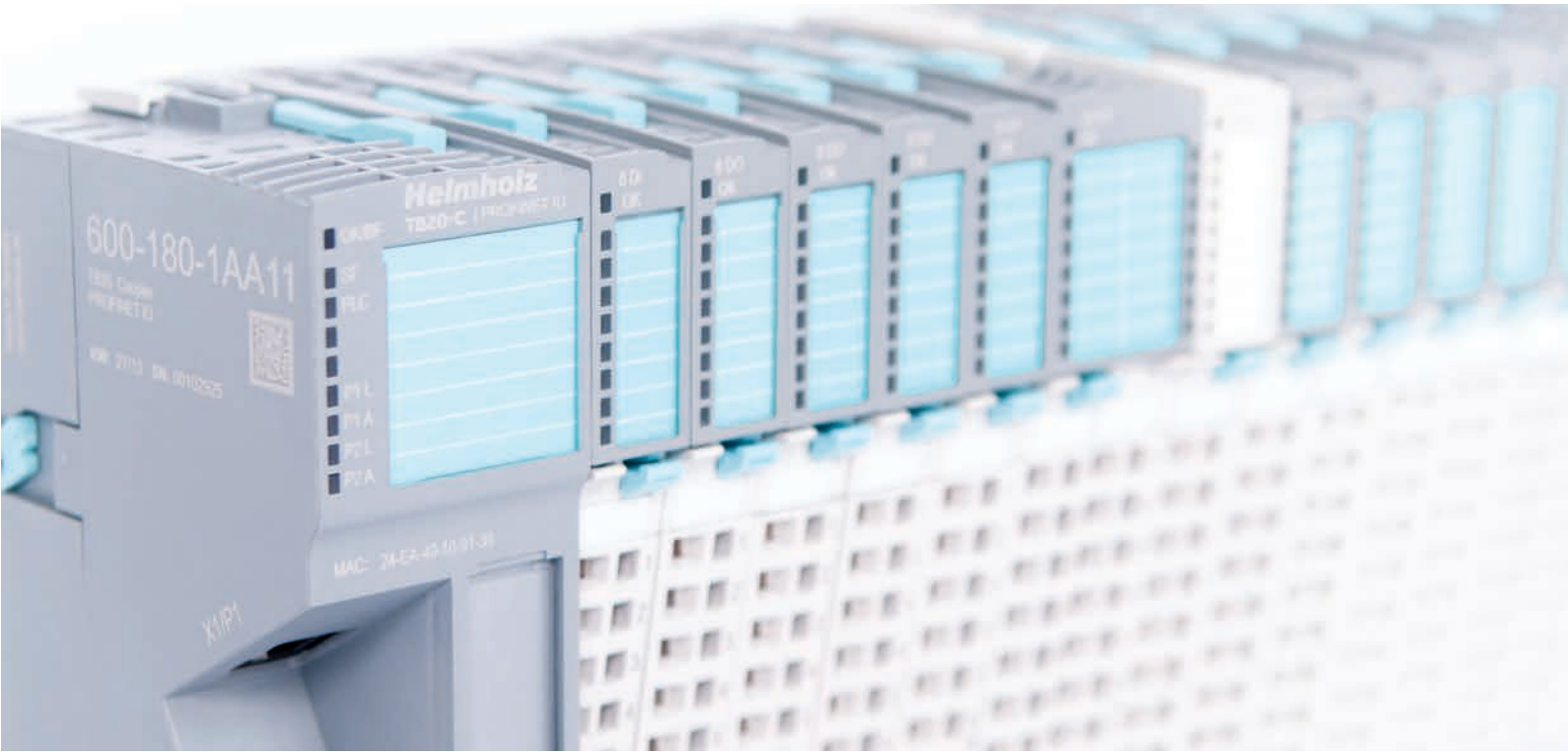
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Distributed Fieldbus I/O System

Catalog
2

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Three-Component Modular Design, Bus Couplers, Hot-Plug Capability





Three-component module design

The I/O module consists of a separate front connector, an electronic module, and a base module All modules are mounted with a locking mechanism on DIN rails, which guarantees reliable electric connection, and can be easily and quickly removed for maintenance and/or system expansions.
Modules are delivered as complete assembled units (i.e., as a single assembly) and can be installed immediately.

Hot-plug capability

Individual modules can be easily and quickly disconnected and replaced while the remaining system continues to run. This electronic module hot-plug functionality helps keep downtimes to a minimum.



PROFINET®

PROFIBUS®

CANopen®

Modbus

EtherNet/IP™

Bus couplers

All bus couplers feature an integrated power module. However, power modules are also available separately for users interested in segmenting the power supply for the I/O modules in their system. Bus couplers for PROFINET, PROFIBUS, CAN Bus, ModbusTCP, and EtherNet/IP are currently available.

EtherCAT and other bus couplers will be available in the future. Designed as an open and vendor-neutral fieldbus system, our portfolio will gradually be expanded and added to.

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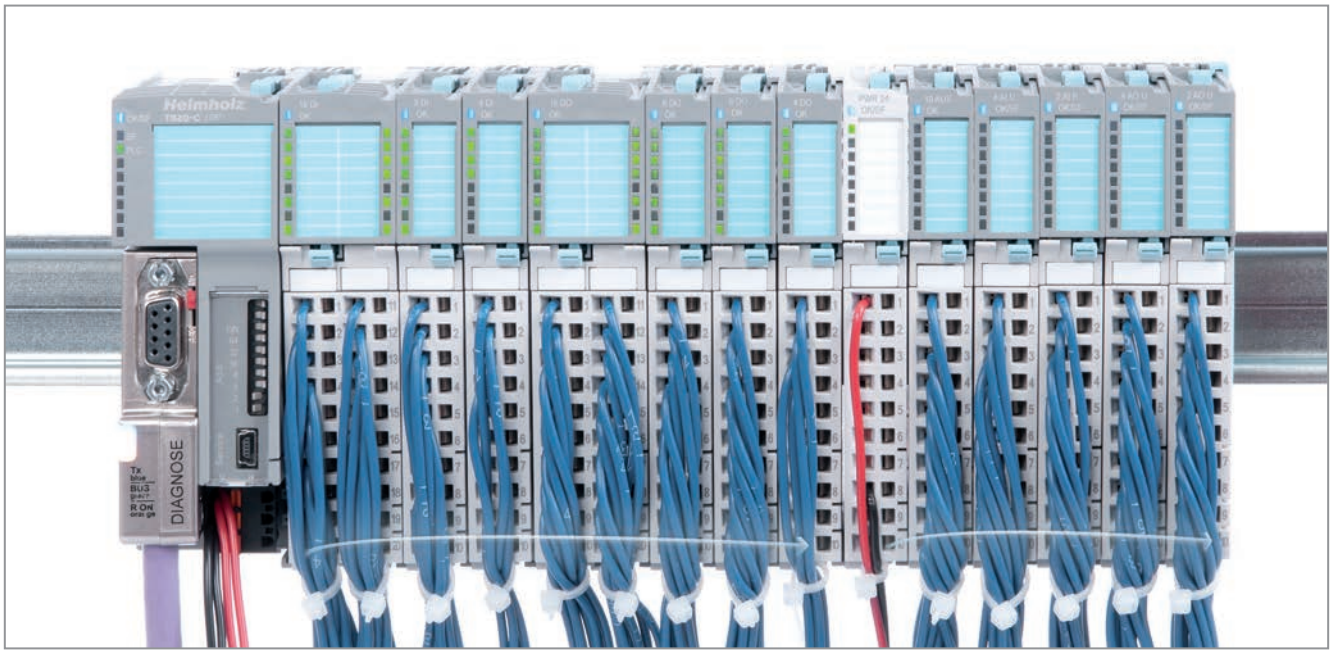


Module granularity

The TB20 system has modules with two, four, eight, and 16 channels available so as to ensure that systems can be designed with utmost flexibility and maximum effectiveness. Digital mixed I/O modules complete the range of products. Moreover, 16-channel modules make it possible to implement up to 1,024 inputs/outputs or up to 512 analog measurement values.

Few types, more functionality

The TB20 I/O system helps you achieve more value by reducing the variety of models and at the same time offering a wide functionality for each module. This facilitates planning, the selection of modules, and storage.

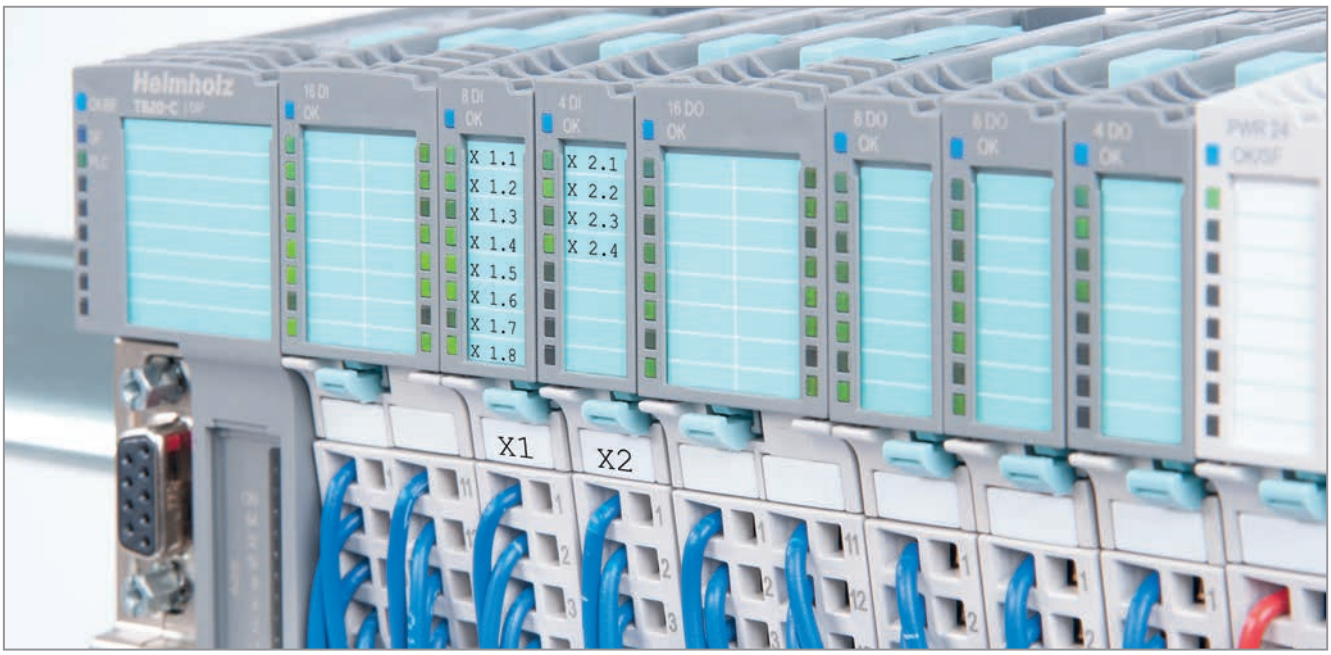


Freely definable auxiliary contact terminal

This additional contact can be used flexibly and from end to end, e.g. in order to provide an additional voltage as a reference ground or implement shielding, adjusting to your technical requirements. This flexibility makes wiring faster and frees up additional distributor terminals.

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Clear, Unique Labels; Electronic Nameplate; Ideal Handling

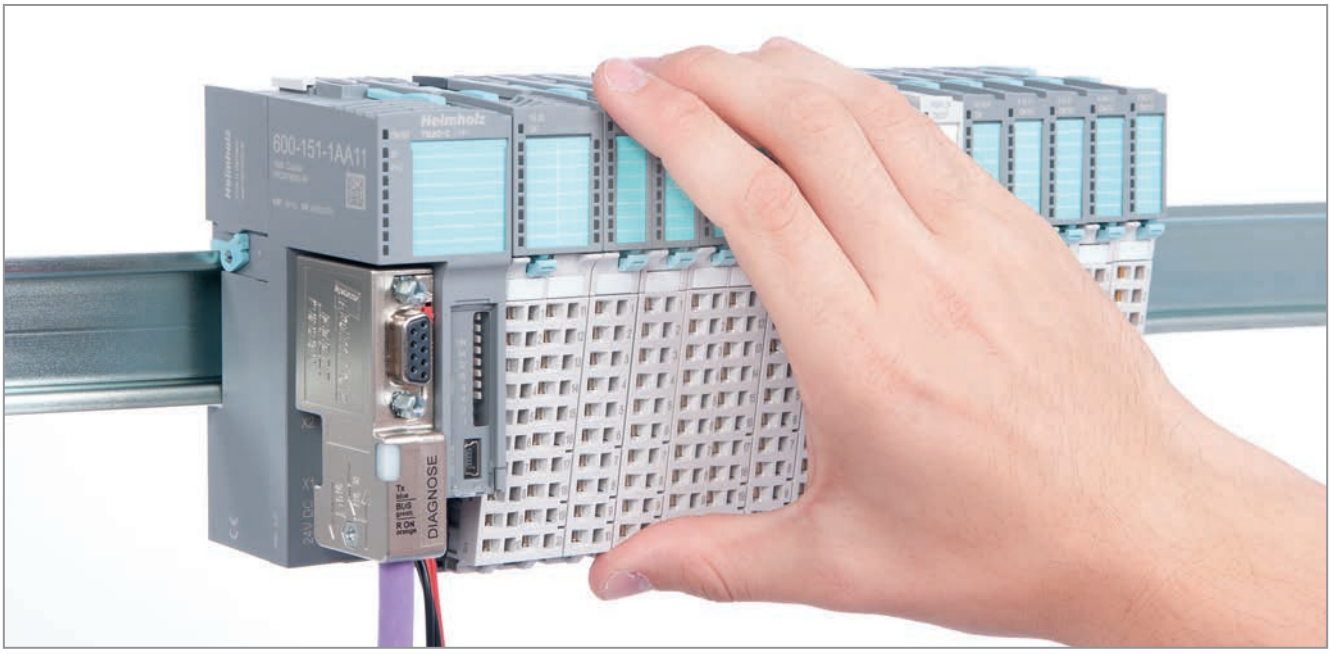


Clear, unique labels

The system's design ensures that each channel is labeled clearly and uniquely. Labels can be easily read during operation, making it possible to directly determine which terminals correspond to which LED indicators. The connector terminal assignment labels are placed on the electronic module, and the label strips can be used with any laser printer . In addition to the I/O modules, the front connector can be labeled as well. Moreover, the corresponding order number of each module is laser engraved behind the label strip.

Electronic nameplate

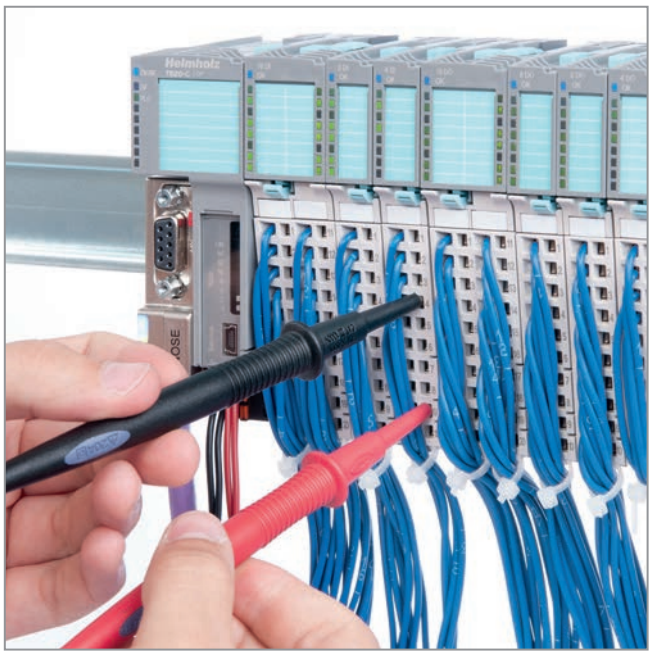
The modules' electronic nameplate contains all of the TB20 module's important information. This information includes the corresponding module ID, module model, order number, unique serial number, hardware version, firmware version, and internal range of functionalities. This information can be read in a number of ways, one of which is using the "TB20 ToolBox" configuration and diagnostics program. The modules' electronic nameplates not only make it possible to prevent configuration errors (setup), but also make maintenance (servicing) easier.

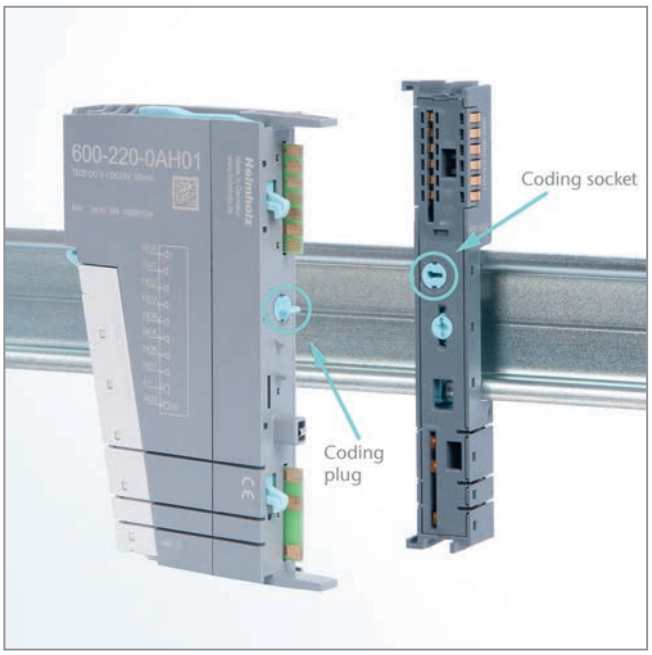


Ideal handling combined with a compact build

The system's ergonomic design makes it easy to handle. Moreover, the space-saving compact dimensions behind it do not take away from the system components' heavy-duty sturdiness and its reliable electrical contacts that make it suitable for industrial applications in accordance with IP20.

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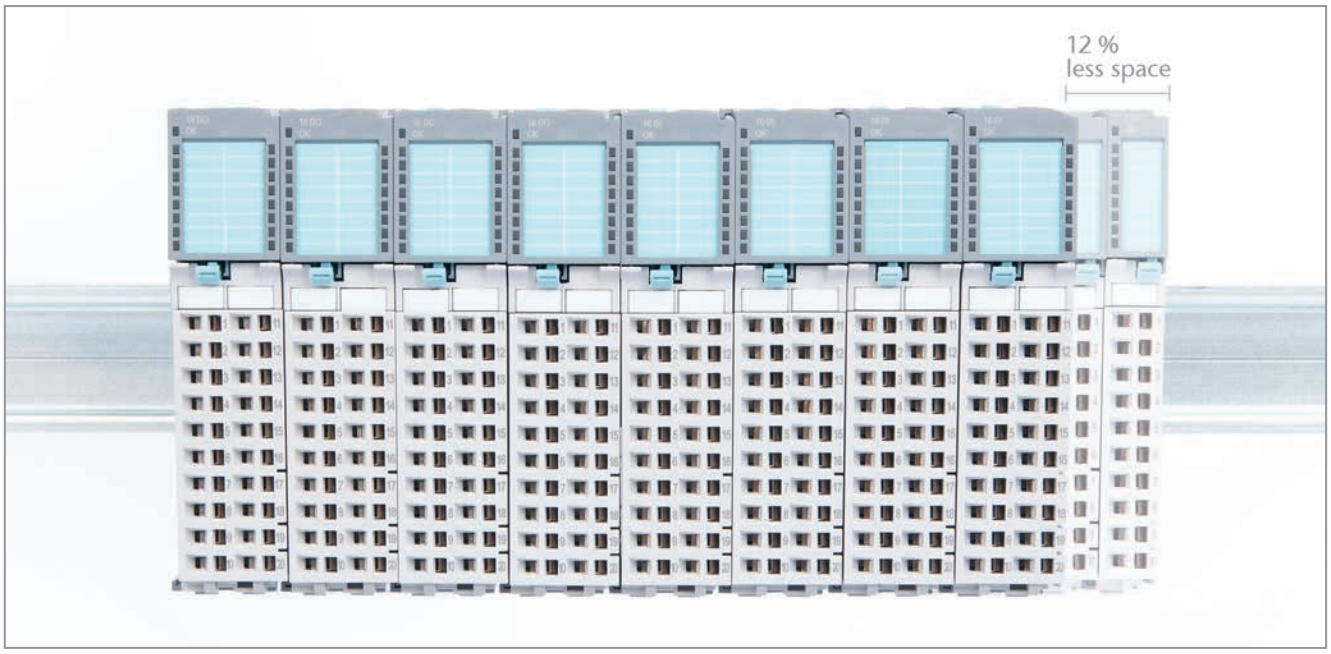


Front connector wiring

The system's front connectors feature spring-type terminals throughout, and can be either snapped into place or wired without an electronic module.
Each terminal is able to accommodate wires with a cross-sectional area of up to 1.5 mm² and is designed to work with test probes.

