Helmholz®
COMPATIBLE WITH YOU

It´s different! **TB20.**
Distributed Fieldbus I/O System

Catalog
3

www.helmholz.com

Have you seen our main catalog yet?

Product Catalog 16 comes with all the information and ordering data you need for our automation system components:
- PROFIBUS
- PROFINET
- NETLink® gateways
- Remote servicing
- Components for S7
- CAN bus
- Interface converters

All catalogs are available for download at your convenience at www.helmholz.com.
If you would prefer, we can also send you print versions of our catalogs.

How to Reach Us

Phone orders: +49 9135 7380-0
Fax orders: +49 9135 7380-490

On the Internet

Homepage: www.helmholz.com
Email: info@helmholz.de

Don't miss out on important information!

Make sure to subscribe to our "Automation Update" newsletter to get the latest information on our products, trade shows, workshops, and important product change notices!

www.helmholz.com

Follow us on ...

Page

TB20 Characteristics ..... 7 – 18

Bus Couplers ..... 19 – 32

Digital Input/Output Modules ..... 33 – 62

Analog Input/Output Modules ..... 63 – 106

Function Modules ..... 107 – 116

Communication Modules ..... 117 – 119

System Modules ..... 120 – 128

Spare Parts/Accessories ..... 129 – 137

Service ..... 138 – 139

Version: November 2014

TB20 Characteristics 7
Three-component module design, hot-plug capability, bus couplers 7
Module granularity, freely definable auxiliary contact 8
Clear and unique labels, electronic nameplate, ideal handling 9
Front connector wiring, Total Solution Concept 10
Final bus cover, coded system, a single order number 11
TB20 ToolBox: Smart planning and configuration, real-time diagnosis 12
TB20 ToolBox: Importing/exporting symbols, simulation (I/O check) 13
Free product macros for electrical engineering software 14
TB20 dimensions 15
Power supply/wiring 16
General technical specifications 18

Bus Couplers 19
PROFINET IO 20
PROFIBUS-DP 22
CANopen® 24
Modbus/TCP 26
EtherNet/IP 28
EtherCAT 30

Digital Input/Output Modules 33
Digital Input Modules
DI 2 x 24 VDC 34
DI 4 x 24 VDC 35
DI 8 x 24 VDC 36
DI 16 x 24 VDC 37
DI 3 x 24 VDC, 3-wire 38
DI 6 x 24 VDC, 3-wire 39
DI 2 x 230 VAC, per channel N, type 1 40
DI 4 x 230 VAC, per channel N, type 1 41
DI 8 x 230 VAC, per channel N, type 1 42
Digital Output Modules
DO 2 x 24 VDC, 500 mA 43
DO 4 x 24 VDC, 500 mA 44
DO 8 x 24 VDC, 500 mA 45
DO 16 x 24 VDC, 500 mA 46
DO 4 x 24 VDC, 700 mA, Highfeature 48
DO 8 x 24 VDC, 700 mA, Highfeature 49
DO 16 x 24 VDC, 700 mA, Highfeature 50
DO 2 x 24 VDC, 2 A 52
DO 4 x 24 VDC, 2 A 53
DO 2 x relays, 5 A, 230 VAC, changeover 54
DO 4 x relays, 5 A, 230 VAC, changeover 56
Digital Mixed Modules
DIO 2 x In/2 x Out 24 VDC, 500 mA 58
DIO 4 x In/4 x Out 24 VDC, 500 mA 59
DIO 8 x Out/8 x In 24 VDC, 500 mA 60

Analog Input/Output Modules 63
Analog Input Modules
AI 2 x I, 0/4–20 mA, ±20 mA, 12 Bit 64
AI 4 x I, 0/4–20 mA, ±20 mA, 12 Bit 66
AI 2 x I, 0/4–20 mA, ±20 mA, Iso., 16 Bit 68
AI 4 x I, 0/4–20 mA, ±20 mA, Iso., 16 Bit 70
AI 8 x I, 0/4–20 mA, ±20 mA, Iso., 16 Bit 72
AI 2 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit 74
AI 4 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit 76
AI 2 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit 78
AI 4 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit 80
AI 8 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit 82
AI 2 x U, ±24 V, 0–24 V, 12 Bit 84
AI 4 x U, ±24 V, 0–24 V, 12 Bit 86
AI 1/2 x R, RTD, 16 Bit, 2/3/4-wire 88
AI 2/4 x R, RTD, 16 Bit, 2/3/4-wire 90
AI 2 x TC, Iso., 16 Bit 92
AI 4 x TC, Iso., 16 Bit 94
AI 8 x TC, Iso., 16 Bit 96
Analog Output Modules
AO 2 x I, 0/4–20 mA, 12 Bit 98
AO 4 x I, 0/4–20 mA, 12 Bit 100
AO 2 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit 102
AO 4 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit 104

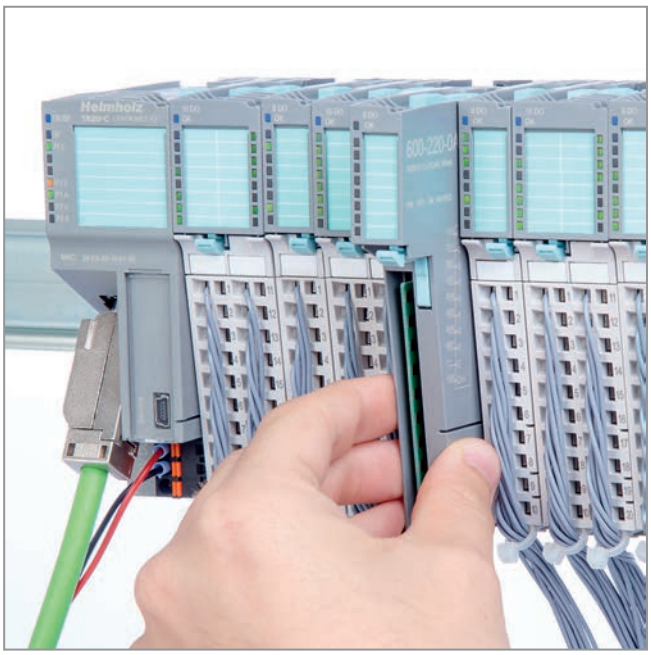
Function Modules 107
Counters
1 x counter 24 V, 500 kHz, 32 Bit 108
1 x counter 5 V (RS422), 4 MHz, 32 Bit 110
SSI Encoder Interface
1 x SSI encoder interface 112
Energy Meter
Energy meter 114

Communication Modules 117
RS-232 serial port 118

System Modules 120
Power and Isolation Module
Power and isolation module 24 VDC, 8 A 121
Potential Distributors
Potential distributor 4 x 24 VDC, HF 122
Potential distributor 9 x 24 VDC 123
Potential distributor 9 x GND 124
Potential distributor 10 x AUX 125
Potential distributor 4 x 24 VDC + 4 x GND 126
Potential distributor 9 x free pot. 127
Power Module
Power module 24 VDC 128

Spare Parts/Accessories....129
Base modules....130
Front connectors, final bus cover, TB20 label package, Mini-USB cable....131
TB20 starter kits....132
Manuals....133
PROFIBUS connectors, PROFIBUS repeaters, PROFIBUS FO....134
CAN bus communication modules, CAN bus connectors, CAN bridge....135
PROFINET connectors, PN/CAN gateway....136

Service....138
Contacts in Germany....138
International Contacts....139



Three-component module design

TB20 I/O modules have three components: a separate front connector, an electronic module, and a base module. A locking mechanism ensures that all modules can be quickly mounted and securely attached on DIN rails while guaranteeing a reliable electrical connection. Likewise, all modules 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 replaced while the remaining system continues to run. This electronic module hot-plug functionality helps keep downtimes to a minimum.

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, Modbus/TCP, EtherNet/IP, and EtherCAT are currently available. Our portfolio is designed as an open and vendor-neutral fieldbus system and will gradually be expanded and added to.

Module granularity, freely definable auxiliary contact

Module granularity

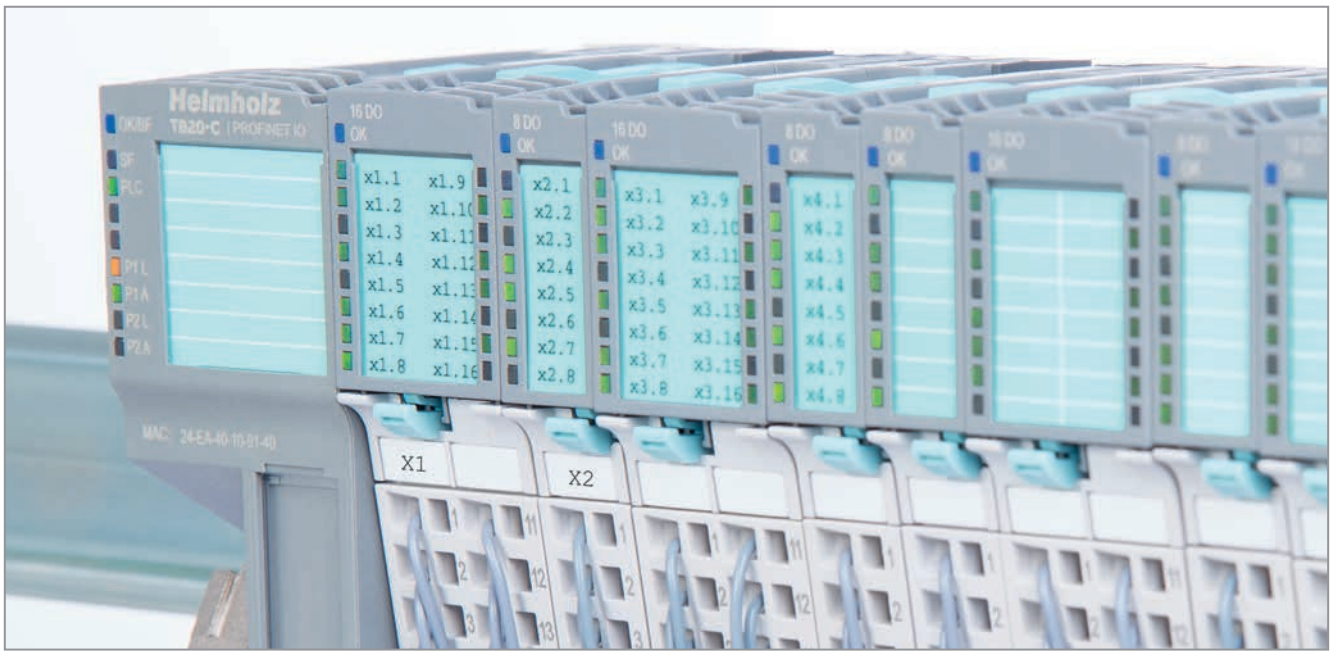
The TB20 system has modules with two, four, eight, and 16 channels available so as to ensure that systems can be designed with utmost flexibility and maximum effectiveness. Digital mixed I/O modules complete the range of products. Moreover, 16-channel modules make it possible to implement up to 1,024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

A small number of models – a lot of functionality

The TB20 I/O system ensures that you will truly be able to take full advantage of its modules by packing every single one of them with unmatched functionality while keeping the number of different model versions small. This makes it easier to design systems, select modules, and manage inventory levels.

Freely definable auxiliary contact (auxiliary terminal)

This additional terminal 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 as necessary. This flexibility makes wiring faster and frees up additional distributor terminals.

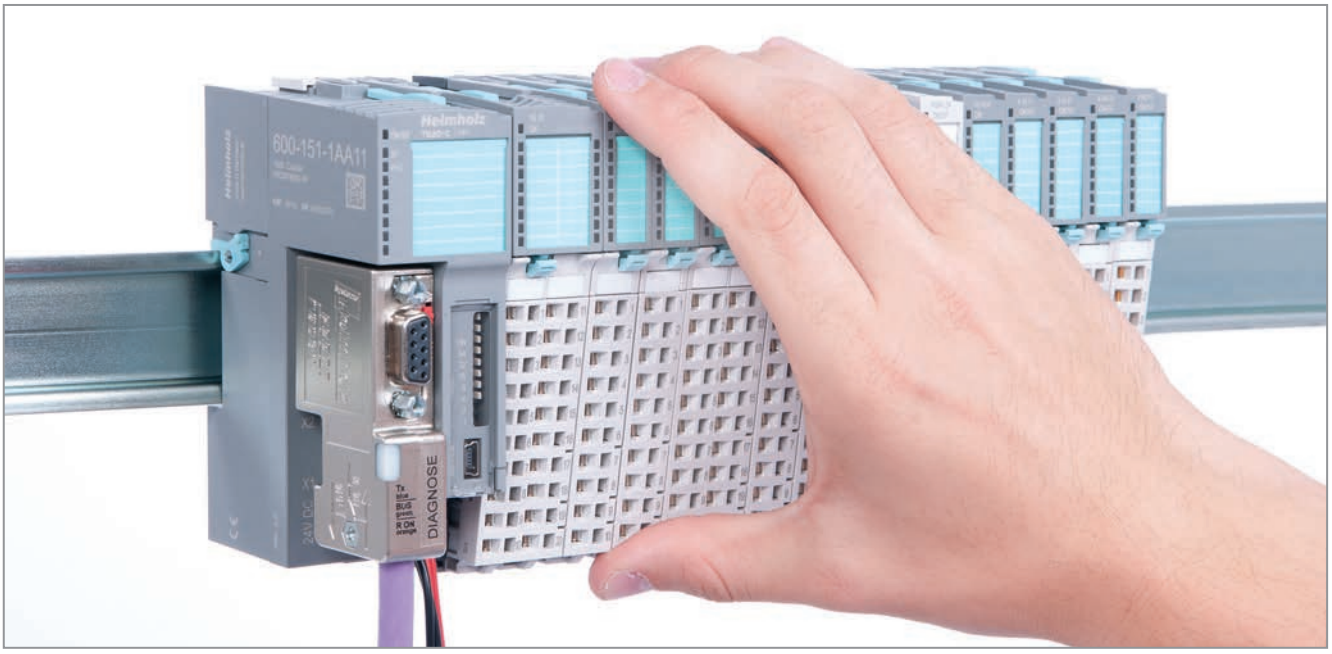


Clear, unique labels

The system's design ensures that each channel will be labeled clearly and uniquely. In fact, labels can be easily read during operation, making it possible to directly determine which terminals correspond to which LED indicators. 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 order number for each module is engraved behind the module's label strip.

Electronic nameplate

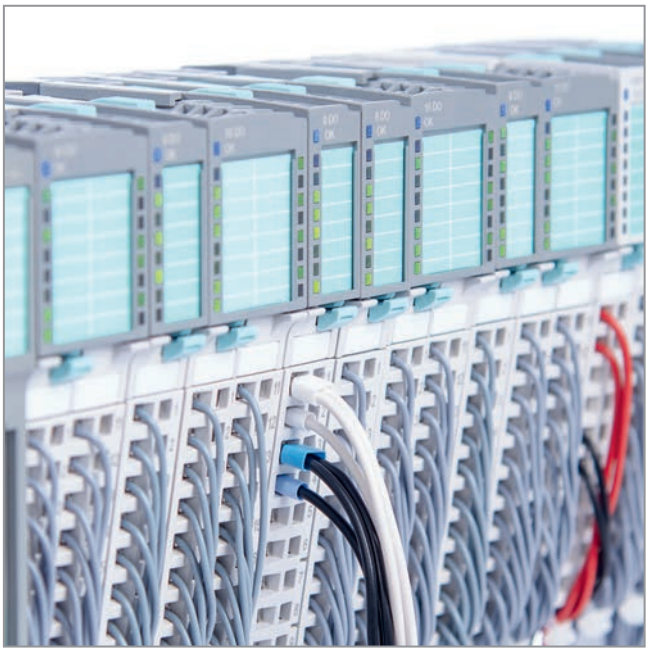
All of a TB20 module's important information can be found on its electronic nameplate. This information includes, for example, the corresponding module ID, order number, unique serial number, hardware version, firmware version, and internal range of functionalities. This information can be read in a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

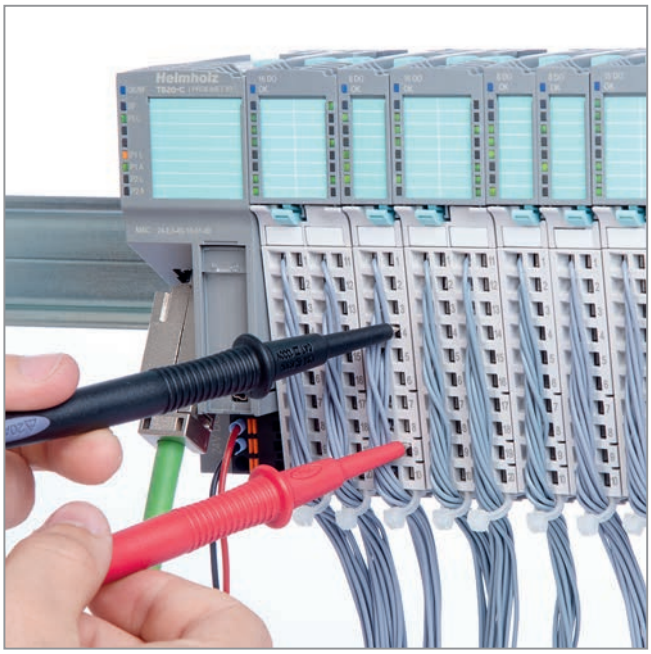


Ideal handling, achieved with a compact design

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 reliable electrical contacts for industrial applications, which are further complemented by an IP20 protection rating.

Front connector wiring, Total Solution Concept

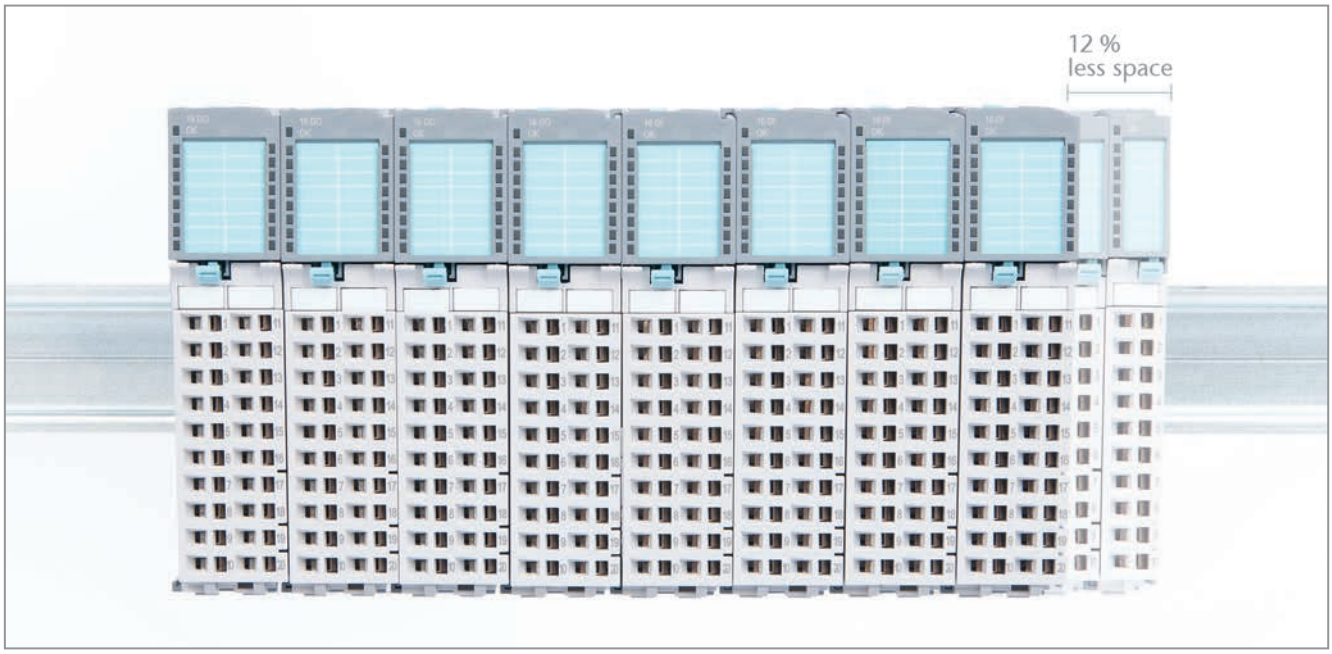




Front connector wiring

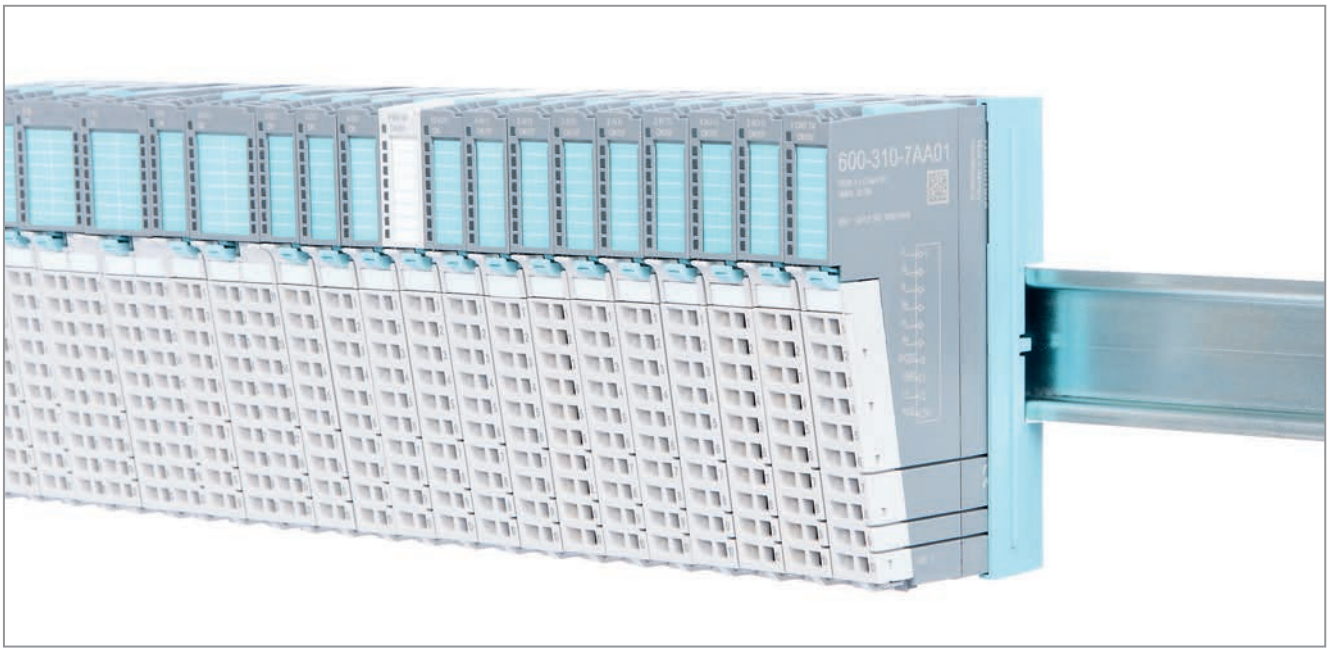
The system's front connectors feature spring-type terminals throughout, and can be either snapped into place or wired without an electronic module.
The front connector's spring-type terminals are designed for a cross-sectional cable area of up to 1.5 mm² (16–22 AWG) with or without ferrules.

