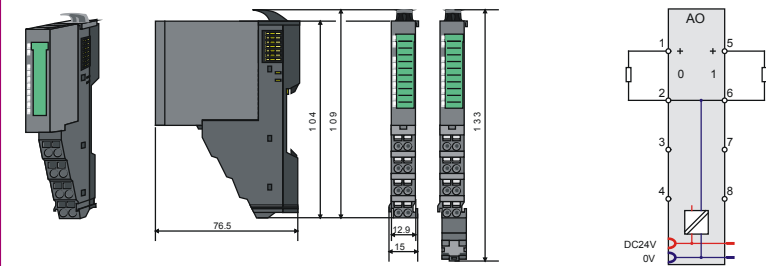
| Order number   | 032-1BB30                  | 032-1BB40                  | 032-1BB70                  | 032-1BD30                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Output data size   | 4 Byte                     | 4 Byte                     | 4 Byte                     | 8 Byte                     |
| <b>Status information, alarms, diagnostics</b>                           |                            |                            |                            |                            |
| Status display   | yes                        | yes                        | yes                        | yes                        |
| Interrupts   | no                         | no                         | no                         | no                         |
| Process alarm  | no                         | no                         | no                         | no                         |
| Diagnostic interrupt   | no                         | no                         | no                         | no                         |
| Diagnostic functions   | yes                        | yes                        | yes                        | yes                        |
| Diagnostics information read-out   | possible                   | possible                   | possible                   | possible                   |
| Module state   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display   | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display  | red LED per channel        | red LED per channel        | red LED per channel        | red LED per channel        |
| <b>Isolation</b>   |                            |                            |                            |                            |
| Between channels   | -                          | -                          | -                          | -                          |
| Between channels of groups to  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus                                       | ✓                          | ✓                          | ✓                          | ✓                          |
| Between channels and power supply  | ✓                          | ✓                          | ✓                          | ✓                          |
| Max. potential difference between circuits                               | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs (U <sub>cm</sub> )              | -                          | -                          | -                          | -                          |
| Max. potential difference between Mana and Mintern (U <sub>iso</sub> )   | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mana (U <sub>cm</sub> )     | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mintern (U <sub>iso</sub> ) | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           |
| Max. potential difference between Mintern and outputs                    | -                          | -                          | -                          | -                          |
| Insulation tested with   | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Mechanical data</b>   |                            |                            |                            |                            |
| Dimensions (WxHxD)   | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>  |                            |                            |                            |                            |
| Operating temperature  | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature  | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>  |                            |                            |                            |                            |
| UL508 certification  | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

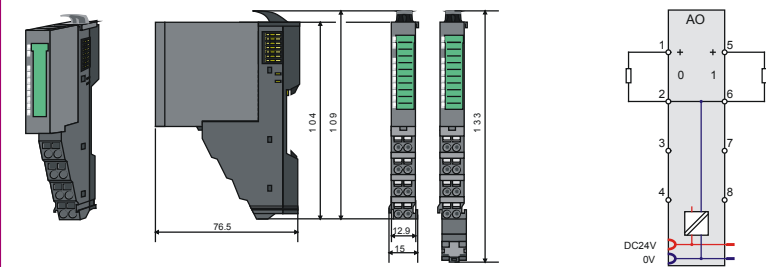
Signal modules analog | Analog output modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

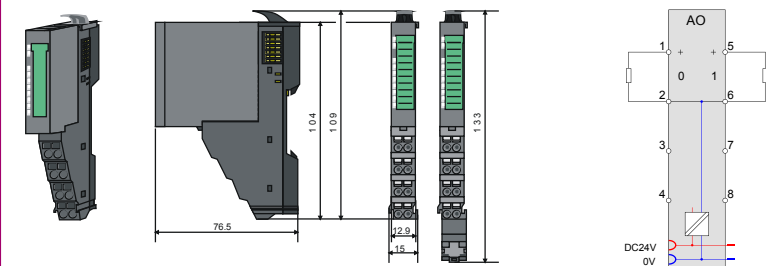
**032-1BB30**



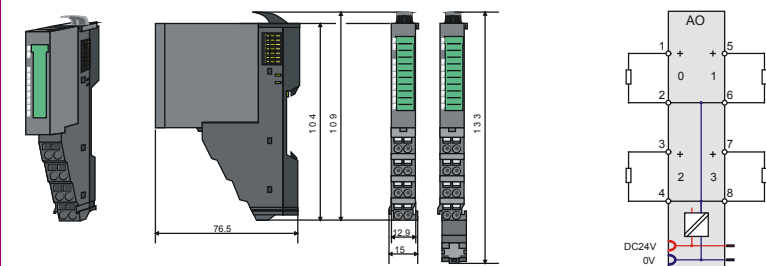
**032-1BB40**



**032-1BB70**







**032-1BD30**



# Analog output modules

## Signal modules analog | Analog output modules

|  |  |                        |  |  |  |
|--|--|------------------------|--|--|--|
| 032-1BB30<br>032-1BB40<br>032-1BB70<br>032-1BD30 | 032-1BD40<br>032-1BD70<br>032-1CB30<br>032-1CB70 | 032-1CD30<br>032-1CD70 |  |  |  |
|--|--|------------------------|--|--|--|

| Order number  | 032-1BD40  | 032-1BD70  | 032-1CB30  | 032-1CB70  |
|---|--|--|--|--|
| Figure  |                   |                     |               |                   |
| Type  | SM 032   | SM 032   | SM 032   | SM 032   |
| Module ID   | 0504 25E0  | 0506 25E0  | 0507 2558  | 0508 2558  |
| <b>General information</b>                              |  |  |  |  |
| Note  | -  | Coming soon  | Coming soon  | Coming soon  |
| Features  | <ul style="list-style-type: none"> <li>▸ 4 outputs 12Bit</li> <li>▸ Current 0(4)...20mA</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 outputs 12Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs 16Bit</li> <li>▸ Voltage 0...+10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 outputs 16Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> |
| <b>Current consumption/power loss</b>                   |  |  |  |  |
| Current consumption from backplane bus                  | 80 mA  | 80 mA  | 80 mA  | 80 mA  |
| Power loss  | 0.8 W  | 1.2 W  | 1.2 W  | 1.2 W  |
| <b>Technical data analog outputs</b>                    |  |  |  |  |
| Number of outputs                                       | 4  | 4  | 2  | 2  |
| Cable length, shielded                                  | 200 m  | 200 m  | 200 m  | 200 m  |
| Rated load voltage                                      | DC 24 V  | DC 24 V  | DC 24 V  | DC 24 V  |
| Current consumption from load voltage L+ (without load) | 15 mA  | 35 mA  | 35 mA  | 35 mA  |
| Voltage output short-circuit protection                 | -  | ✓  | ✓  | ✓  |
| Voltage outputs   | -  | ✓  | ✓  | ✓  |
| Min. load resistance (voltage range)                    | -  | 5 kΩ   | 5 kΩ   | 5 kΩ   |
| Max. capacitive load (current range)                    | -  | 1 μF   | 1 μF   | 1 μF   |
| Output voltage ranges                                   | -  | -10 V ... +10 V  | 0 V ... +10 V  | -10 V ... +10 V  |
| Operational limit of voltage ranges                     | -  | +/-0.3%  | +/-0.3%  | +/-0.3%  |
| Basic error limit voltage ranges with SFU               | -  | +/-0.2%  | +/-0.2%  | +/-0.2%  |
| Current outputs   | ✓  | -  | -  | -  |
| Max. in load resistance (current range)                 | 350 Ω  | -  | -  | -  |
| Max. inductive load (current range)                     | 10 mH  | -  | -  | -  |
| Output current ranges                                   | 0 mA ... +20 mA<br>+4 mA ... +20 mA  | -  | -  | -  |
| Operational limit of current ranges                     | +/-0.4% ... +/-0.5%  | -  | -  | -  |
| Basic error limit current ranges with SFU               | +/-0.2% ... +/-0.3%  | -  | -  | -  |
| Settling time for ohmic load                            | 0.25 ms  | 1.5 ms   | 200 μs   | 200 μs   |
| Settling time for capacitive load                       | -  | 2 ms   | 2 ms   | 2 ms   |
| Settling time for inductive load                        | 1.5 ms   | -  | -  | -  |
| Resolution in bit                                       | 12   | 12   | 16   | 16   |
| Conversion time   | 2 ms all channels  | 2 ms all channels  | 200 μs all channels  | 200 μs all channels  |
| Substitute value can be applied                         | yes  | yes  | yes  | yes  |

| Signal modules analog   Analog output modules |           |           |  |  |  |
|---|-----------|-----------|--|--|--|
| 032-1BB30                                     | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40                                     | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70                                     | 032-1CB30 |           |  |  |  |
| 032-1BD30                                     | 032-1CB70 |           |  |  |  |