Coded system

The integrated rotary coding system prevents users from plugging in modules which should not be plugged into this slot, ensuring that modules can be replaced in a secure manner.
This helps prevent not only damage to the system, but also system malfunctions.

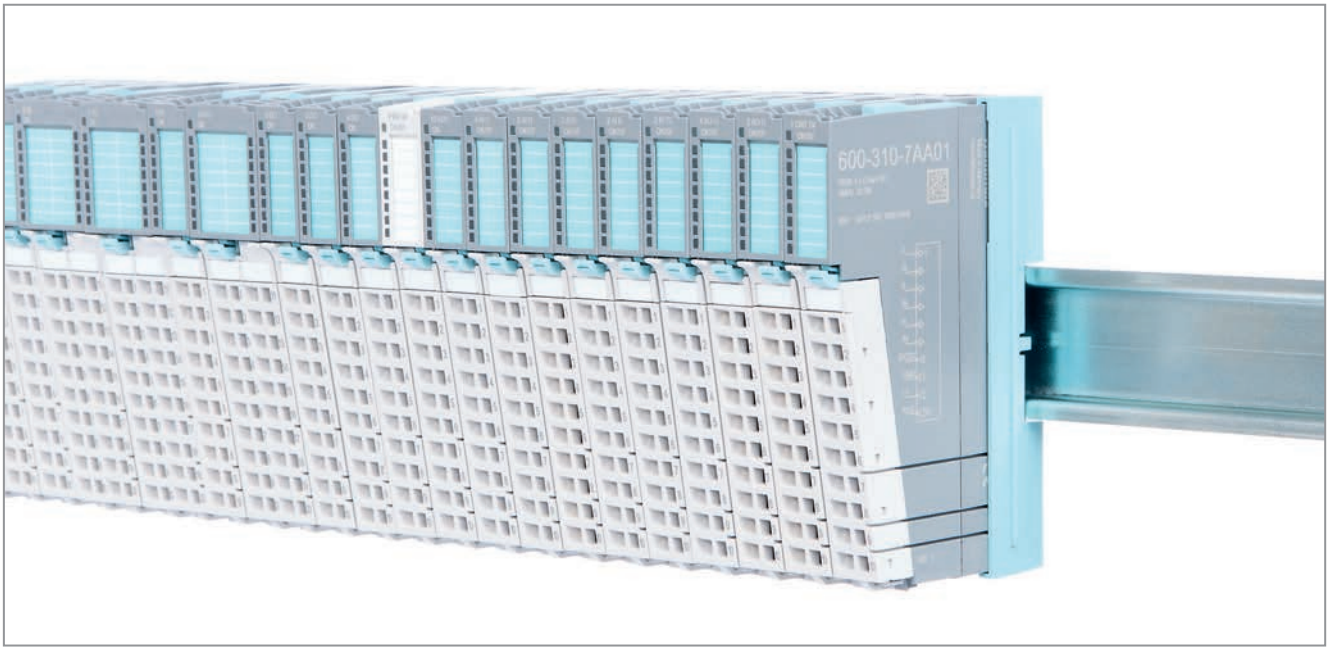


Total solution concept

An ideal variety of modules guarantees that products can be easily selected and conveniently ordered. No additional accessories or add-on parts are required for any unit. Each I/O module stands for quality and is already equipped with a wide range of functionalities.

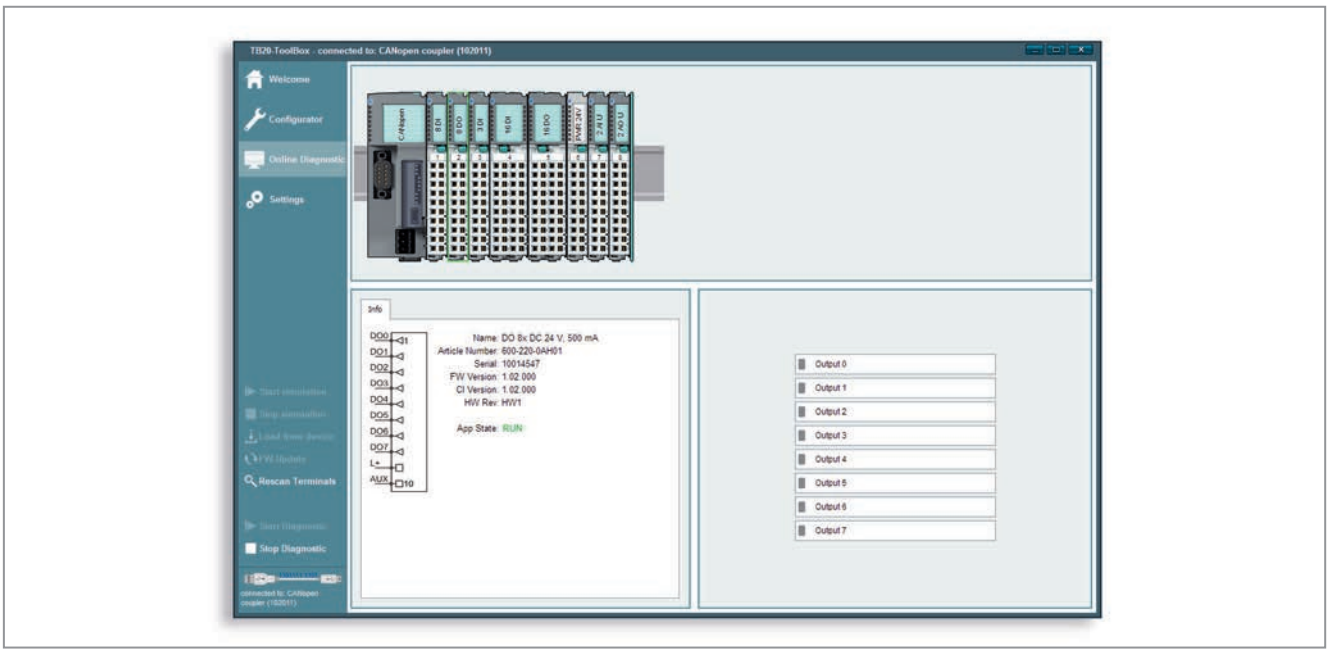
An ideal design width of the system can be achieved by deploying modules with up to 16 channels and digital mixed I/O modules.

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Final bus cover

The final bus cover protects the bus contacts on the last module. It is a passive element, i.e., TB20 I/O systems can work without one if necessary. The final bus cover is already included in the delivery of bus couplers.

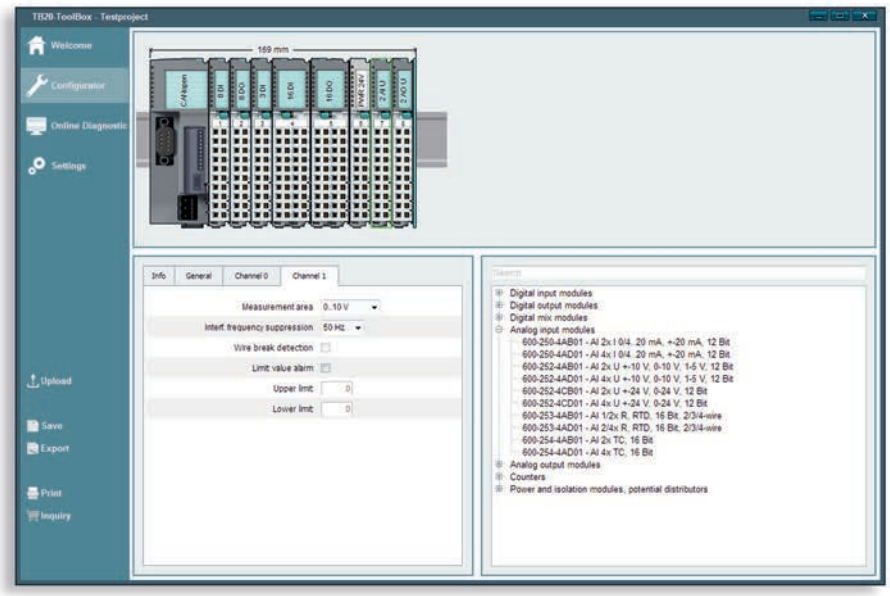


Our service: real-time diagnostics

The "TB20 ToolBox" is a useful setup and maintenance tool used to import configurations, display a system's current status and analyze setup and parameter configuration errors.
An I/O map, the current parameter configuration, and diagnostics messages can all be displayed in real-time. In addition, the tool shows the electronic nameplate for each module, ensuring that all of them can be reliably identified and maintained..

Using the firmware update function makes it possible to keep all devices up to date or add new functions to them.
The "TB20 ToolBox" uses the built-in USB service interface in every coupler or TCP/IP (currently in development) to communicate.
The "TB20 ToolBox" operates under Windows XP, 7, and 8.

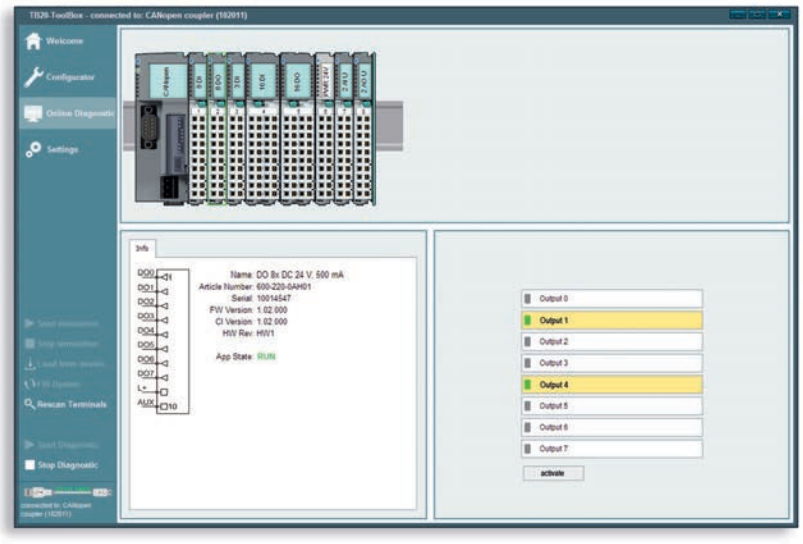
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Smart design and configuration

TB20 ToolBox makes it easy to methodically design TB20 systems. From selecting and positioning components and configuring their parameters to printing label strips, every single step is combined into one single intuitive software package. Integrated terminal mapping, system design width calculations, and current-carrying capacity monitoring all make it possible to quickly design a system without making any mistakes. An existing TB20 I/O system design can be directly loaded as a project to adjust additional parameters or to carry out a label strip print job.

With regard to bus systems that require or allow a direct configuration of the coupler, the "TB20 ToolBox" software makes it possible to set all parameters of the TB20 system and to permanently store them in the coupler. The system's configuration works hand in hand with its diagnostics capabilities. This is further complemented by a function that makes it possible to export description and configuration files for higher-level systems (EDS, DCF, etc.).



Simulation mode

The option of starting the TB20 I/O systems without a higher-level controller by directly reading and writing to inputs and outputs and by configuring parameters for functionality test purposes makes it easier to check the system's wiring and entire design. This ensures your TB20 I/O system is optimally set up and ready for use before it is delivered to you.

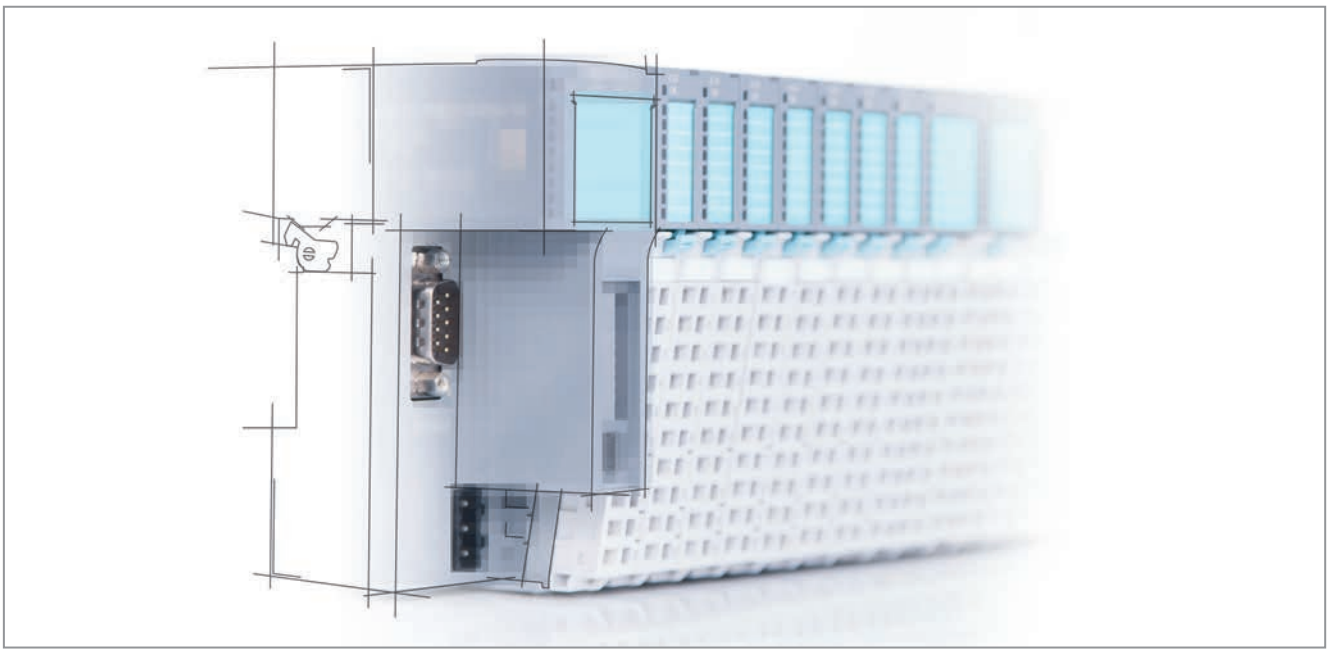


TB20 ToolBox Training
Get introduced to our ToolBox and learn how to use it.

www.youtube.com/user/SystemeHelmholz

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Product Macros free of charge for Electrical Engineering Systems



Product macros free of charge for electrical engineering systems

Speed and efficient processing are, next to reliability, the most important ingredients to a successful project. This even applies to the planning stage, when creating circuit diagrams, documentations, and engineering data for the control cabinet design.
Product macros for electrical engineering systems have proved to be an important element in this respect, because they contain the most important data of the wiring diagram as well as layout and item related data for the parts lists.
In order to integrate the TB20 distributed I/O system into your construction planning in a fast and efficient way, product macros for all system components are now available free of charge.

The pre-configured TB20 macros are available for download in the production section of our web page (www.helmholz.com) under the category "Planning Tools".

Currently, there are macros available for:
WSCAD* (from WSCAD Suite 2012 on)
EPLAN Electric P8** (compatible from Version 2.0 on and higher)

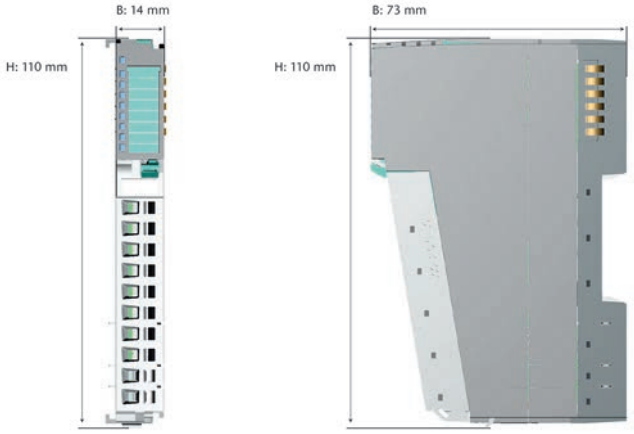
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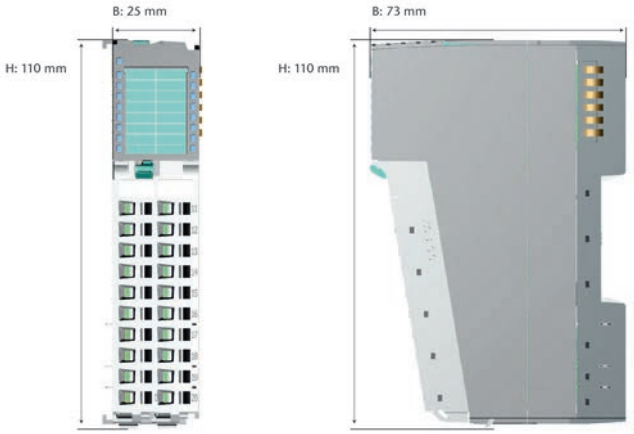
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TB20 dimensioning

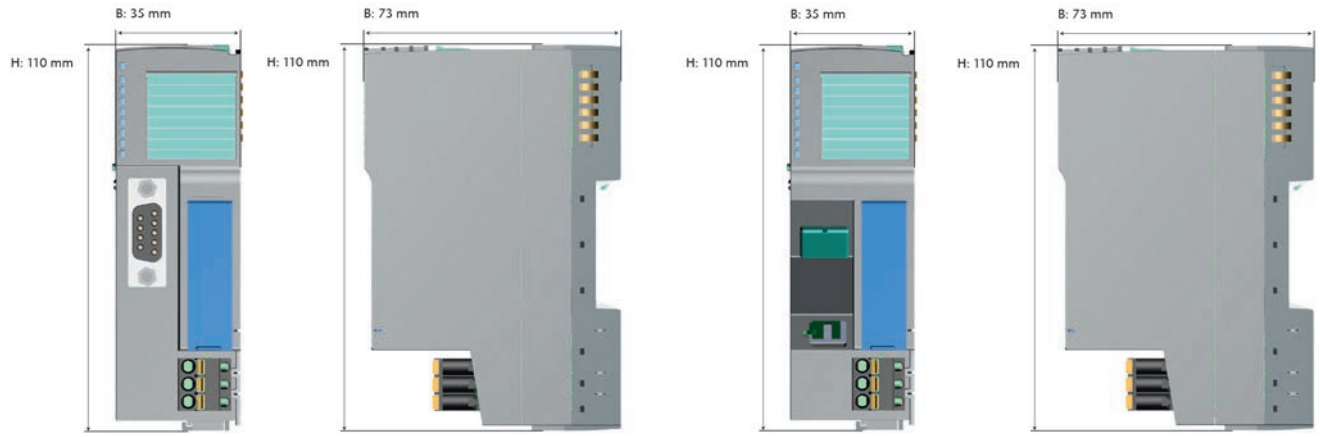
Module with standard width



Module with double width



Bus couplers



General technical data

This page contains the general technical data for all modules. Module-specific specifications can be found on the relevant product pages.