It is also possible, for example, to connect two 0.75 mm² wires to a single spring-type terminal, provided the maximum cross-sectional cable area of 1.5 mm² per terminal is not exceeded. In addition, the terminals are also designed to work with test probes.



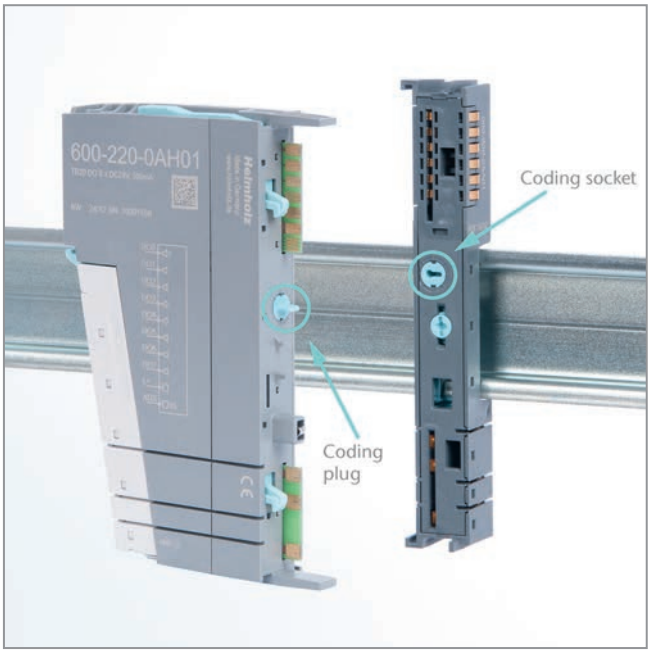
Total Solution Concept

An ideal variety of modules ensures that users will be able to easily select the products they need and conveniently order them.
In addition, no additional accessories or add-on parts are required for any unit, and each individual I/O module is characterized by unparalleled quality and a large number of functionalities that come as standard. Moreover, using modules with up to 16 digital or 8 analog channels and digital mixed I/O modules makes it possible to implement a powerful system with a compact configuration.



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 included as standard with every bus coupler.



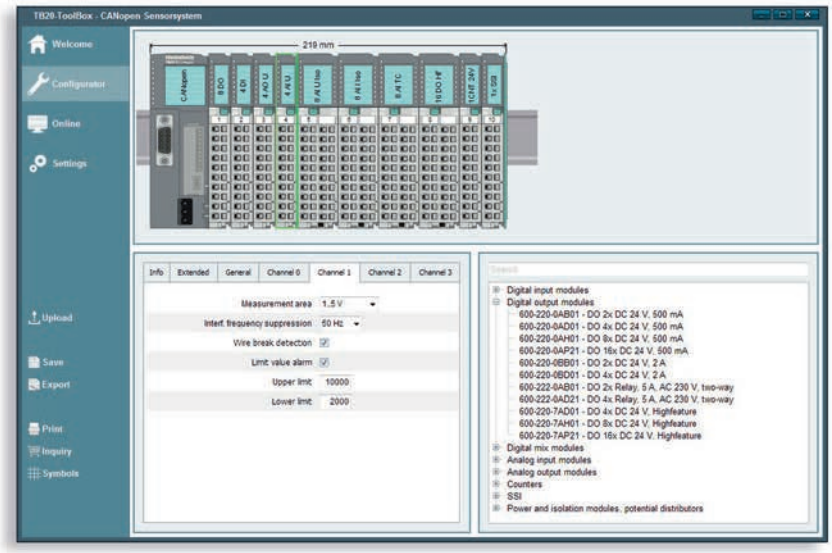
Coded system

The integrated rotary coding system prevents users from accidentally plugging incorrect modules into each other, ensuring that modules can be replaced in a foolproof manner.
This not only helps prevent damage to the system, but also system malfunctions.

A single order number for all three components

Every single I/O module has a single order number, i.e., it comes with its front connector, electronic module, and base module (as a single assembly). This ensures that you will be able to install any I/O module immediately.

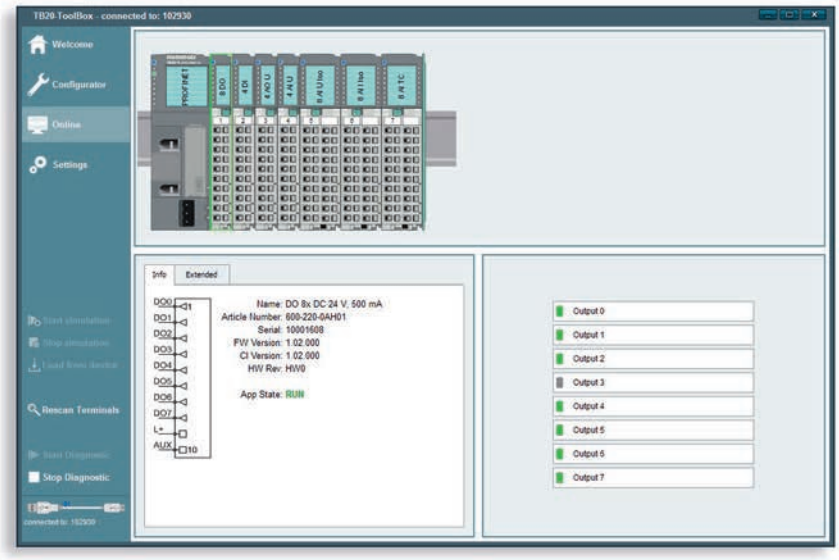
TB20 ToolBox: Smart planning and configuration, real-time diagnosis



Smart planning 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 and documentation for projects, every single step is combined into one single intuitive software package. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Existing TB20 I/O system configurations can be imported directly as a project in order to further configure their parameters or print label strips. In addition, TB20 ToolBox can be used to configure all the parameters in a TB20 system and store them in the coupler's non-volatile memory when working with bus systems that require the coupler to be configured directly. In fact, the software's configuration and diagnostic functionalities will work hand in hand during the entire process.

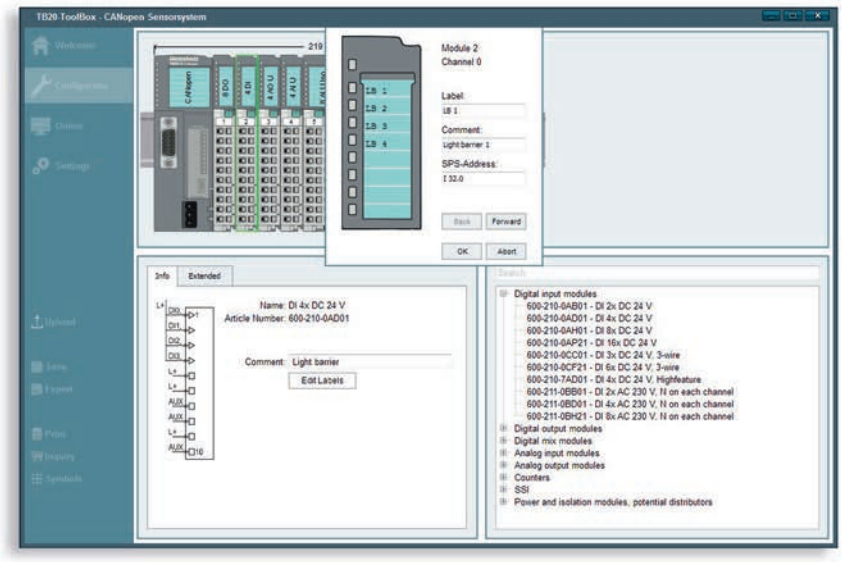


What we offer: real-time diagnosis

TB20 ToolBox is a practical setup and servicing tool used to import configurations, display a system's current status, and analyze parameter configuration and setup errors. An I/O map, the current parameter configuration, and diagnostic messages can all be displayed in real-time. In addition, the tool shows the electronic nameplate for each module, ensuring that every single one can be reliably identified and serviced.

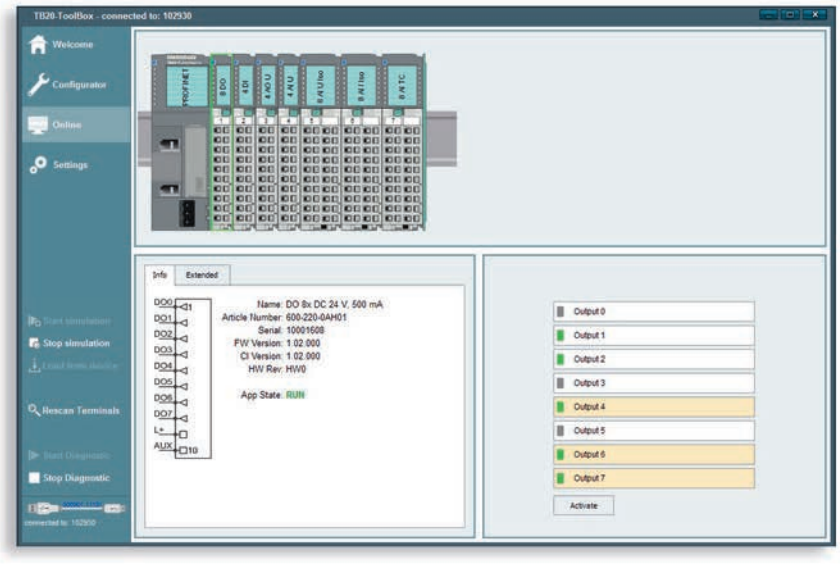
A firmware update function makes it possible to keep all devices up to date and add new functions to them.
TB20 ToolBox uses the USB service port that is integrated into all couplers, or TCP/IP (still in development as of this writing), in order to communicate.
TB20 ToolBox runs on Windows* XP, 7, 8.

* Windows is a registered trademark of Microsoft Corporation.



Importing/exporting symbols

TB20 ToolBox can be used to define the following for each channel in the configuration: labeling of the strip label, a symbol description, and a PLC address. This information can be imported or exported in a variety of formats, making it possible to efficiently use TB20 ToolBox as a configuration tool together with electrical engineering software (e.g., EPLAN and WSCAD) on one hand and with PLC programming software on the other.

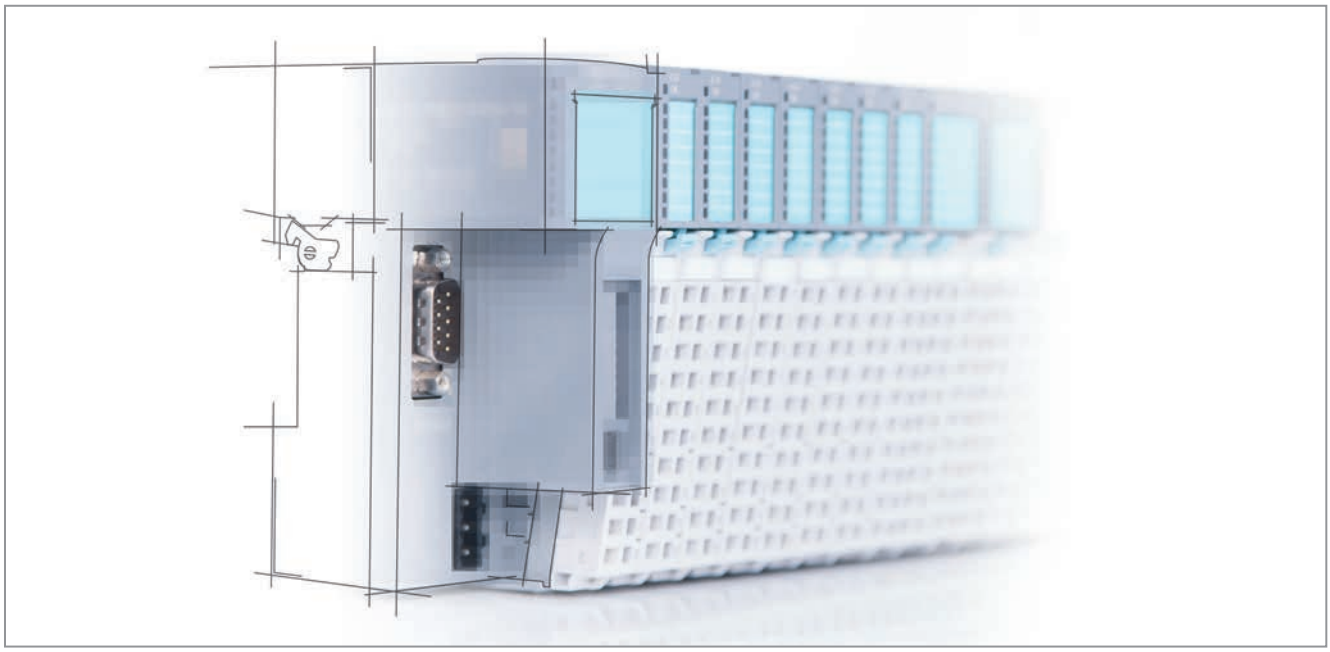


Simulation (I/O check)

The option of setting up TB20 I/O systems without a higher-level controller by directly reading and writing to inputs and outputs and configuring parameters for functionality testing purposes makes it easier to check the system's wiring and entire design. This way, you can rest assured knowing that your TB20 I/O system is ideally configured and ready for use before your machine is delivered.

TB20 ToolBox training
A few minutes is all you need to learn more about our ToolBox and how to use it.

www.youtube.com/user/SystemeHelmholz



Free product macros for electrical engineering software

Reliability, speed, and efficiency are the key criteria for successfully completing a project. And they need to be met during the planning stage already, as the circuit diagrams, documentation, and design data for panel building that are prepared during this step all play a decisive role in how a project will turn out.
Product macros for electrical engineering software have proven to be invaluable tools within this context, the reason? By containing the most important circuit diagram data, as well as layout and item data for bills of materials, they ensure that systems can be designed as quickly as possible.
This is why Systeme Helmholz has free product macros available for all the components in the TB20 I/O system, ensuring that you will be able to quickly and efficiently integrate your TB20 distributed I/O system into your designs.

To download these ready-to-use TB20 macros free of charge, please visit our website (www.helmholz.com), go to the "Products" area, and then click on the "Planning Tools" option.

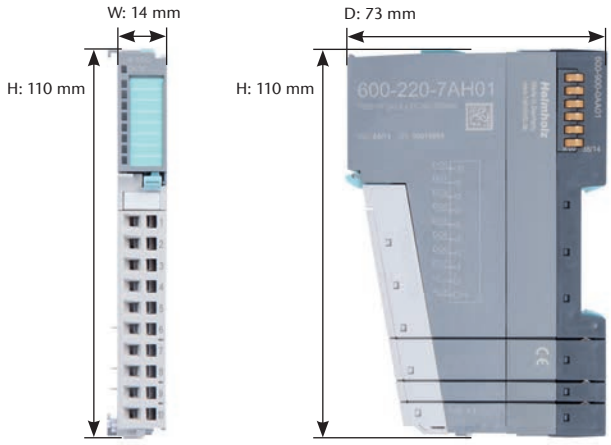
As of this writing, there are macros available for:
WSCAD*
EPLAN Electric P8** (compatible with version 2.0 and higher)

* WSCAD is a registered trademark of WSCAD electronic GmbH

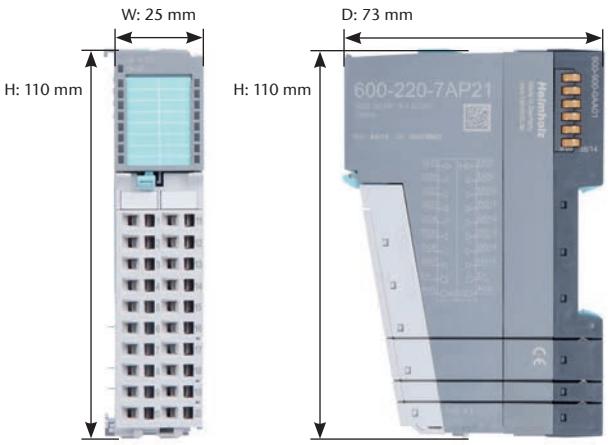
** EPLAN and EPLAN Electric P8 are registered trademarks of EPLAN Software & Service GmbH & Co. KG.