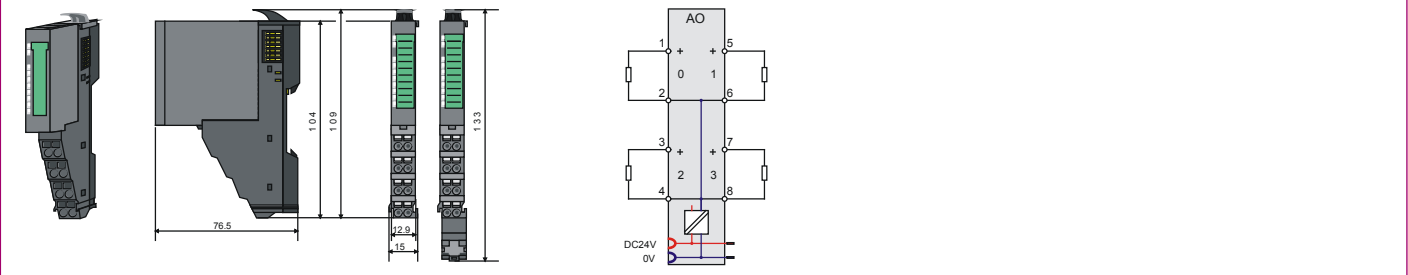
| Order number   | 032-1BD40                  | 032-1BD70                  | 032-1CB30                  | 032-1CB70                  |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Output data size   | 8 Byte                     | 8 Byte                     | 4 Byte                     | 4 Byte                     |
| <b>Status information, alarms, diagnostics</b>                           |                            |                            |                            |                            |
| Status display   | yes                        | yes                        | yes                        | yes                        |
| Interrupts   | no                         | no                         | no                         | no                         |
| Process alarm  | no                         | no                         | no                         | no                         |
| Diagnostic interrupt   | no                         | no                         | no                         | no                         |
| Diagnostic functions   | yes                        | yes                        | yes                        | yes                        |
| Diagnostics information read-out   | possible                   | possible                   | possible                   | possible                   |
| Module state   | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display   | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display  | red LED per channel        | red LED per channel        | red LED per channel        | red LED per channel        |
| <b>Isolation</b>   |                            |                            |                            |                            |
| Between channels   | -                          | -                          | -                          | -                          |
| Between channels of groups to  | -                          | -                          | -                          | -                          |
| Between channels and backplane bus                                       | ✓                          | ✓                          | ✓                          | ✓                          |
| Between channels and power supply  | ✓                          | ✓                          | ✓                          | ✓                          |
| Max. potential difference between circuits                               | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs (U <sub>cm</sub> )              | -                          | -                          | -                          | -                          |
| Max. potential difference between Mana and Mintern (U <sub>iso</sub> )   | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mana (U <sub>cm</sub> )     | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mintern (U <sub>iso</sub> ) | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           |
| Max. potential difference between Mintern and outputs                    | -                          | -                          | -                          | -                          |
| Insulation tested with   | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Mechanical data</b>   |                            |                            |                            |                            |
| Dimensions (WxHxD)   | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight   | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>  |                            |                            |                            |                            |
| Operating temperature  | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature  | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>  |                            |                            |                            |                            |
| UL508 certification  | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

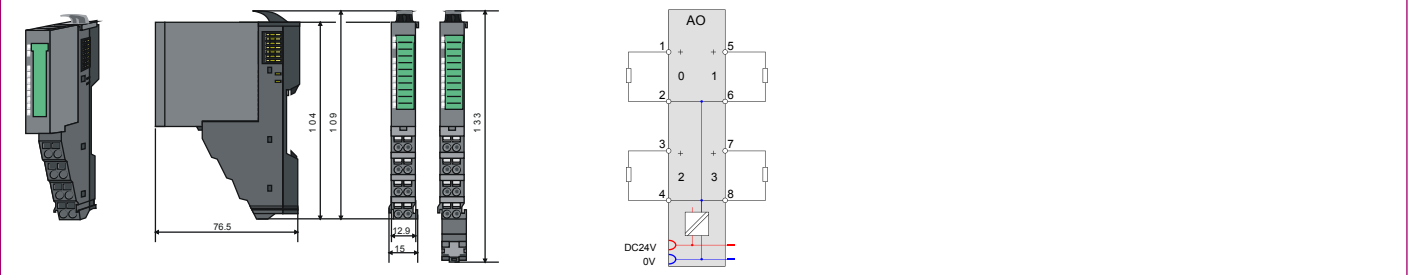
Signal modules analog | Analog output modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

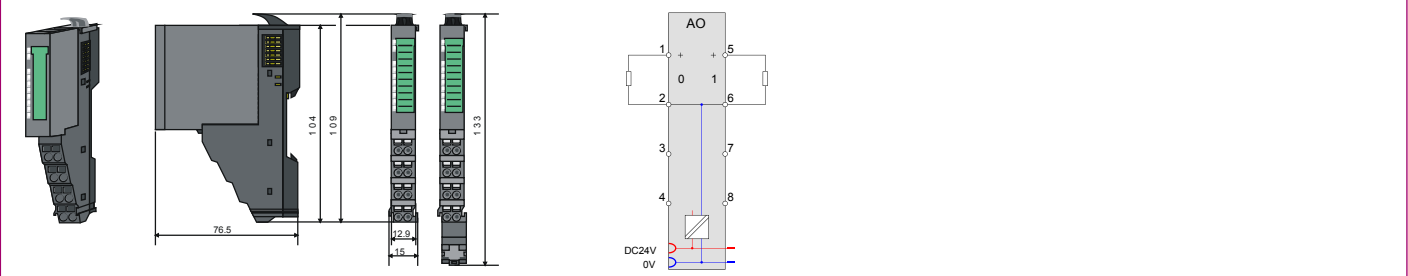
032-1BD40



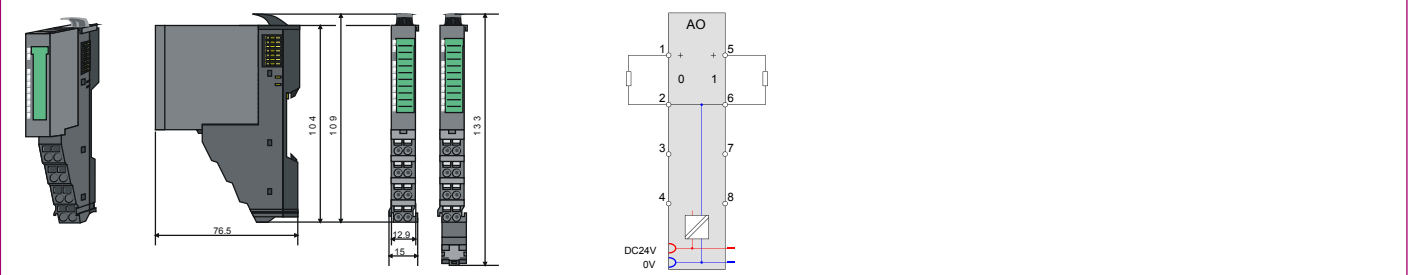
032-1BD70



032-1CB30





032-1CB70



# Analog output modules

## Signal modules analog | Analog output modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

| Order number  | 032-1CD30   | 032-1CD70  |  |  |
|---|---|--|--|--|
| Figure  |                |                     |  |  |
| Type  | SM 032  | SM 032   |  |  |
| Module ID   | 0509 2560   | 050A 2560  |  |  |
| <b>General information</b>                              |   |  |  |  |
| Note  | Coming soon   | Coming soon  |  |  |
| Features  | <ul style="list-style-type: none"> <li>▸ 4 outputs 16Bit</li> <li>▸ Voltage 0...10 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 4 outputs 16Bit</li> <li>▸ Voltage -10 V...+10 V</li> </ul> |  |  |
| <b>Current consumption/power loss</b>                   |   |  |  |  |
| Current consumption from backplane bus                  | 80 mA   | 80 mA  |  |  |
| Power loss  | 1.2 W   | 1.2 W  |  |  |
| <b>Technical data analog outputs</b>                    |   |  |  |  |
| Number of outputs                                       | 4   | 4  |  |  |
| Cable length, shielded                                  | 200 m   | 200 m  |  |  |
| Rated load voltage                                      | DC 24 V   | DC 24 V  |  |  |
| Current consumption from load voltage L+ (without load) | 35 mA   | 35 mA  |  |  |
| Voltage output short-circuit protection                 | ✓   | ✓  |  |  |
| Voltage outputs   | ✓   | ✓  |  |  |
| Min. load resistance (voltage range)                    | 5 kΩ  | 5 kΩ   |  |  |
| Max. capacitive load (current range)                    | 1 μF  | 1 μF   |  |  |
| Output voltage ranges                                   | 0 V ... +10 V   | -10 V ... +10 V  |  |  |
| Operational limit of voltage ranges                     | +/-0.3%   | +/-0.3%  |  |  |
| Basic error limit voltage ranges with SFU               | +/-0.2%   | +/-0.2%  |  |  |
| Current outputs   | -   | -  |  |  |
| Max. in load resistance (current range)                 | -   | -  |  |  |
| Max. inductive load (current range)                     | -   | -  |  |  |
| Output current ranges                                   | -   | -  |  |  |
| Operational limit of current ranges                     | -   | -  |  |  |
| Basic error limit current ranges with SFU               | -   | -  |  |  |
| Settling time for ohmic load                            | 200 μs  | 200 μs   |  |  |
| Settling time for capacitive load                       | 2 ms  | 2 ms   |  |  |
| Settling time for inductive load                        | -   | -  |  |  |
| Resolution in bit                                       | 16  | 16   |  |  |
| Conversion time   | 200 μs all channels   | 200 μs all channels  |  |  |
| Substitute value can be applied                         | yes   | yes  |  |  |