In order to obtain ordering information for all our TB20 manuals, please refer to page 115. All manuals are available in German and English and can also be downloaded on the Internet at www.helmholz.com.

General technical data	
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Isolation voltage	1.5 kV
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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Bus Couplers

PROFINET IO
PROFIBUS-DP
CANopen®
ModbusTCP
EtherNet/IP

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PROFINET IO

The PROFINET bus coupler connects the PROFINET bus with the peripheral modules.
In order to start, a bus coupler and at least one peripheral module are required.
A total of 63 user-defined modules can be connected in series to the bus coupler. The bus coupler supports hot-plugging for exchanging modules during operation.
It detects peripheral modules that are plugged in and assigns each module to the inputs and outputs of the process image.

Note:
The 24 V power supply connector, the final bus cover element and the base module are already included in the delivery.

General characteristics

- IO device as per PROFINET IO (61158-6-10)
- Integrated 2-port switch
- Full duplex 100 Mbps transmission rate
- 344 bytes of input data; 344 bytes of output data
- A maximum of 63 peripheral modules
- Supports hot-plug
- Conformance Class C (IRT)
- Media Redundancy Protocol (MRP)
- Automatic addressing / hot-swapping (LLDP, DCP)
- Topology detection
- I&M data
- Diagnostic alarms, process alarms, pull/plug alarms
- Integration using GSDML file
- 24 VDC power supply
- Integrated power supply unit for powering peripheral modules (2.5 A)
- Supplies the system's I/O voltage (24 VDC)
- 5 LEDs, one of them bi-color
- USB device port for online diagnostics, starting and firmware update with "TB20 ToolBox"

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Technical data/Ordering data	
TB20-C, Bus Coupler PROFINET IO comes with 24 V power supply connector, final bus cover, base module	**600-180-1AA11**
PROFINET interfaces	
· Protocol	PROFINET IO as per IEC 61158-6-10
· Fieldbus physics	Ethernet
· Transmission rate	100 Mbps full duplex
· I/O image size	344/344 bytes
· Connector	2x RJ45, integrated switch
· Features	Conformance Class C (IRT) | Media Redundancy Protocol (MRP) | Automatic addressing / topology discovery (LLDP, DCP) PTCP | statistic counter
· Alarm functions	Diagnostic alarms Process alarms Pull/plug alarms
· Minimum Cycle Time	250 µsec.
· IRT-Bridge Delay	< 3 µsec.
USB port	
· Protocol	Full-speed USB 2.0 Device
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	75 mA
Power dissipation	Max. 8 W
Power supply for modules	5 VDC, max 2.5 A
Dimensions (H x W x D)	110 mm x 35 mm x 73 mm
Weight	115 g
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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PROFIBUS-DP

The PROFIBUS-DP bus coupler connects the PROFIBUS with the peripheral modules. It supports the DP-V0 and DP-V1 protocols. In order to start, a bus coupler and at least one peripheral module are required.
A total of 64 user-defined modules can be connected in series to the bus coupler. The bus coupler supports hot-plugging for exchanging modules during operation.
It detects peripheral modules that are plugged in and assigns each module to the inputs and outputs of the process image.

Note:
The 24 V power supply connector, the final bus cover element and the base module are already included in the delivery.

General characteristics

- PROFIBUS-DP slave as per EN 50170/IEC 61158
- Supports all PROFIBUS baud rates
- DP-V0 and DP-V1 support
- A maximum of 64 modules
- Supports hot-plug
- Up to 244 bytes of input data and 244 bytes of output data
- One class 1 master connection with 240 bytes of payload data
- Up to three class 2 master connections with 240 bytes of payload data (as a DP-V1 slave)
- 24 VDC power supply
- I&M data
- Integrated power supply unit for powering peripheral modules (2.5 A)
- Supplies the system's I/O voltage (24 VDC)
- DIP switch for configuring the PROFIBUS address; can be covered
- 3 LEDs, one of them bi-color
- USB device port for online diagnostics, starting and firmware update with "TB20 ToolBox"

Parameters

- Diagnostic alarm: On | Off
- Process alarm: On | Off
- Pull/plug alarm: On | Off
- Startup when expected/actual configuration differ: On | Off (hot-plugging allowed: Yes | No)
- Identifier-related diagnostics: On | Off
- Module status: On | Off
- Channel-related diagnostics: On | Off

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Technical data/Ordering data	
TB20-C, Bus Coupler PROFIBUS-DP Slave comes with 24 V power supply connector, final bus cover, base module	**600-151-1AA11**
PROFIBUS interface	
· Protocol	PROFIBUS-DP/V0 & DP/V1 as per EN 50170
· Baud rate	9.6 KBaud to 12 MBaud, automatic detection
· I/O image size	244 bytes In / 244 bytes Out
· Parameter configuration length	244 bytes
· Interface	RS485
· Connector	9-pin D-sub female connector
USB port	
· Protocol	Full-speed USB 2.0 Device
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	75 mA
Power dissipation	Max. 8 W
Power supply for modules	5 VDC, max 2.5 A
Dimensions (H x W x D)	110 mm x 35 mm x 73 mm
Weight	115 g
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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CANopen®

The CANopen® bus coupler connects the CAN bus with the peripheral modules. It supports the CANopen® protocol as per DS301 and uses the DSP401 profile for digital and analog I/O modules.
In order to start, a bus coupler and at least one peripheral module are required.
A total of 64 user-defined modules can be connected in series to the bus coupler. The bus coupler supports hot-plugging for exchanging modules during operation.
This coupler makes it possible to use SDOs to freely access all I/O values, parameters, and diagnostics, and can manage up to 256 bytes of I/O data with the PDO protocol.

Note:
The 24 V power supply connector, the final bus cover element and the base module are already included in the delivery.

General characteristics

- CANopen® protcol as per DSP301 and DS401
- Baud rates of 50 kbps to 1 Mbps
- 24 TPDOs / 24 RPDOs
- One SDO server
- Producer heartbeat
- 2 x consumer heartbeat
- Node guarding
- SYNC object
- Storable parameter configuration
- A maximum of 64 modules
- Supports hot-plug
- 24 VDC power supply
- Integrated power supply unit for powering peripheral modules (2.5 A)
- Supplies the system's I/O voltage (24 VDC)
- DIP switches for configuring the node ID and bit rate; can be covered
- 5 LEDs, one of them bi-color
- USB device port for online diagnostics, parameter configuration, starting and firmware update with "TB20 ToolBox"

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Technical data/Ordering data	
TB20-C, Bus Coupler CANopen® Slave comes with 24 V power supply connector, final bus cover, base module	**600-160-1AA11**
CAN interface	
· Protocol	CANopen® as per DSP301 V4.2 and DS401 V3.0
· Baud rate	50, 100, 125, 250, 500, 800, 1,000 kbps
· TPDOs	24
· RPDOS	24
· Interface	ISO 11898-2
· Connector	9-pin D-sub male connector
USB port	
· Protocol	Full-speed USB 2.0 Device
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	75 mA
Power dissipation	Max. 8 W
Power supply for modules	5 VDC, max 2.5 A
Dimensions (H x W x D)	110 mm x 35 mm x 73 mm
Weight	115 g
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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ModbusTCP



ModbusTCP

The ModbusTCP bus coupler allows access to the peripheral module data via the ModbusTCP protocol.
In order to start, a bus coupler and at least one peripheral module are required.
A total of 64 user-defined modules can be connected in series to the bus coupler. The bus coupler supports hot-plugging for exchanging modules during operation.
It detects peripheral modules that are plugged in and assigns the I/O data and parameters of each module to the Modbus registers.
The ModbusTCP bus coupler has an integrated 2-port switch that allows a configuration as a star topology as well as a line topology.
The large I/O image size of 2 kbytes allows the implementation of even larger and more complex designs.
The control and status registers can be used to configure and monitor the coupler behavior with ModbusTCP.
With the help of the TB20 ToolBox, the configuration of the system design and the module parameters can be easily set and transmitted to the coupler.

Note:
The 24 V power supply connector, the final bus cover element and the base module are already included in the delivery.

General characteristics

- ModbusTCP protocol
- Modbus Watchdog for monitoring the connection
- Integrated 2-port switch
- Access to up to 10 stations simultaneously (TCP connections)
- A maximum of 64 modules
- 2 x RJ45 connectors
- 1,024 bytes input data / 1,024 bytes output data
- 126 bytes parameter data per module
- With the help of "TB20 ToolBox", modules can be freely configured
- Configuration of coupler action parameters in the control register
- Reading of the coupler state with the status register
- Module diagnostics and process alarms supported
- Supports hot-plug
- 24 VDC power supply
- Integrated power supply unit for powering peripheral modules (2.5 A)
- Supplies the system's I/O voltage (24 VDC)
- 7 LEDs, one of them bi-color
- USB device port for online diagnostics, parameter configuration, starting and firmware update with "TB20 ToolBox"

Technical data/Ordering data	
TB20-C, Bus Coupler ModbusTCP comes with 24 V power supply connector, final bus cover, base module	**600-170-1AA11**
Ethernet	
· Protocol	ModbusTCP
· Fieldbus physics	Ethernet
· Transmission rate	10/100 Mbits/s, automatic detection (auto negotiation, auto crossover)
· I/O image size	1024/1024 bytes
· Parameters per module	126 bytes
· Connector	2x RJ45, integrated switch
· Supports Modbus function codes	1, 2, 3, 4, 5, 6, 15, 16, 22, 23
· TCP connections	10 stations
USB port	
· Protocol	Full-speed USB 2.0 Device
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	75 mA
Power dissipation	Max. 8 W
Power supply for modules	5 VDC, max 2.5 A
Dimensions (H x W x D)	110 mm x 35 mm x 73 mm
Weight	115 g
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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EtherNet/IP

The EtherNet/IP bus coupler allows access to the peripheral module data via the EtherNet/IP protocol.
In order to start, a bus coupler and at least one peripheral module are required.
A total of 64 user-defined modules can be connected in series to the bus coupler. The bus coupler supports hot-plugging for exchanging modules during operation.
It detects peripheral modules that are plugged in and allows access to the module's I/O data via input/output assemblies.
The EtherNet/IP bus coupler has an integrated 2-port switch that allows a configuration as a star topology as well as a line topology.
The large I/O image size of one kbyte allows the implementation of even larger and more complex designs.
With the help of the TB20 ToolBox the configuration of the system design and the module parameters can be easily set and transmitted to the coupler.

Note:
The 24 V power supply connector, the final bus cover element and the base module are already included in the delivery.

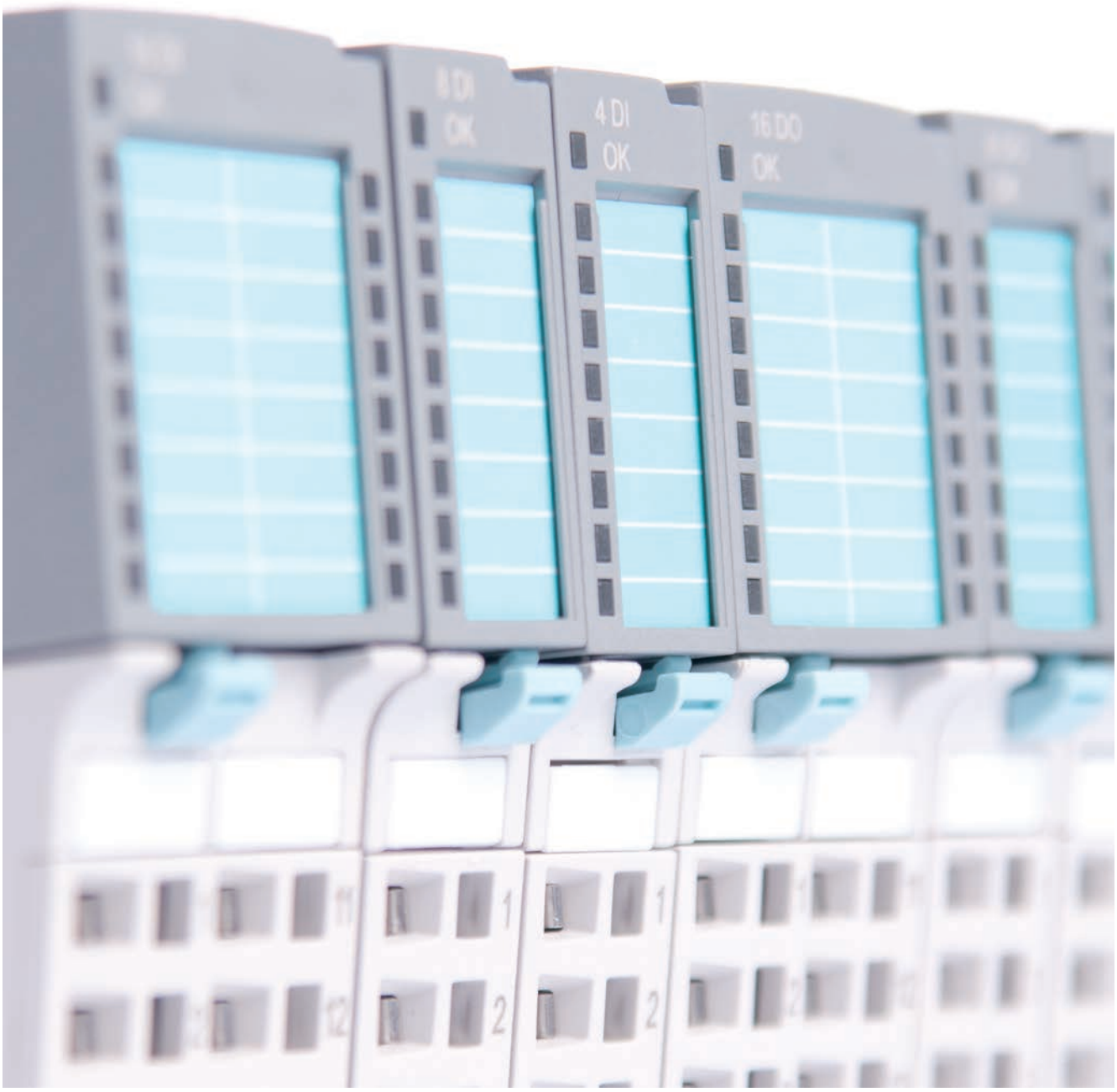
General characteristics

- EtherNet/IP protocol
- 511 bytes input assembly, 511 bytes output assembly
- Automatic assignment of module I/O data to the assemblies
- Implicit messaging (transport class 1)
- Explicit messaging (transport class 3)
- Integrated 2-port switch
- 2 x RJ45 connectors
- A maximum of 64 modules
- With the help of "TB20 ToolBox" modules can be freely configured
- Retentive storage of the configuration and configured parameters
- Supports hot-plug
- DIP switch for configuring the host ID; can be covered (relative to the base IP address)
- DHCP (selection using DIP switch)
- 24 VDC power supply
- Integrated power supply unit for powering peripheral modules (2.5 A)
- Supplies the system's I/O voltage (24 VDC)
- 9 LEDs, 3 of them bi-color
- USB device port for online diagnostics, parameter configuration, starting and firmware update with "TB20 ToolBox"

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Technical data/Ordering data	
TB20-C, Bus Coupler EtherNet/IP comes with 24 V power supply connector, final bus cover, base module	**600-175-1AA11**
Ethernet	
· Protocol	EtherNet/IP
· Fieldbus physics	Ethernet
· Transmission rate	10/100 Mbits/s, automatic detection (auto negotiation, auto crossover)
· Input/Output assembly size	511/511 bytes
· Protocol transmission model	Implicit messaging (transport class 1) Explicit messaging (transport class 3)
· Host-ID	Configurable using DIP switch
· DHCP	Yes, selection using DIP switch
· Connector	2x RJ45, integrated switch
USB port	
· Protocol	Full-speed USB 2.0 Device
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	75 mA
Power dissipation	Max. 8 W
Power supply for modules	5 VDC, max 2.5 A
Dimensions (H x W x D)	110 mm x 35 mm x 73 mm
Weight	115 g
Certifications	CE, UL pending
Noise immunity	DIN EN 61000-6-2 “EMC Immunity”
Interference emission	DIN EN 61000-6-4 “EMC Emission”
Vibration and shock resistance	DIN EN 60068-2-8;2008 “Vibration” DIN EN 60068-27:2010 “Shock”
Protection rating	IP 20
Relative humidity	95 % without condensation
Installation position	Any
Permissible ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C

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Digital Input/Output Modules

Digital In
Digital Out
Digital Mix

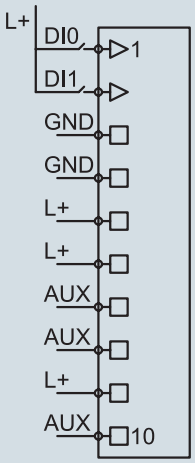
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DI 2 x 24 VDC



DI 2 x 24 VDC

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	Input 1
3	GND
4	GND
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 2 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

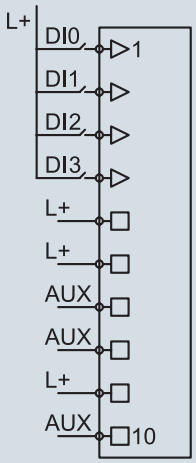
Technical data/Ordering data	
Digital Input Module – DI 2 x 24 VDC	**600-210-0AB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 0.5 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DI 4 x 24 VDC

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	Input 1
3	Input 2
4	Input 3
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

· 4 inputs, electrically isolated from backplane bus
· 24 VDC input voltage
· Can accommodate two-wire proximity switch
· A blue LED indicates the operating status
· Green LEDs (one for each input) indicate the inputs' states

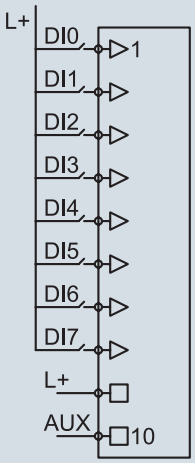
Technical data/Ordering data	
Digital Input Module – DI 4 x 24 VDC	**600-210-0AD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 0.95 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

DI 8 x 24 VDC



DI 8 x 24 VDC

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	Input 1
3	Input 2
4	Input 3
5	Input 4
6	Input 5
7	Input 6
8	Input 7
9	L+, 24 VDC
10	AUX



General characteristics

- 8 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- The blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Technical data/Ordering data	
Digital Input Module – DI 8 x 24 VDC	**600-210-0AH01**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 1.85 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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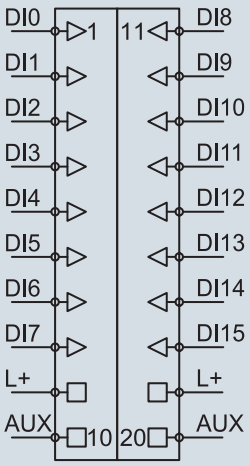


DI 16 x 24 VDC

General characteristics

- 16 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

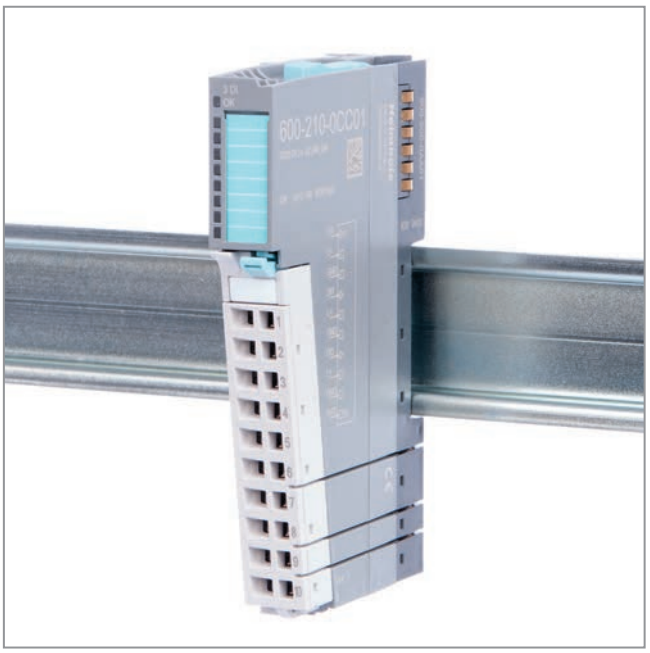
Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	Input 0	11	Input 8
2	Input 1	12	Input 9
3	Input 2	13	Input 10
4	Input 3	14	Input 11
5	Input 4	15	Input 12
6	Input 5	16	Input 13
7	Input 6	17	Input 14
8	Input 7	18	Input 15
9	L+, 24 VDC	19	L+, 24 VDC
10	AUX	20	AUX