TB20 Dimensions

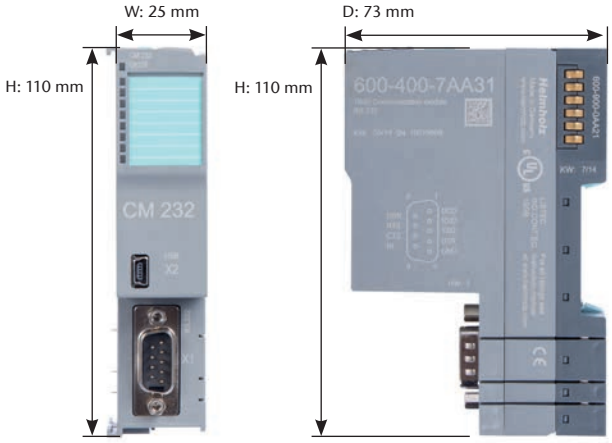
Module with standard width



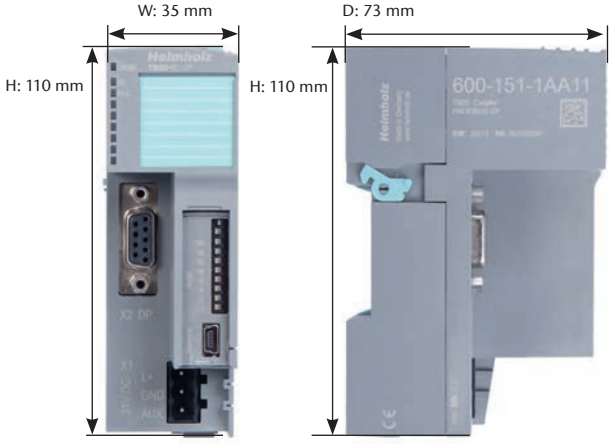
Module with double width

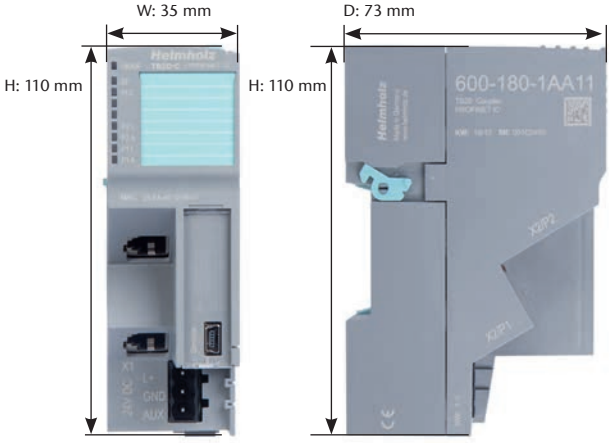


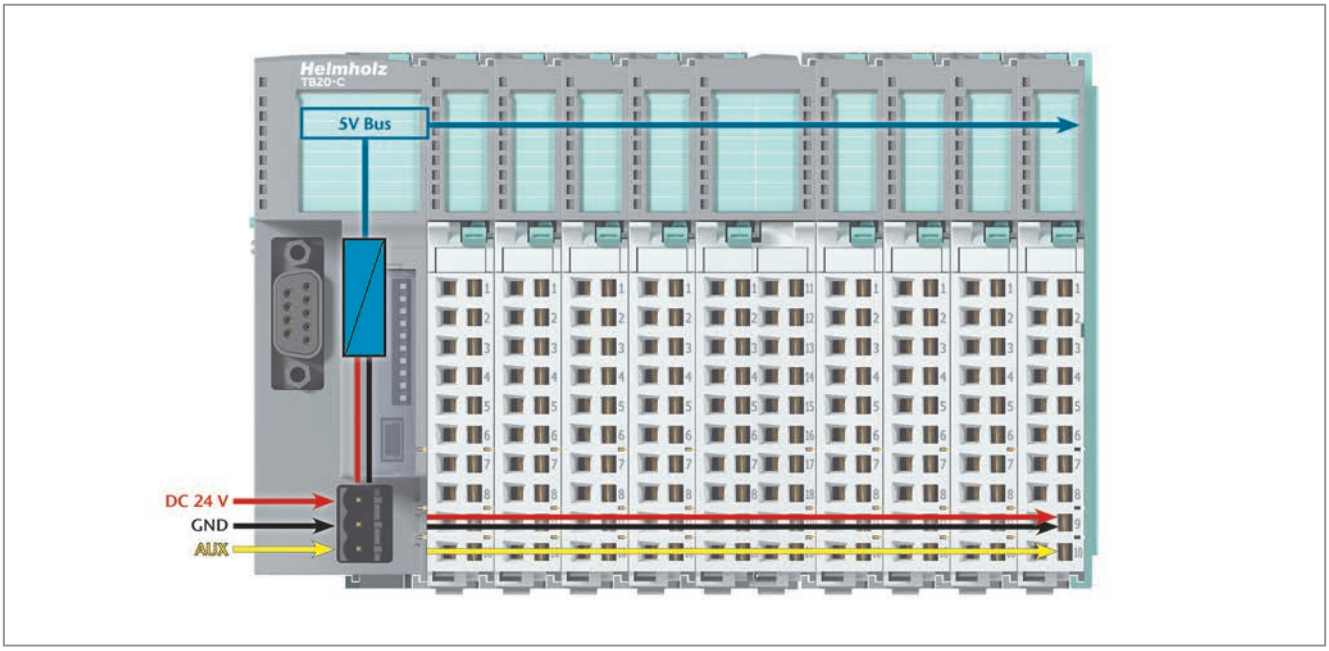
Communication module



Bus Couplers

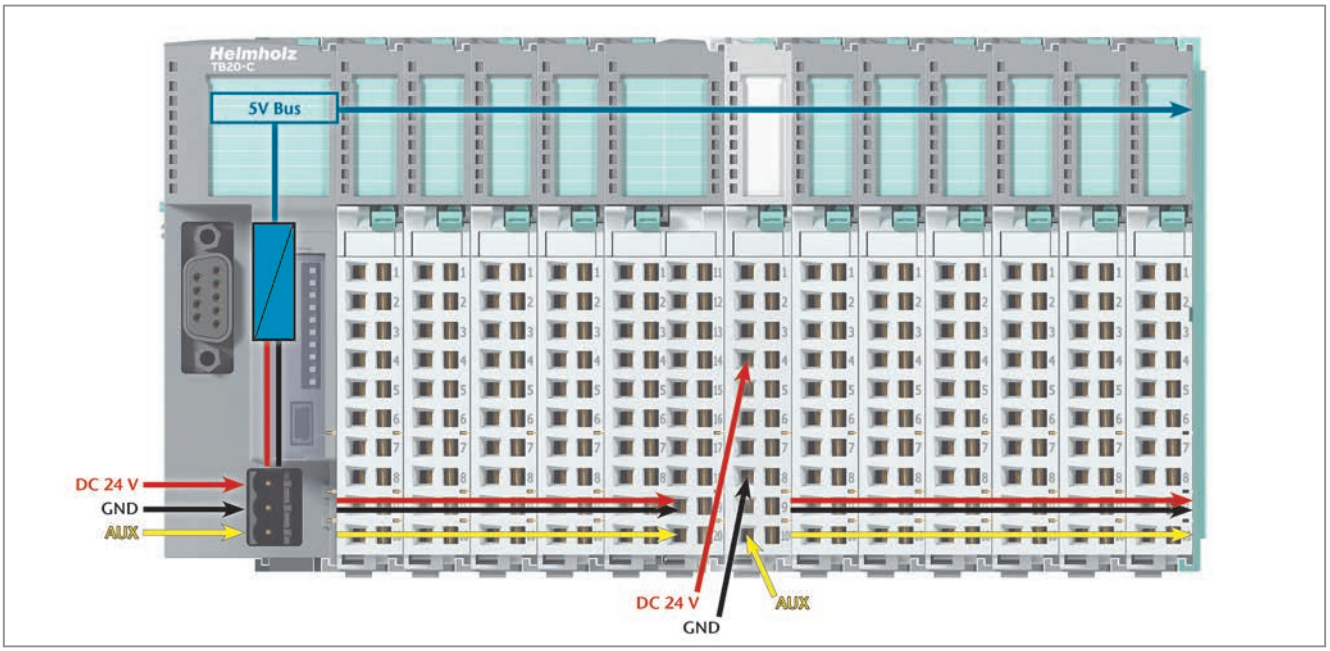






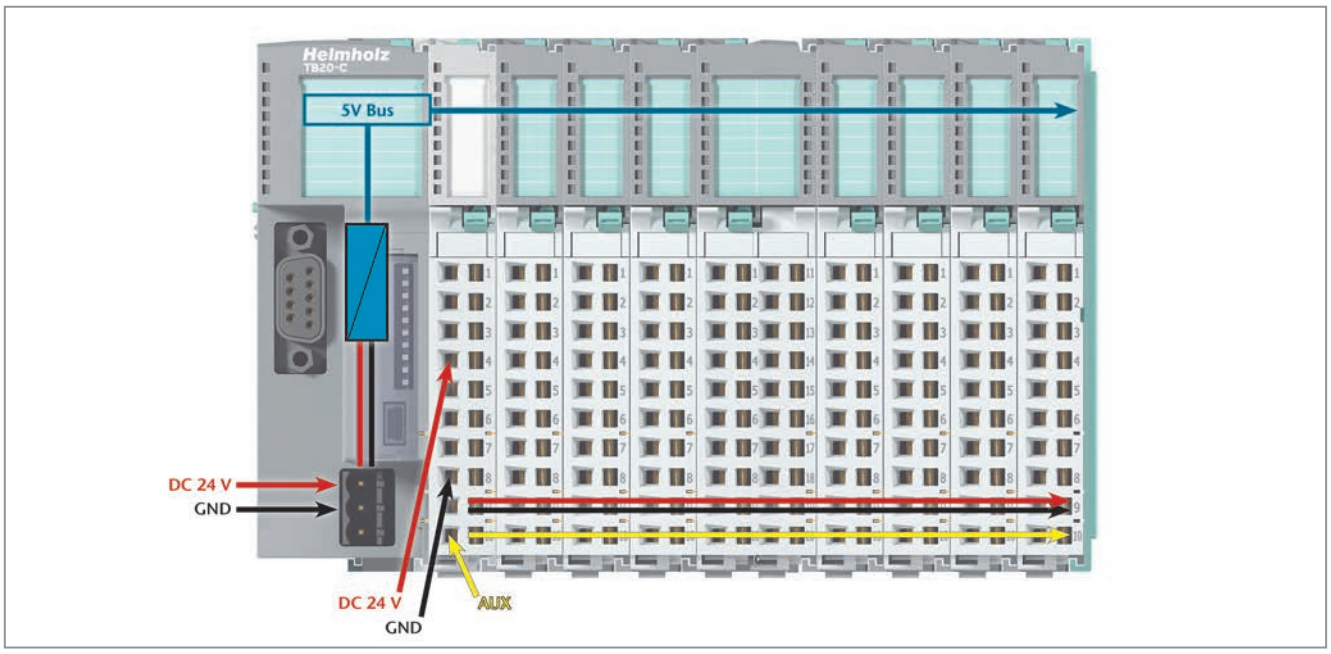
I/O modules powered directly, no power module required

The load voltage for the outputs can be supplied directly from the bus coupler, rendering the use of a power module unnecessary.



Power and isolation module for a new power supply section (segment)

If you want to segment the power supply, you can use a power and isolation module.
A power and isolation module will segment the 24 V load voltage on the left and power the modules that follow it.



Separate power supply segments for the coupler and the I/O components

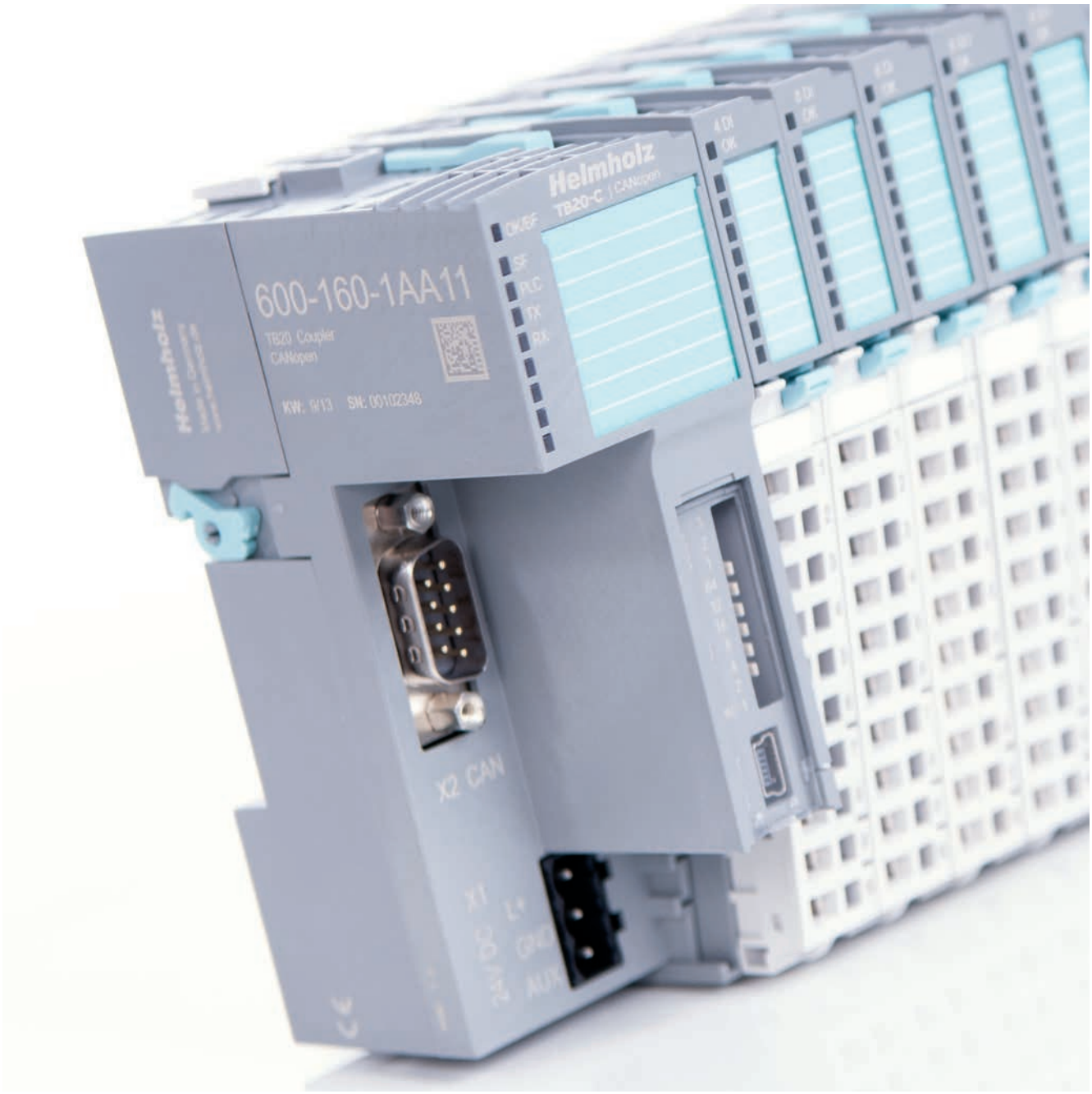
If you want the loads to be completely powered by a different power supply or connected only until later on, a power and isolation module needs to be added right after the coupler.

General technical specifications

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

In order to obtain ordering information for all TB20 manuals, please refer to page 133 . All manuals are available in German and English and can also be downloaded on the Internet at www.helmholz.com.

General technical specifications	
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



Bus Couplers

PROFINET IO
PROFIBUS-DP
CANopen®
Modbus/TCP
EtherNet/IP
EtherCAT

PROFINET IO

The PROFINET bus coupler is designed to connect a PROFINET bus to TB20 peripheral modules.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 63 modules of any kind connected in series with the bus coupler. The bus coupler supports hot-plug for replacing modules during operation.
In addition, it will recognize all connected peripheral modules and assign each module the corresponding inputs/outputs from the process image table.

PROFINET bus coupler with Power over Ethernet (PoE):
A PROFINET bus coupler version featuring Power over Ethernet (PoE) will soon be available as well.
This bus coupler will make it possible to run a distributed I/O station with nothing more than an Ethernet cable.

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- I/O device as per PROFINET IO (61158-6-10)
- Integrated two-port switch
- Full-duplex transmission rate of 100 Mbps
- 344 bytes of input data; 344 bytes of output data
- Up to 63 peripheral modules
- Modules can be replaced during operation (hot-plug)
- Conformance Class C (IRT)
- Media Redundancy Protocol (MRP)
- Automatic addressing / hot-swapping (LLDP, DCP)
- Topology discovery
- 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)
- 7 LEDs, two of them bi-color
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)
- Concealed "factory reset" switch for restoring the module to its factory settings

Technical specifications/Ordering data	
TB20-C, PROFINET IO bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-180-1AA11**
PROFINET interfaces	
· Protocol	PROFINET IO as defined in IEC 61158-6-10
· Physical layer	Ethernet
· Transmission rate	100 Mbps, full-duplex
· I/O image table size	344/344 bytes
· Connector	Two 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	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	63
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
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 For UL applications: 0 °C to 50 °C
Transport and storage temperature	-20 °C to 80 °C

PROFIBUS-DP

The PROFIBUS DP bus coupler is designed to connect a PROFIBUS bus to TB20 peripheral modules. It supports the DP-V0 and DP-V1 protocols.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 64 modules of any kind connected in series with the bus coupler. The bus coupler supports hot-plug for replacing modules during operation.
In addition, it will recognize all connected peripheral modules and assign each module the corresponding inputs/outputs from the process image table.

Bit packing:
Starting with firmware version 1.20, the states of 2-bit and 4-bit I/O modules can be packed together in bytes, making it possible to take full advantage of all the space in the process image table.

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- PROFIBUS DP slave as defined in EN 50170/IEC 61158
- Supports all PROFIBUS baud rates
- DP-V0 and DP-V1 support
- Up to 64 peripheral modules
- Modules can be replaced during operation (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)
- Bit packing for 2-bit and 4-bit modules
- 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 setting the PROFIBUS address; can be covered
- 3 LEDs, two of them bi-color
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)

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
- Submodule status: On | Off
- Channel-related diagnostics: On | Off

Technical specifications/Ordering data	
TB20-C, PROFIBUS DP slave bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-151-1AA11**
PROFIBUS interface	
· Protocol	PROFIBUS DP/V0 & DP/V1 as defined in EN 50170
· Baud rate	9.6 Kbaud to 12 Mbaud, automatic detection
· I/O image table size	244 / 244 bytes
· Parameter configuration length	244 bytes
· Interface	RS-485
· Connector	9-pin D-sub female connector
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	64
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
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 For UL applications: 0 °C to 50 °C
Transport and storage temperature	-20 °C to 80 °C

CANopen®

The CANopen® bus coupler is designed to connect a CAN bus to TB20 peripheral modules. It supports the CANopen® protocol as defined in DS 301 and uses the DSP-401 profile for digital and analog I/O modules.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 64 modules of any kind connected in series with the bus coupler. The bus coupler supports hot-plug for replacing modules during operation.
In addition, this coupler makes it possible to use SDOs to freely access all I/O values, parameters, and diagnostics, and can manage up to 192 bytes of I/O data with the PDO protocol.

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- CANopen® protocol as defined in DSP301 and DS401
- Baud rates of 50 kbps to 1 Mbps
- 24 TPDOs / 24 RPDOs
- One SDO server
- Heartbeat producer
- Two heartbeat consumers
- Node guarding
- SYNC object
- Storable parameter configuration
- Up to 64 peripheral modules
- Modules can be replaced during operation (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 switch for setting the node ID and baud rate; can be covered
- 5 LEDs, two of them bi-color
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)

Technical specifications/Ordering data	
TB20-C, CANopen® slave bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-160-1AA11**
CAN interface	
· Protocol	CANopen® as defined in DSP301 V4.2 and DS401 V3.0
· Baud rate	50, 100, 125, 250, 500, 800, 1000 kbps
· TPDOs	24
· RPDOS	24
· Interface	ISO 11898-2
· Connector	9-pin D-sub male connector
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	64
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
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 For UL applications: 0 °C to 50 °C
Transport and storage temperature	-20 °C to 80 °C

Modbus/TCP

Modbus/TCP

The Modbus/TCP bus coupler makes it possible to access data from peripheral modules using the Modbus/TCP protocol.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 64 modules of any kind connected in series with the bus coupler. The bus coupler supports hot-plug for replacing modules during operation.
It detects peripheral modules that are plugged in and assigns the I/O data and parameters of each module to the corresponding Modbus registers.
The Modbus/TCP bus coupler features an integrated two-port switch that allows for star and line topology configurations.
A large I/O image table size of 2 kbytes makes it possible to implement comprehensive and complex systems.
The control and status registers can be used to configure and monitor the coupler's behavior with Modbus/TCP.
TB20 ToolBox can be used to easily configure the system and the various module parameters and transfer the corresponding settings to the coupler.

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- Watchdog for monitoring the connection
- Simultaneous access to up to 10 stations (TCP connections)
- Integrated two-port switch
- Up to 64 peripheral modules
- Modules can be replaced during operation (hot-plug)
- Two RJ45 connectors
- 2048 bytes of input data; 2048 bytes of output data
- 126 bytes of parameter data per module
- The coupler's behavior can be configured using control registers
- The coupler's state can be read using status registers
- Supports module diagnostics
- 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, two of them bi-color
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)
- Concealed "factory reset" switch for restoring the module to its factory settings

Technical specifications/Ordering data	
TB20-C, Modbus/TCP bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-170-1AA11**
Ethernet interfaces	
· Protocol	Modbus/TCP
· Transmission rate	10/100 Mbps, automatic detection (auto-negotiation, auto-crossover)
· I/O image table size	2048/2048 bytes
· Parameters per module	126 bytes
· Connector	Two RJ45, integrated switch
· Supports Modbus function codes	1, 2, 3, 4, 5, 6, 15, 16, 22, 23
· TCP connections	10 stations
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	64
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
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 For UL applications: 0 °C to 50 °C
Transport and storage temperature	-20 °C to 80 °C

EtherNet/IP

The EtherNet/IP bus coupler makes it possible to access data from peripheral modules using the EtherNet/IP protocol.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 64 modules of any kind connected in series with the bus coupler. The bus coupler supports hot-plug for replacing modules during operation.
It detects peripheral modules that are plugged in and allows access to the modules' I/O data via input/output assemblies.
The EtherNet/IP bus coupler features an integrated two-port switch that allows for star and line topology configurations.
A large I/O image table size of one kbyte makes it possible to implement comprehensive and complex systems.
TB20 ToolBox can be used to easily configure the system and the various module parameters and transfer the corresponding settings to the coupler.