**Signal modules analog | Analog output modules**

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

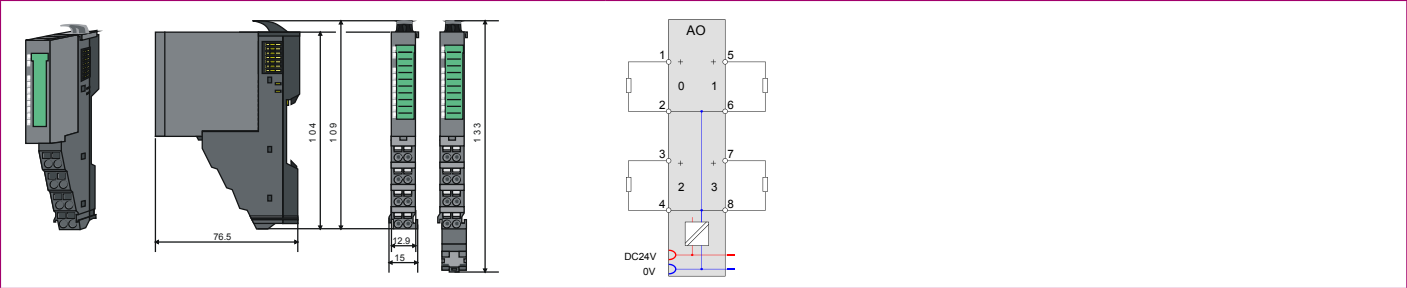
| Order number   | 032-1CD30                  | 032-1CD70                  |  |  |
|--|----------------------------|----------------------------|--|--|
| Output data size   | 8 Byte                     | 8 Byte                     |  |  |
| <b>Status information, alarms, diagnostics</b>                           |                            |                            |  |  |
| Status display   | yes                        | yes                        |  |  |
| Interrupts   | no                         | no                         |  |  |
| Process alarm  | no                         | no                         |  |  |
| Diagnostic interrupt   | no                         | no                         |  |  |
| Diagnostic functions   | yes                        | yes                        |  |  |
| Diagnostics information read-out   | possible                   | possible                   |  |  |
| Module state   | green LED                  | green LED                  |  |  |
| Module error display   | red LED                    | red LED                    |  |  |
| Channel error display  | red LED per channel        | red LED per channel        |  |  |
| <b>Isolation</b>   |                            |                            |  |  |
| Between channels   | -                          | -                          |  |  |
| Between channels of groups to  | -                          | -                          |  |  |
| Between channels and backplane bus                                       | ✓                          | ✓                          |  |  |
| Between channels and power supply  | ✓                          | ✓                          |  |  |
| Max. potential difference between circuits                               | -                          | -                          |  |  |
| Max. potential difference between inputs (U <sub>cm</sub> )              | -                          | -                          |  |  |
| Max. potential difference between Mana and Mintern (U <sub>iso</sub> )   | -                          | -                          |  |  |
| Max. potential difference between inputs and Mana (U <sub>cm</sub> )     | -                          | -                          |  |  |
| Max. potential difference between inputs and Mintern (U <sub>iso</sub> ) | DC 75 V/ AC 60 V           | DC 75 V/ AC 60 V           |  |  |
| Max. potential difference between Mintern and outputs                    | -                          | -                          |  |  |
| Insulation tested with   | DC 500 V                   | DC 500 V                   |  |  |
| <b>Mechanical data</b>   |                            |                            |  |  |
| Dimensions (WxHxD)   | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |  |  |
| Weight   | 60 g                       | 60 g                       |  |  |
| <b>Environmental conditions</b>  |                            |                            |  |  |
| Operating temperature  | 0 °C to 60 °C              | 0 °C to 60 °C              |  |  |
| Storage temperature  | -25 °C to 70 °C            | -25 °C to 70 °C            |  |  |
| <b>Certifications</b>  |                            |                            |  |  |
| UL508 certification  | in preparation             | in preparation             |  |  |

# Connections, Interfaces

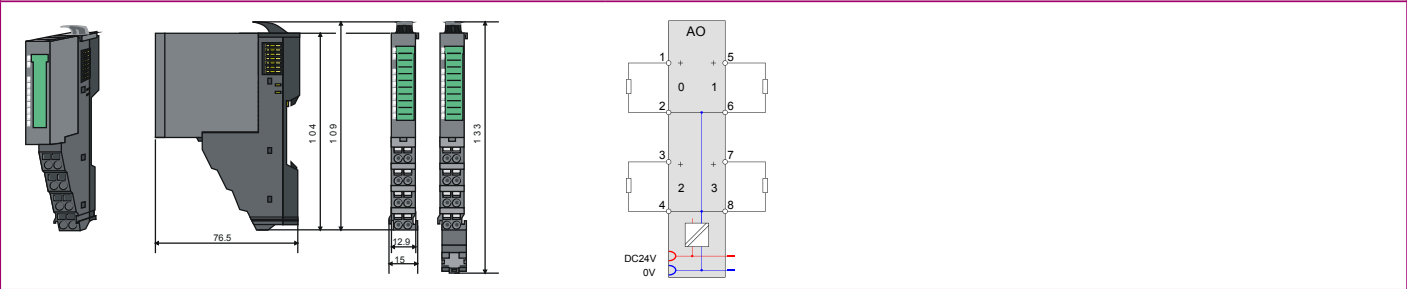
Signal modules analog | Analog output modules

|           |           |           |  |  |  |
|-----------|-----------|-----------|--|--|--|
| 032-1BB30 | 032-1BD40 | 032-1CD30 |  |  |  |
| 032-1BB40 | 032-1BD70 | 032-1CD70 |  |  |  |
| 032-1BB70 | 032-1CB30 |           |  |  |  |
| 032-1BD30 | 032-1CB70 |           |  |  |  |

## 032-1CD30



## 032-1CD70





System SLIO

System 100V

System 200V

System 300S

System 500S

HMI

Software

Accessories

Appendix

# Communication processors



## Structure and Function

Communications processors are used to connect different target and source systems, e.g. via Ethernet to higher-level ERP systems or serially to scanners, printers and other peripherals.

### CP 040 - serial

The communication processors CP 040 serial enable the serial process coupling to different target and source systems. Depending on the module they have a RS232 or a RS422/485 interface.

### Characteristics



- › Support for all standard protocols (ASCII, STX/ETX, 3964 (R) and Modbus (master, slave)
- › Internal communication via VIPA FBs
- › Compact design
- › LED status indicator
- › Electrically isolated to the backplane bus
- › Assembly with 35 mm profile rail
- › 24 month warranty

# Overview

| Order no.                    | Name/Description   | Page      |
|------------------------------|--|-----------|
| RS232/422/485- and other CPs |  |           |
| 040-1BA00                    | <b>CP 040 - Communication processor</b><br>‣ RS232 interface     | <b>76</b> |
| 040-1CA00                    | <b>CP 040 - Communication processor</b><br>‣ RS422/485 interface | <b>76</b> |

# RS232/422/485- and other CPs

| Communication processors   RS232/422/485- and other CPs |  |  |  |  |  |
|---|--|--|--|--|--|
| 040-1BA00   |  |  |  |  |  |
| 040-1CA00   |  |  |  |  |  |

| Order number                                   | 040-1BA00   | 040-1CA00   |  |  |
|--|---|---|--|--|
| Figure   |  |  |  |  |
| Type   | CP 040, PtP RS232   | CP 040, RS422/485   |  |  |
| Module ID                                      | 0A01 1C0F   | 0A41 1C1F   |  |  |
| <b>General information</b>                     |   |   |  |  |
| Note   | -   | -   |  |  |
| Features                                       | ▸ RS232 interface   | ▸ RS422/485 interface   |  |  |
| <b>Current consumption/power loss</b>          |   |   |  |  |
| Current consumption from backplane bus         | 100 mA  | 100 mA  |  |  |
| Power loss                                     | 1 W   | 1 W   |  |  |
| <b>Status information, alarms, diagnostics</b> |   |   |  |  |
| Status display                                 | yes   | yes   |  |  |
| Interrupts                                     | yes, parameterizable  | yes, parameterizable  |  |  |
| Process alarm                                  | no  | no  |  |  |
| Diagnostic interrupt                           | yes, parameterizable  | yes, parameterizable  |  |  |
| Diagnostic functions                           | yes, parameterizable  | yes, parameterizable  |  |  |
| Diagnostics information read-out               | possible  | possible  |  |  |
| Supply voltage display                         | green LED   | green LED   |  |  |
| Group error display                            | red LED   | red LED   |  |  |
| Channel error display                          | red LED   | red LED   |  |  |
| <b>Point-to-point communication</b>            |   |   |  |  |
| PtP communication                              | ✓   | ✓   |  |  |
| Interface isolated                             | ✓   | ✓   |  |  |
| RS232 interface                                | ✓   | -   |  |  |
| RS422 interface                                | -   | ✓   |  |  |
| RS485 interface                                | -   | ✓   |  |  |
| Connector                                      | Terminal module   | Terminal module   |  |  |
| Transmission speed, min.                       | 150 bit/s   | 150 bit/s   |  |  |
| Transmission speed, max.                       | 115.2 kbit/s  | 115.2 kbit/s  |  |  |
| Cable length, max.                             | 15 m  | 1200 m  |  |  |
| <b>Point-to-point protocol</b>                 |   |   |  |  |
| ASCII protocol                                 | ✓   | ✓   |  |  |
| STX/ETX protocol                               | ✓   | ✓   |  |  |
| 3964(R) protocol                               | ✓   | ✓   |  |  |
| RK512 protocol                                 | -   | -   |  |  |

| Communication processors   RS232/422/485- and other CPs |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| 040-1BA00<br>040-1CA00                                  |  |  |  |  |  |  |

| Order number                    | 040-1BA00                  | 040-1CA00                  |  |  |
|---------------------------------|----------------------------|----------------------------|--|--|
| USS master protocol             | -                          | -                          |  |  |
| Modbus master protocol          | ✓                          | ✓                          |  |  |
| Modbus slave protocol           | ✓                          | ✓                          |  |  |
| Special protocols               | -                          | -                          |  |  |
| <b>Mechanical data</b>          |                            |                            |  |  |
| Dimensions (WxHxD)              | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |  |  |
| Weight                          | 60 g                       | 60 g                       |  |  |
| <b>Environmental conditions</b> |                            |                            |  |  |
| Operating temperature           | 0 °C to 60 °C              | 0 °C to 60 °C              |  |  |
| Storage temperature             | -25 °C to 70 °C            | -25 °C to 70 °C            |  |  |
| <b>Certifications</b>           |                            |                            |  |  |
| UL508 certification             | in preparation             | in preparation             |  |  |