Technical data/Ordering data	
Digital Input Module – DI 16 x 24 VDC	**600-210-0AP21**
Number of inputs	16
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 23 mA
Power dissipation	Max. 3.7 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

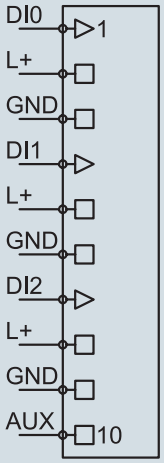
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DI 3 x 24 VDC, 3-wire



DI 3 x 24 VDC, 3-wire

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	L+, 24 VDC
3	GND
4	Input 1
5	L+, 24 VDC
6	GND
7	Input 2
8	L+, 24 VDC
9	GND
10	AUX

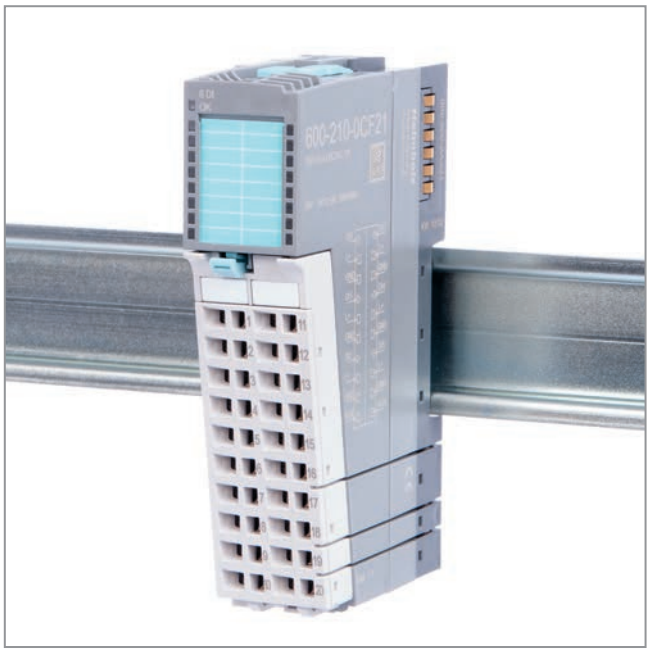


General characteristics

- 2 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate 3-wire sensors
- Fuse for 24 VDC
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Technical data/Ordering data	
Digital Input Module – DI 3 x 24 VDC, 3-wire	**600-210-0CC01**
Number of inputs	3
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 0.7 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
L+ fuse	4 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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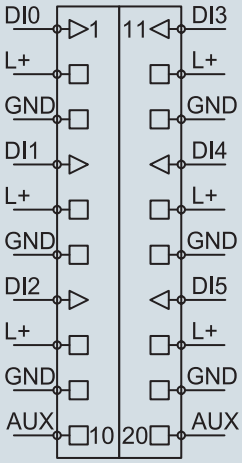
DI 6 x 24 VDC, 3-wire

General characteristics

- 6 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate 3-wire sensors
- Fuse for 24 VDC
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Terminal Assignment

Terminal	Assignment	Terminal	Assignment
1	Input 0	11	Input 3
2	L+, 24 VDC	12	L+, 24 VDC
3	GND	13	GND
4	Input 1	14	Input 4
5	L+, 24 VDC	15	L+, 24 VDC
6	GND	16	GND
7	Input 2	17	Input 5
8	L+, 24 VDC	18	L+, 24 VDC
9	GND	19	GND
10	AUX	20	AUX



Technical data/Ordering data	
Digital Input Module – DI 6 x 24 VDC, 3-wire	**600-210-0CF21**
Number of inputs	6
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 1.4 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
L+ fuse	4 A per group Group 1: terminals 2, 5, and 8 | Group 2: terminals 12, 15, and 18
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

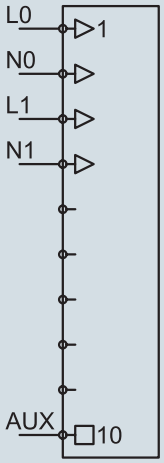
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DI 2 x 230 VAC, channel-wise N, type 1



DI 2 x 230 VAC, channel-wise N, type 1

Terminal Assignment	
Terminal	**Assignment**
1	Input 0 L
2	Input 0 N
3	Input 1 L
4	Input 1 N
5	n.c.
6	n.c.
7	n.c.
8	n.c.
9	n.c.
10	AUX



General characteristics

· 2 inputs, electrically isolated from backplane bus
· 110– 230 VAC input voltage
· Neutral conductors are connected channel-wise
· A blue LED indicates the operating status
· Green LEDs (one for each input) indicate the inputs' states

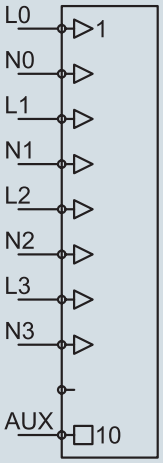
Technical data/Ordering data	
Digital Input Module – DI 2 x 230 VAC, channel-wise N, type 1	**600-211-0BB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 3.8 W
Input characteristic curve	Type 1, EN 61131-2
Input frequency	50 Hz / 60 Hz
Input voltage · For low signal ("0") · For high signal ("1")	 0 V to 40 V 79 V to 253 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DI 4 x 230 VAC, channel-wise N, type 1

Terminal Assignment	
Terminal	**Assignment**
1	Input 0 L
2	Input 0 N
3	Input 1 L
4	Input 1 N
5	Input 2 L
6	Input 2 N
7	Input 3 L
8	Input 3 N
9	n.c.
10	AUX



General characteristics

· 4 inputs, electrically isolated from backplane bus
· 110– 230 VAC input voltage
· Neutral conductors are connected channel-wise
· A blue LED indicates the operating status
· Green LEDs (one for each input) indicate the inputs' states

Technical data/Ordering data	
Digital Input Module – DI 4 x 230 VAC, channel-wise N, type 1	**600-211-0BD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 7.6 W
Input characteristic curve	Type 1, EN 61131-2
Input frequency	50 Hz / 60 Hz
Input voltage · For low signal ("0") · For high signal ("1")	 0 V to 40 V 79 V to 253 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DI 8 x 230 VAC, channel-wise, type 1

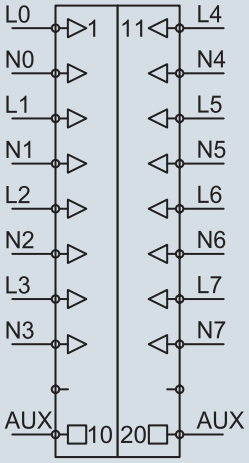


DI 8 x 230 VAC, channel-wise, type 1

General characteristics

- 8 inputs, electrically isolated from backplane bus
- 110– 230 VAC input voltage
- Neutral conductors are connected channel-wise
- The blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	Input 0 L	11	Input 4 L
2	Input 0 N	12	Input 4 N
3	Input 1 L	13	Input 5 L
4	Input 1 N	14	Input 5 N
5	Input 2 L	15	Input 6 L
6	Input 2 N	16	Input 6 N
7	Input 3 L	17	Input 7 L
8	Input 3 N	18	Input 7 N
9		19	
10	AUX	20	AUX



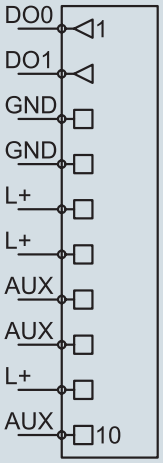
Technical data/Ordering data	
Digital Input Module – DI 8 x 230 VAC, channel-wise N, type 1	**600-211-0BH21**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 15.2 W
Input characteristic curve	Type 1, EN 61131-2
Input frequency	50 Hz / 60 Hz
Input voltage · For low signal ("0") · For high signal ("1")	 0 V to 40 V 79 V to 253 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

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DO 2 x 24 VDC, 500 mA

Terminal Assignment	
Terminal	**Assignment**
1	Output 0
2	Output 1
3	GND
4	GND
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 2 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Technical data/Ordering data	
Digital Output Module – DO 2 x 24 VDC, 500 mA	**600-220-0AB01**
Number of outputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 10 mA + load Max. 27.5 mA
Power dissipation	Max. 0.7 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

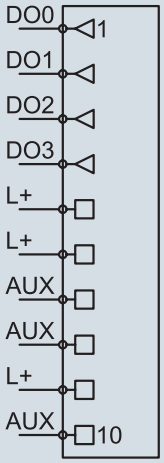
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DO 4 x 24 VDC, 500 mA



DO 4 x 24 VDC, 500 mA

Terminal Assignment	
Terminal	**Assignment**
1	Output 0
2	Output 1
3	Output 2
4	Output 3
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 4 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

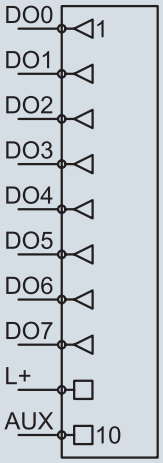
Technical data/Ordering data	
Digital Output Module – DO 4 x 24 VDC, 500 mA	**600-220-0AD01**
Number of outputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 20 mA + load Max. 30 mA
Power dissipation	Max. 1.0 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DO 8 x 24 VDC, 500 mA

Terminal Assignment	
Terminal	**Assignment**
1	Output 0
2	Output 1
3	Output 2
4	Output 3
5	Output 4
6	Output 5
7	Output 6
8	Output 7
9	L+, 24 VDC
10	AUX



General characteristics

· 8 outputs, electrically isolated from backplane bus
· 24 VDC output voltage
· 500 mA output voltage per channel
· A blue LED indicates the operating status
· Green LEDs (one for each input) indicate the inputs' states

Technical data/Ordering data	
Digital Output Module – DO 8 x 24 VDC, 500 mA	**600-220-0AH01**
Number of outputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 40 mA + load Max. 35 mA
Power dissipation	Max. 2.5 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DO 16 x 24 VDC, 500 mA

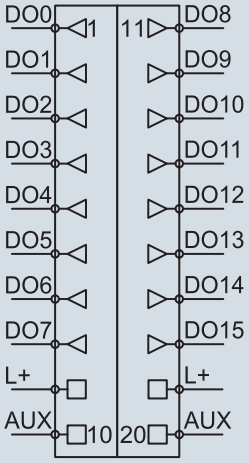


DO 16 x 24 VDC, 500 mA

General characteristics

- 16 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the inputs' states

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	Output 0	11	Output 8
2	Output 1	12	Output 9
3	Output 2	13	Output 10
4	Output 3	14	Output 11
5	Output 4	15	Output 12
6	Output 5	16	Output 13
7	Output 6	17	Output 14
8	Output 7	18	Output 15
9	L+, 24 VDC	19	L+, 24 VDC
10	AUX	20	AUX



Technical data/Ordering data	
Digital Output Module – DO 16 x 24 VDC, 500 mA	**600-220-0AP21**
Number of outputs	16
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 80 mA + load Max. 47 mA
Power dissipation	Max. 5 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

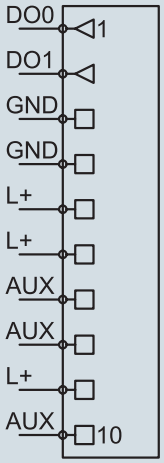
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DO 2 x 24 VDC, 2 A



DO 2 x 24 VDC, 2 A

Terminal Assignment	
Terminal	**Assignment**
1	Output 0
2	Output 1
3	GND
4	GND
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 2 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 2 A output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the outputs' states

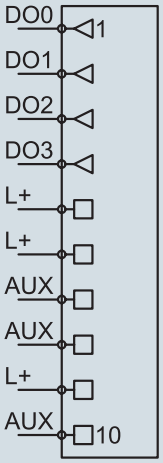
Technical data/Ordering data	
Digital Output Module – DO 2 x 24 VDC, 2 A	**600-220-0BB01**
Number of outputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 2 A Max. 0.5 mA
Current draw · External · Internal	 Max. 20 mA + load Max. 30 mA
Power dissipation	Max. 0.7 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DO 4 x 24 VDC, 2 A

Terminal Assignment	
Terminal	**Assignment**
1	Output 0
2	Output 1
3	Output 2
4	Output 3
5	L+, 24 VDC
6	L+, 24 VDC
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 4 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 2 A output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the outputs' states

Technical data/Ordering data	
Digital Output Module – DO 4 x 24 VDC, 2 A	**600-220-0BD01**
Number of outputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 2 A Max. 0.5 mA
Current draw · External · Internal	 Max. 30 mA + load Max. 30 mA
Power dissipation	Max. 1.1 W
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DO 2 x Relays, 5 A, 230 VAC, change-over

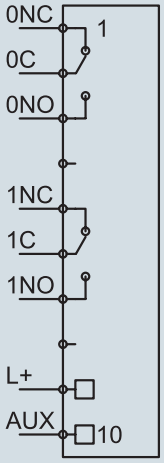


DO 2 x Relays, 5 A, 230 VAC, change-over

General characteristics

- Potential-free switching
- 2 relays / change-overs
- 5 A output voltage per relay
- Up to 230 VAL switching voltage per relay
- Impulse switch 2x input words (switching cycles *1,000)
- Switch filter to protect against high frequency relay switching (10 Hz)
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the outputs' states

Terminal Assignment	
Terminal	**Assignment**
1	Relay 0 „normally closed“
2	Relay 0 „common“
3	Relay 0 „normally open“
4	n.c.
5	Relay 1 „normally closed“
6	Relay 1 „common“
7	Relay 1 „normally open“
8	n.c.
9	L+, 24 VDC
10	AUX



Technical data/Ordering data	
TB20, Digital Output Module – DO 2 x Relays, 5 A, 230 VAC, change-over	**600-222-0AB01**
Number of outputs	4 (2 x change-over relays)
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Current draw · External · Internal	 Max. 30 mA Max. 30 mA
Power dissipation	Max. 1.5 W
Relays	2
· Max. continuous current / max. inrush current	5 A / 10 A
· Nominal voltage / max. switching voltage	250 VAC / 400 VAC
· Max. switching voltage AC1	1,500 VA
· Max. switching capacity AC15 (230 VAC)	300 VA
· Single phase motor load, AC3 – operating (230 VAC)	0.185 kW
· Max. switching current DC1: 30/110/220 V	6/0.2/0.12 A
· Min. switching current	500 mW (12 V / 10 mA)
· Mechanical service life	$10 * 10^6$ switching cycles
· Electrical service life AC1	60,000 switching cycles
· Rated voltage coil / contacts	6 kV (8 mm)
· Rated voltage of open contacts	1,000 VAC
· Max. switching frequency (internal protection)	10 Hz
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 80 g

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DO 4 x Relays, 5 A, 230 VAC, change-over



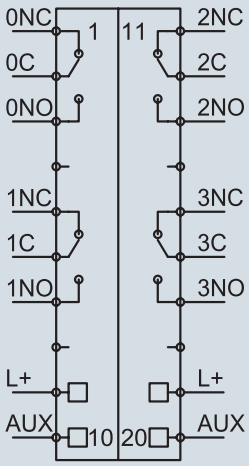
DO 4 x Relays, 5 A, 230 VAC, change-over

General characteristics

- Potential-free switching
- 4 relays / change-overs
- 5 A output voltage per relay
- Up to 230 VAL switching voltage per relay
- Impulse switch 4x input words (switching cycles *1,000)
- Switch filter to protect against high frequency relay switching (10 Hz)
- A blue LED indicates the operating status
- Green LEDs (one for each input) indicate the outputs' states

Terminal Assignment

Terminal	Assignment	Terminal	Assignment
1	Relay 0 „normally closed“	11	Relay 0 „normally closed“
2	Relay 0 „common“	12	Relay 0 „common“
3	Relay 0 „normally open“	13	Relay 0 „normally open“
4	n.c.	14	n.c.
5	Relay 1 „normally closed“	15	Relay 1 „normally closed“
6	Relay 1 „common“	16	Relay 1 „common“
7	Relay 1 „normally open“	17	Relay 1 „normally open“
8	n.c.	18	n.c.
9	L+, 24 VDC	19	L+, 24 VDC
10	AUX	20	AUX



Technical data/Ordering data	
TB20, Digital Output Module – DO 4 x relays, 5 A, 230 VAC, change-over	**600-222-0AD21**
Number of outputs	8 (4 x change-over relays)
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Current draw · External · Internal	 Max. 60 mA Max. 60 mA
Power dissipation	Max. 2.5 W
Relays	4
· Max. continuous current / max. inrush current	5 A / 10 A
· Nominal voltage / max. switching voltage	250 VAC / 400 VAC
· Max. switching voltage AC1	1,500 VA
· Max. switching capacity AC15 (230 VAC)	300 VA
· Single phase motor load, AC3 – operating (230 VAC)	0.185 kW
· Max. switching current DC1: 30/110/220 V	6 /0.2 / 0.12 A
· Min. switching current	500 mW (12 V / 10 mA)
· Mechanical service life	$10 * 10^6$ switching cycles
· Electrical service life AC 1	60,000 switching cycles
· Rated voltage coil / contacts	6 kV (8 mm)
· Rated voltage of open contacts	1,000 VAC
· Max. switching frequency (internal protection)	10 Hz
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 120 g

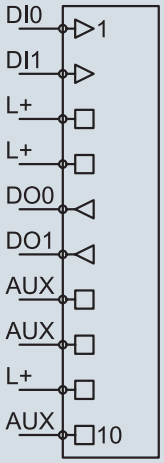
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DIO 2 x In/2 x Out 24 VDC, 500 mA



DIO 2 x In/2 x Out 24 VDC, 500 mA

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	Input 1
3	L+, 24 VDC
4	L+, 24 VDC
5	Output 0
6	Output 1
7	AUX
8	AUX
9	L+, 24 VDC
10	AUX



General characteristics

- 2 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- 2 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input/output) indicate the inputs' and outputs' states

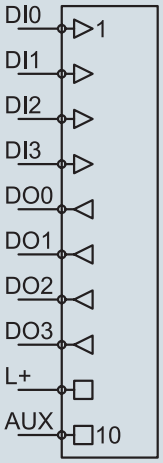
Technical data/Ordering data	
Digital Mix Module – DIO 2 x In/2 x Out 24 VDC, 500 mA	**600-230-0AD01**
Number of inputs	2
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Number of outputs	2
Supply voltage U_p, U_s · Rated · Ripple U_{ss} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Current draw · External · Internal	 Max. 10 mA + load Max. 25 mA
Power dissipation	Max. 1.2 W
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DIO 4 x In/4 x Out 24 VDC, 500 mA

Terminal Assignment	
Terminal	**Assignment**
1	Input 0
2	Input 1
3	Input 2
4	Input 3
5	Output 0
6	Output 1
7	Output 2
8	Output 3
9	L+, 24 VDC
10	AUX



General characteristics

- 4 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- 4 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input/output) indicate the inputs' and outputs' states

Technical data/Ordering data	
Digital Mix Module – DIO 4 x In/4 x Out 24 VDC, 500 mA	**600-230-0AH01**
Number of inputs	4
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For high signal ("1")	 -3 V to 9 V 12 V to 30 V
Number of outputs	4
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Current draw · External · Internal	 Max. 20 mA + load Max. 28 mA
Power dissipation	Max. 1.95 W
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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DIO 8 x In/8 x Out 24 VDC, 500 mA