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- Supports unicast and multicast CIP connections
- 511 bytes of input assembly data; 511 bytes of output assembly data
- TB20 ToolBox can be used for easy access to assembly sizes and to the structure of the image table within the assemblies
- Up to 64 peripheral modules
- Modules can be replaced during operation (hot-plug)
- Implicit messaging (transport class 1)
- Explicit messaging (transport class 3)
- TCP watchdog
- IP address can be set relative to a base IP address by using a DIP switch that can be covered
- DHCP (can be selected using DIP switch)
- Integrated two-port switch with two RJ45 connectors
- Module process data is automatically assigned to the EtherNet/IP mapping
- 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, three of them bi-color
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)
- Concealed "factory reset" switch for restoring the module to its factory settings

Technical specifications/Ordering data	
TB20-C, EtherNet/IP bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-175-1AA11**
Ethernet interfaces	
· Protocol	EtherNet/IP
· Transmission rate	10/100 Mbps, automatic detection (auto-negotiation, auto-crossover)
· Input/output assembly size	511/511 bytes
· Connector	Two RJ45, integrated switch
· Protocol transmission model	Implicit messaging (transport class 1) Explicit messaging (transport class 3)
· IP address	Can be set with software and/or DIP switch
· DHCP	Yes; can be selected using DIP switch
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	64
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
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 For UL applications: 0 °C to 50 °C
Transport and storage temperature	-20 °C to 80 °C

EtherCAT

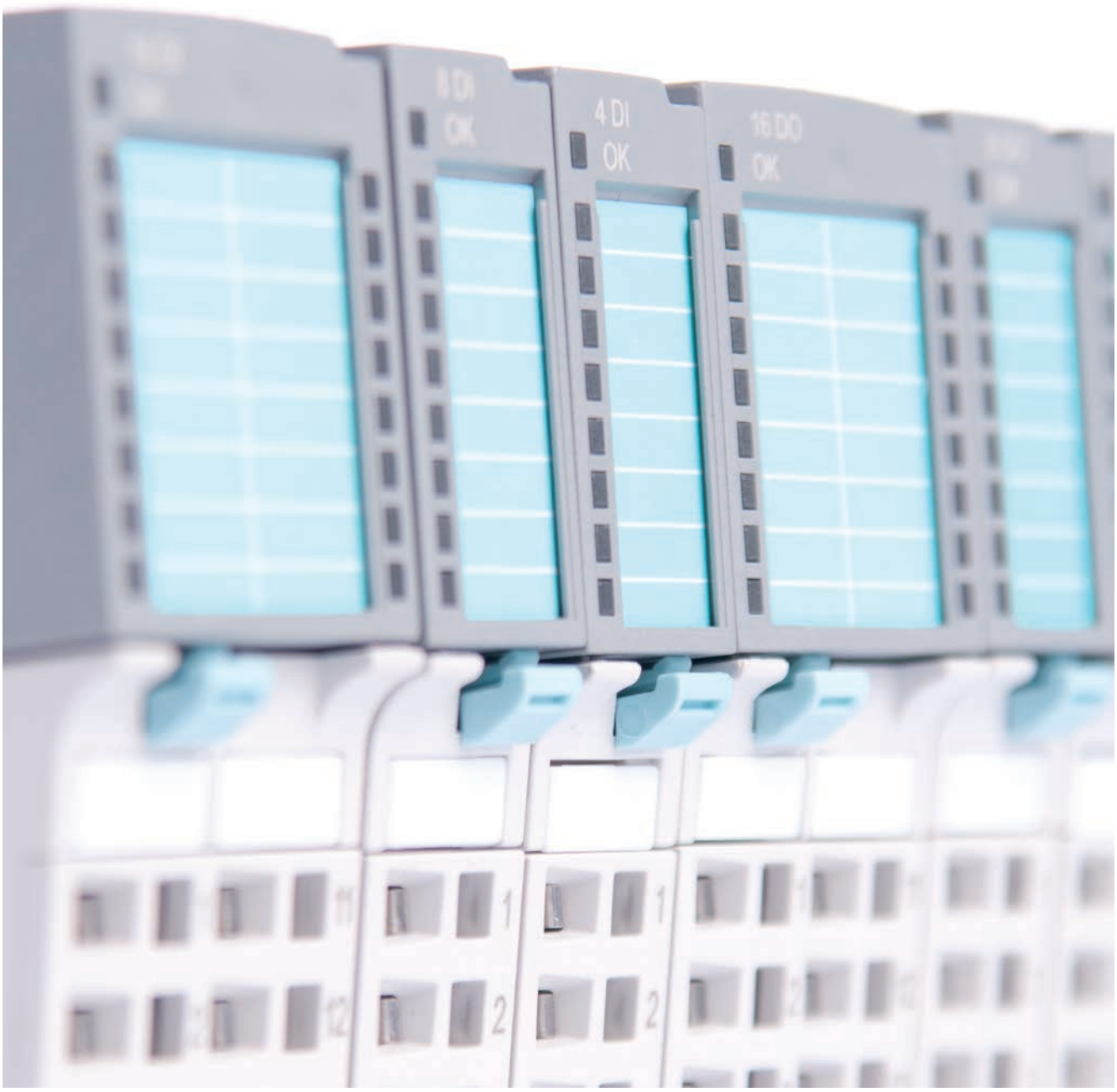
The EtherCAT bus coupler makes it possible to access data from peripheral modules using the EtherCAT protocol.
A functioning TB20 configuration will always require a bus coupler and at least one peripheral module, but can accommodate up to 64 modules of any kind connected in series with the bus coupler.
It detects peripheral modules that are plugged in and can assign the corresponding I/O data to an EtherCAT mapping automatically.
The EtherCAT bus coupler supports the Modular Device Profile.
A large I/O image table size of 1,024 bytes makes it possible to implement comprehensive and complex systems.
TB20 ToolBox can be used to easily configure the system and the various module parameters and transfer the corresponding settings to the coupler.
Alternatively, the configuration can also be edited using the CoE object dictionary.
Finally, running TB20 systems can be diagnosed in real-time and set up for testing purposes if an EtherCAT master is not yet connected (simulation / I/O check).

Note:
The 24 V power supply connector, the final bus cover, and the base module are included as standard.
TB20 ToolBox makes it easy to methodically design TB20 systems. Integrated terminal mapping, system width calculations, and current-carrying capacity monitoring all make it possible to quickly design systems without making any mistakes.

Characteristics

- EtherCAT slave with Modular Device Profile (MDP) support
- Two EtherCAT ports (RJ45, 100BASE-TX)
- Up to 64 peripheral modules
- Modules can be replaced during operation (hot-plug)
- Automatic module I/O data mapping
- 1024 bytes of input data; 1024 bytes of output data
- 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 used as indicators for the current coupler, EtherCAT, and the link/activity status
- USB device port for online diagnostics, configuring parameters, setup, and firmware updates with "TB20 ToolBox"
- Can be alternatively configured, including its parameters, using the CoE protocol
- TB20 ToolBox simulation for setting up the I/O system without a higher-level controller in order to test the system's operation (I/O check)
- Concealed "factory reset" switch for restoring the module to its factory settings

Technical specifications/Ordering data	
TB20-C, EtherCAT bus coupler comes with 24 V power supply connector, final bus cover, base module	**600-185-1AA11**
EtherCAT interfaces	
· Protocol	EtherCAT
· Transmission rate	100 Mbps
· I/O image table size	1024/1024 bytes
· Connector	Two RJ45
· EtherCAT functions	Modular Device Profile, CoE object dictionary, automatic mapping
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Number of modules that can be connected in series	64
Voltage supply	24 VDC, 18–28 VDC
Current draw without modules (internal)	150 mA
Power dissipation	Max. 8.5 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	130 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



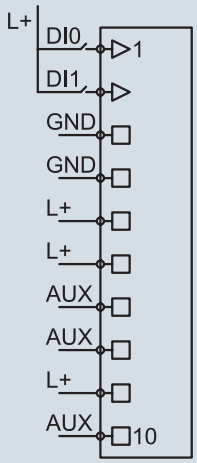
Digital Input/Output Modules

Digital In
Digital Out
Digital Mix

DI 2 x 24 VDC

DI 2 x 24 VDC

Pin 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



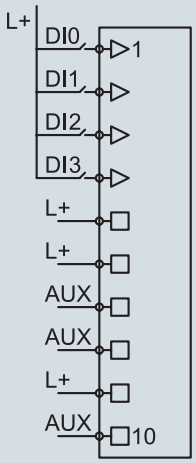
Characteristics

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

Technical specifications/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 low 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
Certifications	CE, UL

DI 4 x 24 VDC

Pin 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



Characteristics

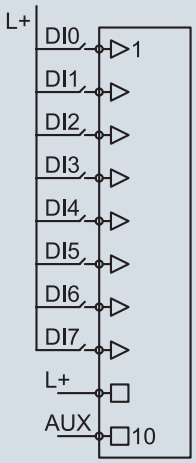
· 4 inputs, electrically isolated from the backplane bus
· 24 VDC input voltage
· Can accommodate two-wire proximity sensors
· A blue LED indicates the module's operating status
· Green LEDs (one for each input) indicate the inputs' states

Technical specifications/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 low 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
Certifications	CE, UL

DI 8 x 24 VDC

DI 8 x 24 VDC

Pin 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



Characteristics

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

Technical specifications/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 low 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
Certifications	CE, UL

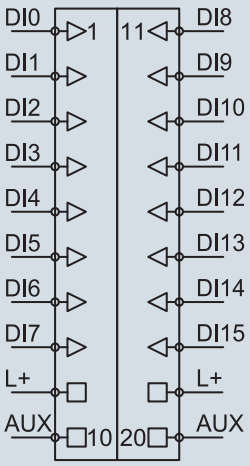
DI 16 x 24 VDC

Characteristics

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

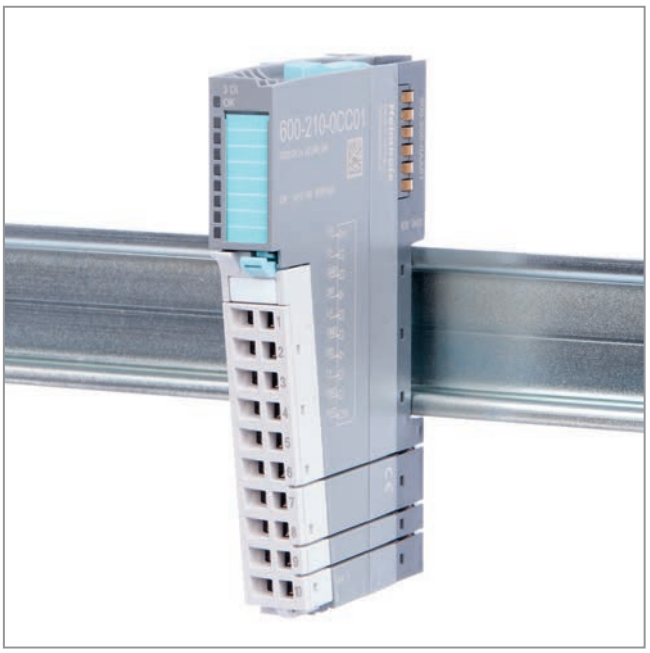
Pin Assignment

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



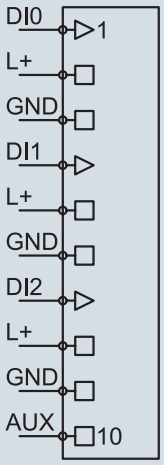
Technical specifications/Ordering data	
Digital input module – DI 16 x 24 VDC	**600-210-0AP21**
Number of inputs	16
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 23 mA
Power dissipation	Max. 3.7 W
Input characteristic curve	Type 2, EN 61131-2
Reverse polarity protection for inputs	Yes
Input voltage · For low signal ("0") · For low 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
Certifications	CE, UL

DI 3 x 24 VDC, 3-wire



DI 3 x 24 VDC, 3-wire

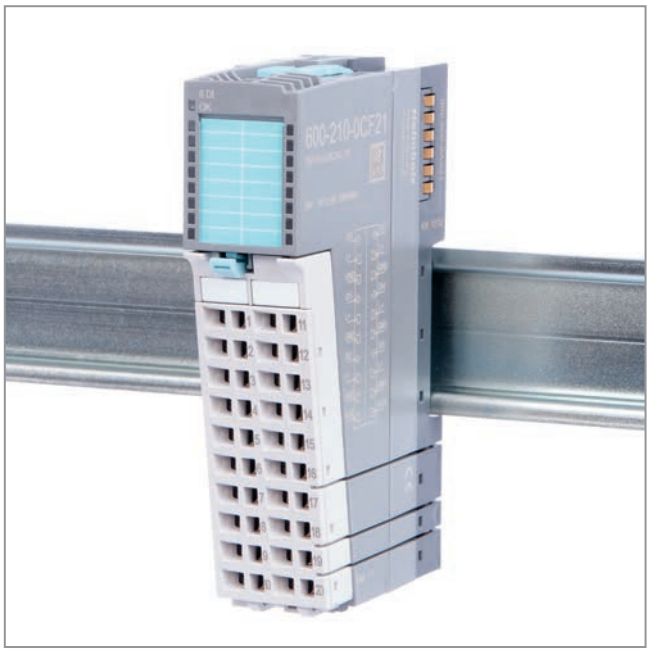
Pin Assignment	
Terminal	**Assignment**
1	Input 0
2	L+, 24 VDC
3	GND
4	Input 1
5	L+, 24 VDC
6	GND
7	Input 2
8	L+, 24 VDC
9	GND
10	AUX



Characteristics

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

Technical specifications/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 low 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
Certifications	CE, UL



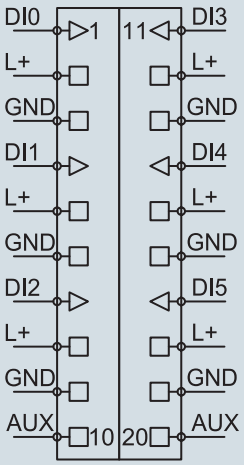
DI 6 x 24 VDC, 3-wire

Characteristics

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

Pin 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

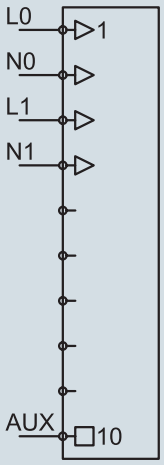


Technical specifications/Ordering data	
Digital input module – DI 6 x 24 VDC, 3-wire	**600-210-0CF21**
Number of inputs	6
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Max. 0 mA Max. 22 mA
Power dissipation	Max. 1.4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

DI 2 x 230 VAC, per channel N, type 1

DI 2 x 230 VAC, per channel N, type 1

Pin 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



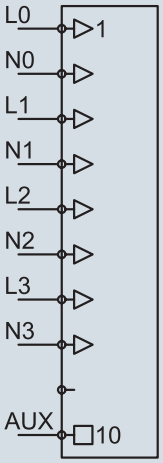
Characteristics

- 2 inputs, electrically isolated from the backplane bus
- 110– 230 VAC input voltage
- Each channel has its own individual neutral conductor terminal
- A blue LED indicates the module's operating status
- Green LEDs (one for each input) indicate the inputs' states

Technical specifications/Ordering data	
Digital input module – DI 2 x 230 VAC, per channel 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 low 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
Certifications	CE, UL

DI 4 x 230 VAC, per channel N, type 1

Pin 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



Characteristics

- 4 inputs, electrically isolated from the backplane bus
- 110– 230 VAC input voltage
- Each channel has its own individual neutral conductor terminal
- A blue LED indicates the module's operating status
- Green LEDs (one for each input) indicate the inputs' states

Technical specifications/Ordering data	
Digital input module – DI 4 x 230 VAC, per channel 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 low 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
Certifications	CE, UL

DI 8 x 230 VAC, per channel N, type 1

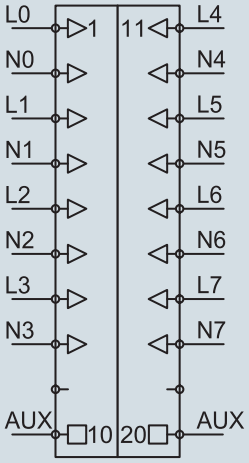
DI 8 x 230 VAC, per channel N, type 1

Characteristics

- 8 inputs, electrically isolated from the backplane bus
- 110– 230 VAC input voltage
- Each channel has its own individual neutral conductor terminal
- A blue LED indicates the module's operating status
- Green LEDs (one for each input) indicate the inputs' states

Pin Assignment

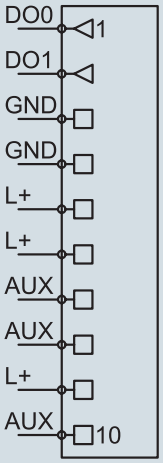
Terminal	Assignment	Terminal	Assignment
1	Input 0 L	11	Input 4 L
2	Input 0 N	12	Input 4 N
3	Input 1 L	13	Input 5 L
4	Input 1 N	14	Input 5 N
5	Input 2 L	15	Input 6 L
6	Input 2 N	16	Input 6 N
7	Input 3 L	17	Input 7 L
8	Input 3 N	18	Input 7 N
9		19	
10	AUX	20	AUX



Technical specifications/Ordering data	
Digital input module – DI 8 x 230 VAC, per channel 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 low 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
Certifications	CE, UL

DO 2 x 24 VDC, 500 mA

Pin 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



Characteristics

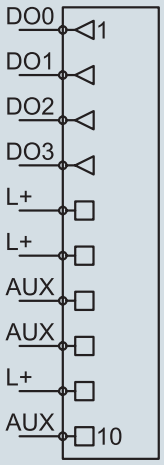
- 2 outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the module's operating status
- Green LEDs (one for each output) indicate the outputs' states

Technical specifications/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 individual 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
Certifications	CE, UL

DO 4 x 24 VDC, 500 mA

DO 4 x 24 VDC, 500 mA

Pin 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



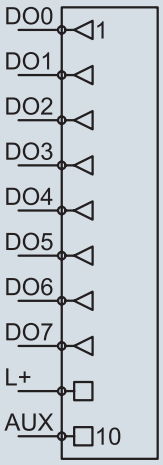
Characteristics

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

Technical specifications/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 individual 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
Certifications	CE, UL

DO 8 x 24 VDC, 500 mA

Pin 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



Characteristics

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

Technical specifications/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 individual 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
Certifications	CE, UL

DO 16 x 24 VDC, 500 mA

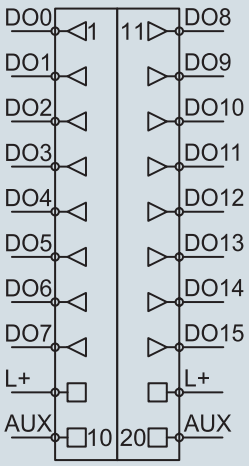
DO 16 x 24 VDC, 500 mA

Characteristics

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

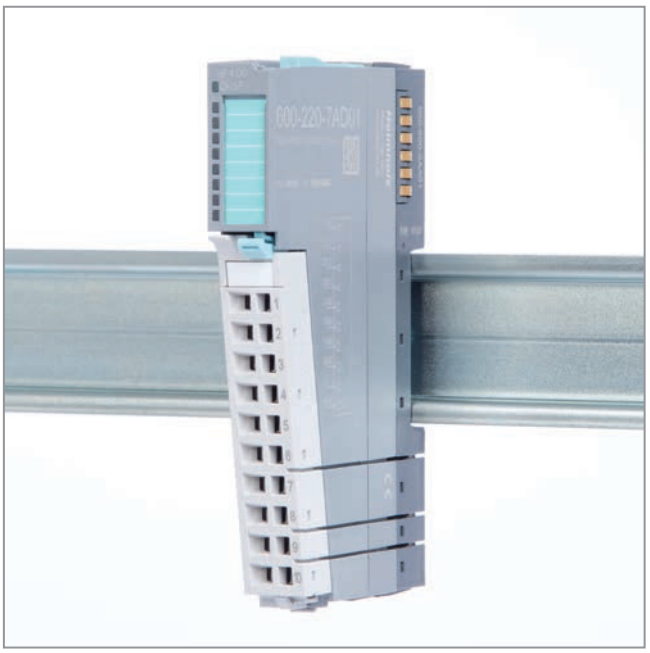
Pin Assignment

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



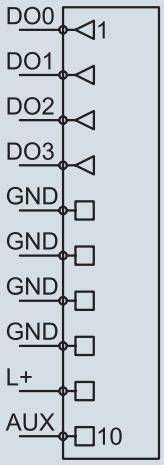
Technical specifications/Ordering data	
Digital output module – DO 16 x 24 VDC, 500 mA	**600-220-0AP21**
Number of outputs	16
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Supply voltage U_P, U_S · Rated · Ripple U_{SS} · Permissible range (with ripple) · 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 individual 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
Certifications	CE, UL