# Connections, Interfaces

| Communication processors   RS232/422/485- and other CPs |  |  |  |  |  |
|---|--|--|--|--|--|
| 040-1BA00   |  |  |  |  |  |
| 040-1CA00   |  |  |  |  |  |

### 040-1BA00

**Mechanical Dimensions:**

- Width: 76.5 mm
- Height (top): 10.4 mm
- Height (middle): 10.9 mm
- Height (bottom): 12.9 mm
- Height (right): 1.33 mm

**Pinout Diagrams:**

- CP 040:** 1: TxD, 2: CTS, 3: GND, 4: DTR, 5: RxD, 6: RTS, 7: GND, 8: DCD.
- Periphery:** 1: TxD, 2: RTS, 3: DCD, 4: DSR, 5: RxD, 6: CTS, 7: GND, 8: Ri.

### 040-1CA00

**Mechanical Dimensions:**

- Width: 76.5 mm
- Height (top): 10.4 mm
- Height (middle): 10.9 mm
- Height (bottom): 12.9 mm
- Height (right): 1.33 mm

**Pinout Diagrams:**

- CP 040:** 1: TxD+, 2: RxD+, 3: GND, 4: TERM, 5: RxD-, 6: RTS, 7: GND, 8: TERM.
- Periphery (RS485):** 1: RxD-TxD-P (B), 2: RxD-TxD-N (A), 3: (GND), 4: RxD-TxD-P (B), 5: RxD-TxD-N (A), 6: (GND), 7: RxD-TxD-P (B), 8: RxD-TxD-N (A).
- Periphery (RS422):** 1: RxD-N (A), 2: TxD-N (A), 3: TxD-P (B), 4: RxD-P (B), 5: RxD-N (A), 6: TxD-N (A), 7: TxD-P (B), 8: RxD-P (B).





System SLIO

System 100V

System 200V

System 300S

System 500S

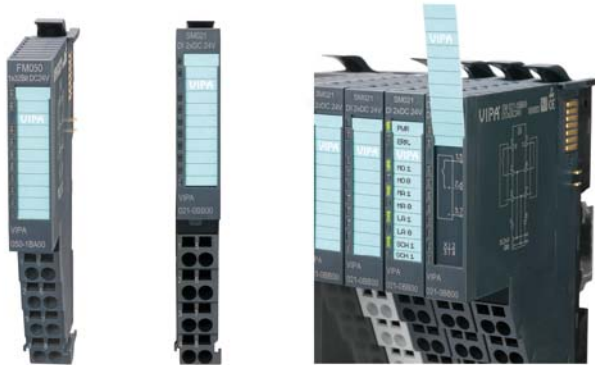
HMI

Software

Accessories

Appendix

# Function modules



## Structure and Function

Function modules (FM) are intelligent modules that perform technological tasks such as position determination, counting and positioning, and other complex functions in the automation independently. They are used when there are high demands on accuracy and dynamic in the starting of automation tasks.

Different functional modules, for example counter modules, SSI modules provide exactly the functions that are required for the respective tasks.

Each functional module consists of a terminal and an electronic module.

The terminal module (TM) contains the retainer for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for the wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

The functionality of the signal module is defined via the electronic module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

### Characteristics





- › Supports fast counter systems up to 1 MHz
- › Counting direction invertible
- › Integrated digital outputs
- › For direct connection of incremental encoders
- › Electrically isolated to the backplane bus
- › Direct mapping and readability of the channel conditions via status LEDs
- › Safe and time-saving installation by the terminal assignment mounted on the module
- › When changing the module equipment identification (BMK) is retained on the TM
- › Individual single-channel lettering on insertion strip
- › 24 month warranty

# Overview

| Order no.       | Name/Description  | Page      |
|-----------------|---|-----------|
| Counter modules |   |           |
| 050-1BA00       | <b>FM 050 - Counter module</b><br>‣ 1 Counter 32 Bit (AB)<br>‣ DC 24 V  | <b>82</b> |
| 050-1BA10       | <b>FM 050 - Counter module</b><br>‣ 1 Counter 32 Bit (AB)<br>‣ DC 5 V   | <b>82</b> |
| 050-1BB00       | <b>FM 050 - Counter module</b><br>‣ 2 Counter 32 Bit (AB)<br>‣ DC 24 V  | <b>82</b> |
| 050-1BB30       | <b>FM 050 - Counter module</b><br>‣ 2 Counter 32 Bit (AB)<br>‣ DC 24 V  | <b>82</b> |
| SSI modules     |   |           |
| 050-1BS00       | <b>FM 050S - SSI module</b><br>‣ SSI - Encoder<br>‣ Master or slave mode<br>‣ Encoder frequency 125 kHz...2 MHz<br>‣ $\mu$ s time stamp for encoder value | <b>86</b> |

# Counter modules

| Function modules | Counter modules |  |  |  |  |  |
|------------------|-----------------|--|--|--|--|--|
| 050-1BA00        |                 |  |  |  |  |  |
| 050-1BA10        |                 |  |  |  |  |  |
| 050-1BB00        |                 |  |  |  |  |  |
| 050-1BB30        |                 |  |  |  |  |  |

| Order number  | 050-1BA00  | 050-1BA10   | 050-1BB00  | 050-1BB30  |
|---|--|---|--|--|
| Figure  |             |            |           |           |
| Type  | FM 050   | FM 050  | FM 050   | FM 050   |
| Module ID   | 08C1 3800  | 08C2 3801   | 08C3 380A  | 08C4 388B  |
| <b>General information</b>  |  |   |  |  |
| Note  | -  | -   | -  | -  |
| Features  | <ul style="list-style-type: none"> <li>▸ 1 Counter 32 Bit (AB)</li> <li>▸ DC 24 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 1 Counter 32 Bit (AB)</li> <li>▸ DC 5 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 Counter 32 Bit (AB)</li> <li>▸ DC 24 V</li> </ul> | <ul style="list-style-type: none"> <li>▸ 2 Counter 32 Bit (AB)</li> <li>▸ DC 24 V</li> </ul> |
| <b>Current consumption/power loss</b>                               |  |   |  |  |
| Current consumption from backplane bus                              | 75 mA  | 70 mA   | 75 mA  | 75 mA  |
| Power loss  | 1 W  | 0.85 W  | 0.9 W  | 0.9 W  |
| <b>Technical data digital inputs</b>                                |  |   |  |  |
| Number of inputs  | 5  | -   | 4  | 4  |
| Cable length, shielded  | 100 m  | 100 m   | 100 m  | 100 m  |
| Cable length, unshielded  | -  | -   | -  | -  |
| Rated load voltage  | DC 20.4...28.8 V   | DC 20.4...28.8 V  | DC 20.4...28.8 V   | DC 20.4...28.8 V   |
| Reverse polarity protection of rated load voltage                   | -  | -   | -  | -  |
| Current consumption from load voltage L+ (without load)             | 20 mA  | 20 mA   | 15 mA  | 15 mA  |
| Rated value   | DC 20.4...28.8 V   | -   | DC 20.4...28.8 V   | DC 20.4...28.8 V   |
| Input voltage for signal "0"  | DC 0...5 V   | -   | DC 0...5 V   | DC 0...5 V   |
| Input voltage for signal "1"  | DC 15...28.8 V   | -   | DC 15...28.8 V   | DC 15...28.8 V   |
| Input voltage hysteresis  | -  | -   | -  | -  |
| Frequency range   | -  | -   | -  | -  |
| Input resistance  | -  | 120 Ω   | -  | -  |
| Input current for signal "1"  | 3 mA   | -   | 3 mA   | 3 mA   |
| Connection of Two-Wire-BEROs possible                               | ✓  | -   | ✓  | ✓  |
| Max. permissible BERO quiescent current                             | 0.5 mA   | -   | 0.5 mA   | 0.5 mA   |
| Input delay of "0" to "1"   | 0,8 μs   | 0,8 μs  | 0,8 μs   | 0,8 μs   |
| Input delay of "1" to "0"   | 0,8 μs   | 0,8 μs  | 0,8 μs   | 0,8 μs   |
| Number of simultaneously utilizable inputs horizontal configuration | 5  | -   | 4  | 4  |
| Number of simultaneously utilizable inputs vertical configuration   | 5  | -   | 4  | 4  |
| Input characteristic curve  | IEC 61131, type 1  | -   | IEC 61131, type 1  | IEC 61131, type 1  |
| Initial data size   | 12 Byte  | 8 Byte  | 12 Byte  | 12 Byte  |
| <b>Technical data digital outputs</b>                               |  |   |  |  |