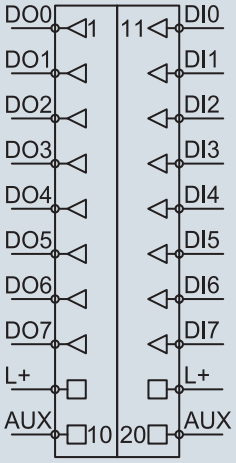


DIO 8 x In/8 x Out 24 VDC, 500 mA

General characteristics

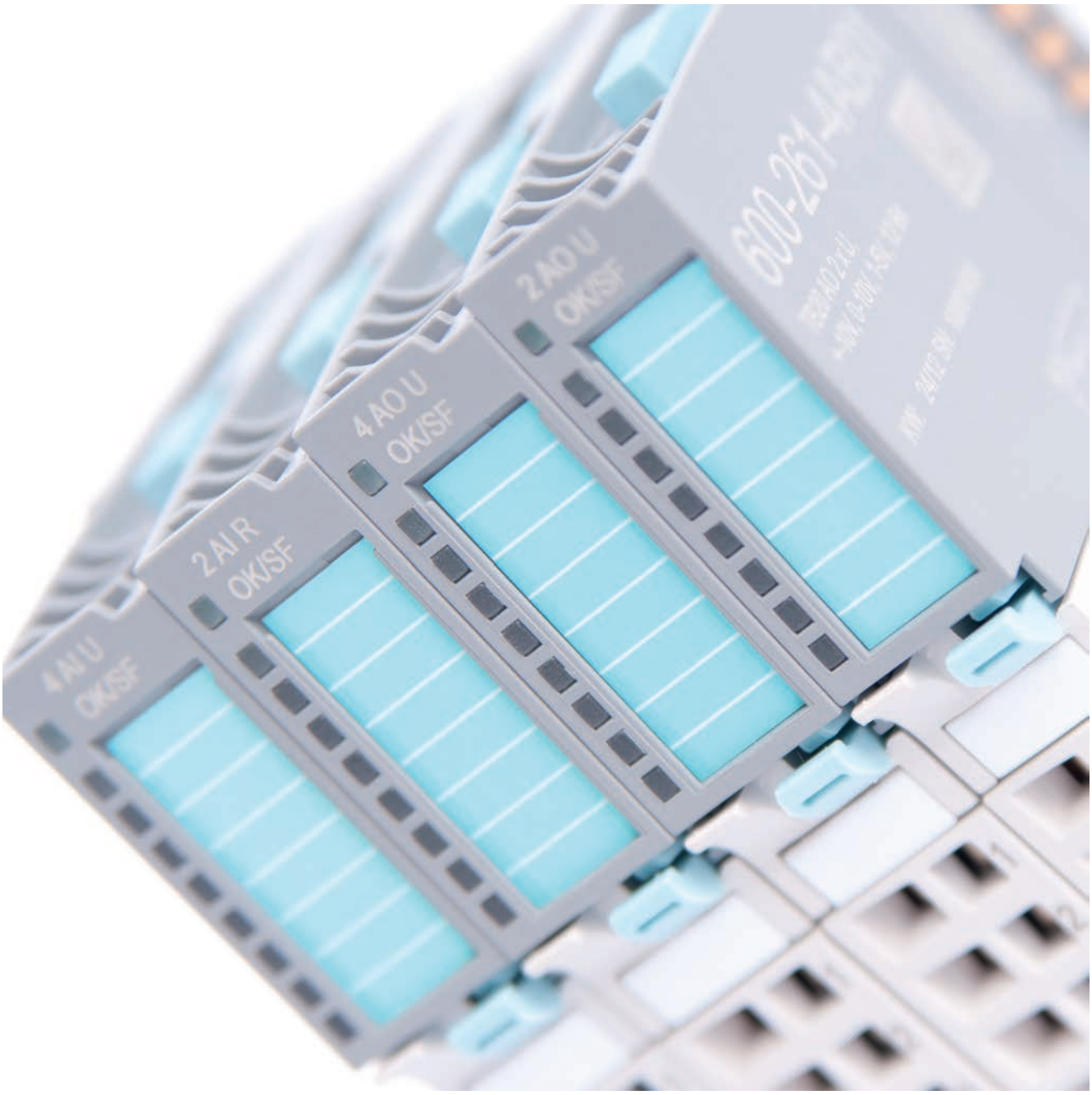
- 8 inputs, electrically isolated from backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity switch
- 8 outputs, electrically isolated from backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the operating status
- Green LEDs (one for each input/output) indicate the inputs' and outputs' states

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	Output 0	11	Input 0
2	Output 1	12	Input 1
3	Output 2	13	Input 2
4	Output 3	14	Input 3
5	Output 4	15	Input 4
6	Output 5	16	Input 5
7	Output 6	17	Input 6
8	Output 7	18	Input 7
9	L+, 24 VDC	19	L+, 24 VDC
10	AUX	20	AUX



Technical data/Ordering data	
Digital Mix Module – DIO 8 x Out/8 x In 24 VDC, 500 mA	**600-230-0AP21**
Number of inputs	8
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal (“0”) · For high signal (“1”)	 -3 V to 9 V 12 V to 30 V
Number of outputs	8
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · Voltage for t < 10 ms	 24 VDC Max. 3.6 V 20 ... 30 V 50 V
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Output short-circuit protection	Electronic, for each channel
Inductive cutoff voltage limit	-48 V
Current draw · External · Internal	 Max. 40 mA + load Max. 35 mA
Power dissipation	Max. 4.35 W
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

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Analog Input/Output Modules

Analog In
Analog Out

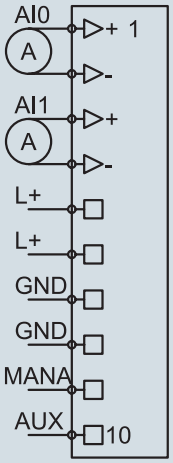
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AI 2 x I, 0/4–20 mA, ±20 mA, 12-Bit



AI 2 x I, 0/4–20 mA, ±20 mA, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	L+, 24 VDC
6	L+, 24 VDC
7	L-, GND
8	L-, GND
9	Mana
10	AUX



General characteristics

- 2 analog inputs for measuring current (electrically isolated from the backplane bus)
- 2 process input words
- Measuring ranges of 0–20 mA, 4–20 mA, ±20 mA, individually configurable for each channel
- Measurement resolution 12 bits + sign
- Diagnostic messages
- Wire break detection (for 4–20 mA)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 4–20 mA only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 2 x I, 0/4–20 mA, ±20 mA, 12-Bit	**600-250-4AB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 20 mA / 50 ohms 4 ... 20 mA / 50 ohms ±20 mA / 50 ohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 4–20 mA only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	12 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

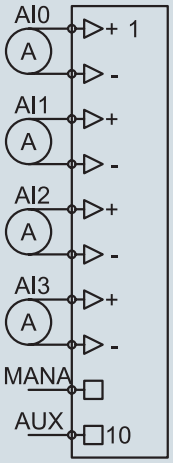
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AI 4 x I, 0/4–20 mA, ±20 mA, 12-Bit



AI 4 x I, 0/4–20 mA, ±20 mA, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	Mana
10	AUX



General characteristics

- 4 analog inputs for measuring current (electrically isolated from the backplane bus)
- 4 process input words
- Measuring ranges of 0–20 mA, 4–20 mA, ±20 mA, individually configurable for each channel
- Measurement resolution 12 bits + sign
- Diagnostic messages
- Wire break detection (for 4–20 mA)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 4–20 mA only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

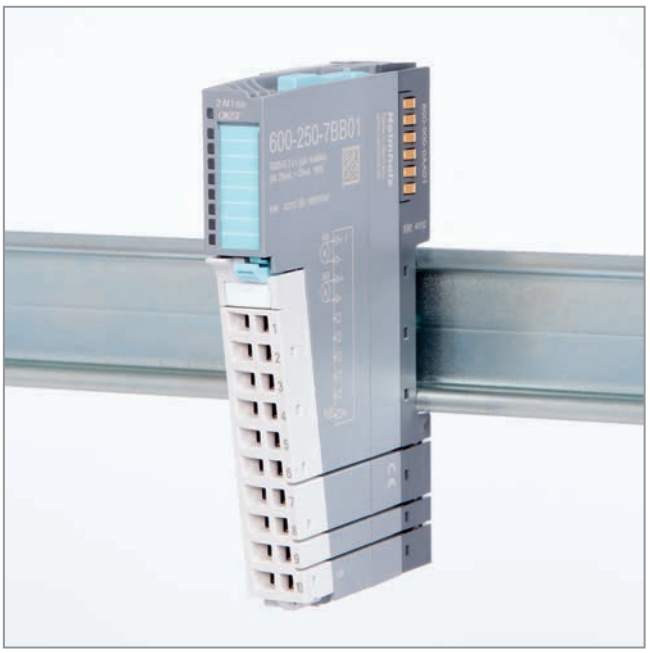
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Technical data/Ordering data	
Analog Input Module – AI 4 x I, 0/4–20 mA, ±20 mA, 12-Bit	**600-250-4AD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 20 mA / 50 ohms 4 ... 20 mA / 50 ohms ±20 mA / 50 ohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 4–20 mA only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	22 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

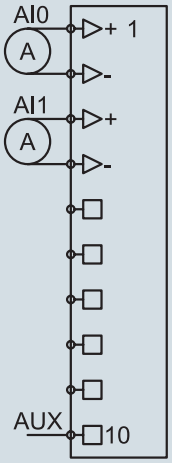
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AI 2 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit



AI 2 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	n.c.
6	n.c.
7	n.c.
8	n.c.
9	Mana
10	AUX



General characteristics

- 2 analog inputs for measuring current
- Channels electrically isolated from each other and from backplane bus
- 2 process input words
- Measuring ranges of 0–20 mA, 4–20 mA, ±20 mA, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 4–20 mA)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 4–20 mA only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

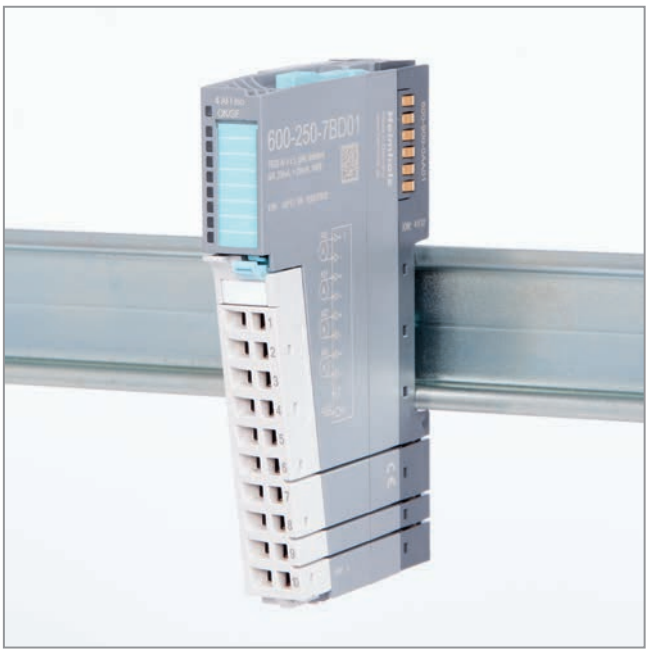
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Technical data/Ordering data	
Analog Input Module – AI 2 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit	**600-250-7BB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 20 mA / 50 ohms 4 ... 20 mA / 50 ohms ±20 mA / 50 ohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 4–20 mA only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25°C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	14 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

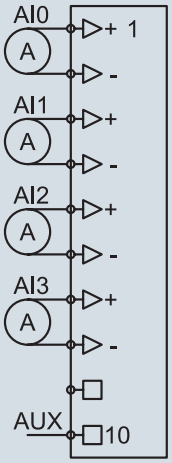
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AI 4 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit



AI 4 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	n.c.
10	AUX



General characteristics

- 4 analog inputs for measuring current
- Channels electrically isolated from each other and from backplane bus
- 4 process input words
- Measuring ranges of 0–20 mA, 4–20 mA, ±20 mA, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 4–20 mA)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 4–20 mA only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 4 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit	**600-250-7BD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 20 mA / 50 ohms 4 ... 20 mA / 50 ohms ±20 mA / 50 ohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 4–20 mA only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25°C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	24 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 80 g

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AI 8 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit

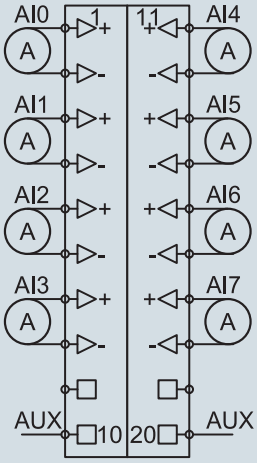


AI 8 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit

General characteristics

- 8 analog inputs for measuring current
- Channels electrically isolated from each other and from backplane bus
- 8 process input words
- Measuring ranges of 0–20 mA, 4–20 mA, ±20 mA, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 4–20 mA)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions#
- A bi-color LED (red/green) indicates the channel's status

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	AI0 +	11	AI4 +
2	AI0 -	12	AI4 -
3	AI1 +	13	AI5 +
4	AI1 -	14	AI5 -
5	AI2 +	15	AI6 +
6	AI2 -	16	AI6 -
7	AI3 +	17	AI7 +
8	AI3 -	18	AI7 -
9	n.c.	19	n.c.
10	AUX	20	AUX



Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 4–20 mA only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 8 x I, 0/4–20 mA, ±20 mA, iso., 16-Bit	**600-250-7BH21**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 20 mA / 50 ohms 4 ... 20 mA / 50 ohms ±20 mA / 50 ohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 4–20 mA only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25°C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	44 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

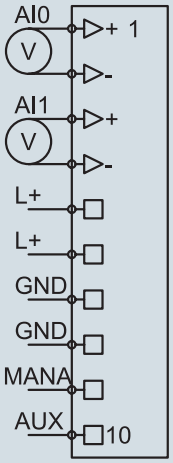
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AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit



AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	L+, 24 VDC
6	L+, 24 VDC
7	L-, GND
8	L-, GND
9	Mana
10	AUX



General characteristics

- 2 analog inputs for measuring voltage (electrically isolated from the backplane bus)
- 2 process input words
- Measuring ranges of 0–10 V, 1–5V, ±10 V, ±5 V, ±2.5 V, individually configurable for each channel
- Measurement resolution 12 bits + sign
- Diagnostic messages
- Wire break detection (for 1–5 V)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 1–5 V only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0 ... 10 V | 1 ... 5 V | ±10 V | ±5 V | ±2,5 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit	**600-252-4AB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 10 V / 10 Mohms 1 ... 5 V / 10 Mohms ±10 V / 10 Mohms ±5 V / 10 Mohms ±2.5 V / 10 Mohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 1–5 V only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	12 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

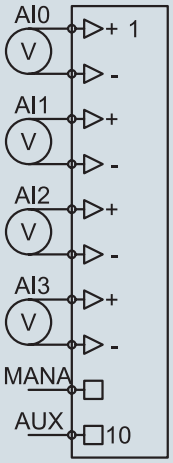
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AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit



AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	Mana
10	AUX



General characteristics

- 4 analog inputs for measuring voltage (electrically isolated from the backplane bus)
- 4 process input words
- Measuring ranges of 0–10 V, 1–5V, ±10 V, ±5 V, ±2.5 V, individually configurable for each channel
- Measurement resolution 12 bits + sign
- Diagnostic messages
- Wire break detection (for 1–5 V)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 1–5 V only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0 ... 10 V | 1 ... 5 V | ±10 V | ±5 V | ±2,5 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit	**600-252-4AD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 10 V / 10 Mohms 1 ... 5 V / 10 Mohms ±10 V / 10 Mohms ±5 V / 10 Mohms ±2.5 V / 10 Mohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 1–5 V only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	22 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

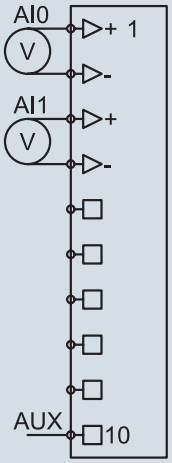
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AI 2 x U, ±10 V, 0–10 V, 1–5 V, iso., 16-Bit



AI 2 x U, ±10 V, 0–10 V, 1–5 V, iso., 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	n.c.
6	n.c.
7	n.c.
8	n.c.
9	n.c.
10	AUX



General characteristics

- 2 analog inputs for measuring voltage
- Channels electrically isolated from each other and from backplane bus
- 2 process input words
- Measuring ranges of 0–10 V, 1–5V, ±10 V, ±5 V, ±2.5 V, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 1–5 V)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 1–5 V only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0 ... 10 V | 1 ... 5 V | ±10 V | ±5 V | ±2,5 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

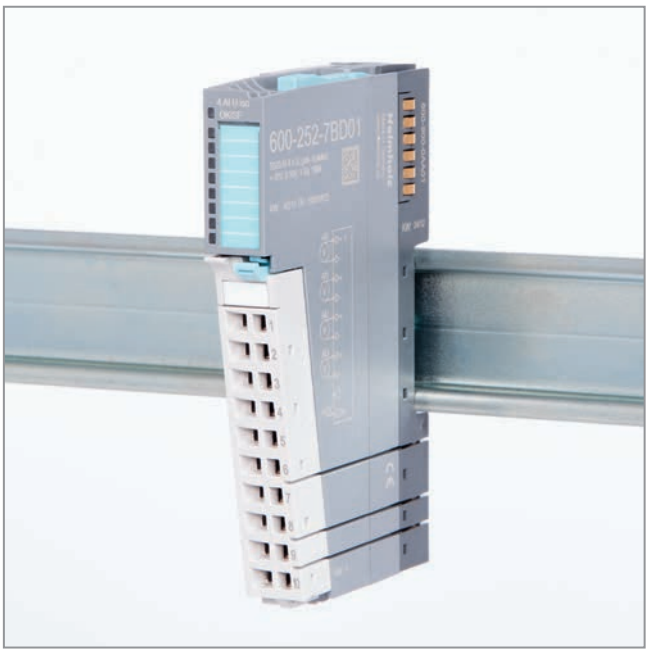
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Technical data/Ordering data	
Analog Input Module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, iso., 16-Bit	**600-252-7BB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 10 V / 10 Mohms 1 ... 5 V / 10 Mohms ±10 V / 10 Mohms ±5 V / 10 Mohms ±2.5 V / 10 Mohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 1–5 V only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	14 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

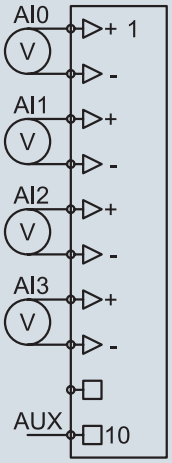
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AI 4 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit



AI 4 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	n.c.
10	AUX



General characteristics

- 4 analog inputs for measuring voltage
- Channels electrically isolated from each other and from backplane bus
- 4 process input words
- Measuring ranges of 0–10 V, 1–5V, ±10 V, ±5 V, ±2.5 V, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 1–5 V)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 1–5 V only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0 ... 10 V | 1 ... 5 V | ±10 V | ±5 V | ±2,5 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 4 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit	**600-252-7BD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 10 V / 10 Mohms 1 ... 5 V / 10 Mohms ±10 V / 10 Mohms ±5 V / 10 Mohms ±2.5 V / 10 Mohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 1–5 V only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	24 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 80 g

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AI 8 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit

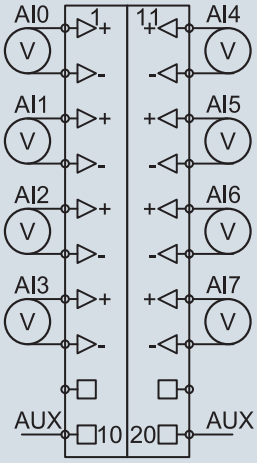


AI 8 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit

General characteristics

- 8 analog inputs for measuring voltage
- Channels electrically isolated from each other and from backplane bus
- 8 process input words
- Measuring ranges of 0–10 V, 1–5V, ±10 V, ±5 V, ±2.5 V, individually configurable for each channel
- Measurement resolution up to 15 bits + sign
- Diagnostic messages
- Wire break detection (for 1–5 V)
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	AI0 +	11	AI4 +
2	AI0 -	12	AI4 -
3	AI1 +	13	AI5 +
4	AI1 -	14	AI5 -
5	AI2 +	15	AI6 +
6	AI2 -	16	AI6 -
7	AI3 +	17	AI7 +
8	AI3 -	18	AI7 -
9	n.c.	19	n.c.
10	AUX	20	AUX



Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection (for 1–5 V only): On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range:
  Disabled | 0 ... 10 V | 1 ... 5 V | ±10 V | ±5 V | ±2,5 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

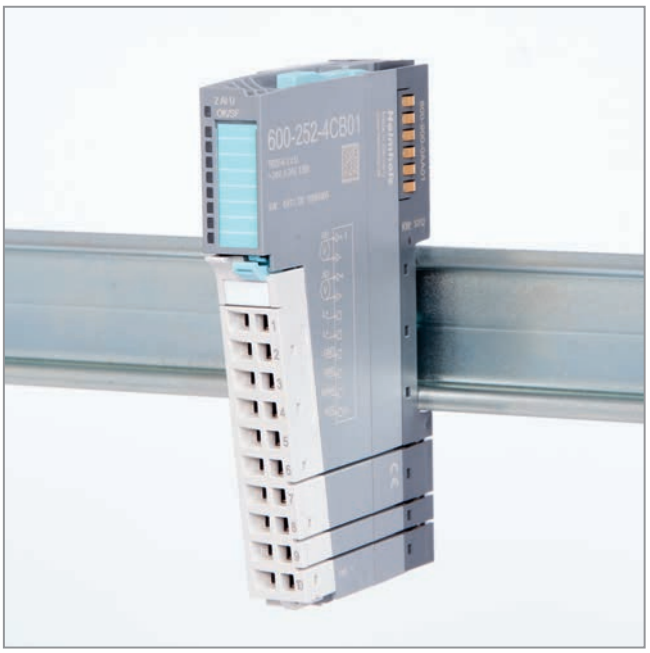
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Technical data/Ordering data	
Analog Input Module – AI 8 x U, ±10 V, 0–10 V, 1–5 V, 16-Bit	**600-252-7BH21**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges / load resistance	0 ... 10 V / 10 Mohms 1 ... 5 V / 10 Mohms ±10 V / 10 Mohms ±5 V / 10 Mohms ±2.5 V / 10 Mohms
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break (for 1–5 V only) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.2 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.1 %, operational error limit at 25°C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	44 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

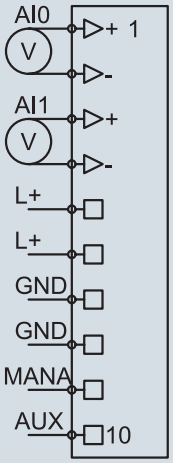
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AI 2 x U, ±24 V, 0–24 V, 12-Bit



AI 2 x U, ±24 V, 0–24 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	L+, 24 VDC
6	L+, 24 VDC
7	L-, GND
8	L-, GND
9	Mana
10	AUX



General characteristics

- 2 analog inputs for measuring voltage (electrically isolated from the backplane bus)
- 2 process input words
- Measuring ranges of 0–24, ±24 V, individually configurable for each channel
- Measurement resolution up to 12 bits + sign
- Diagnostic messages
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Interference frequency suppression: None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: Disabled | 0 ... 24 V | ±24 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 2 x U, ±24 V, 0–24 V, 12-Bit	**600-252-4CB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 24 V / 10 Mohms ±24 V / 10 Mohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	12 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

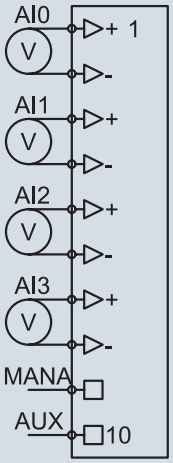
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AI 4 x U, ±24 V, 0–24 V, 12-Bit



AI 4 x U, ±24 V, 0–24 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	Mana
10	AUX



General characteristics

- 4 analog inputs for measuring voltage (electrically isolated from the backplane bus)
- 4 process input words
- Measuring ranges of 0–24, ±24 V, individually configurable for each channel
- Measurement resolution up to 12 bits + sign
- Diagnostic messages
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Interference frequency suppression: None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: Disabled | 0 ... 24 V | ±24 V
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 4 x U, ±24 V, 0–24 V, 12-Bit	**600-252-4CD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges / load resistance	0 ... 24 V / 10 Mohms ±24 V / 10 Mohms
Measuring method	Integration
Measurement resolution	12 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	22 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

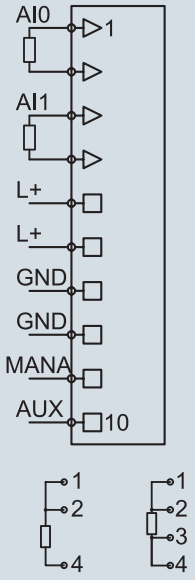
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AI 1/2 x R, RTD, 16-Bit, 2/3/4-wire



AI 1/2 x R, RTD, 16-Bit, 2/3/4-wire

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	L+, 24 VDC
6	L+, 24 VDC
7	L-, GND
8	L-, GND
9	Mana
10	AUX



General characteristics

- 1/2 inputs for measuring resistance (electrically isolated from the backplane bus)
- 2 process input words
- Measuring ranges 150 ohms, 300 ohms, 600 ohms, 3,000 ohms, 6,000 ohms, PT 100, PT 1000, Ni 100, Ni 1000, LGNi 1000, individually configurable for each channel
- Can accommodate 2/3/4-wire sensors
- Measurement resolution 15 bits + sign
- Diagnostic messages
- Wire break detection
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5
- Temperature unit:
  Celsius x 10 | Fahrenheit x 10 | Kelvin x 10

Parameters for each channel

- Wire break detection: On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: 150 ohms, 300 ohms, 600 ohms, 3,000 ohms, 6,000 ohms, PT 100, PT 1000, Ni 100, Ni 1000, LGNi 1000
- Sensor type: Disabled | 2-wire | 3-wire (channel 0 only) | 4-wire (channel 0 only)
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 1/2 x R, RTD, 16-Bit, 2/3/4-wire	**600-253-4AB01**
Number of inputs	1/2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1.0 W
Measuring ranges	150 ohms 300 ohms 600 ohms 3,000 ohms 6,000 ohms PT 100 PT 1000 Ni 100 Ni 1000 LGNi 1000
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	14 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

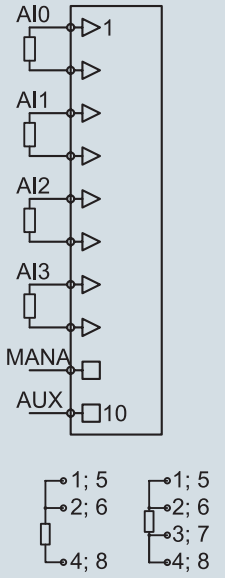
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AI 2/4 x R, RTD, 16-Bit, 2/3/4-wire



AI 2/4 x R, RTD, 16-Bit, 2/3/4-wire

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	Mana
10	AUX



General characteristics

- 2/4 inputs for measuring resistance (electrically isolated from the backplane bus)
- 4 process input words
- Measuring ranges 150 ohms, 300 ohms, 600 ohms, 3,000 ohms, 6,000 ohms, PT 100, PT 1000, Ni 100, Ni 1000, LGNi 1000, individually configurable for each channel
- Can accommodate 2/3/4-wire sensors
- Measurement resolution 15 bits + sign
- Diagnostic messages
- Wire break detection
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5
- Temperature unit:
  Celsius x 10 | Fahrenheit x 10 | Kelvin x 10

Parameters for each channel

- Wire break detection: On | Off
- Interference frequency suppression:
  None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: 150 ohms, 300 ohms, 600 ohms, 3,000 ohms, 6,000 ohms, PT 100, PT 1000, Ni 100, Ni 1000, LGNi 1000
- Sensor type: Disabled | 2-wire | 3-wire (channels 0 & 2 only) | 4-wire (channels 0 &2 only)
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 2/4 x R, RTD, 16-Bit, 2/3/4-wire	**600-253-4AD01**
Number of inputs	2/4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1.0 W
Measuring ranges / load resistance	150 ohms 300 ohms 600 ohms 3,000 ohms 6,000 ohms PT 100 PT 1000 Ni 100 Ni 1000 LGNi 1000
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Wire break Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	26 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

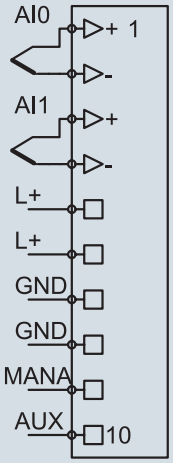
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AI 2 x TC, 16-Bit



AI 2 x TC, 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	L+, 24 VDC
6	L+, 24 VDC
7	L-, GND
8	L-, GND
9	Mana
10	AUX



General characteristics

- 2 inputs, electrically isolated from backplane bus
- 2 process input words
- 2 process output words (for temperature compensation)
- Measuring range of ±80 mV
- Supported thermocouples: E, J, K, N, R, S, T, B, C, L
- Measurement resolution 15 bits + sign
- External or internal temperature compensation
- Diagnostic messages
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5 (for ±80 mV only)
- Temperature unit: Celsius x 10 | Fahrenheit x 10 | Kelvin x 10

Parameters for each channel

- Wire break detection: On | Off
- Interference frequency suppression: None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: ±80 mV
- Thermocouples: E | J | K | N | R | S | T | B | C | L
- Temperature compensation: Internal | External | Process data-based
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Input Module – AI 2 x TC, 16-Bit	**600-254-4AB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No (available from the first quarter 2014)
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges	±80 mV
Thermocouples	E (-270 °C ... 990 °C) J (-210 °C ... 1200 °C) K (-270 °C ... 1380 °C) N (-270 °C ... 1320 °C) R (-50 °C ... 1775 °C) S (-50 °C ... 1775 °C) T (-270 °C ... 405 °C) B (0 °C ... 1800 °C) C (0 °C ... 2320 °C) L (0 °C ... 900 °C)
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	26 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

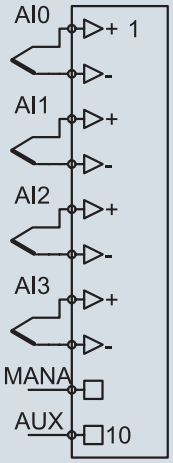
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AI 4 x TC, 16-Bit



AI 4 x TC, 16-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AI0 +
2	AI0 -
3	AI1 +
4	AI1 -
5	AI2 +
6	AI2 -
7	AI3 +
8	AI3 -
9	Mana
10	AUX



General characteristics

- 4 inputs, electrically isolated from backplane bus
- 4 process input words
- 4 process output words (for temperature compensation)
- Measuring range of ±80 mV
- Supported thermocouples: E, J, K, N, R, S, T, B, C, L
- Measurement resolution 15 bits + sign
- External or internal temperature compensation
- Diagnostic messages
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5 (for ±80 mV only)
- Temperature unit: Celsius x 10 | Fahrenheit x 10 | Kelvin x 10

Parameters for each channel

- Wire break detection: On | Off
- Interference frequency suppression: None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: ±80 mV
- Thermocouples: E | J | K | N | R | S | T | B | C | L
- Temperature compensation: Internal | External | Process data-based
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

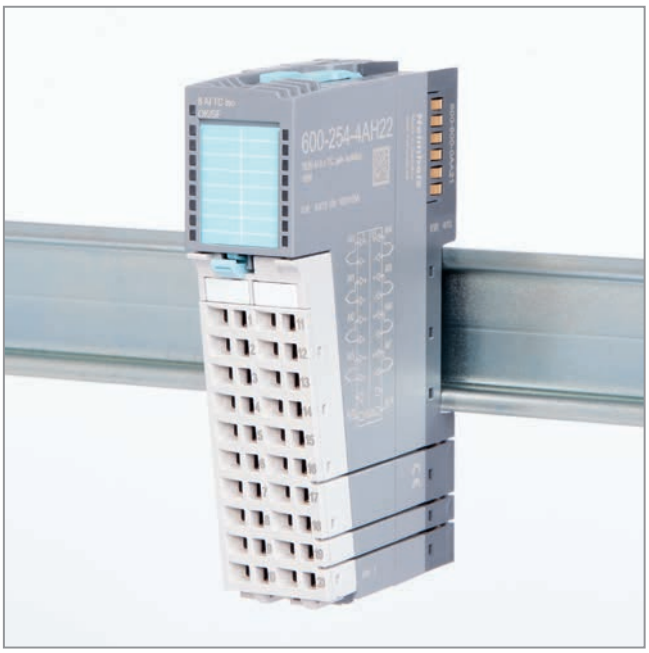
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Technical data/Ordering data	
Analog Input Module – AI 4 x TC, 16-Bit	**600-254-4AD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No (available from the first quarter 2014)
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	Max. 0.7 W
Measuring ranges	±80 mV
Thermocouples	E (-270 °C ... 990 °C) J (-210 °C ... 1200 °C) K (-270 °C ... 1380 °C) N (-270 °C ... 1320 °C) R (-50 °C ... 1775 °C) S (-50 °C ... 1775 °C) T (-270 °C ... 405 °C) B (0 °C ... 1800 °C) C (0 °C ... 2320 °C) L (0 °C ... 900 °C)
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	26 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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AI 8 x TC, iso., 16-Bit

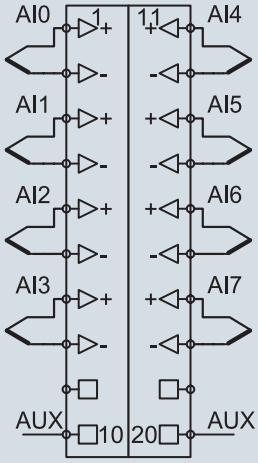


AI 8 x TC, iso., 16-Bit

General characteristics

- 8 inputs
- Channels electrically isolated from each other and from backplane bus
- 8 process input words, 8 process output words (for temperature compensation)
- Measuring range of ±80 mV
- Supported thermocouples: E, J, K, N, R, S, T, B, C, L
- Measurement resolution up to 15 bits + sign
- External or internal temperature compensation
- Diagnostic messages
- Limit value alarms for each channel
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions
- A bi-color LED (red/green) indicates the channel's status

Terminal Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	AI0 +	11	AI4 +
2	AI0 -	12	AI4 -
3	AI1 +	13	AI5 +
4	AI1 -	14	AI5 -
5	AI2 +	15	AI6 +
6	AI2 -	16	AI6 -
7	AI3 +	17	AI7 +
8	AI3 -	18	AI7 -
9	n.c.	19	n.c.
10	AUX	20	AUX



Parameters for the module

- Diagnostic alarm: On | Off
- Diagnosis overflow/underflow: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5 (for ±80 mV only)
- Temperature unit: Celsius x 10 | Fahrenheit x 10 | Kelvin x 10

Parameters for each channel

- Wire break detection: On | Off
- Interference frequency suppression: None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
- Measuring range: ±80 mV
- Thermocouples: E | J | K | N | R | S | T | B | C | L
- Temperature compensation: Internal | External | Process data-based
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

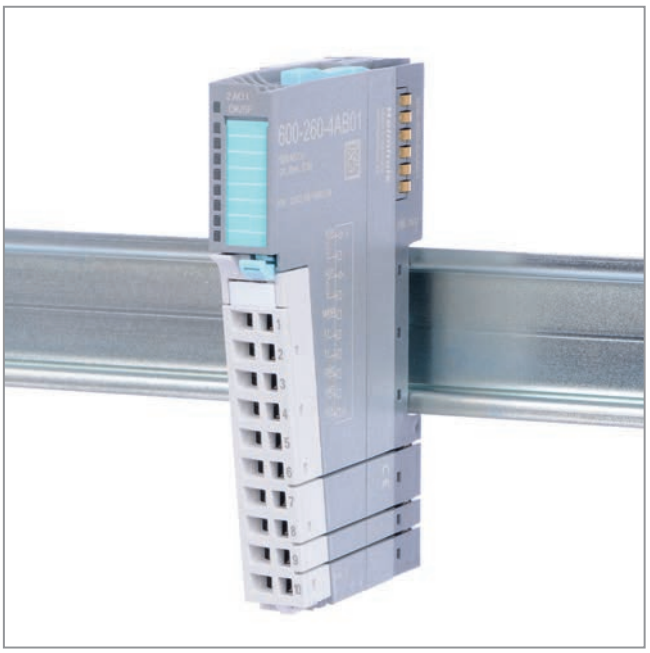
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Technical data/Ordering data	
Analog Input Module – AI 8 x TC, iso., 16-Bit	**600-254-4AH22**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges	±80 mV
Thermocouples	E (-270 °C ... 990 °C) J (-210 °C ... 1200 °C) K (-270 °C ... 1380 °C) N (-270 °C ... 1320 °C) R (-50 °C ... 1775 °C) S (-50 °C ... 1775 °C) T (-270 °C ... 405 °C) B (0 °C ... 1800 °C) C (0 °C ... 2320 °C) L (0 °C ... 900 °C)
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Diagnosis	Upper measuring range limit exceeded (overflow) Lower measuring range limit fallen below (underflow) Parameter assignment error
Process alarms	Upper and lower limit per channel
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	51 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 110 g

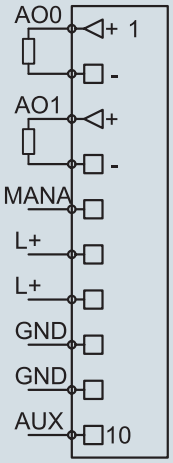
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AO 2 x I, 0/4–20 mA, 12-Bit



AO 2 x I, 0/4–20 mA, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AO0 +
2	AO0 -
3	AO1 +
4	AO1 -
5	Mana
6	L+, 24 VDC
7	L+, 24 VDC
8	L-, GND
9	L-, GND
10	AUX



General characteristics

- 2 analog outputs, electrically isolated from backplane bus
- 2 process output words (4 bytes)
- Output range 0–20 mA , 4–20 mA
- Resolution 12 bits
- Substitute value functionality
- Diagnostic messages
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection: On | Off
- Output range: 0–20 mA | 4–20 mA
- Available substitute value options: Outputs de-energized | Retain last value | Apply substitute value
- Substitute value: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Output Module – AO 2 x I, 0/4–20 mA, 12-Bit	**600-260-4AB01**
Number of outputs	2
Output ranges	0 ... 20 mA 4 ... 20 mA
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 60 mA Max. 26 mA
Power dissipation	Max. 1.9 W
Connection for actuators	2-wire connection
Load resistance	Max. 600 ohms
Inductive load	Max. 100 mH
No-load voltage	Max. 18 V
Reading calculation	
· Resolution	12 bits
· Settling time	0.2 ms for resistive loads 2.2 ms for capacitive loads 0.5 ms for inductive loads (<=1 mH) 3.3 ms for inductive loads (<=3.3 mH)
Diagnosis	External reference voltage missing (L+) Wire break Parameter assignment error
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	7 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

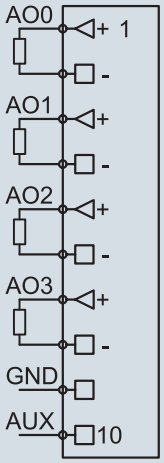
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AO 4 x I, 0/4–20 mA, 12-Bit