DO 4 x 24 VDC, 700 mA, Highfeature



DO 4 x 24 VDC, 700 mA, Highfeature

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



Characteristics

- 4 outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 700 mA output voltage per channel
- A blue LED indicates the module's operating status
- Green/red LEDs indicate the outputs' states
- 24 V load voltage monitoring and diagnosis
- Short circuit to GND monitoring and diagnosis for each individual channel
- Channel status information in input image table
- Pulse stretching: 5 ms–1,275 ms
- Overtemperature detection

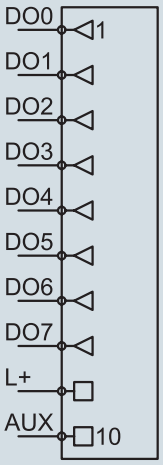
Channel LED signals

Off	Output off
Solid green light	Output on
Solid red light	24 V load voltage (L+) missing
Flashing red light	Short circuit to GND detected

Technical specifications/Ordering data	
Digital output module – DO 4 x 24 VDC, 700 mA, HF	**600-220-7AD01**
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	 700 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 40 mA + load Max. 30 mA
Power dissipation	Max. 1.0 W
Output short-circuit protection	Electronic, for each individual channel, diagnosis
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
Certifications	CE, UL pending

DO 8 x 24 VDC, 700 mA, Highfeature

Pin 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



Characteristics

- 8 outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 700 mA output voltage per channel
- A blue LED indicates the module's operating status
- Green/red LEDs indicate the outputs' states
- 24 V load voltage monitoring and diagnosis
- Short circuit to GND monitoring and diagnosis for each individual channel
- Channel status information in input image table
- Pulse stretching: 5 ms–1,275 ms
- Overtemperature detection

Channel LED signals

Off	Output off
Solid green light	Output on
Solid red light	24 V load voltage (L+) missing
Flashing red light	Short circuit to GND detected

Technical specifications/Ordering data	
Digital output module – DO 8 x 24 VDC, 700 mA, HF	**600-220-7AH01**
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	 700 mA Max. 0.5 mA
Current draw · External · Internal	 Max. 40 mA + load Max. 35 mA
Power dissipation	Max. 1.0 W
Output short-circuit protection	Electronic, for each individual channel, diagnosis
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
Certifications	CE, UL pending

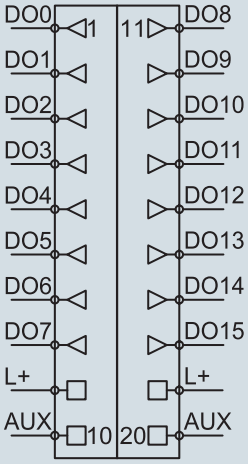
DO 16 x 24 VDC, 700 mA, Highfeature

DO 16 x 24 VDC, 700 mA, Highfeature

Characteristics

- 16 outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 700 mA output voltage per channel
- A blue LED indicates the module's operating status
- Green/red LEDs indicate the outputs' states
- 24 V load voltage monitoring and diagnosis
- Short circuit to GND monitoring and diagnosis for each individual channel
- Channel status information in input image table
- Pulse stretching: 5 ms–1,275 ms
- Overtemperature detection

Pin 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



Channel LED signals

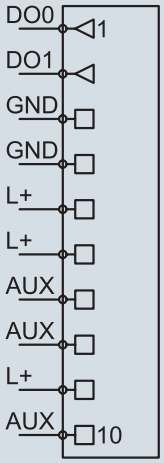
Off	Output off
Solid green light	Output on
Solid red light	24 V load voltage (L+) missing
Flashing red light	Short circuit to GND detected

Technical specifications/Ordering data	
Digital output module – DO 16 x 24 VDC, 700 mA, HF	**600-220-7AP21**
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 · All channels together	 700 mA Max. 0.5 mA Max. 8 A
Current draw · External · Internal	 Max. 80 mA + load Max. 40 mA
Power dissipation	Max. 2.5 W
Output short-circuit protection	Electronic, for each individual channel, diagnosis
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
Certifications	CE, UL pending

DO 2 x 24 VDC, 2 A

DO 2 x 24 VDC, 2 A

Pin 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



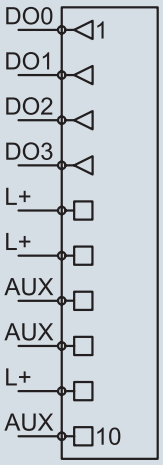
Characteristics

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

Technical specifications/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 individual 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
Certifications	CE, UL

DO 4 x 24 VDC, 2 A

Pin 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



Characteristics

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

Technical specifications/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 individual 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
Certifications	CE, UL

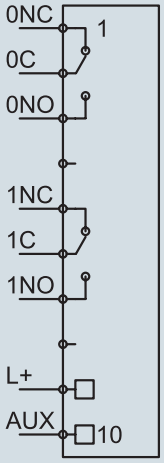
DO 2 x relays, 5 A, 230 VAC, changeover

DO 2 x relays, 5 A, 230 VAC, changeover

Characteristics

- Dry contact switching
- Two changeover relays
- 5 A output voltage per relay
- Up to 230 VAC switching voltage per relay
- Switching operation counter: two input words (switching operations *1,000)
- Transient filter for protection against high-frequency relay switching (10 Hz)
- A blue LED indicates the module's operating status
- Green LEDs (one for each output) indicate the outputs' states

Pin 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 specifications/Ordering data	
Digital output module – DO 2 x relays, 5 A, 230 VAC, changeover	**600-222-0AB01**
Number of outputs	4 (two changeover 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
· Rated voltage / max. switching voltage	250 VAC / 400 VAC
· Max. switching power for utilization category AC-1	1,500 VA
· Max. switching power for utilization category AC-15 (230 VAC)	300 VA
· Single-phase motor load, utilization category AC-3 – running (230 VAC)	0.185 kW
· Max. switching current for utilization category DC-1: 30/110/220 V	6/0.2/0.12 A
· Min. switching capacity	500 mW (12 V / 10 mA)
· Mechanical life	10 * 10^6 switching operations
· Electrical life for utilization category AC-1	60,000 switching operations
· Dielectric strength, coil to contact	6 kV (8 mm)
· Dielectric strength across 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
Certifications	CE, UL

DO 4 x relays, 5 A, 230 VAC, changeover

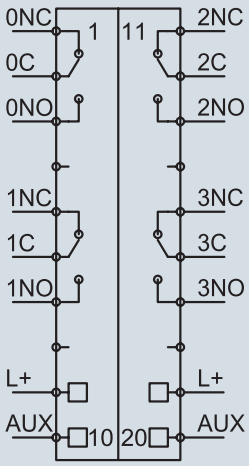
DO 4 x relays, 5 A, 230 VAC, changeover

Characteristics

- Dry contact switching
- Four changeover relays
- 5 A output voltage per relay
- Up to 230 VAC switching voltage per relay
- Switching operation counter: four input words (switching operations *1,000)
- Transient filter for protection against high-frequency relay switching (10 Hz)
- A blue LED indicates the module's operating status
- Green LEDs (one for each output) indicate the outputs' states

Pin 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

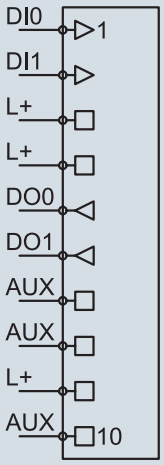


Technical specifications/Ordering data	
Digital output module – DO 4 x relays, 5 A, 230 VAC, changeover	**600-222-0AD21**
Number of outputs	8 (four changeover relays)
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Supply voltage U_P, U_S · Rated · Ripple 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
· Rated voltage / max. switching voltage	250 VAC / 400 VAC
· Max. switching power for utilization category AC-1	1,500 VA
· Max. switching power for utilization category AC-15 (230 VAC)	300 VA
· Single-phase motor load, utilization category AC-3 – running (230 VAC)	0.185 kW
· Max. switching current for utilization category DC-1: 30/110/220 V	6/0.2 /0.12 A
· Min. switching capacity	500 mW (12 V / 10 mA)
· Mechanical life	10 * 10^6 switching operations
· Electrical life for utilization category AC-1	60,000 switching operations
· Dielectric strength, coil to contact	6 kV (8 mm)
· Dielectric strength across 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
Certifications	CE, UL

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

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

Pin 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



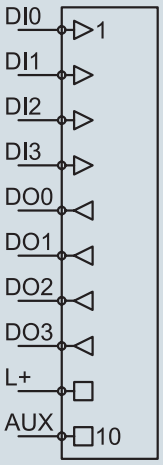
Characteristics

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

Technical specifications/Ordering data	
Digital mixed 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 low 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 individual 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
Certifications	CE, UL

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

Pin 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



Characteristics

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

Technical specifications/Ordering data	
Digital mixed 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 low 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 individual 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
Certifications	CE, UL

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

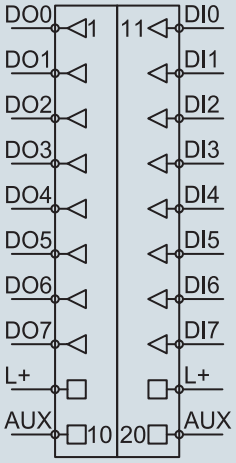
DIO 8 x Out/8 x In 24 VDC, 500 mA

Characteristics

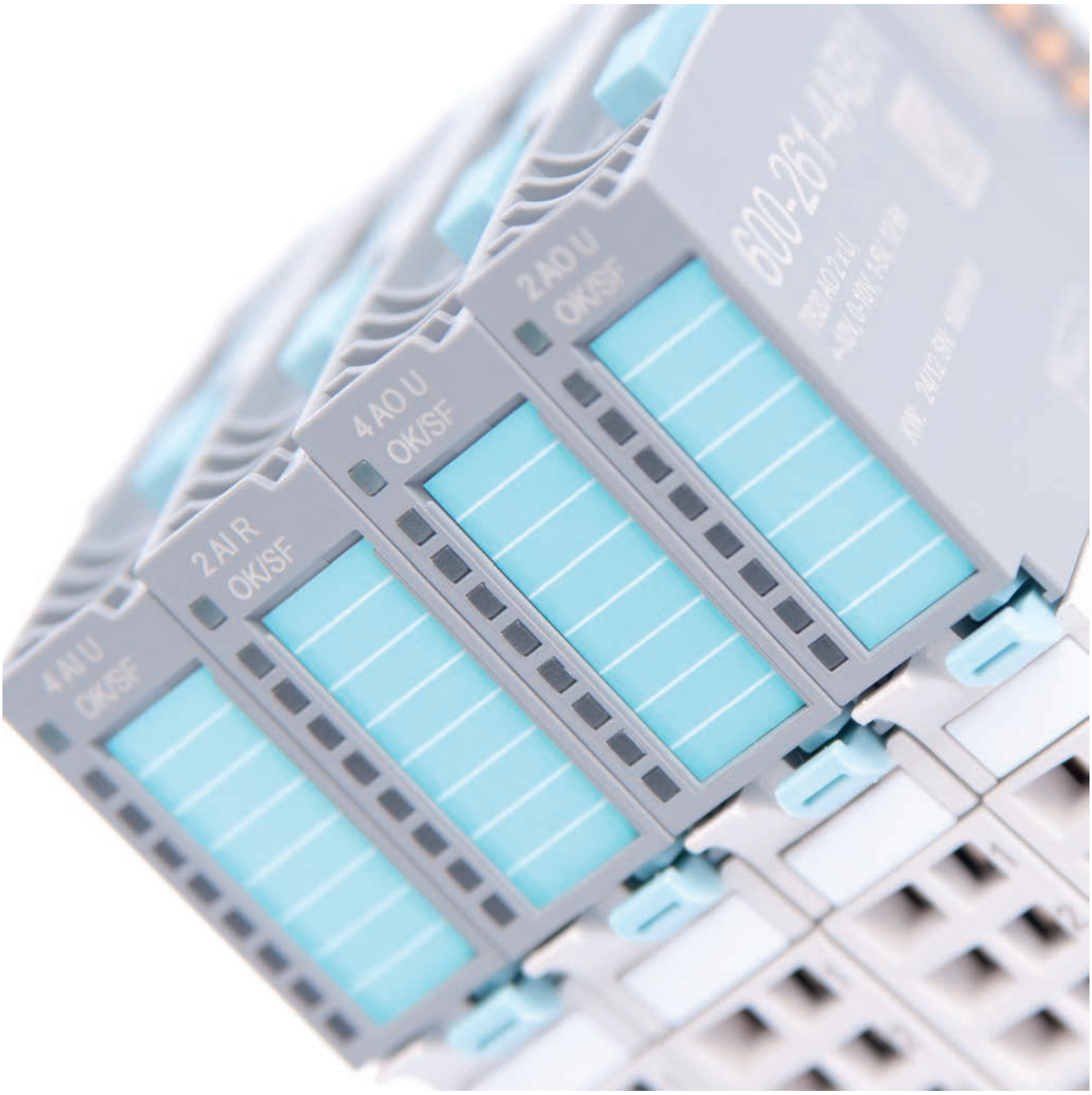
- 8 inputs, electrically isolated from the backplane bus
- 24 VDC input voltage
- Can accommodate two-wire proximity sensors
- 8 outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 500 mA output voltage per channel
- A blue LED indicates the module's operating status
- Green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

Pin 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 specifications/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 low 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 individual 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
Certifications	CE, UL



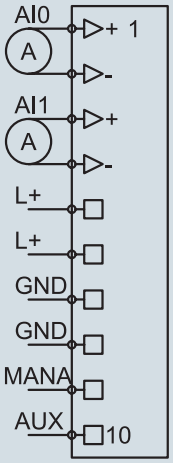
Analog Input/Output Modules

Analog In
Analog Out

AI 2 x I, 0/4–20 mA, ±20 mA, 12 Bit

AI 2 x I, 0/4–20 mA, ±20 mA, 12 Bit

Pin 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



Characteristics

- 2 analog inputs for measuring current, electrically isolated from the backplane bus
- 2 process input words
- Measuring ranges: 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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

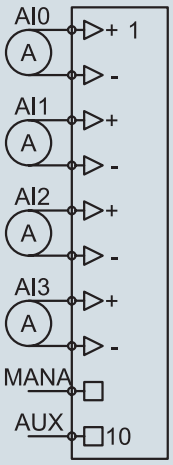
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

AI 4 x I, 0/4–20 mA, ±20 mA, 12 Bit

AI 4 x I, 0/4–20 mA, ±20 mA, 12 Bit

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



Characteristics

- 4 analog inputs for measuring current, electrically isolated from the backplane bus
- 4 process input words
- Measuring ranges: 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
- Overflow / underflow diagnosis: On | Off
- Representation values: SIMATIC* S7 | SIMATIC* S5

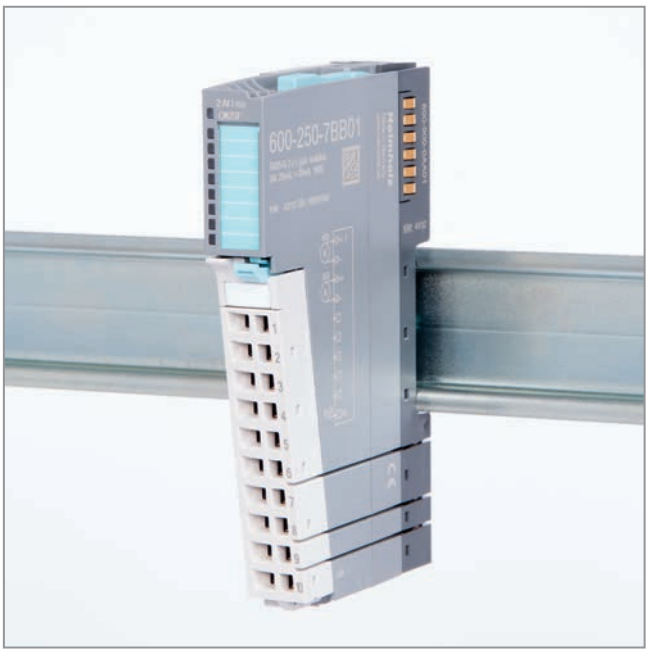
Parameters for each channel

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

* SIMATIC is a registered trademark of Siemens AG.

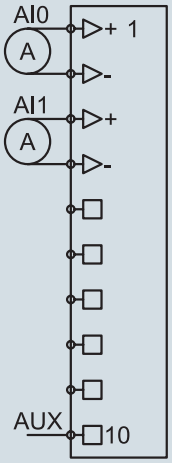
Technical specifications/Ordering data	
Analog input module – AI 4 x I, 0/4–20 mA, ±20 mA, 12 Bit	**600-250-4AD01**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 Not needed Max. 95 mA
Power dissipation	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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

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

Pin 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



Characteristics

- 2 analog inputs for measuring current
- Channels electrically isolated from each other and from the backplane bus
- 2 process input words
- Measuring ranges: 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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

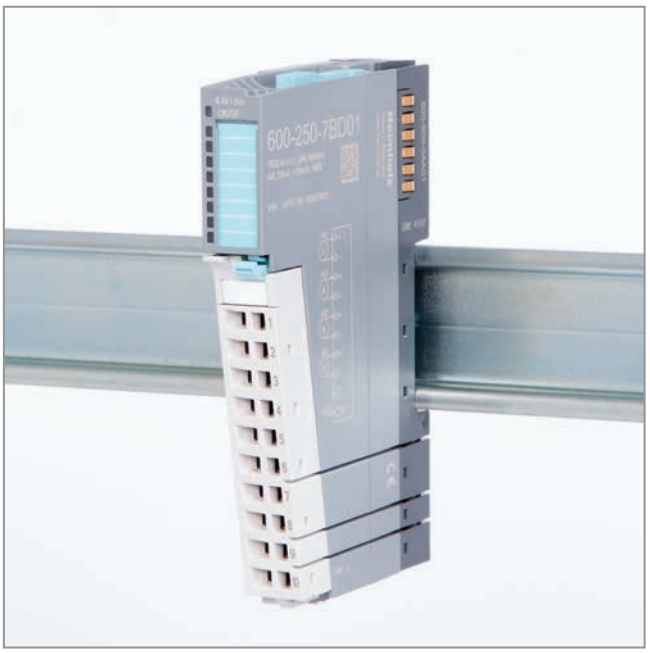
* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

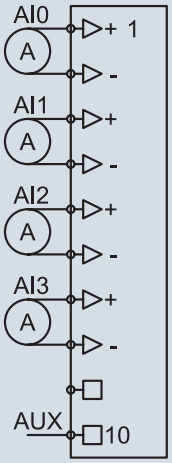
Technical specifications/Ordering data	
Analog input module – AI 2 x I, 0/4–20 mA, ±20 mA, Iso., 16 Bit	**600-250-7BB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power 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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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

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



Characteristics

- 4 analog inputs for measuring current
- Channels electrically isolated from each other and from the backplane bus
- 4 process input words
- Measuring ranges: 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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

Technical specifications/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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2.5 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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

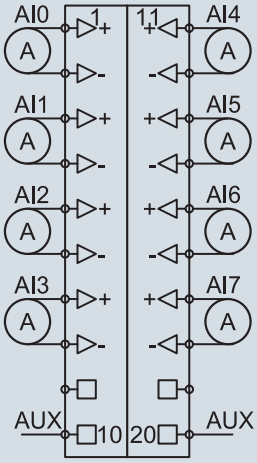
AI 8 x I, 0/4–20 mA, ±20 mA, Iso., 16 Bit

Characteristics

- 8 analog inputs for measuring current
- Channels electrically isolated from each other and from the backplane bus
- 8 process input words
- Measuring ranges: 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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Pin 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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges:
  Disabled | 0–20 mA | 4–20 mA | ±20 mA
- Limit value alarms enabled: On | Off
- Upper/lower limit: 16-bit analog value (±27648)

* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

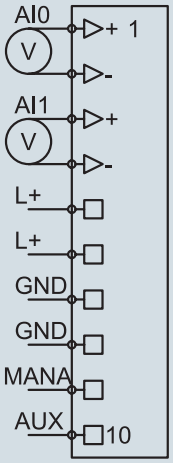
Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

Technical specifications/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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 3 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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

Pin 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



Characteristics

- 2 analog inputs for measuring voltage, electrically isolated from the backplane bus
- 2 process input words
- Measuring ranges: 0–10 V, 1–5 V, ±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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 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)