| Function modules | Counter modules |  |  |  |  |  |
|------------------|-----------------|--|--|--|--|--|
| 050-1BA00        |                 |  |  |  |  |  |
| 050-1BA10        |                 |  |  |  |  |  |
| 050-1BB00        |                 |  |  |  |  |  |
| 050-1BB30        |                 |  |  |  |  |  |

| Order number  | 050-1BA00        | 050-1BA10 | 050-1BB00 | 050-1BB30 |
|---|------------------|-----------|-----------|-----------|
| Number of outputs   | 1                | -         | -         | -         |
| Cable length, shielded  | 100 m            | -         | -         | -         |
| Cable length, unshielded                                      | 100 m            | -         | -         | -         |
| Rated load voltage  | DC 20.4...28.8 V | -         | -         | -         |
| Current consumption from load voltage L+ (without load)       | -                | -         | -         | -         |
| Output delay of "0" to "1"                                    | 30 µs            | -         | -         | -         |
| Output delay of "1" to "0"                                    | 30 µs            | -         | -         | -         |
| Minimum load current  | -                | -         | -         | -         |
| Lamp load   | 10 W             | -         | -         | -         |
| Parallel switching of outputs for redundant control of a load | not possible     | -         | -         | -         |
| Parallel switching of outputs for increased power             | not possible     | -         | -         | -         |
| Actuation of digital input                                    | ✓                | -         | -         | -         |
| Switching frequency with resistive load                       | max. 10 kHz      | -         | -         | -         |
| Switching frequency with inductive load                       | max. 0.5 Hz      | -         | -         | -         |
| Switching frequency on lamp load                              | max. 10 kHz      | -         | -         | -         |
| Internal limitation of inductive shut-off voltage             | L+ (-52 V)       | -         | -         | -         |
| Short-circuit protection of output                            | yes, electronic  | -         | -         | -         |
| Trigger level   | 1 A              | -         | -         | -         |
| Number of operating cycle of relay outputs                    | -                | -         | -         | -         |
| Switching capacity of contacts                                | -                | -         | -         | -         |
| Output data size  | 10 Byte          | 10 Byte   | 12 Byte   | 4 Byte    |
| <b>Technical data counters</b>                                |                  |           |           |           |
| Number of counters  | 1                | 1         | 2         | 2         |
| Counterwidth  | 32 Bit           | 32 Bit    | 32 Bit    | 32 Bit    |
| Maximum input frequency                                       | 100 kHz          | 500 kHz   | 100 kHz   | 100 kHz   |
| Maximum count frequency                                       | 400 kHz          | 2 MHz     | 400 kHz   | 400 kHz   |
| Mode incremental encoder                                      | ✓                | ✓         | ✓         | ✓         |
| Mode pulse / direction  | ✓                | ✓         | ✓         | ✓         |
| Mode pulse  | -                | -         | -         | -         |
| Mode frequency counter  | -                | -         | -         | -         |
| Mode period measurement                                       | -                | -         | -         | -         |
| Gate input available  | ✓                | -         | -         | -         |
| Latch input available   | ✓                | -         | -         | -         |
| Reset input available   | ✓                | ✓         | -         | -         |
| Counter output available                                      | ✓                | -         | -         | -         |
| <b>Status information, alarms, diagnostics</b>                |                  |           |           |           |

| Function modules | Counter modules |  |  |  |  |  |
|------------------|-----------------|--|--|--|--|--|
| 050-1BA00        |                 |  |  |  |  |  |
| 050-1BA10        |                 |  |  |  |  |  |
| 050-1BB00        |                 |  |  |  |  |  |
| 050-1BB30        |                 |  |  |  |  |  |

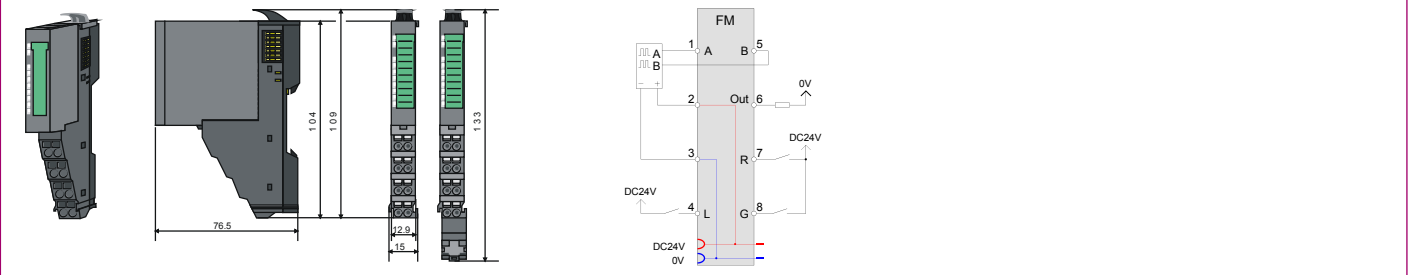
| Order number  | 050-1BA00                  | 050-1BA10                  | 050-1BB00                  | 050-1BB30                  |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Status display  | yes                        | yes                        | yes                        | yes                        |
| Interrupts  | yes, parameterizable       | yes, parameterizable       | yes, parameterizable       | no                         |
| Process alarm   | yes, parameterizable       | yes, parameterizable       | yes, parameterizable       | no                         |
| Diagnostic interrupt  | yes, parameterizable       | yes, parameterizable       | yes, parameterizable       | no                         |
| Diagnostic functions  | yes, parameterizable       | yes, parameterizable       | yes, parameterizable       | no                         |
| Diagnostics information read-out                            | possible                   | possible                   | possible                   | possible                   |
| Module state  | green LED                  | green LED                  | green LED                  | green LED                  |
| Module error display  | red LED                    | red LED                    | red LED                    | red LED                    |
| Channel error display                                       | none                       | none                       | none                       | none                       |
| <b>Isolation</b>  |                            |                            |                            |                            |
| Between channels  | -                          | -                          | -                          | -                          |
| Between channels of groups to                               | -                          | -                          | -                          | -                          |
| Between channels and backplane bus                          | ✓                          | ✓                          | ✓                          | ✓                          |
| Between channels and power supply                           | -                          | -                          | -                          | -                          |
| Max. potential difference between circuits                  | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs (Ucm)              | -                          | -                          | -                          | -                          |
| Max. potential difference between Mana and Mintern (Uiso)   | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mana (Ucm)     | -                          | -                          | -                          | -                          |
| Max. potential difference between inputs and Mintern (Uiso) | -                          | -                          | -                          | -                          |
| Max. potential difference between Mintern and outputs       | -                          | -                          | -                          | -                          |
| Insulation tested with                                      | DC 500 V                   | DC 500 V                   | DC 500 V                   | DC 500 V                   |
| <b>Mechanical data</b>                                      |                            |                            |                            |                            |
| Dimensions (WxHxD)  | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm | 12.9 mm x 109 mm x 76.5 mm |
| Weight  | 60 g                       | 60 g                       | 60 g                       | 60 g                       |
| <b>Environmental conditions</b>                             |                            |                            |                            |                            |
| Operating temperature                                       | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              | 0 °C to 60 °C              |
| Storage temperature   | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            | -25 °C to 70 °C            |
| <b>Certifications</b>                                       |                            |                            |                            |                            |
| UL508 certification   | in preparation             | in preparation             | in preparation             | in preparation             |