AO 4 x I, 0/4–20 mA, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AO0 +
2	AO0 -
3	AO1 +
4	AO1 -
5	AO2 +
6	AO2 -
7	AO3 +
8	AO3 -
9	GND
10	AUX



General characteristics

- 4 analog outputs, electrically isolated from backplane bus
- 4 process output words (8 bytes)
- Output range 0–20 mA , 4–20 mA
- Resolution 12 bits
- Substitute value functionality
- Diagnostic messages
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection: On | Off
- Output range: 0–20 mA | 4–20 mA
- Available substitute value options: Outputs de-energized | Retain last value | Apply substitute value
- Substitute value: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Output Module – AO 4 x I, 0/4–20 mA, 12-Bit	**600-260-4AD01**
Number of outputs	4
Output ranges	0 ... 20 mA 4 ... 20 mA
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 100 mA Max. 26 mA
Power dissipation	Max. 3 W
Connection for actuators	2-wire connection
Load resistance	Max. 600 ohms
Inductive load	Max. 100 mH
No-load voltage	Max. 18 V
Reading calculation	
· Resolution	12 bits
· Settling time	0.2 ms for resistive loads 2.2 ms for capacitive loads 0.5 ms for inductive loads (<=1 mH) 3.3 ms for inductive loads (<=3.3 mH)
Diagnosis	External reference voltage missing (L+) Wire break Parameter assignment error
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	13 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

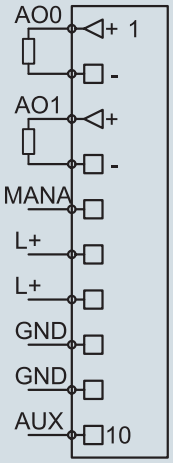
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AO 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit



AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AO0 +
2	AO0 -
3	AO1 +
4	AO1 -
5	Mana
6	L+, 24 VDC
7	L+, 24 VDC
8	L-, GND
9	L-, GND
10	AUX



General characteristics

- 2 analog outputs, electrically isolated from backplane bus
- 2 process output words (4 bytes)
- Output range of ±10 V, 0–10 V, 1–5 V
- Measurement resolution 12 bits + sign
- Substitute value functionality
- Diagnostic messages
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

- Wire break detection: On | Off
- Output range: ±10 V | 0–10 V | 1–5 V
- Available substitute value options: Outputs de-energized | Retain last value | Apply substitute value
- Substitute value: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Output Module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit	**600-261-4AB01**
Number of outputs	2
Output ranges	±10 V 0–10 V 1–5 V
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 45 mA Max. 24 mA
Power dissipation	Max. 1.6 W
Connection for actuators	2-wire connection
Load resistance	Min. 1 kohm
Capacitive load	Max. 1 µF
Short-circuit protection	Yes
Short-circuit current	Max. 25 mA
Reading calculation	
· Resolution	12 bits + sign
· Settling time	0.2 ms for resistive loads 2.2 ms for capacitive loads 0.5 ms for inductive loads (<=1 mH) 3.3 ms for inductive loads (<=3.3 mH)
Diagnosis	External reference voltage missing (L+) Short circuit to GND Parameter assignment error
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	7 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

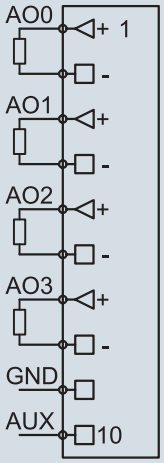
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AO 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit



AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit

Terminal Assignment	
Terminal	**Assignment**
1	AO0 +
2	AO0 -
3	AO1 +
4	AO1 -
5	AO2 +
6	AO2 -
7	AO3 +
8	AO3 -
9	GND
10	AUX



General characteristics

- 4 analog outputs, electrically isolated from backplane bus
- 4 process output words (8 bytes)
- Output range of ±10 V, 0–10 V, 1–5 V
- Measurement resolution 12 bits + sign
- Substitute value functionality
- Diagnostic messages
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Parameters for the module

- Diagnostic alarm: On | Off
- Value representation: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

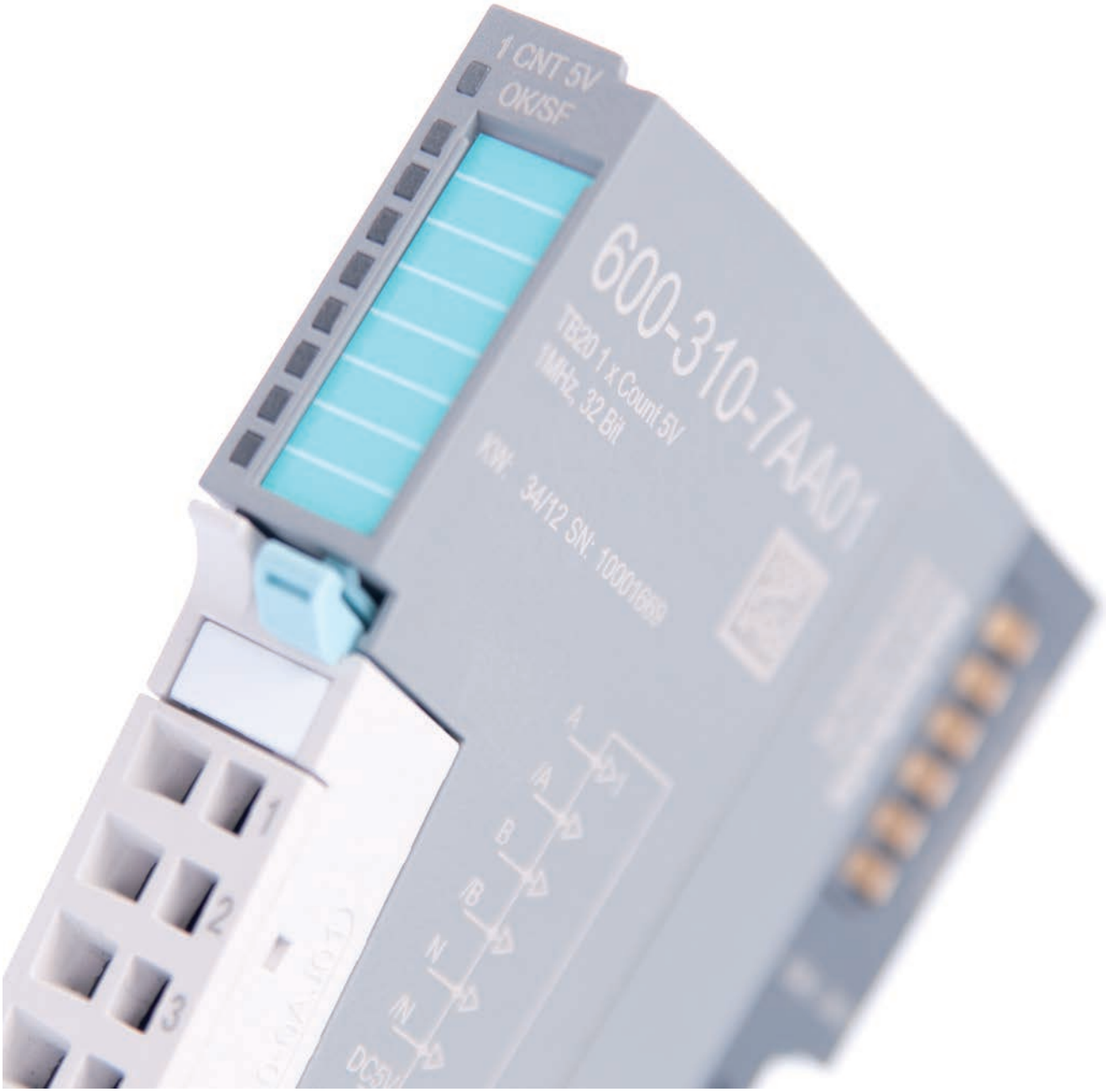
- Wire break detection: On | Off
- Output range: ±10 V | 0–10 V | 1–5 V
- Available substitute value options: Outputs de-energized | Retain last value | Apply substitute value
- Substitute value: 16-bit analog value (±27648)

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Technical data/Ordering data	
Analog Output Module – AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12-Bit	**600-261-4AD01**
Number of outputs	4
Output ranges	±10 V 0–10 V 1–5 V
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 75 mA Max. 24 mA
Power dissipation	Max. 2.4 W
Connection for actuators	2-wire connection
Load resistance	Min. 1 kohm
Capacitive load	Max. 1 µF
Short-circuit protection	Yes
Short-circuit current	Max. 25 mA
Reading calculation	
· Resolution	12 bits + sign
· Settling time	0.2 ms for resistive loads 2.2 ms for capacitive loads 0.5 ms for inductive loads (<=1 mH) 3.3 ms for inductive loads (<=3.3 mH)
Diagnosis	External reference voltage missing (L+) Short circuit to GND Parameter assignment error
Error limits	
· Operational error limit	±0.5 % within the entire temperature range, relative to the nominal range
· Basic error limit	±0.3 %, operational error limit at 25 °C, relative to the nominal range
· Temperature error	±0.005 %/K, relative to the nominal range
· Linearity error	±0.05 %/K, relative to the nominal range
· Repeating accuracy in steady state at 25 °C	±0.05 %/K, relative to the nominal range
Parameter configuration length	13 bytes
Group error indicator	Red LED
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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Function Modules

Counters

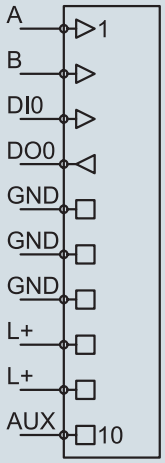
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1x Counter 24 V, 500 kHz, 32-Bit



1x Counter 24 V, 500 kHz, 32-Bit

Terminal Assignment	
Terminal	**Assignment**
1	A
2	B
3	Input 0
4	Output 0
5	GND
6	GND
7	GND
8	L+ 24 VDC
9	L+ 24 VDC
10	AUX



Counters are used to detect pulses that are faster than a controller's cycles, i.e., signals that the controller will be unable to detect properly and that therefore need to be pre-processed. This counter module detects the edges of 24-V signals as pulses. Pulses can be counted or converted into a frequency, rotational speed, or period.
This counter module features an additional 24-V input and a 24-V output for a direct response to start pulses and to quick system state changes.

General characteristics

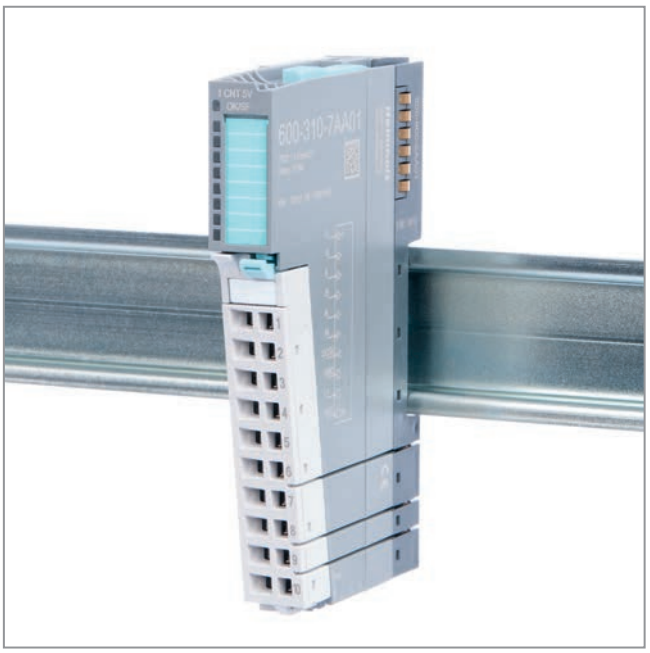
- 32-bit counter
- Up to 500 KHz (quadruple evaluation)
- Connection of 24-V incremental encoders and proximity sensors
- Capturing modes:
  - Pulse & direction
  - Rotary encoder with single evaluation
  - Rotary encoder with double evaluation
  - Rotary encoder with quadruple evaluation
- Counting methods
  - Continuous counting
  - Once-only counting
  - Periodic counting
- Measuring mode:
  - Frequency measurement
  - Rotational speed measurement
  - Period measurement
- Programmable input:
  - PLC input
  - Enable (HW gate)
  - Synchronization
  - Periodic synchronization
  - Latch
  - Latch & retrigger
  - Can be inverted
- Programmable output:
  - PLC output
  - Count >= Reference value
  - Count <= Reference value
  - Count = Reference value
  - Can apply a substitute value at STOP
- Filters: 10/50/100/500 KHz
- All inputs can be inverted
- Limits for counter and measured readings
- Hysteresis for input
- Pulse duration for output
- Refresh rate / averaging time for measuring mode
- 8 bytes of input data (count and status)
- 8 bytes of output data (preset count and commands)

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Technical data/Ordering data	
Function module – 1x Counter 24 V, 500 kHz, 32-Bit	**600-300-7AA01**
Number of counters	1
Counter bit depth	32 bits
Input frequency	Max. 125 KHz
Counting frequency	Max. 500 KHz (for quadruple evaluation)
Input voltage	24 VDC
Electrically isolated from backplane bus	Yes
Inputs/outputs electrically isolated from each other	No
Current draw · External · Internal	 10 mA + load Max. 86 mA
Power dissipation	0.8 W
Input characteristic curve	Type 2, EN 61131-2
Output current · Rated · Leakage current	 500 mA Max. 0.5 mA
Short-circuit protection	Electronic
Parameter configuration length	16 bytes
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

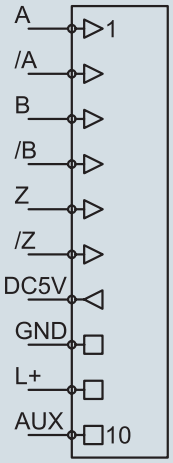
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1x Counter 5 V (RS422), 4 MHz, 32-Bit



1x Counter 5 V (RS422), 4 MHz, 32-Bit

Terminal Assignment	
Terminal	**Assignment**
1	A
2	/A
3	B
4	/B
5	Z
6	/Z
7	5 VDC
8	GND
9	L+, 24 VDC
10	AUX



Counters are used to detect pulses that are faster than a controller's cycles, i.e., signals that the controller will be unable to detect properly and that therefore need to be pre-processed. This counter module detects the edges of 5-V differential signals (as per the RS-422 standard) as pulses. This transmission method is particularly well-suited to high transmission frequencies due to its high degree of noise immunity.
Pulses can be counted or converted into a frequency, rotational speed, or period.

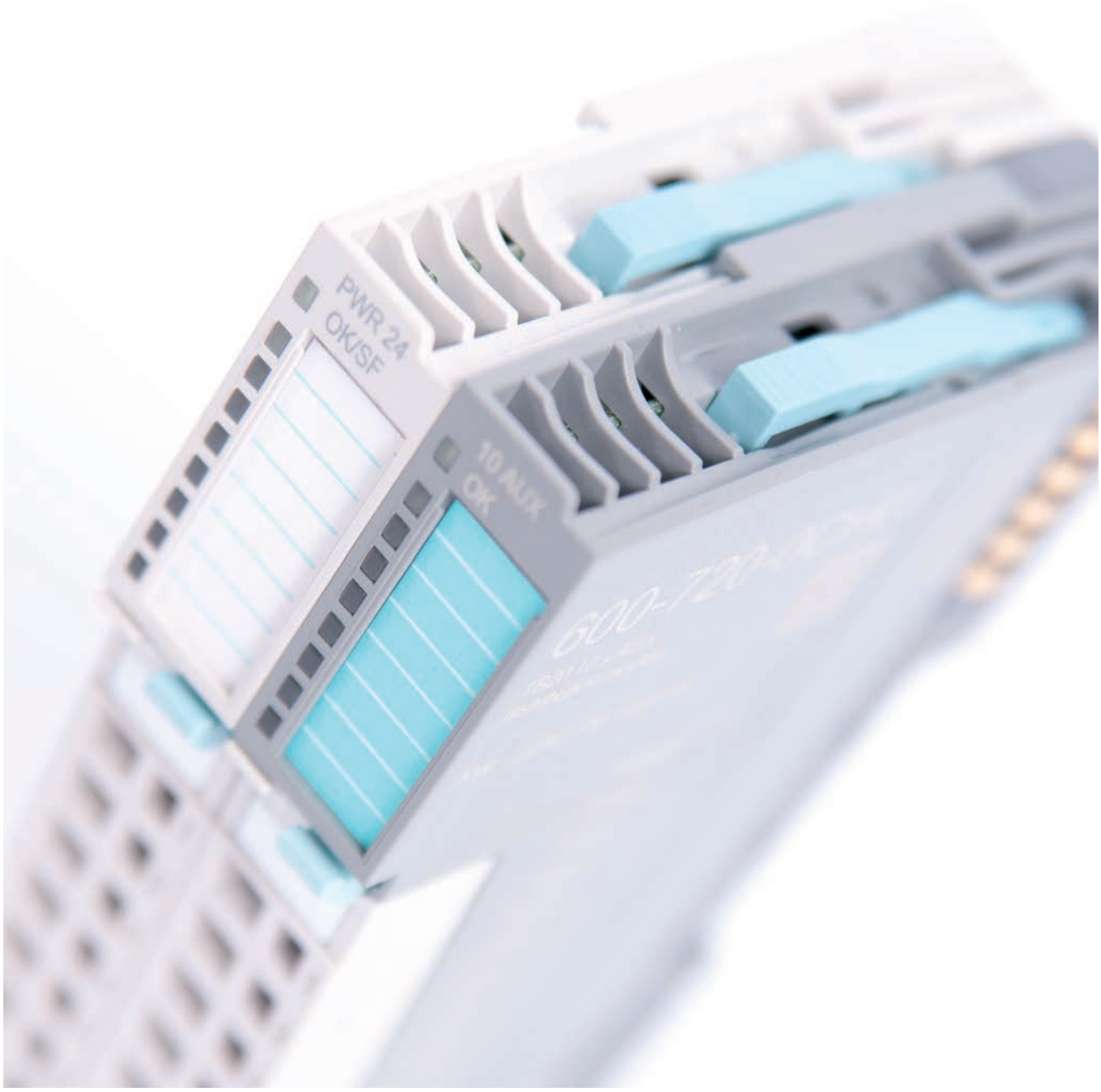
General characteristics

- 32-bit counter
- Up to 4 MHz (quadruple evaluation)
- Accommodates 5-V incremental encoders (RS-422)
- Index input
- 5-V supply for sensors
- Capturing modes:
  - Pulse & direction
  - Rotary encoder with double evaluation
  - Rotary encoder with quadruple evaluation
- Counter mode:
  - Continuous counting
  - Once-only counting
  - Periodic counting
- Measuring mode:
  - Frequency measurement
  - Rotational speed measurement
  - Period measurement
- Synchronization:
  - Off
  - Only-once
  - Periodic
- Filters: 50 kHz | 100 kHz | 500 kHz | 1 MHz
- Limits for counter and measured readings
- Refresh rate / averaging time for measuring mode
- 8 bytes of input data (count and status)
- 8 bytes of output data (preset count and commands)

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Technical data/Ordering data	
Function module – 1x Counter 5 V (RS422), 4 MHz, 32-Bit	**600-310-7AA01**
Number of counters	1
Counter bit depth	32 bits
Input frequency	Max. 1 MHz
Counting frequency	Max. 4 MHz (for quadruple evaluation)
Input voltage	5 VDC, RS-422 differential signal
Electrically isolated from backplane bus	Yes
Sensor supply	5 V ±10%, 190 mA
Current draw · External · Internal	 50 mA 86 mA
Power dissipation	1 W
Parameter configuration length	15 bytes
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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System Modules

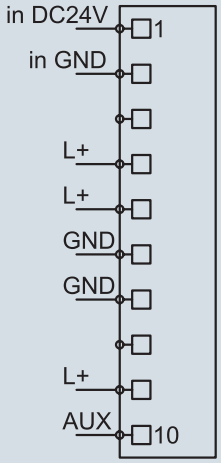
Power Modules
Power and Isolation Modules
Potential Distributors

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Power Module 24 VDC

Terminal Assignment	
Terminal	**Assignment**
1	24 VDC IN
2	GND IN
3	-
4	L+, 24 VDC
5	L+, 24 VDC
6	GND
7	GND
8	-
9	L+, 24 VDC
10	AUX



The 24 VDC power module provides a new supply voltage for the backplane bus and also serves as a power and isolation module for the power bus' 24 VDC, GND, and AUX.