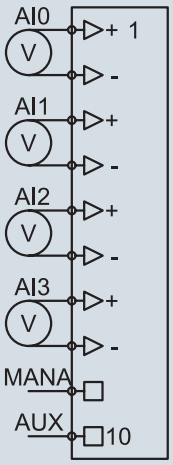
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

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

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



Characteristics

- 4 analog inputs for measuring voltage, electrically isolated from the backplane bus
- 4 process input words
- Measuring ranges: 0–10 V, 1–5 V, ±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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 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)

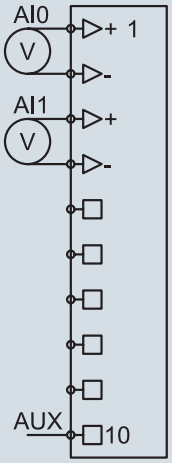
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

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

Pin 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



Characteristics

- 2 analog inputs for measuring voltage
- Channels electrically isolated from each other and from the backplane bus
- 2 process input words
- Measuring ranges: 0–10 V, 1–5 V, ±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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 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)

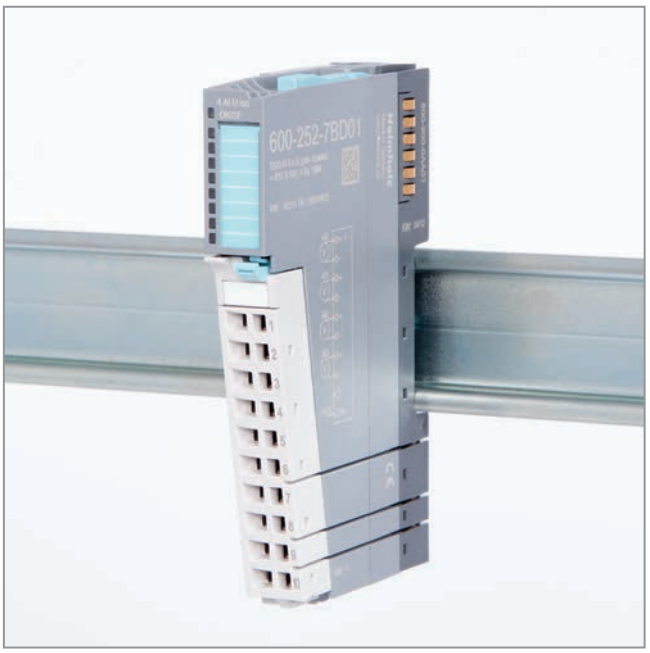
* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

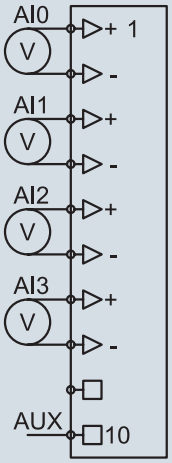
Technical specifications/Ordering data	
Analog input module – AI 2 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit	**600-252-7BB01**
Number of inputs	2
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power 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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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



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

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



Characteristics

- 4 analog inputs for measuring voltage
- Channels electrically isolated from each other and from the backplane bus
- 4 process input words
- Measuring ranges: 0–10 V, 1–5 V, ±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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 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)

* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

Technical specifications/Ordering data	
Analog input module – AI 4 x U, ±10 V, 0–10 V, 1–5 V, Iso., 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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2.5 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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

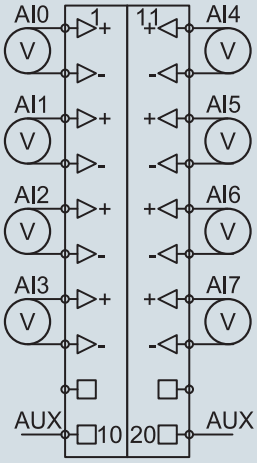
AI 8 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit

Characteristics

- 8 analog inputs for measuring voltage
- Channels electrically isolated from each other and from the backplane bus
- 8 process input words
- Measuring ranges: 0–10 V, 1–5 V, ±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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Pin 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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 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)

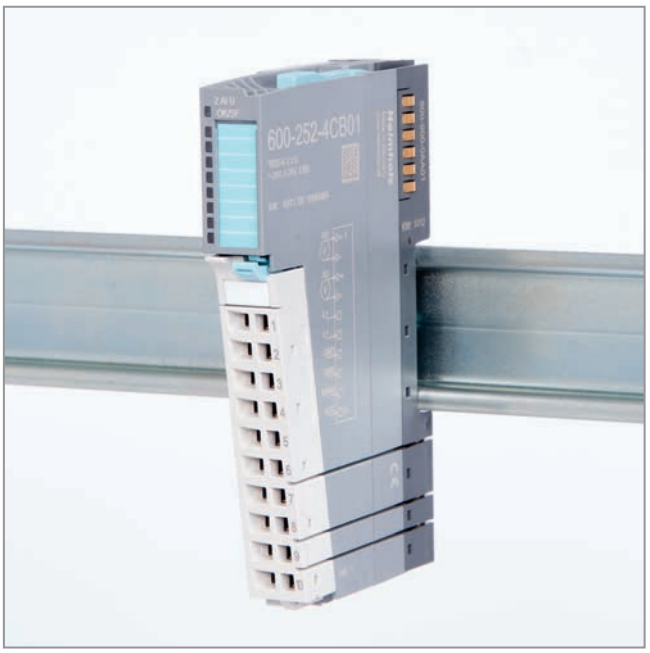
* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

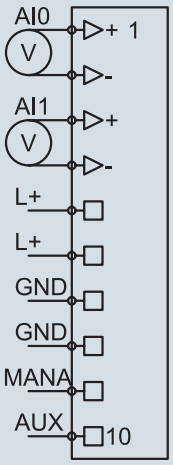
Technical specifications/Ordering data	
Analog input module – AI 8 x U, ±10 V, 0–10 V, 1–5 V, Iso., 16 Bit	**600-252-7BH21**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power 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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 3 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

AI 2 x U, ±24 V, 0–24 V, 12 Bit



AI 2 x U, ±24 V, 0–24 V, 12 Bit

Pin 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



Characteristics

- 2 analog inputs for measuring voltage, electrically isolated from the backplane bus
- 2 process input words
- Measuring ranges: 0–24 V, ±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
- Overflow / underflow diagnosis: On | Off
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

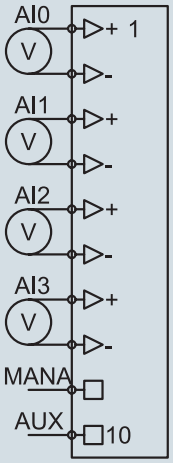
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

AI 4 x U, ±24 V, 0–24 V, 12 Bit

AI 4 x U, ±24 V, 0–24 V, 12 Bit

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



Characteristics

- 4 analog inputs for measuring voltage, electrically isolated from the backplane bus
- 4 process input words
- Measuring ranges: 0–24 V, ±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
- Overflow / underflow diagnosis: On | Off
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

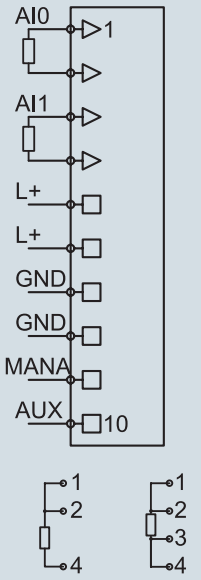
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

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

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

Pin 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



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, Pt100, Pt1000, Ni100, Ni1000, LG-Ni1000, 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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 150 ohms| 300 ohms | 600 ohms | 3,000 ohms | 6,000 ohms | Pt100 | Pt1000 | Ni100 | Ni1000| LG-Ni1000
- 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)

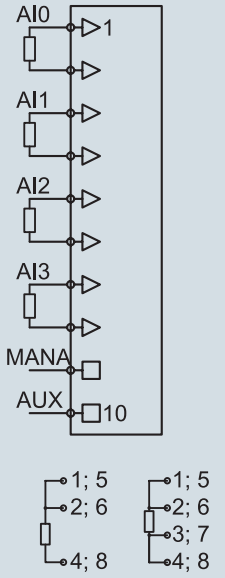
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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 Pt100 Pt1000 Ni100 Ni1000 LG-Ni1000
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

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

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

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



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, Pt100, Pt1000, Ni100, Ni1000, LG-Ni1000, 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
- Overflow / underflow diagnosis: On | Off
- Representation values: 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 ranges: 150 ohms| 300 ohms | 600 ohms | 3,000 ohms | 6,000 ohms | Pt100 | Pt1000 | Ni100 | Ni1000| LG-Ni1000
- 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)

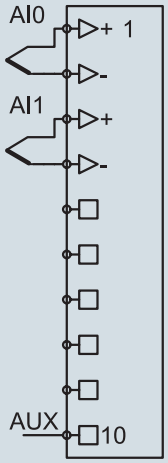
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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 Pt100 Pt1000 Ni100 Ni1000 LG-Ni1000
Measuring method	Integration
Measurement resolution	15 bits + sign
Interference frequency suppression	None | 10 Hz | 50 Hz | 60 Hz | 400 Hz
Refresh rate / conversion rate	Number of active channels * conversion time + 16 ms for wire break detection per channel if enabled The conversion time will depend on the interference frequency suppression setting being used: None: 8 ms 400 Hz: 45 ms 60 Hz: 109 ms 50 Hz: 128 ms 10 Hz: 342 ms
Diagnoses	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
General 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
Certifications	CE, UL

AI 2 x TC, Iso., 16 Bit

AI 2 x TC, Iso., 16 Bit

Pin 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



Characteristics

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

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values:
  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 ranges: ±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)

* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

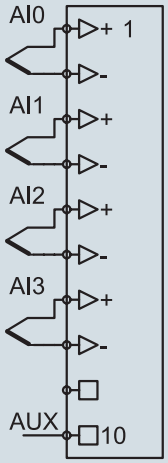
Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

Technical specifications/Ordering data	
Analog input module – AI 2 x TC, Iso., 16 Bit	**600-254-4AB02**
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	±80 mV
Thermocouples	E (-270 °C–990 °C) J (-210 °C –1,200 °C) K (-270 °C–1,380 °C) N (-270 °C–1,320 °C) R (-50 °C–1,775 °C) S (-50 °C–1,775 °C) T (-270 °C–405 °C) B (0 °C–1,800 °C) C (0 °C–2,320 °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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL

AI 4 x TC, Iso., 16 Bit

AI 4 x TC, Iso., 16 Bit

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



Characteristics

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

Parameters for the module

- Diagnostic alarm: On | Off
- Overflow / underflow diagnosis: On | Off
- Representation values:
  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 ranges: ±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)

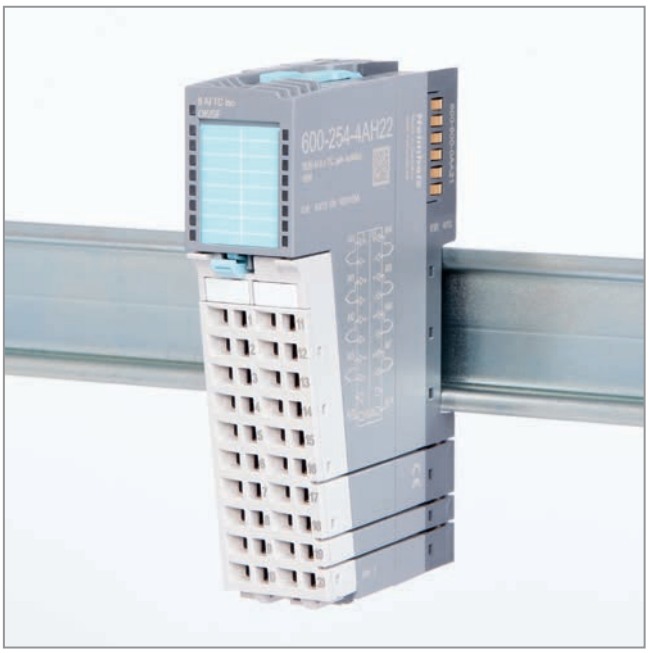
* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

Technical specifications/Ordering data	
Analog input module – AI 4 x TC, Iso., 16 Bit	**600-254-4AD02**
Number of inputs	4
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
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 –1,200 °C) K (-270 °C–1,380 °C) N (-270 °C–1,320 °C) R (-50 °C–1,775 °C) S (-50 °C–1,775 °C) T (-270 °C–405 °C) B (0 °C–1,800 °C) C (0 °C–2,320 °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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 2.5 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL

AI 8 x TC, Iso., 16 Bit

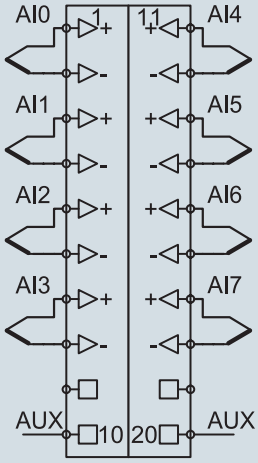


AI 8 x TC, Iso., 16 Bit

Characteristics

- 8 inputs
- Channels electrically isolated from each other and from the backplane bus
- 8 process input words, 8 process output words (for temperature compensation)
- Measuring range: ±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
- Red/green bi-color LEDs (one for each channel) indicate the channels' states

Pin 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
- Overflow / underflow diagnosis: On | Off
- Representation values:
  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 ranges: ±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)

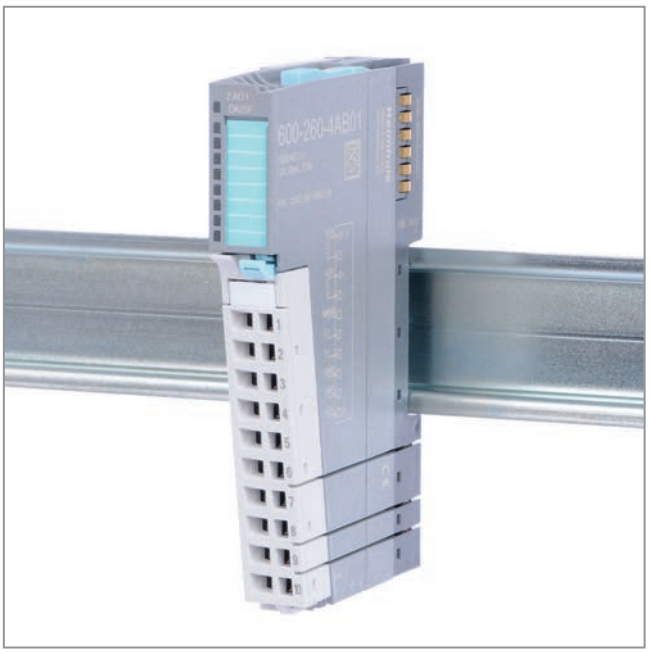
* SIMATIC is a registered trademark of Siemens AG.

Channel LED signals

Flashing red light	Parameter assignment error on channel
Solid red light	Reading overflow/underflow or wire break
Flashing green light	Reading within overrange
Solid green light	Channel configured, normal reading
Off	Channel disabled or module not yet configured

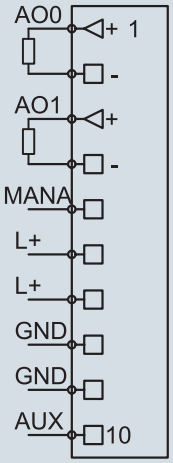
Technical specifications/Ordering data	
Analog input module – AI 8 x TC, Iso., 16 Bit	**600-254-4AH22**
Number of inputs	8
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	Yes
Current draw · External · Internal	 Not needed Max. 140 mA
Power dissipation	Max. 1 W
Measuring ranges	±80 mV
Thermocouples	E (-270 °C–990 °C) J (-210 °C –1,200 °C) K (-270 °C–1,380 °C) N (-270 °C–1,320 °C) R (-50 °C–1,775 °C) S (-50 °C–1,775 °C) T (-270 °C–405 °C) B (0 °C–1,800 °C) C (0 °C–2,320 °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
Refresh rate / conversion rate	Depends on the interference frequency suppression setting being used: None: 3 ms 400 Hz: 8 ms 60 Hz: 51 ms 50 Hz: 60 ms 10 Hz: 160 ms
Diagnoses	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
General 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
Certifications	CE, UL pending

AO 2 x I, 0/4–20 mA, 12 Bit



AO 2 x I, 0/4–20 mA, 12 Bit

Pin 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



Characteristics

- 2 analog outputs, electrically isolated from the backplane bus
- 2 process output words (4 bytes)
- Output ranges: 0–20 mA, 4–20 mA
- 12-bit resolution
- 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
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

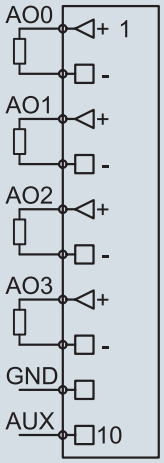
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
· Refresh time	0.2 ms
· 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)
Diagnoses	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
General 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
Certifications	CE, UL

AO 4 x I, 0/4–20 mA, 12 Bit

AO 4 x I, 0/4–20 mA, 12 Bit

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



Characteristics

- 4 analog outputs, electrically isolated from the backplane bus
- 4 process output words (8 bytes)
- Output ranges: 0–20 mA, 4–20 mA
- 12-bit resolution
- 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
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

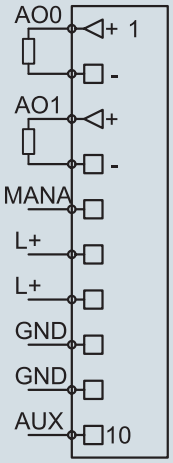
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/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
· Refresh time	0.2 ms
· 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)
Diagnoses	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
General 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
Certifications	CE, UL

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

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

Pin 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



Characteristics

- 2 analog outputs, electrically isolated from the backplane bus
- 2 process output words (4 bytes)
- Output ranges: ±10 V, 0–10 V, 1–5 V
- 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
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

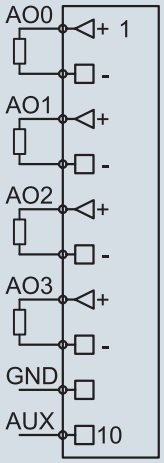
* SIMATIC is a registered trademark of Siemens AG.

Technical specifications/Ordering data	
Analog output module – AO 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
· Refresh time	0.2 ms
· 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)
Diagnoses	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
General 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
Certifications	CE, UL

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

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

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



Characteristics

- 4 analog outputs, electrically isolated from the backplane bus
- 4 process output words (8 bytes)
- Output ranges: ±10 V, 0–10 V, 1–5 V
- 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

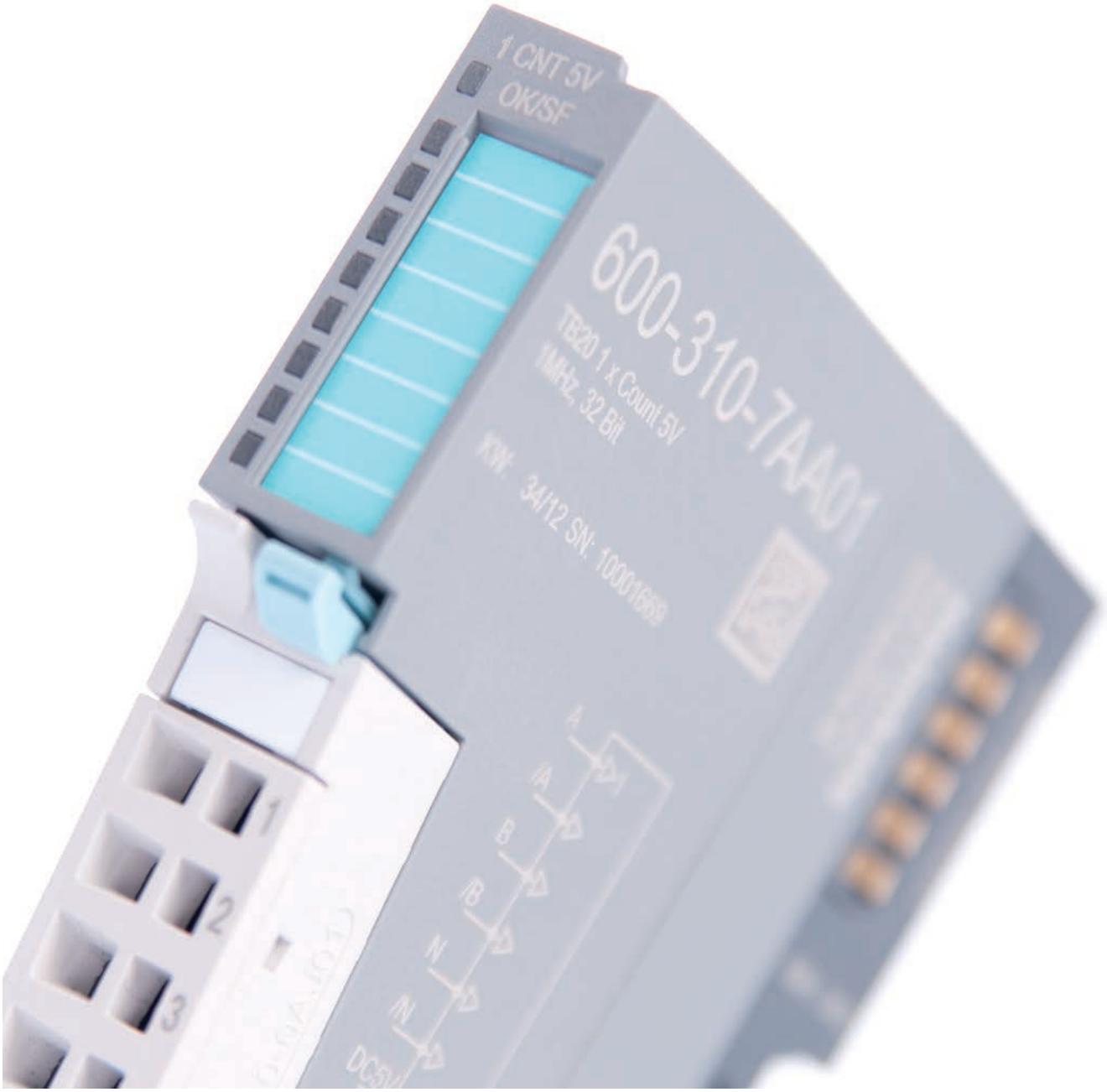
- Diagnostic alarm: On | Off
- Representation values: SIMATIC* S7 | SIMATIC* S5

Parameters for each channel

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

* SIMATIC is a registered trademark of Siemens AG.