# Connections, Interfaces

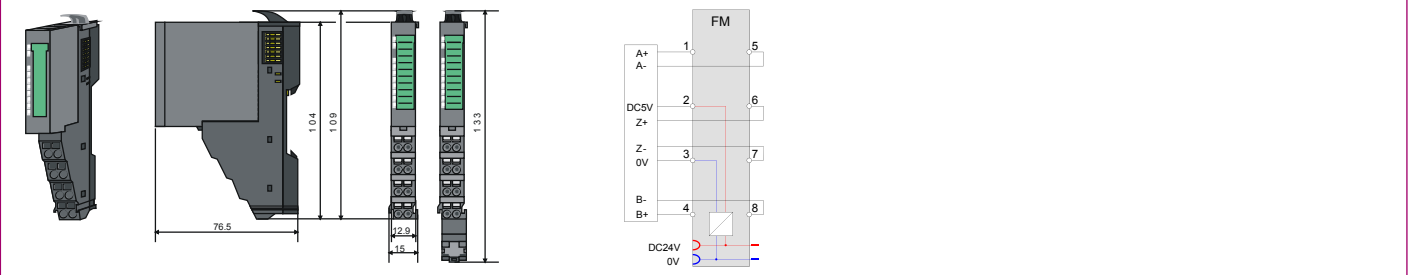
Function modules | Counter modules

- 050-1BA00
- 050-1BA10
- 050-1BB00
- 050-1BB30

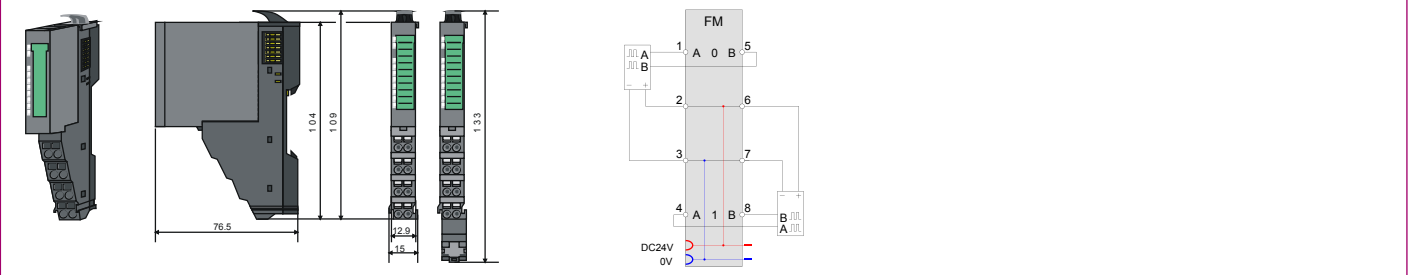
**050-1BA00**



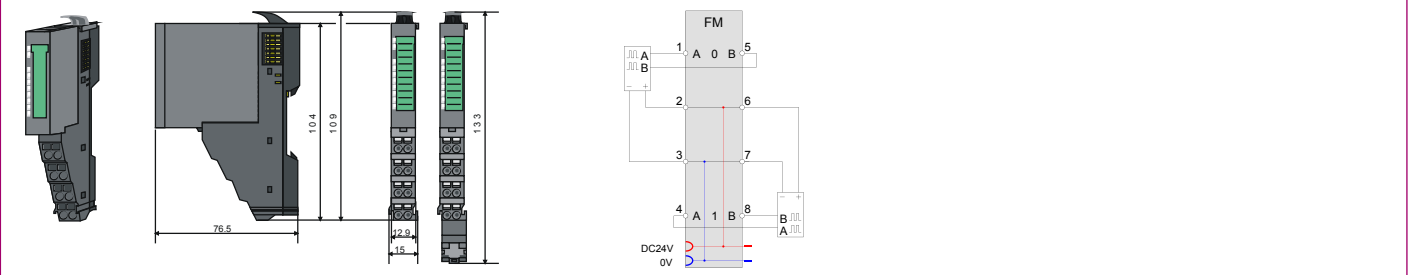
**050-1BA10**



**050-1BB00**




**050-1BB30**



# SSI modules

| Function modules   SSI modules |  |  |  |  |  |  |
|--------------------------------|--|--|--|--|--|--|
| 050-1BS00                      |  |  |  |  |  |  |

| Order number  | 050-1BS00   |  |  |  |
|---|---|--|--|--|
| Figure  |    |  |  |  |
| Type  | FM 050  |  |  |  |
| Module ID   | 09C1 7800   |  |  |  |
| <b>General information</b>                                |   |  |  |  |
| Note  | -   |  |  |  |
| Features  | <ul style="list-style-type: none"> <li>▸ SSI - Encoder</li> <li>▸ Master or slave mode</li> <li>▸ Encoder frequency 125 kHz...2 MHz</li> <li>▸ µs time stamp for encoder value</li> </ul> |  |  |  |
| <b>Current consumption/power loss</b>                     |   |  |  |  |
| Current consumption from backplane bus                    | 70 mA   |  |  |  |
| Power loss  | 1 W   |  |  |  |
| Parallel switching of outputs for increased power         | -   |  |  |  |
| <b>Status information, alarms, diagnostics</b>            |   |  |  |  |
| Status display  | yes   |  |  |  |
| Interrupts  | yes, parameterizable  |  |  |  |
| Process alarm   | no  |  |  |  |
| Diagnostic interrupt                                      | yes, parameterizable  |  |  |  |
| Diagnostic functions                                      | yes, parameterizable  |  |  |  |
| Diagnostics information read-out                          | possible  |  |  |  |
| Module state  | green LED   |  |  |  |
| Module error display                                      | red LED   |  |  |  |
| Channel error display                                     | none  |  |  |  |
| <b>Isolation</b>  |   |  |  |  |
| Between channels  | -   |  |  |  |
| Between channels of groups to                             | -   |  |  |  |
| Between channels and backplane bus                        | ✓   |  |  |  |
| Between channels and power supply                         | -   |  |  |  |
| Max. potential difference between circuits                | -   |  |  |  |
| Max. potential difference between inputs (Ucm)            | -   |  |  |  |
| Max. potential difference between Mana and Mintern (Uiso) | -   |  |  |  |
| Max. potential difference between inputs and Mana (Ucm)   | -   |  |  |  |



| Function modules   SSI modules |  |  |  |  |  |  |
|--------------------------------|--|--|--|--|--|--|
| 050-1BS00                      |  |  |  |  |  |  |

|   |                            |  |  |  |
|---|----------------------------|--|--|--|
| <b>Order number</b>   | <b>050-1BS00</b>           |  |  |  |
| Max. potential difference between inputs and Mintern (Uiso) | -                          |  |  |  |
| Max. potential difference between Mintern and outputs       | -                          |  |  |  |
| Insulation tested with                                      | DC 500 V                   |  |  |  |
| <b>Mechanical data</b>                                      |                            |  |  |  |
| Dimensions (WxHxD)  | 12.9 mm x 109 mm x 76.5 mm |  |  |  |
| Weight  | 60 g                       |  |  |  |
| <b>Environmental conditions</b>                             |                            |  |  |  |
| Operating temperature                                       | 0 °C to 60 °C              |  |  |  |
| Storage temperature   | -25 °C to 70 °C            |  |  |  |
| <b>Certifications</b>                                       |                            |  |  |  |
| UL508 certification   | in preparation             |  |  |  |



# Connections, Interfaces

| Function modules   SSI modules |  |  |  |  |  |  |
|--------------------------------|--|--|--|--|--|--|
| 050-1BS00                      |  |  |  |  |  |  |

**050-1BS00**

The technical drawing includes the following details:

- Dimensions:**
  - Front view: 76.5 mm width, 104 mm height.
  - Top view: 109 mm height.
  - Terminal block view: 12.9 mm width, 13.3 mm height.
- Terminal Connections:**
  - 1: CO+
  - 2: CO-
  - 3: DI+
  - 4: DI-
  - 5: (Empty)
  - 6: (Empty)
  - 7: (Empty)
  - 8: (Empty)
- Power Connections:**
  - DC24V (Red)
  - 0V (Blue)



System SLIO

System 100V

System 200V

System 300S

System 500S

HMI

Software

Accessories

Appendix

# Interface modules



## Structure and Function

Interface modules (IM) form the interface between process level and parent bus system. All control signals are transmitted through the internal backplane bus to the electronics module (EM).

In the case of the interface module the bus interface and power module (PM) are integrated in a single casing. Both the bus interface and the electronics of the connected peripheral modules are supplied with power via the integrated power module.

Up to 64 I/O modules can be operated on the interface module.

### Characteristics





- › Support for various fieldbus systems
- › Functional DIP switches for address setting for the PROFIBUS-DP and CANopen with transparent cover
- › MAC address on the front in plain text
- › Electrical isolation between fieldbus and input/output field
- › Integrated DC 24 V power module to the electronic and load voltage supply of the peripheral modules
- › Easy to maintain, replaceable power module
- › Up to 64 signal and function modules per interface module
- › 24 month warranty

# Overview

| Order no.                           | Name/Description  | Page |
|-------------------------------------|---|------|
| Fieldbus slave modules without I/Os |   |      |
| 053-1CA00                           | <b>IM 053CAN - CANopen slave</b><br>† CANopen slave<br>† 16 Rx und 16 Tx PDOs<br>† 2 SDOs<br>† PDO-Linking<br>† PDO-Mapping: fix  | 92   |
| 053-1DN00                           | <b>IM 053DN - DeviceNet slave</b><br>† DeviceNet slave<br>† Group 2 only Device<br>† Poll only Device<br>† Baude rate: 125, 250 and 500kbit/s<br>† max. 64 peripheral modules | 92   |
| 053-1DP00                           | <b>IM 053DP - PROFIBUS-DP slave</b><br>† PROFIBUS-DP slave (DP-V0, DP-V1),<br>† For max. 64 Periphery modules<br>† 244 Byte input and 244 Byte output data                    | 92   |
| 053-1EC00                           | <b>IM 053EC - EtherCAT slave</b><br>† EtherCAT slave<br>† 64 peripheral modules<br>† RJ45 jack 100BaseTX  | 92   |
| 053-1MT00                           | <b>IM 053MT - Modbus/TCP slave</b><br>† Modbus/TCP slave,<br>† I/O configuration via field bus<br>† Adjustable I/O cycle (0.5...4 ms)   | 95   |
| 053-1PN00                           | <b>IM 053PN - PROFINET-IO slave</b><br>† PROFINET-IO slave<br>† Transfer rate 100Mbit/s<br>† max. 64 peripheral modules   | 95   |