General characteristics

- New supply voltage for the backplane bus
- 2.5 A, 5 VDC output current for the backplane bus
- Powers the power bus to the right
- Segments the power bus on the left
- A green LED indicates the 24 VDC status
- Diagnostic messages in the event of a loss of voltage or short circuit on the backplane bus
- A bi-color LED (blue/red) indicates the module's operating status and any malfunctions

Technical data/Ordering data	
System Module – Power Module 24 VDC	**600-700-0AA01**
Electrically isolated from backplane bus	No
Current draw · External · Internal	 Max. 10 mA + load Max. 35 mA
24 VDC supply	18–30 VDC
Rated input current	Max. 8 A, overcurrent protection device
Reverse polarity protection	Up to 60 V, electronic
Power dissipation	Max. 0.7 W
Load · Per contact · Total load, 24 VDC · Total load, GND · Total load, AUX	 8 A 8 A 8 A 8 A
Group error indicator	Red LED
Hot-pluggable	No
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

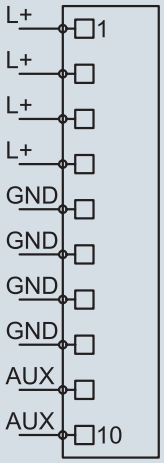
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Power and Isolation Module 24 VDC, 8 A



Power and Isolation Module 24 VDC, 8 A

Terminal Assignment	
Terminal	**Assignment**
1	L+, 24 VDC
2	L+, 24 VDC
3	L+, 24 VDC
4	L+, 24 VDC
5	GND
6	GND
7	GND
8	GND
9	AUX
10	AUX



The 24 VDC, 8 A power and isolation module serves as a power supply module for the power bus' 24 VDC, GND, and AUX to the right, while segmenting the power bus on the left.
This module can be used to subdivide the power bus into individual segments.

General characteristics

- Powers the power bus to the right
- Segments the power bus on the left
- A green LED indicates the 24 VDC status
- A blue LED indicates the operating status

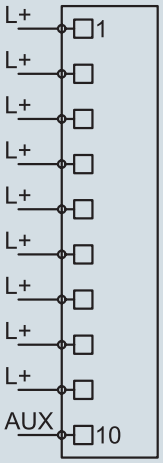
Technical data/Ordering data	
System Module – Power and Isolation Module 24 VDC, 8 A	**600-710-0AA01**
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 Max. 22 mA Max. 5 mA
Power dissipation	Max. 0.3 W
Load · Per contact · Total 24 VDC supply · Total GND supply · Total AUX supply	 8 A 8 A 8 A 8 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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Potential Distributor 9 x 24 VDC

Terminal Assignment	
Terminal	**Assignment**
1	L+, 24 VDC
2	L+, 24 VDC
3	L+, 24 VDC
4	L+, 24 VDC
5	L+, 24 VDC
6	L+, 24 VDC
7	L+, 24 VDC
8	L+, 24 VDC
9	L+, 24 VDC
10	AUX



The 9 x 24 VDC potential distributor makes the 24 VDC supply from the power bus available on the front connector.

General characteristics

- Max. 8 A supply load
- Supplies its outputs using the power bus
- A blue LED indicates the operating status

Technical data/Ordering data	
System Module – Potential Distributor 9 x 24 VDC	**600-720-0AH01**
Number of outputs	9
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 0 mA Max. 22 mA
Power dissipation	Max. 0.1 W
Load · Per contact · Total load	 8 A 8 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

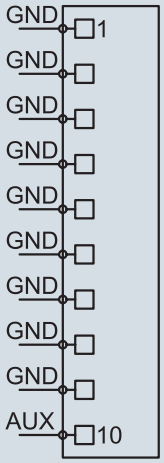
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Potential Distributor 9 x GND



Potential Distributor 9 x GND

Terminal Assignment	
Terminal	**Assignment**
1	GND
2	GND
3	GND
4	GND
5	GND
6	GND
7	GND
8	GND
9	GND
10	AUX



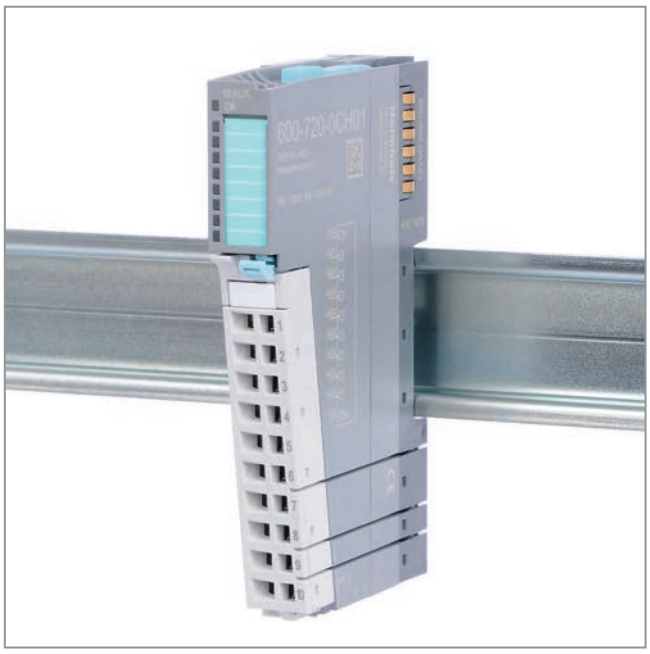
The 9 x GND potential distributor makes the GND connection from the power bus available on the front connector.

General characteristics

· Max. 8 A supply load
· Supplies its outputs using the power bus
· A blue LED indicates the operating status

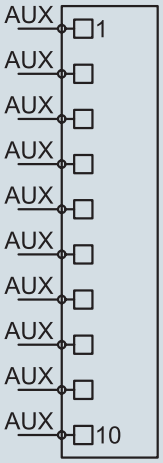
Technical data/Ordering data	
System Module – Potential Distributor 9 x GND	**600-720-0BH01**
Number of outputs	9
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 0 mA Max. 22 mA
Power dissipation	Max. 0.1 W
Load · Per contact · Total load	 8 A 8 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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Potential Distributor 10 x AUX

Terminal Assignment	
Terminal	**Assignment**
1	AUX
2	AUX
3	AUX
4	AUX
5	AUX
6	AUX
7	AUX
8	AUX
9	AUX
10	AUX



The 10 x AUX potential distributor makes the AUX connection from the power bus available on the front connector.

General characteristics

- Max. 8 A supply load
- Supplies its outputs using the power bus
- A blue LED indicates the operating status

Technical data/Ordering data	
System Module – Potential Distributor 10 x AUX	**600-720-0CH01**
Number of outputs	10
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 0 mA Max. 22 mA
Power dissipation	Max. 0.1 W
Load · Per contact · Total load	 8 A 8 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

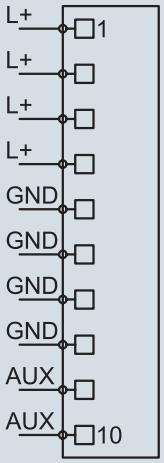
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Potential Distributor 4 x DC 24 V + 4 x GND



Potential Distributor 4 x DC 24 V + 4 x GND

Terminal Assignment	
Terminal	**Assignment**
1	L+, 24 VDC
2	L+, 24 VDC
3	L+, 24 VDC
4	L+, 24 VDC
5	GND
6	GND
7	GND
8	GND
9	AUX
10	AUX



The 4 x 24 VDC + 4 x GND potential distributor makes the 24 VDC supply and the GND connection from the power bus available on the front connector.

General characteristics

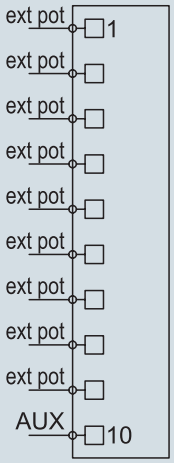
- Max. 8 A supply load
- Supplies its outputs using the power bus
- A blue LED indicates the operating status

Technical data/Ordering data	
System Module – Potential Distributor 4 x 24 VDC + 4 x GND	**600-720-0DH01**
Number of outputs	10, in three groups: 4 x 24 VDC, 4 x GND, 2 x AUX
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 0 mA Max. 22 mA
Power dissipation	Max. 0.1 W
Load · Per contact · Total load, 24 VDC · Total load, GND · Total load, AUX	 8 A 8 A 8 A 8 A
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g



Potential Distributor 9 x Free pot.

Terminal Assignment	
Terminal	**Assignment**
1	External pot.
2	External pot.
3	External pot.
4	External pot.
5	External pot.
6	External pot.
7	External pot.
8	External pot.
9	External pot.
10	AUX



The “9 x free” potential distributor makes 9 contacts that are connected to each other available on the front connector. The potential distributed through these contacts can be freely chosen.

General characteristics

· Max. 8 A supply load
· Can accommodate any supply potential
· A blue LED indicates the operating status

Technical data/Ordering data	
System Module – Potential Distributor 9 x Free pot.	**600-720-0XH01**
Number of outputs	9
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 0 mA Max. 22 mA
Power dissipation	Max. 0.1 W
Load · Per contact · Total load	 8 A 8 A
Permissible potential difference relative to GND	48 VAC
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g

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Spare Parts/Accessories

Base Modules
Front Connectors
Final Bus Cover
Label Sheets

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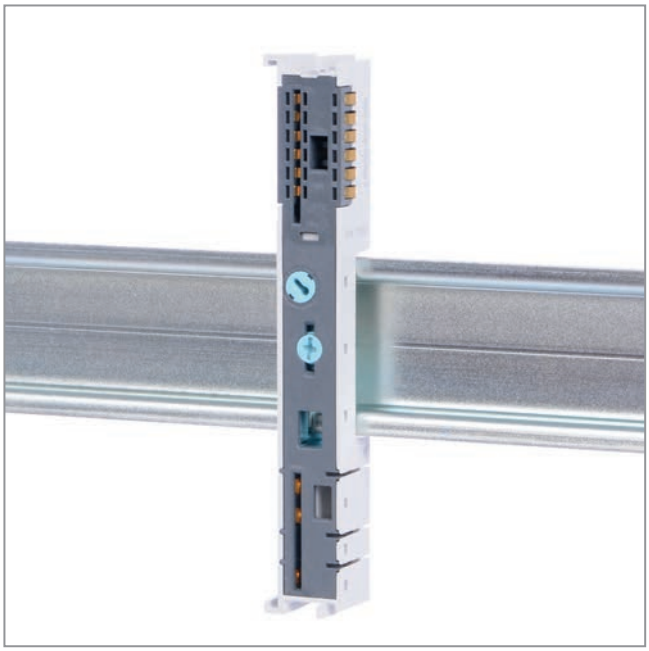
Base Module, 14 mm-Width Standard



Base Module, 25 mm-Width



Base Module for Power and Isolation Modules



Base Module for Power Modules and Bus Couplers

The base modules for the TB20 system are available as spare parts in sets of five.

Note:
Modules are delivered as complete assembled units with front connector and base module and can be installed immediately.

Ordering data	
Base Module, 14 mm-Width Standard (set of five)	600-900-9AA01
Base Module, 25 mm-Width (set of five)	600-900-9AA21
Base Module, for Power and Isolation Module (set of five)	600-900-9BA01
Base Module, for Power Module or Bus Coupler (set of five)	600-900-9CA01

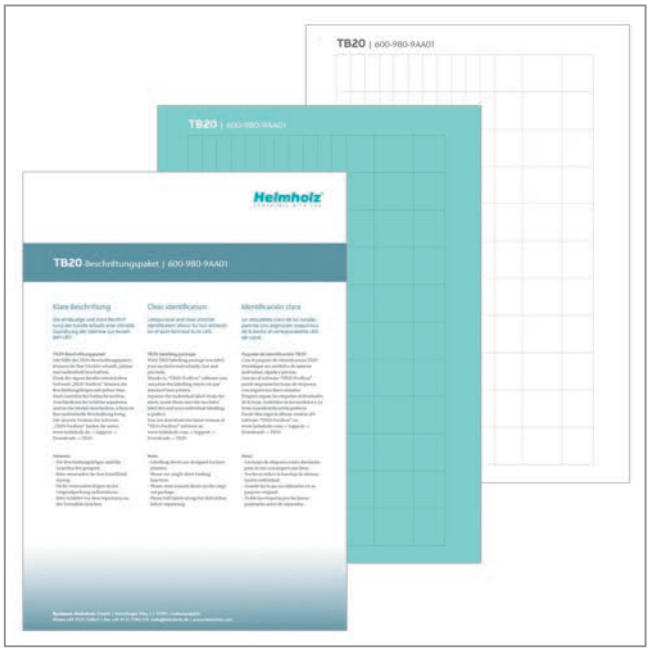
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10-Terminal Front Connector, 20-Terminal Front Connector, Final Bus Cover

The front connectors as well as the final bus cover for the TB20 system are as spare parts available in sets of five.

Note:
Modules are delivered as complete assembled units with front connector and base module and can be installed immediately. The final bus cover is already included in the delivery.



Labeling Package

The TB20 labeling package allows users to label their modules quickly, accurately, and according to their specific needs. Our TB20 ToolBox software makes it possible to print out label sheets with laser printers. Afterwards you only need to separate the labels, slide them into the relevant module, and voila! Your custom labels will be ready and in place.
To download the latest version of TB20 ToolBox, please visit: www.helmholz.com -> Support -> Downloads -> TB20

Table of Contents
Each label package includes the following:
- Title page/quick start guide
- Eight green A4 label sheets
- Two white A4 label sheets

Each A4 label sheet includes:
-121 labels for 14-mm modules
-11 labels for 25-mm modules
-11 labels for bus couplers
-11 labels for communication modules

General characteristics

- Unique, clear channel labeling
- Makes it possible to quickly determine which terminals correspond to which LEDs
- Compatible with laser printers
- Free TB20 ToolBox software

Ordering data	
10-Terminal Front Connector (set of five)	600-910-9AJ01
20-Terminal Front Connector (set of five)	600-910-9AT21
Final Bus Cover (set of five)	600-920-9AA01
TB20 Labeling Package	600-980-9AA01
Mini-USB Cable	700-755-8VK11

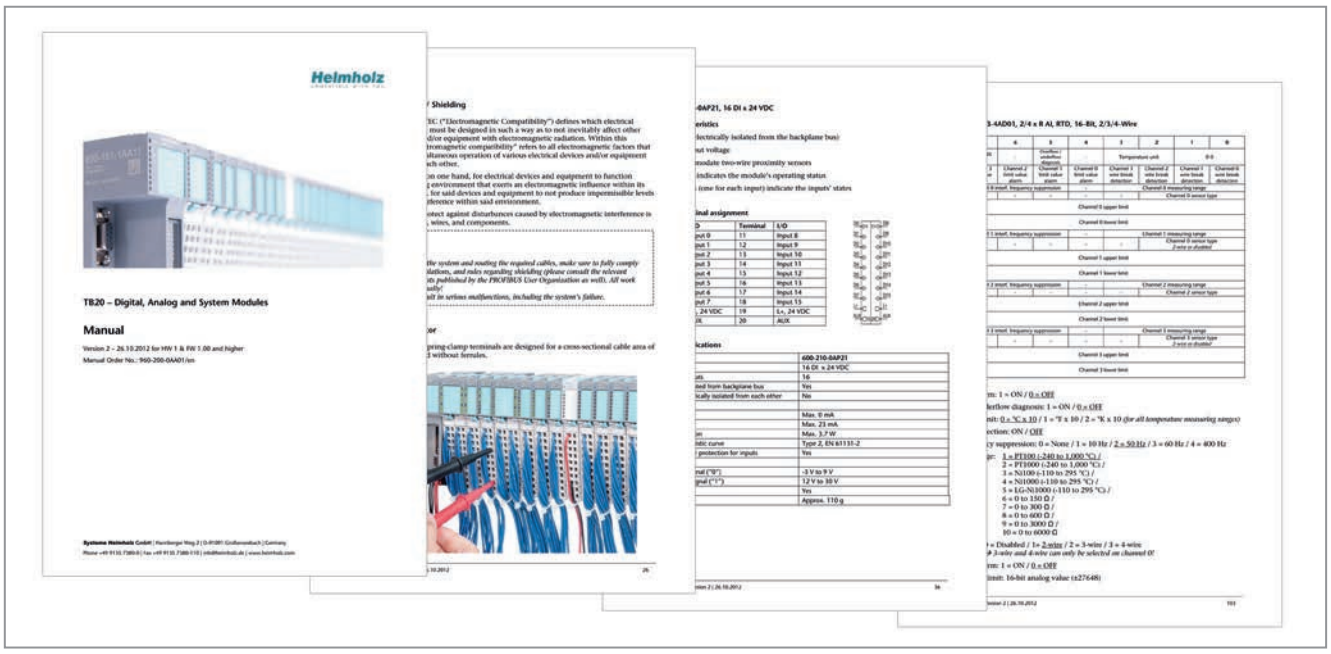
TB20 Starter Kits



TB20 Starter Kit for PROFIBUS-DP

The TB20 starter kit will enable you to become familiar with the new TB20 system and test it extensively without breaking the bank.
This starter kit includes the most common modules, all required software, and the accessories you will need to get started.

Ordering data			
TB20 Starter Kit	**600-990-STRT1**	**600-990-STRT2**	**600-990-STRT3**
	PROFIBUS-DP	**CANopen® Slave**	**PROFINET IO**
· 1 x bus coupler PROFIBUS-DP	600-151-1AA11	600-160-1AA11	600-180-1AA11
· 1 x Digital Input Module – DI 4 x 24 VDC	600-210-0AD01	600-210-0AD01	600-210-0AD01
· 1 x Digital Input Module – DI 16 x 24 VDC	600-210-0AP21	600-210-0AP21	600-210-0AP21
· 1 x Digital Output Module – DO 8 x 24 VDC, 500 mA	600-220-0AH01	600-220-0AH01	600-220-0AH01
· 1 x System Module – Power and Isolation Module 24 VDC, 8 A	600-710-0AA01	600-710-0AA01	600-710-0AA01
· 1 x System Module – Potential Distributor 9 x 24 VDC	600-720-0AH01	600-720-0AH01	600-720-0AH01
· 1 x Analog Input Module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-bit	600-252-4AB01	600-252-4AB01	600-252-4AB01
· 1 x Analog Output Module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12-bit	600-261-4AB01	600-261-4AB01	600-261-4AB01
· 1 x PROFIBUS cable ready-to-use, flexible, 1 m (2 x 90° PROFIBUS connector with PG port) · or 1 x CAN bus connector · or 1 x Ethernet cable, 3m	700-970-2VK01	700-690-1BB12	700-881-1VK21
· 1 x mini-USB cable	700-755-8VK11	700-755-8VK11	700-755-8VK11
· 1 x DIN rail			
· 1 x USB flash drive with software and manuals			
· 1 x transportation case			



TB20 Manuals

The technical documentation for the TB20 system is made up of several manuals. These manuals are subdivided by module and coupler type.
Each manual contains all necessary hardware and programming information, including a detailed description of the relevant individual modules.
In addition, each manual also includes instructions for correctly assembling and installing the relevant modules.

Ordering data	
TB20 Manual – PROFINET IO Coupler, German/English	**960-180-1AA11**
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TB20 Manual – Digital, Analog, and System Modules, German/English	**960-200-0AA01**
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