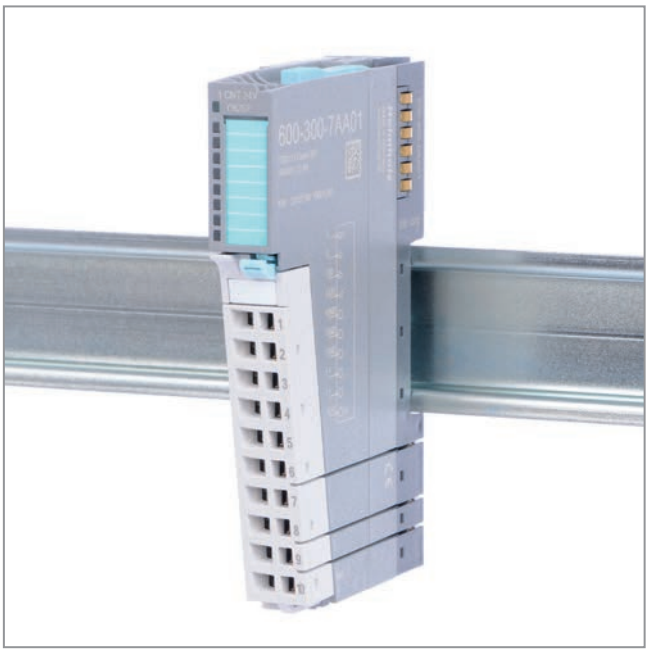
Technical specifications/Ordering data	
Analog output module – AO 4 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit	**600-261-4AD01**
Number of outputs	4
Output ranges	±10 V 0-10 V 1-5 V
Electrically isolated from backplane bus	Yes
Channels electrically isolated from each other	No
Current draw · External · Internal	 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
· Refresh time	0.2 ms
· 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)
Diagnoses	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
General 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
Certifications	CE, UL



Function Modules

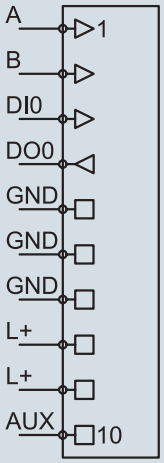
Counters
SSI Encoder Interface
Energy Meter

1 x counter 24 V, 500 kHz, 32 Bit



1 x counter 24 V, 500 kHz, 32 Bit

Pin 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



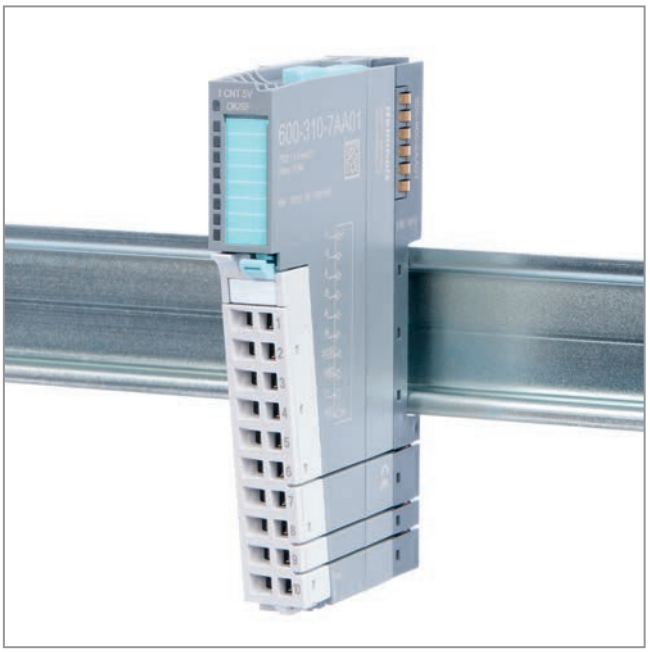
Counters are used to detect pulses that are faster than a controller's cycles, i.e., signals that the controller will be unable to detect properly and that therefore need to be pre-processed. This counter module detects the edges of 24-V signals as pulses, which can be counted or converted into a frequency, 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.

Characteristics

- 32-bit counter
- Up to 500 KHz (X4 evaluation)
- Accommodates 24 V incremental encoders and proximity sensors
- Capturing modes:
  - Pulse & direction
  - Rotary encoder with X1 evaluation
  - Rotary encoder with X2 evaluation
  - Rotary encoder with X4 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)

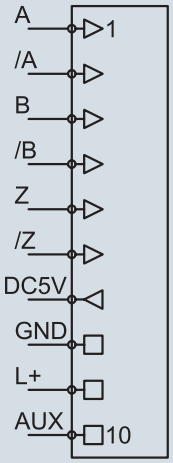
Technical specifications/Ordering data	
Function module – 1 x counter 24 V, 500 kHz, 32 Bit	**600-300-7AA01**
Number of counters	1
Counter bit depth	32 bits
Input frequency	Max. 125 kHz
Counting frequency	Max. 500 kHz (for X4 evaluation)
Input voltage	24 VDC
Electrically isolated from backplane bus	Yes
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
Certifications	CE, UL

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



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

Pin 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



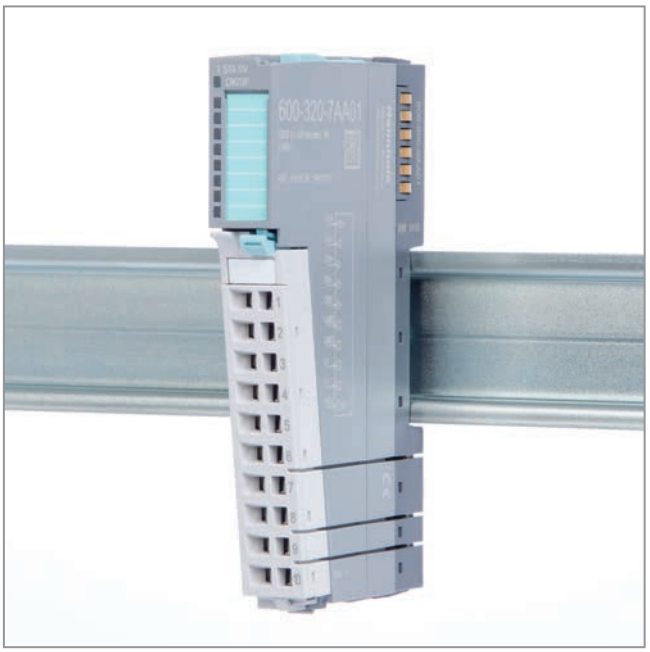
Counters are used to detect pulses that are faster than a controller's cycles, i.e., signals that the controller will be unable to detect properly and that therefore need to be pre-processed.
This counter module detects the edges of 5 V differential signals (as per the RS-422 standard) as pulses. This transmission method, i.e., differential signaling, 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.

Characteristics

- 32-bit counter
- Up to 4 MHz (X4 evaluation)
- Accommodates 5 V incremental encoders (RS-422)
- Index input
- 5 V supply for sensors
- Capturing modes:
  - Pulse & direction
  - Rotary encoder with X2 evaluation
  - Rotary encoder with X4 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)

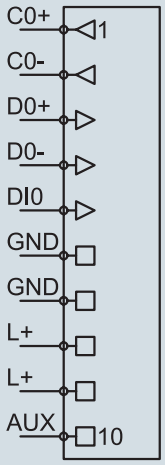
Technical specifications/Ordering data	
Function module – 1 x counter 5 V (RS422), 4 MHz, 32 Bit	**600-310-7AA01**
Number of counters	1
Counter bit depth	32 bits
Input frequency	Max. 1 MHz
Counting frequency	Max. 4 MHz (for X4 evaluation)
Input voltage	5 VDC, RS-422 differential signal
Electrically isolated 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
Certifications	CE, UL

1 x SSI encoder interface



1 x SSI encoder interface

Pin Assignment	
Terminal	**Assignment**
1	C0+
2	C0-
3	D0+
4	D0-
5	DI0
6	GND
7	GND
8	L+, 24 VDC
9	L+, 24 VDC
10	AUX

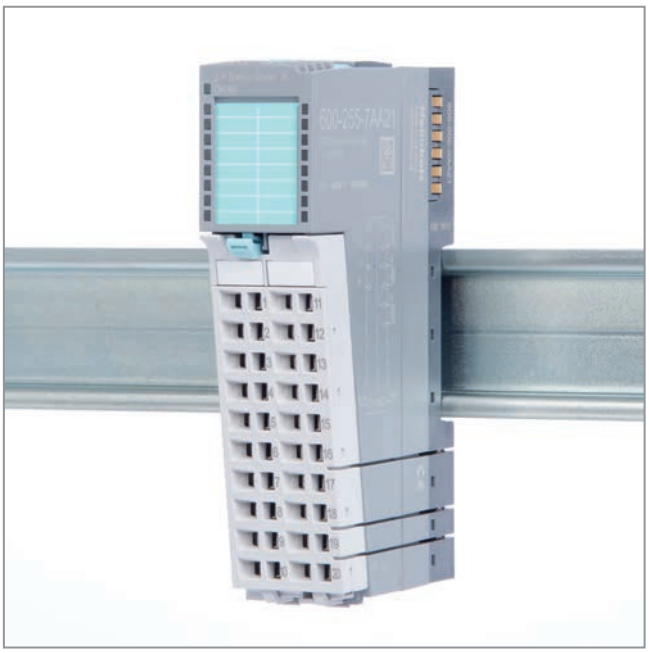


Synchronous Serial Interface is a standard that makes it possible to obtain absolute position data for a linear or angular position sensor.
In terms of hardware, the module's SSI is implemented as a point-to-point connection as defined in the RS-422 standard. Moreover, in order to avoid ground loops, opto-isolators are used to achieve full electrical isolation.
Excellent noise immunity is ensured by the fact that the clock and data signals are sent through twisted pair cables using synchronous and symmetric transmission. The result is high reliability and robustness, making the module ideal for use in industrial environments.
The TB20 SSI encoder interface makes it possible to connect an SSI encoder with a transmission rate of up to 2 MHz. And, since the number of data bits is also adjustable, the module provides utmost flexibility in terms of supported encoder resolutions.
Data values can be in binary code or reflected binary code (Gray code), and can be normalized so as to ensure that only position-relevant bits will be transmitted.
In addition, a parity bit can be optionally evaluated in order to check data integrity. Also, the module is able to transmit special bits, which are used by some sensors in order to take care of tasks such as signaling error states to a master.
A digital 24 V input can be configured as a latch function in order to retain the encoder value when specific external events occur.
Moreover, two configurable comparators make it easy to quickly detect positions in the PLC program.
In addition to the encoder value, all relevant encoder interface status information is available in the PLC input image table.

Characteristics

- Accommodates an absolute encoder as per RS-422
- Supports 13 to 31 data bits
- Single-turn and multi-turn
- Encoder value normalization
  (the encoder value will only contain position-relevant bits)
- Direction indicator
- Direction reversal
- Internal Gray-binary conversion
- Supports transmission rates of up to 2 MHz
- Encoder value parity check
- Re-transmission
- Digital 24 V "latch function" input for freezing the current encoder value
- Comparator function with loadable reference values, configurable depending on the direction of rotation
- 24 V encoder supply

Technical specifications/Ordering data	
Function module – 1 x SSI encoder interface	**600-320-7AA01**
Number of SSI decoders	1
Supported data bits	13–31 bits
Parity	None, even, odd
Internal Gray-binary conversion	Configurable
Direction detection	Yes
Direction reversal	Configurable
Encoder value normalization	Configurable
Encoder value latch function	Can be triggered with a 24 V digital input
Power supplied to encoder by module	24 VDC, 100 mA, fused
Electrically isolated from backplane bus	Yes
Diagnoses	Wire break / frame errors 24 V encoder supply Parameter assignment errors
Current draw · External · Internal	 Max. 20 mA + load on 24 V encoder supply (max. 100 mA) Max. 130 mA
Power dissipation	Max. 1.0 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	10 bytes
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 75 g
Certifications	CE, UL pending



Energy Meter, 1 A/5 A

The energy meter function module can be used to measure all important current and voltage measurement values on 230 VAC networks. Input voltages (3 phases + N) can be connected directly to the module.
Input currents are coupled through current transformers. Energy meter module 600-255-7AA21 is designed for a maximum secondary current of 1 A, while module 600-255-7BA21 is designed for a maximum secondary current of 5 A.
Other rated secondary currents, as well as the use of Rogowski coils, are available upon request.
In addition to general status information, the module's configuration can be used to show up to 7 readings in the input image table.
In the event of a system failure, the controllable meter's values will be stored in non-volatile memory.

Characteristics

- Measures current, voltage, power, and energy
- 1 three-phase or 3 single-phase
- 3-wire and 4-wire voltage measurements
- Current measurements through 1 A or 5 A current transformer (secondary current)
- Measures real, reactive, and apparent power and energy
- Energy meter with gate function; values are stored in the module in a non-volatile manner
- Configurable process input image table
- Diagnostic messages

Parameters for the module

- Overvoltage / undervoltage threshold
- Overcurrent threshold
- Zero crossing timeout
- Enable energy meter
- 50/60 Hz line frequency
- 3-wire or 4-wire voltage measurement
- Process image table input values

Parameters for phases A, B, and C

- Primary current
- Secondary current
- Phase angle error correction (for current transformer phase angle error)
- Zero crossing, overvoltage / undervoltage, overcurrent diagnoses

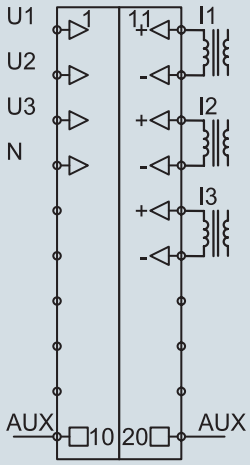
Configurable process input image table

- 7 readings at the same time
- A, B, C RMS voltages
- A, B, C RMS currents
- A, B, C, and total real power/energy
- A, B, C, and total apparent power/energy
- A, B, C, and total reactive power/energy
- Frequency
- A, B, C, and total power factor
- Phase angle between the voltages or between the currents

Diagnostic messages

- Phase shift
- Overvoltage / undervoltage
- Overcurrent
- No zero crossing (no phase)
- Parameter assignment error

Pin Assignment			
Terminal	**Assignment**	**Terminal**	**Assignment**
1	U 1	11	I 1 +
2	U 2	12	I 1 -
3	U 3	13	I 2 +
4	N	14	I 2 -
5	n.c.	15	I 3 +
6	n.c.	16	I 3 +
7	n.c.	17	n.c.
8	n.c.	18	n.c.
9	n.c.	19	n.c.
10	AUX	20	AUX



Technical specifications/Ordering data	
Function module – Energy meter, 1 A **Function module – Energy meter, 5 A**	**600-255-7AA21** **600-255-7BA21**
Number of inputs	A, B, C, N voltages A, B, C currents
Voltage	Max. 400 VAC
Max. secondary current	1 A (600-255-7AA21) 5 A (600-255-7BA21)
Electrically isolated from backplane bus	Yes
Diagnoses	Overvoltage / undervoltage Overcurrent No zero crossing Phase shift
Parameter configuration length	32 bytes
General error indicator	Red LED
Current draw Internal	 Max. 150 mA
Power dissipation	Max. 2.0 W
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 120 g
Certifications	CE, UL pending

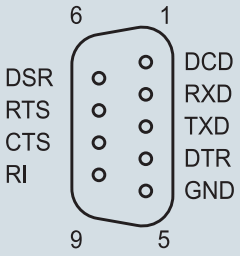
Communication Modules

Serial Interface

RS-232 serial port

RS-232 serial port

Pin Assignment	
Pin	**Assignment**
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



The serial communications module from the TB20 product line can be used for serial data communications (as defined in the RS-232 or RS-422/485 standard) between two communication devices using low to medium transmission rates.
The other communication device can be a serial module or any other device that supports the aforementioned standards.
This serial module supports both the ASCII and 3964R protocols, making it possible to integrate downstream devices (e.g., printers, laser scanners, etc.) into higher-level bus systems and networks in an automation system. It also makes it possible to implement communications with other system parts.

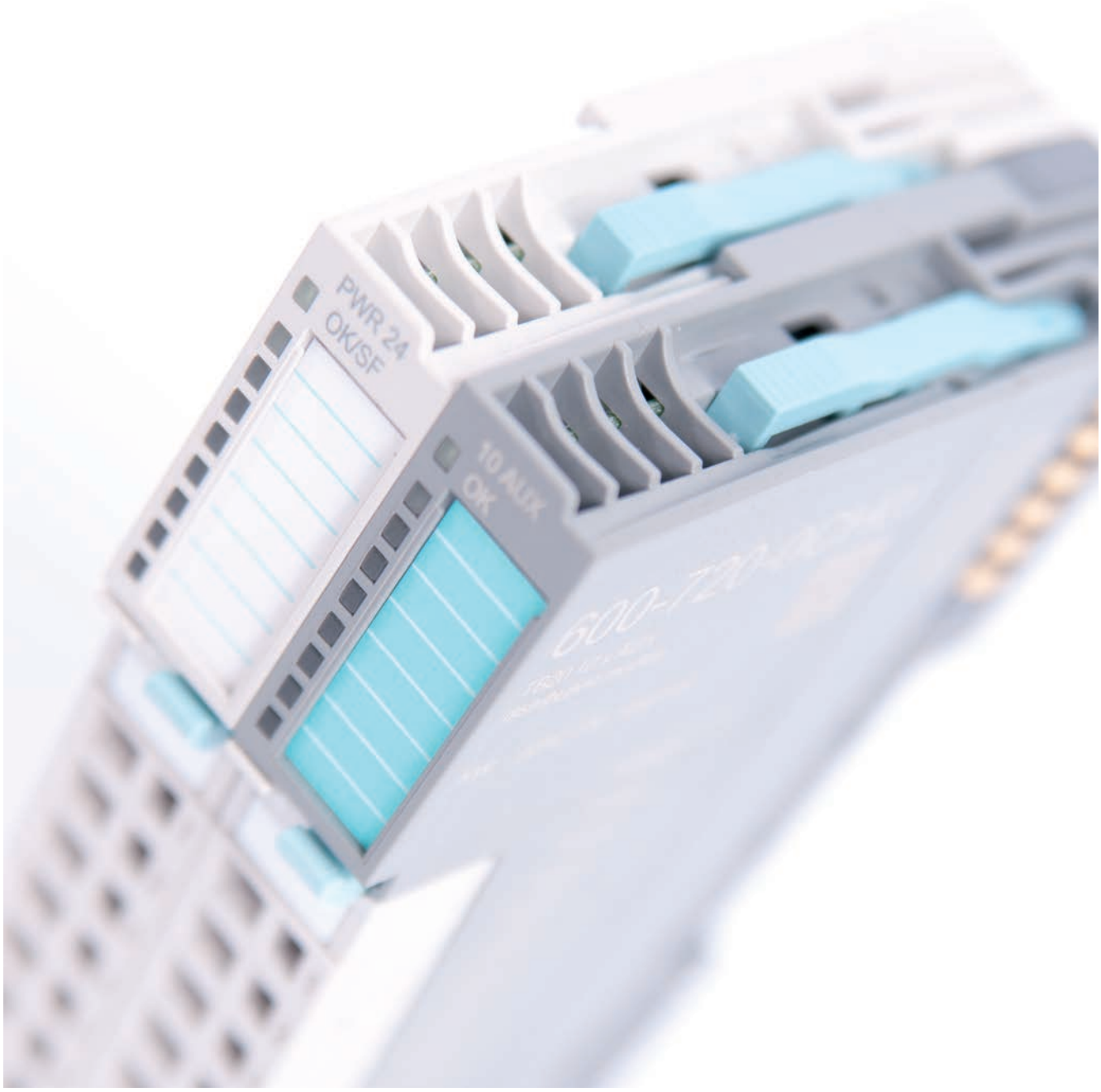
Characteristics

- RS-232 port (RS-422/RS-485 currently in development)
- ASCII, 3964R protocols
- 110 to 115,200 baud
- 7/8 data bits
- 1/2 stop bits
- Parity: none, even, odd, custom
- Frame end detection after terminator, number of characters, inter-character delay
- Frame length of up to 224 characters

Diagnoses

- Wire break
- Underflow / overflow buffer
- Internal module error
- Parameter assignment error
- Message error

Technical specifications/Ordering data	
Communication module – RS-232 serial interface	**600-400-7AA31**
Protocols	ASCII, 3964R
Physical layer	RS-232
Baud rates	110, 300, 600, 1,200, 4,800, 9,600, 14,400, 19,200, 38,400, 57,600, 76,800, 115,200 baud
Connector	9-pin D-sub
Data bits	7 data bits / 8 data bits
Stop bits	1 stop bit / 2 stop bits
Parity	None / Even / Odd / Custom
ASCII frame end detection	Terminator, number of characters, inter-character delay (1–65,535 ms)
Block check 3964(R)	Configurable
Frame length	1–224 characters
Diagnoses	Wire break Underflow / overflow buffer Internal module error Parameter assignment error Message error
USB port	
· Protocol	USB 2.0 Device Full Speed
· Connector	Mini-USB
· Electrical isolation	Yes
· Isolation voltage	1.5 kV
Current draw · External · Internal	 Max. 0 mA Max. 130 mA
Power dissipation	Max. 0.7 W
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 25 mm x 73 mm
Weight	Approx. 120 g
Certifications	CE, UL pending

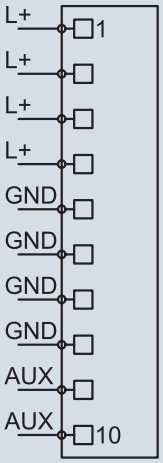


System Modules

Power and Isolation Module
Potential Distributors
Power Module

Power and isolation module 24 VDC, 8 A

Pin 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 a power bus into individual segments.