# Fieldbus slave modules without I/Os

| Interface modules   Fieldbus slave modules without I/Os |           |  |  |  |  |  |
|---|-----------|--|--|--|--|--|
| 053-1CA00   | 053-1MT00 |  |  |  |  |  |
| 053-1DN00   | 053-1PN00 |  |  |  |  |  |
| 053-1DP00   |           |  |  |  |  |  |
| 053-1EC00   |           |  |  |  |  |  |

| Order number                                   | 053-1CA00  | 053-1DN00   | 053-1DP00   | 053-1EC00  |
|--|--|---|---|--|
| Figure   |   |    |    |   |
| Type   | IM 053CAN  | IM 053DN  | IM 053DP  | IM 053EC   |
| Module ID                                      | -  | -   | -   | -  |
| <b>General information</b>                     |  |   |   |  |
| Note   | -  | Coming soon   | -   | -  |
| Features                                       | <ul style="list-style-type: none"> <li>› CANopen slave</li> <li>› 16 Rx und 16 Tx PDOs</li> <li>› 2 SDOs</li> <li>› PDO-Linking</li> <li>› PDO-Mapping: fix</li> </ul> | <ul style="list-style-type: none"> <li>› DeviceNet slave</li> <li>› Group 2 only Device</li> <li>› Poll only Device</li> <li>› Baud rate: 125, 250 and 500kbit/s</li> <li>› max. 64 peripheral modules</li> </ul> | <ul style="list-style-type: none"> <li>› PROFIBUS-DP slave (DP-V0, DP-V1),</li> <li>› For max. 64 Periphery modules</li> <li>› 244 Byte input and 244 Byte output data</li> </ul> | <ul style="list-style-type: none"> <li>› EtherCAT slave</li> <li>› 64 peripheral modules</li> <li>› RJ45 jack 100BaseTX</li> </ul> |
| <b>Technical data power supply</b>             |  |   |   |  |
| Power supply (rated value)                     | DC 24 V  | DC 24 V   | DC 24 V   | DC 24 V  |
| Power supply (permitted range)                 | DC 20.4...28.8 V   | DC 20.4...28.8 V  | DC 20.4...28.8 V  | DC 20.4...28.8 V   |
| Reverse polarity protection                    | ✓  | ✓   | ✓   | ✓  |
| Current consumption (no-load operation)        | 90 mA  | 90 mA   | 90 mA   | 95 mA  |
| Current consumption (rated value)              | 0.95 A   | 0.95 A  | 0.95 A  | 0.95 A   |
| Inrush current                                 | 2.8 A  | 2.8 A   | 2.8 A   | 2.8 A  |
| I <sup>2</sup> t                               | 0.25 A <sup>2</sup> s  | 0.25 A <sup>2</sup> s   | 0.25 A <sup>2</sup> s   | 0.25 A <sup>2</sup> s  |
| Max. current drain at backplane bus            | 3 A  | 3 A   | 3 A   | 3 A  |
| Max. current drain load supply                 | 10 A   | 10 A  | 10 A  | 10 A   |
| Power loss                                     | 3 W  | 3 W   | 3 W   | 3 W  |
| <b>Status information, alarms, diagnostics</b> |  |   |   |  |
| Status display                                 | yes  | yes   | yes   | yes  |
| Interrupts                                     | yes, parameterizable   | -   | yes, parameterizable  | yes, parameterizable   |
| Process alarm                                  | no   | -   | yes, parameterizable  | yes, parameterizable   |
| Diagnostic interrupt                           | yes, parameterizable   | -   | yes, parameterizable  | yes, parameterizable   |
| Diagnostic functions                           | yes, parameterizable   | -   | yes, parameterizable  | yes, parameterizable   |
| Diagnostics information read-out               | possible   | possible  | possible  | possible   |
| Supply voltage display                         | green LED  | green LED   | green LED   | green LED  |
| Service Indicator                              | -  | -   | -   | -  |
| Group error display                            | red LED  | red SF LED  | red LED   | red SF LED   |
| Channel error display                          | none   | none  | none  | none   |
| <b>Hardware configuration</b>                  |  |   |   |  |
| Racks, max.                                    | 1  | 1   | 1   | 1  |
| Modules per rack, max.                         | 64   | 64  | 64  | 64   |

| Interface modules                                |                        | Fieldbus slave modules without I/Os |  |  |  |  |
|--|------------------------|-------------------------------------|--|--|--|--|
| 053-1CA00<br>053-1DN00<br>053-1DP00<br>053-1EC00 | 053-1MT00<br>053-1PN00 |                                     |  |  |  |  |

| Order number                    | 053-1CA00                                    | 053-1DN00                                    | 053-1DP00                                    | 053-1EC00                  |
|---------------------------------|--|--|--|----------------------------|
| Number of digital modules, max. | 64   | 64   | 64   | 64                         |
| Number of analog modules, max.  | 64   | 64   | 64   | 64                         |
| <b>Communication</b>            |  |  |  |                            |
| Fieldbus                        | CANopen                                      | DeviceNet                                    | PROFIBUS-DP to EN 50170                      | EtherCAT                   |
| Type of interface               | CAN  | CAN  | RS485 isolated                               | Ethernet 100 MBit          |
| Connector                       | Sub-D, 9-pin, male                           | 5-pin Open Style Connector                   | Sub-D, 9-pin, female                         | 2 x RJ45                   |
| Topology                        | Linear bus with bus termination at both ends | Linear bus with bus termination at both ends | Linear bus with bus termination at both ends | -                          |
| Electrically isolated           | ✓  | ✓  | ✓  | ✓                          |
| Number of participants, max.    | 127  | 64   | 125  | 65535                      |
| Node addresses                  | 1 - 127                                      | 0 - 63                                       | 1 - 125                                      | -                          |
| Transmission speed, min.        | 10 kbit/s                                    | 125 kbit/s                                   | 9.6 kbit/s                                   | 100 Mbit/s                 |
| Transmission speed, max.        | 1 Mbit/s                                     | 500 kbit/s                                   | 12 Mbit/s                                    | 100 Mbit/s                 |
| Address range inputs, max.      | 128 Byte                                     | 256 Byte                                     | 244 Byte                                     | 4 KB                       |
| Address range outputs, max.     | 128 Byte                                     | 256 Byte                                     | 244 Byte                                     | 4 KB                       |
| Number of TxPDOs, max.          | 16   | -  | -  | -                          |
| Number of RxPDOs, max.          | 16   | -  | -  | -                          |
| <b>Mechanical data</b>          |  |  |  |                            |
| Dimensions (WxHxD)              | 48.5 mm x 109 mm x 76.5 mm                   | 48.5 mm x 109 mm x 76.5 mm                   | 48.5 mm x 109 mm x 76.5 mm                   | 48.5 mm x 109 mm x 76.5 mm |
| Weight                          | 155 g  | 155 g  | 155 g  | 155 g                      |
| <b>Environmental conditions</b> |  |  |  |                            |
| Operating temperature           | 0 °C to 60 °C                                | 0 °C to 60 °C                                | 0 °C to 60 °C                                | 0 °C to 60 °C              |
| Storage temperature             | -25 °C to 70 °C                              | -25 °C to 70 °C                              | -25 °C to 70 °C                              | -25 °C to 70 °C            |
| <b>Certifications</b>           |  |  |  |                            |
| UL508 certification             | in preparation                               | in preparation                               | in preparation                               | in preparation             |

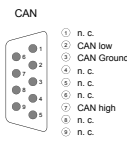
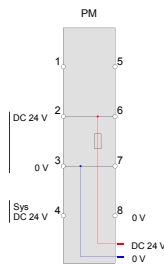
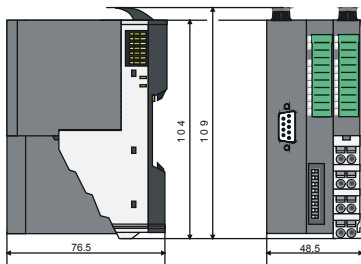
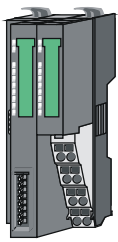
# Connections, Interfaces

## Interface modules | Fieldbus slave modules without I/Os

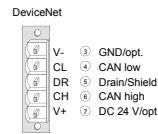
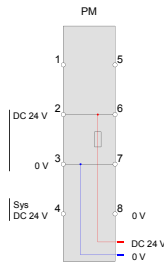
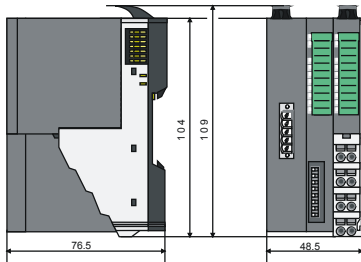
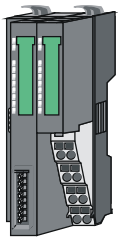
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053-1DN00  
053-1DP00  
053-1EC00

053-1MT00  
053-1PN00

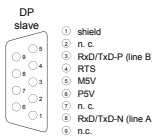
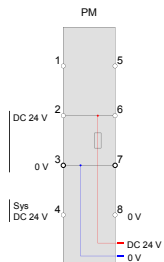
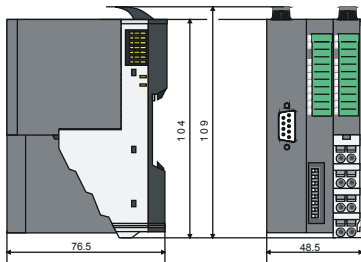
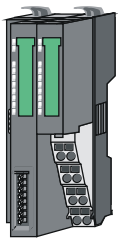
### 053-1CA00



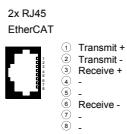
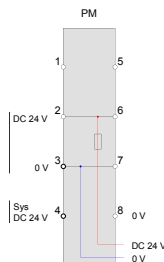
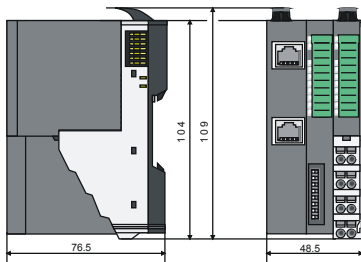
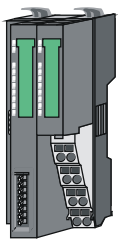
### 053-1DN00