Characteristics

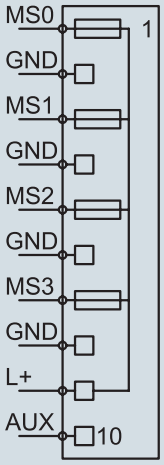
- Powers the power bus to the right
- Segments the power bus on the left
- A green LED indicates the 24 VDC status
- A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL

Potential distributor 4 x 24 VDC, Highfeature

Potential distributor 4 x 24 VDC, Highfeature

Pin Assignment	
Terminal	**Assignment**
1	MS 0
2	GND
3	MS 1
4	GND
5	MS 2
6	GND
7	MS 3
8	GND
9	L+
10	AUX



The 4 x 24 VDC Highfeature potential distributor can be used to power up to four transducers or 3-wire sensors. Moreover, it features a monitoring functionality that not only monitors the 24 V load voltage, but that also monitors for overload and short-circuit conditions at the supply outputs.
In the event of a fault, the module will send a diagnostic signal to the PLC and change the color of the corresponding LEDs to red. Status information in the process input image table makes it easier to monitor the power supply module.

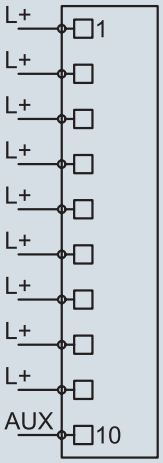
Characteristics

- 4 power supply outputs, electrically isolated from the backplane bus
- 24 VDC output voltage
- 100 mA output voltage per channel
- Self-resetting fuse
- A blue LED indicates the module's operating status
- Green/red LEDs indicate the outputs' states
- 24 V load voltage monitoring and diagnosis
- Short circuit to GND monitoring and diagnosis for each individual channel
- Channel status information in input image table

Technical specifications/Ordering data	
System module – Potential distributor 4 x 24 VDC, HF	**600-730-4AD01**
Number of outputs	4
Electrically isolated from backplane bus	Yes
Current draw · External · Internal	 10 mA + load Max. 30mA
Power dissipation	Max. 0.1 W
Load · Per output · Short circuit	 100 mA Self-resetting fuse
Hot-pluggable	Yes
Dimensions (H x W x D)	110 mm x 14 mm x 73 mm
Weight	Approx. 70 g
Certifications	CE, UL pending

Potential distributor 9 x 24 VDC

Pin 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.

Characteristics

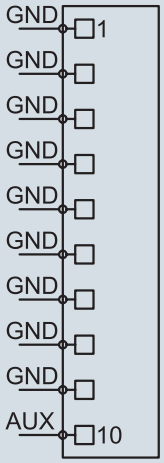
· Max. 8 A supply load
· Powers its outputs using the power bus
· A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL pending

Potential distributor 9 x GND

Potential distributor 9 x GND

Pin 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.

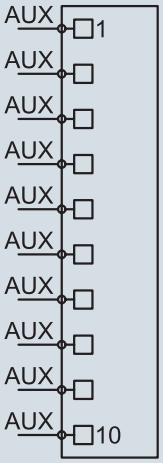
Characteristics

· Max. 8 A supply load
· Powers its outputs using the power bus
· A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL pending

Potential distributor 10 x AUX

Pin 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.

Characteristics

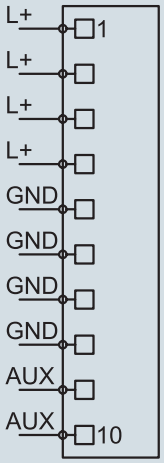
- Max. 8 A supply load
- Powers its outputs using the power bus
- A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL pending

Potential distributor 4 x 24 VDC + 4 x GND

Potential distributor 4 x 24 VDC + 4 x GND

Pin 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.

Characteristics

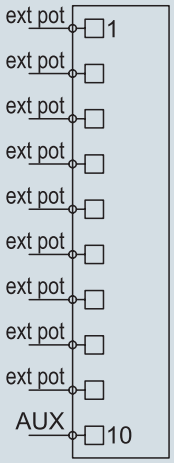
- Max. 8 A supply load
- Powers its outputs using the power bus
- A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL pending

Potential distributor 9 x free pot.

Potential distributor 9 x free pot.

Pin 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.

Characteristics

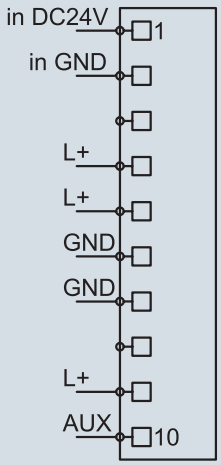
- Max. 8 A supply load
- Can accommodate any supply potential
- A blue LED indicates the module's operating status

Technical specifications/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
Certifications	CE, UL pending

Power module 24 VDC

Power module 24 VDC

Pin 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.

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 specifications/Ordering data	
System module – 24 VDC power module	**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
General 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
Certifications	CE, UL

Spare Parts/Accessories

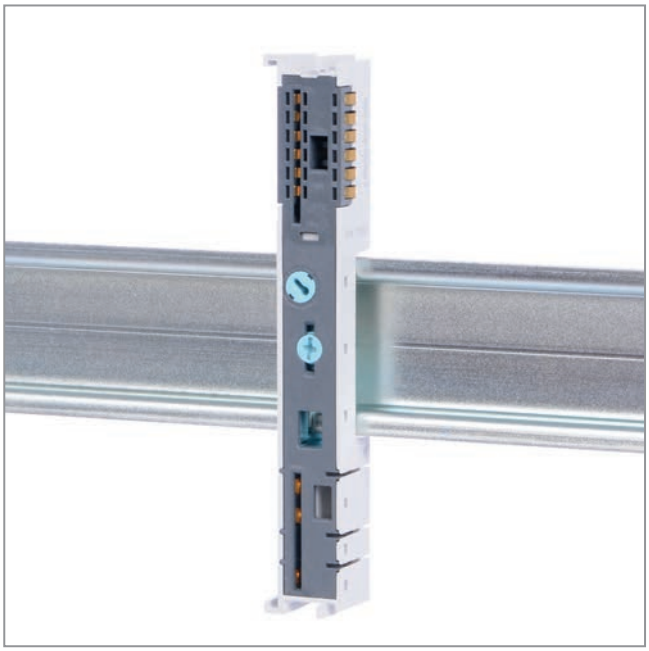
Base Module
Front Connector
Final Bus Cover
Label Sheets
TB20 starter kits
Manuals

Base modules

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.

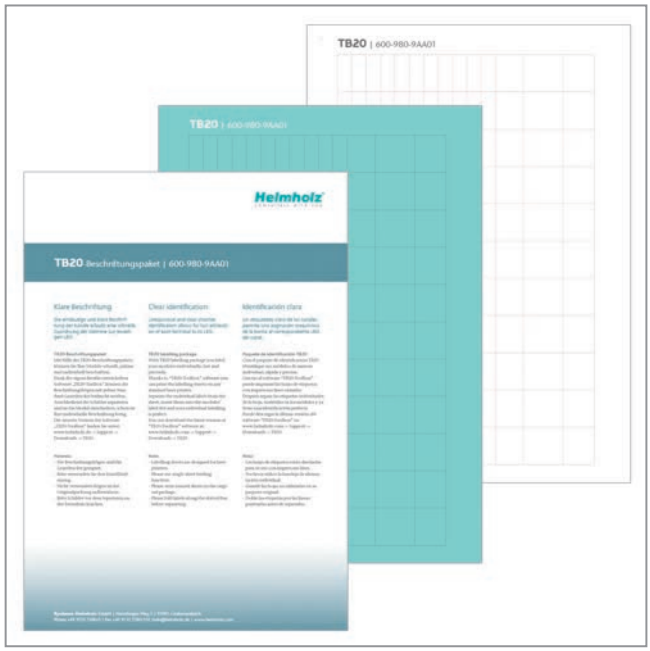
Note:
All modules are delivered as complete assembled units with their front connector and base module (i.e., as a single assembly) and can be installed immediately.

Ordering information	
Base module, standard,14 mm-width (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

10-terminal front connector, 20-terminal front connector, final bus cover

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

Note:
All modules are delivered as complete assembled units with their front connector and base module (i.e., as a single assembly) and can be installed immediately.
The final bus cover is included as standard with every bus coupler.



Label package

Our TB20 label package will enable you to label your modules quickly, accurately, and according to their specific needs.
You can use the "TB20 ToolBox" software to print out label sheets with a laser printer, after which you will only need to separate the labels, slide them into the relevant module, and voilà!
Your custom labels will be ready and in place.
To download the latest version of TB20 ToolBox, please visit:
www.helmholz.de -> Support -> Downloads -> TB20

Content
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

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

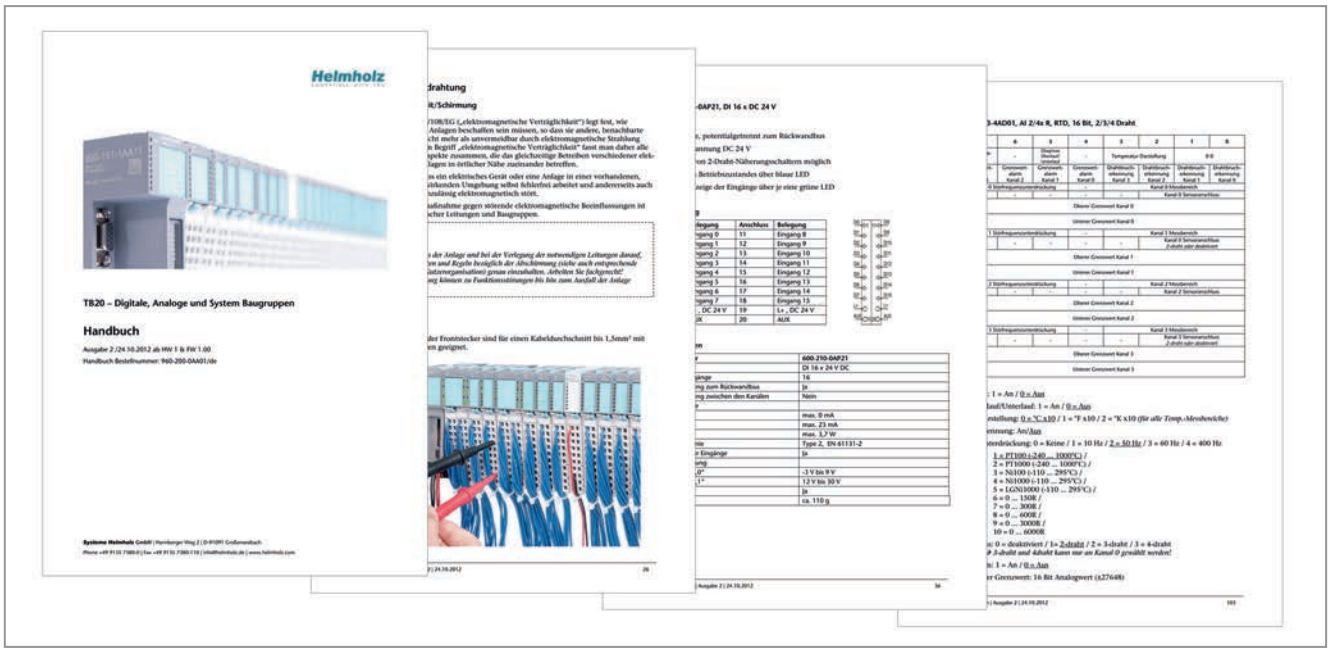
Ordering information	
10-terminal front connector (set of five)	600-910-9AJ01
20-terminal front connector (set of five)	600-910-9AT21
Final bus cover (set of five)	600-920-9AA01
TB20 label package	600-980-9AA01
Mini-USB cable	700-755-8VK11

TB20 starter kits

TB20 starter kit for PROFIBUS-DP

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

Ordering information			
TB20 starter kit	**600-990-STRT1**	**600-990-STRT2**	**600-990-STRT3**
	PROFIBUS-DP	**CANopen® slave**	**PROFINET IO**
· One PROFIBUS-DP bus coupler	600-151-1AA11	600-160-1AA11	600-180-1AA11
· One digital input module – DI 4 x 24 VDC	600-210-0AD01	600-210-0AD01	600-210-0AD01
· One digital input module – DI 16 x 24 VDC	600-210-0AP21	600-210-0AP21	600-210-0AP21
· One digital output module – DO 8 x 24 VDC, 500 mA	600-220-0AH01	600-220-0AH01	600-220-0AH01
· One system module – Power and isolation module 24 VDC, 8 A	600-710-0AA01	600-710-0AA01	600-710-0AA01
· One system module – 9 x 24 VDC potential distributor	600-720-0AH01	600-720-0AH01	600-720-0AH01
· One 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
· One analog output module – AO 2 x U, ±10 V, 0–10 V, 1–5 V, 12 Bit	600-261-4AB01	600-261-4AB01	600-261-4AB01
· One ready-to-use, flexible, 1-m PROFIBUS cable (two 90° PROFIBUS connectors with PG port) · or one CAN bus connector · or one Ethernet cable, 3m	700-970-2VK01	700-690-1BB12	700-881-1VK21
· One Mini-USB cable	700-755-8VK11	700-755-8VK11	700-755-8VK11
· One DIN rail			
· One USB flash drive with software and manuals			
· One 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 information	
TB20 Manual – PROFINET IO Coupler, German/English	**960-180-1AA11**
TB20 Manual – PROFIBUS DP Coupler, German/English	**960-151-1AA11**
TB20 Manual – CANopen® Slave Coupler, German/English	**960-160-1AA11**
TB20 Manual – Modbus/TCP Coupler, German/English	**960-170-1AA11**
TB20 Manual – EtherNet/IP Coupler, German/English	**960-175-1AA11**
TB20 Manual – Digital, Analog, and System Modules, German/English	**960-200-0AA01**
TB20 Manual – 1x Counter 24 V, 500 kHz, 32 Bit, German/English	**960-300-0AA01**
TB20 Manual – 1x Counter 5 V, 4 MHz, 32 Bit, German/English	**960-310-0AA01**
TB20 Manual – SSI Encoder Interface, German/English	**960-320-7AA01**

PROFIBUS connectors
We offer a comprehensive range of PROFIBUS connectors that can be used with TB20 couplers.

For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

PROFIBUS repeaters
Repeaters are needed in applications that involve large PROFIBUS networks with more than 32 nodes or long cable distances.
We offer a wide range of repeaters, including our FLEXtra® multiRepeaters, which enable users, for example, to set up star topologies in PROFIBUS.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

PROFIBUS optical giber cables
The devices in the FLEXtra® FO and OPTopus series enable users to convert electrical PROFIBUS signals into optical signals.
This makes it possible to take advantage of all the benefits provided by optical signal transmissions in industrial automation applications (e.g., in spatially large networks and environments vulnerable to EMC) without the need for complex technical solutions.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

CAN bus communication modules
We have a wide range of CAN bus modules that can be used to connect automation devices to CAN buses.
Additional functions, as well as customer-specific features, further enhance their usefulness.

For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

CAN bus connectors
We offer a comprehensive range of CAN bus connectors that can be used with TB20 couplers.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

CAN bridge
Our CAN bridge makes it possible to connect two CAN networks of the same type or of different types. It can be used as a message repeater to expand network distances, as well as to connect different CAN networks together.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

PROFINET connectors
Featuring EasyConnect® quick-connection technology, our PROFINET connectors can be used to connect components, such as PROFINET stations, to a PROFINET cable with a length of up to 100 m.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

PN-CAN gateway
Our PN-CAN gateway can be used to integrate CANopen® devices into a PROFINET network while functioning as a full-fledged CANopen® master.
For detailed information, ordering information, and technical specifications, please consult our main catalog or visit us at www.helmholz.com.

Contacts in Germany

Headquarters
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Karsten Eichmüller
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
karsten.eichmueller@helmholz.de

Northern Germany Sales
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Fabian Slowakiewicz
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
fabian.slowakiewicz@helmholz.de
fs@helmholz.de

Western Germany Sales
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Martin Güll
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
martin.guell@helmholz.de

H-I Elektronik Vertrieb GmbH
Düsseldorfer Straße 547
47055 Duisburg
Thomas Dohmen
Stephan Schmücker
Phone: +49 (203) 76 14 03
Fax: +49 (203) 76 44 00
vertrieb@h-i-elektronik.de
www.h-i-elektronik.de

Eastern Germany Sales
B-S-K Industrievertretungen
Holzmühlenstrasse 4
09212 Limbach-Oberfrohna
Siegfried Renner
Phone: +49 (376 09) 583 55
Fax: +49 (376 09) 583 56
siegfried.renner@helmholz.de

Baden-Württemberg Sales
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Markus Wallau
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
markus.wallau@helmholz.de

Northern Bavaria Sales
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Martin Fröhlich
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
martin.froehlich@helmholz.de

Southern Bavaria Sales
Systeme Helmholz GmbH
Hannberger Weg 2
91091 Großenseebach
Manfred Spitzer
Phone: +49 (91 35) 73 80-0
Fax: +49 (91 35) 73 80-490
manfred.spitzer@helmholz.de

Systeme Helmholz GmbH is present in the following countries:

Argentina
Australia
Austria
Belgium
Brazil
Bulgaria
Chile
China
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Hungary
Great Britain (UK)
India
Ireland
Italy
Japan
Latvia
Lebanon
Lithuania
Luxembourg
Malaysia
Mexico
Netherlands
Norway
Philippines
Poland
Portugal
Romania
Russia
Saudi Arabia
Singapore
Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
Turkey
The United Arab Emirates
The United States of America
Vietnam

For our resellers contact addresses, please visit us at www.helmholz.com.

Helmholz®
COMPATIBLE WITH YOU

Systeme Helmholz GmbH | Hannberger Weg 2 | 91091 Großenseebach | Germany
Phone +49 9135 7380-0 | Fax +49 9135 7380-490 | info@helmholz.de | www.helmholz.com

11/2014