### 053-1DP00



### 053-1EC00





# Fieldbus slave modules without I/Os

| Interface modules   Fieldbus slave modules without I/Os |                        |  |  |  |  |  |
|---|------------------------|--|--|--|--|--|
| 053-1CA00<br>053-1DN00<br>053-1DP00<br>053-1EC00        | 053-1MT00<br>053-1PN00 |  |  |  |  |  |

| Order number                                   | 053-1MT00   | 053-1PN00  |  |  |
|--|---|--|--|--|
| Figure   |    |   |  |  |
| Type   | IM 053MT  | IM 053PN   |  |  |
| Module ID                                      | -   | -  |  |  |
| <b>General information</b>                     |   |  |  |  |
| Note   | Coming soon   | Coming soon  |  |  |
| Features                                       | <ul style="list-style-type: none"> <li>▸ Modbus/TCP slave,</li> <li>▸ I/O configuration via field bus</li> <li>▸ Adjustable I/O cycle (0.5...4 ms)</li> </ul> | <ul style="list-style-type: none"> <li>▸ PROFINET-IO slave</li> <li>▸ Transfer rate 100Mbit/s</li> <li>▸ max. 64 peripheral modules</li> </ul> |  |  |
| <b>Technical data power supply</b>             |   |  |  |  |
| Power supply (rated value)                     | DC 24 V   | DC 24 V  |  |  |
| Power supply (permitted range)                 | DC 20.4...28.8 V  | DC 20.4...28.8 V   |  |  |
| Reverse polarity protection                    | ✓   | ✓  |  |  |
| Current consumption (no-load operation)        | 95 mA   | 95 mA  |  |  |
| Current consumption (rated value)              | 0.95 A  | 0.95 A   |  |  |
| Inrush current                                 | 2.8 A   | 2.8 A  |  |  |
| I <sup>2</sup> t                               | 0.25 A <sup>2</sup> s   | 0.25 A <sup>2</sup> s  |  |  |
| Max. current drain at backplane bus            | 3 A   | 3 A  |  |  |
| Max. current drain load supply                 | 10 A  | 10 A   |  |  |
| Power loss                                     | 3 W   | 3 W  |  |  |
| <b>Status information, alarms, diagnostics</b> |   |  |  |  |
| Status display                                 | yes   | yes  |  |  |
| Interrupts                                     | yes, parameterizable  | yes, parameterizable   |  |  |
| Process alarm                                  | yes, parameterizable  | yes, parameterizable   |  |  |
| Diagnostic interrupt                           | yes, parameterizable  | yes, parameterizable   |  |  |
| Diagnostic functions                           | yes, parameterizable  | yes, parameterizable   |  |  |
| Diagnostics information read-out               | possible  | possible   |  |  |
| Supply voltage display                         | green LED   | green LED  |  |  |
| Service Indicator                              | yellow LED  | yellow LED   |  |  |
| Group error display                            | red SF LED  | red SF LED   |  |  |
| Channel error display                          | none  | none   |  |  |
| <b>Hardware configuration</b>                  |   |  |  |  |
| Racks, max.                                    | -   | -  |  |  |
| Modules per rack, max.                         | 64  | 64   |  |  |
| Number of digital modules, max.                | 64  | 64   |  |  |

| Interface modules |           | Fieldbus slave modules without I/Os |  |  |  |  |
|-------------------|-----------|-------------------------------------|--|--|--|--|
| 053-1CA00         | 053-1MT00 |                                     |  |  |  |  |
| 053-1DN00         | 053-1PN00 |                                     |  |  |  |  |
| 053-1DP00         |           |                                     |  |  |  |  |
| 053-1EC00         |           |                                     |  |  |  |  |

| Order number                    | 053-1MT00                  | 053-1PN00                  |  |  |
|---------------------------------|----------------------------|----------------------------|--|--|
| Number of analog modules, max.  | 64                         | 64                         |  |  |
| <b>Communication</b>            |                            |                            |  |  |
| Fieldbus                        | Modbus / TCP/IP            | PROFINET-IO                |  |  |
| Type of interface               | Ethernet 10/100 MBit       | Ethernet 100 MBit          |  |  |
| Connector                       | RJ45                       | 2 x RJ45                   |  |  |
| Topology                        | -                          | -                          |  |  |
| Electrically isolated           | ✓                          | ✓                          |  |  |
| Number of participants, max.    | -                          | -                          |  |  |
| Node addresses                  | -                          | -                          |  |  |
| Transmission speed, min.        | 10 Mbit/s                  | 100 Mbit/s                 |  |  |
| Transmission speed, max.        | 100 Mbit/s                 | 100 Mbit/s                 |  |  |
| Address range inputs, max.      | 1 KB                       | 512 Byte                   |  |  |
| Address range outputs, max.     | 1 KB                       | 512 Byte                   |  |  |
| Number of TxPDOs, max.          | -                          | -                          |  |  |
| Number of RxPDOs, max.          | -                          | -                          |  |  |
| <b>Mechanical data</b>          |                            |                            |  |  |
| Dimensions (WxHxD)              | 48.5 mm x 109 mm x 76.5 mm | 48.5 mm x 109 mm x 76.5 mm |  |  |
| Weight                          | 155 g                      | 155 g                      |  |  |
| <b>Environmental conditions</b> |                            |                            |  |  |
| Operating temperature           | 0 °C to 60 °C              | 0 °C to 60 °C              |  |  |
| Storage temperature             | -25 °C to 70 °C            | -25 °C to 70 °C            |  |  |
| <b>Certifications</b>           |                            |                            |  |  |
| UL508 certification             | in preparation             | in preparation             |  |  |

# Connections, Interfaces

| Interface modules                                | Fieldbus slave modules without I/Os |  |  |  |  |
|--|-------------------------------------|--|--|--|--|
| 053-1CA00<br>053-1DN00<br>053-1DP00<br>053-1EC00 | 053-1MT00<br>053-1PN00              |  |  |  |  |

## 053-1MT00

**PM**

**NET**

- ① Transmit +
- ② Transmit -
- ③ Receive +
- ④ n. c.
- ⑤ n. c.
- ⑥ Receive -
- ⑦ n. c.
- ⑧ n. c.

DC 24 V 0 V

Sys DC 24 V 0 V

DC 24 V 0 V

## 053-1PN00

**PM**

**2x RJ45 Profinet**

- ① Transmit +
- ② Transmit -
- ③ Receive +
- ④ GND
- ⑤ GND
- ⑥ Receive -
- ⑦ GND
- ⑧ GND

DC 24 V 0 V

Sys DC 24 V 0 V

DC 24 V 0 V



# System SLIO accessories



## Structure and Function

System accessories expand the use of the system and facilitate starting.

### 35 mm profile rail

Using 35 mm profile rails the respective modules can be mounted directly on the mounting surface. The profile rail is available in various lengths.

### Manuals

The technical documentation of the respective modules includes various manuals with the necessary hardware and programming information, detailed descriptions of each module, and instructions for structure and assembly.



## SLIO starterKIT



| Order number | Type | Description   | Note |
|--------------|------|---|------|
| 800-1DK10    |      | consisting of: 1 x IM 053DP - PROFIBUS-DP slave, 1x CM 001 Clamps module (4xDC 24V, 4xDC 0V Clamps), 1 x SM 021 Digital Input (DI 8xDC 24V), 1 x SM 021 Digital Input (DI 4xDC 24V), 1x SM 022 Digital Output (DO 4xDC 24V, 0,5A), 1x SM 031 Analog Input (AI 2x12Bit, U), 1x SM 032 Analog Output (AO 2x12Bit, U), 1x PROFIBUS cable ready for connecting including 2x PB connector (972-ODP01 + 972-ODP10), 1x profil rail, 1x SLIO USB stick (with GSD files, Manual, Catalog (german/english), example programs), 1x transport case |      |

## 35 mm profile rail



| Order number | Type               | Description    | Note |
|--------------|--------------------|----------------|------|
| 290-1AF00    | 35 mm profile rail | length 2000 mm |      |
| 290-1AF30    | 35 mm profile rail | length 530 mm  |      |

## Miscellaneous



| Order number | Type                    | Description | Note |
|--------------|-------------------------|-------------|------|
| 000-0AA00    | SLIO bus cover          |             |      |
| 000-0AB00    | SLIO shield bus carrier | 10 pieces   |      |

## Manuals and operating instructions



| Order number | Title                       | Contents   | Language |
|--------------|-----------------------------|--|----------|
| HB300D       | Manual system SLIO, german  | Manual System SLIO - Compendium, German HB300D_SM, HB300D_IM, HB300D_FM, HB300D_PS-CM  | DE       |
| HB300E       | Manual system SLIO, english | Manual System SLIO - Compendium, English HB300E_SM, HB300E_IM, HB300E_FM, HB300E_PS-CM | EN       |
| HB300D_IM    | Manual system SLIO - IM     | IM - Interface modules   | DE       |
| HB300D_SM    | Manual system SLIO - SM     | SM - Signal modules  | DE       |
| HB300D_FM    | Manual system SLIO - FM     | FM - Function modules  | DE       |
| HB300D_PS-CM | Manual system SLIO - PS-CM  | PS-CM - Power modules / Clamp modules  | DE       |
| HB300E_IM    | Manual system SLIO - IM     | IM - Interface modules   | EN       |
| HB300E_SM    | Manual system SLIO - SM     | SM - Signal modules  | EN       |
| HB300E_FM    | Manual system SLIO - FM     | FM - Function modules  | EN       |
| HB300E_PS-CM | Manual system SLIO - PS-CM  | PS-CM - Power modules / Clamps modules   | EN       |