

DeviceNet

Variant with integrated tee-connector: Fieldbus connection input (plug)

Fieldbus connection output (socket)

Fieldbus connection (plug)

Address selection switch

Configuration interface

Fieldbus status display

Module or IP-Link status display

3 types of connection

- 1 | 8 mm snap type connector
- 2 | M8 screw type connector
- 3 | M12 screw type connector

(Special functions: M23 screw type connector)

Power supply feed

Power supply downstream connection

Compact Box
IPxxx-B520
IPxxx-B528

Coupler Box
IL230x-B520
IL230x-B528

IP-Link interface

1 | Shield
2 | V+
3 | V-
4 | CAN H
5 | CAN L

1 | Shield
2 | V+
3 | V-
4 | CAN H
5 | CAN L

1 | + 24 V DC Us
2 | + 24 V DC Up
3 | GND
4 | GND

Connector assignment

IPxxx-, IL230x-B52x | Fieldbus Box modules for DeviceNet

DeviceNet DeviceNet is a sensor/actuator bus system, which is internationally standardised (EN50325) and based on CAN (Controller Area Network). DeviceNet supports a number of communication types for the input and output data:

- Polling: the master module ("scanner") sends the output data cyclically to the assigned devices and receives the input data in an answer telegram.
- Change of State: Telegrams are sent as soon as their contents have changed.
- Cyclic: The modules send the data automatically after a cycle time has elapsed.
- Strobed: The scanner requests the input data using a broadcast telegram to all the devices.

The DeviceNet devices in the Fieldbus Box series support all these types of I/O communication.

DeviceNet devices are parameterised using acyclic services (Explicit Messaging). The effective utilisation of the bus bandwidth allows DeviceNet, particularly in change of state mode, to achieve short system reaction times in spite of the relatively low data rates.

The Beckhoff DeviceNet devices have a powerful implementation of the protocol. Through active participation in the ODVA's technical committees, Beckhoff is contributing to the further development of this bus system, and has in this way itself gathered profound DeviceNet expertise. The fieldbus modules for DeviceNet are available as standard variant (B520) or optionally with integrated tee-connector (B528). This makes the fieldbus wiring much easier. Straight or angled versions of pre-assembled plugs or field-assembled plugs can be used.

Configuration

The node address is set in the range from 0 to 63 using two decimally coded rotary switches. The transmission rate set at the DeviceNet scanner determines the speed of the system and is recognised automatically by the DeviceNet box (auto baud rate). "Electronic Data Sheets" (*.eds files) for DeviceNet configuration tools are available for download from the Beckhoff internet site www.beckhoff.com and on the Beckhoff product CDs. Special I/O parameters not covered by the DeviceNet standard can be set by means of the KS2000 software (serial connection to the configuration interface of the Fieldbus Box) or via acyclic explicit messages.

Diagnostics

The extensive diagnostic functions of the Beckhoff DeviceNet devices allow rapid fault localisation. The diagnostic messages are transmitted over the bus and collated by the master. The status of the network connection, the device status, the status of the inputs and outputs and of the power supply are displayed by LEDs.

Compact Box

Compact Box modules for DeviceNet are available for all relevant industrial signals. In addition to digital and analog input and output modules including thermocouple and RTD inputs, there are also incremental encoder interfaces available for displacement and angle measurement in addition to serial interfaces to solve a large number of communication tasks.

Coupler Box

The DeviceNet Coupler Box gathers the I/O data from the Extension Box modules over the interference-free IP-Link fibre optic cable. It detects the connected modules and automatically allocates the input and output data to the process image. Both data consistency and a clear separation of input and output data are ensured. The Coupler Box has four digital inputs and four digital outputs. Other kinds of signals are available in the Extension Box.

System data	DeviceNet IPxxxx-B52x, IL230x-B52x		
Number of I/O stations	63		
Number of I/O points	depending on controller		
Data transfer medium	shielded copper cable, with power supply, typ. 2 x 2 x 0.25 mm ²		
Distance between stations	500 m	250 m	100 m
Data transfer rates	125 kBaud	250 kBaud	500 kBaud
I/O communication types	bit strobe, polling, cyclic, change of state		

Technical data	IPxxxx-B520	IPxxxx-B528	IL230x-B520	IL230x-B528
Extension modules	–	–	max. 120 with max. 512 byte input and 512 byte output data	max. 120 with max. 512 byte input and 512 byte output data
Digital peripheral signals	according to I/O type	according to I/O type	max. 960 inputs and 960 outputs	max. 960 inputs and 960 outputs
Analog peripheral signals	according to I/O type	according to I/O type	max. 252 inputs and 252 outputs	max. 252 inputs and 252 outputs
DeviceNet type	according to I/O type	according to I/O type	communications adapter	communications adapter
Configuration possibility	through KS2000 or the controller (explicit messaging)			
Data transfer rates	automatic detection up to 500 kbaud			
Bus interface	1 x M12 plug, 5-pin	1 x M12 plug, 5-pin, 1 x M12 socket, 5-pin (tee-connector integrated)	1 x M12 plug, 5-pin	1 x M12 plug, 5-pin, 1 x M12 socket, 5-pin (tee-connector integrated)
Power supply	control voltage: 24 V DC (-15 %/+20 %); load voltage: according to I/O type			
Power supply connection	feed: 1 x M8 male socket, 4-pin; downstream connection: 1 x M8 female socket, 4-pin			
Box supply current	45 mA + current consumption of sensors, max. 0.5 A			
Auxiliary power current	according to I/O type			
Electrical isolation	control voltage/fieldbus: 500 V, control voltage/inputs or outputs: according to I/O type			
Weight	approx. 210 g	approx. 250 g	approx. 210 g	approx. 250 g
Operating/storage temperature	0...+55 °C/-25...+85 °C			
Vibration/shock resistance	conforms to EN 60068-2-6/EN 60068-2-27			
EMC immunity/emission	conforms to EN 61000-6-2/EN 61000-6-4			
Protect. class/installation pos.	IP 65/66/67 (conforms to EN 60529)/variable			
Approvals	CE, UL			

Accessories	
KS2000	configuration software for extended parameterisation
Cordsets	cordsets and connectors

System	
DeviceNet	For further DeviceNet products please see the system overview .

Compact Box

The Compact Box modules for DeviceNet offer a wide range of I/O functionality. All relevant industrial signals are supported. The digital inputs and outputs can be connected either with snap type 8 mm diameter plugs, screw type M8 connectors, or screw type M12 connectors. For analog signals the M12 version is used.

IPxxxx-B520 B528	Compact Box for DeviceNet systems	Plug
Digital input		
IP1000-B520 B528	Compact Box, 8 digital inputs 24 V DC, 3.0 ms filter	8 mm
IP1001-B520 B528	Compact Box, 8 digital inputs 24 V DC, 3.0 ms filter	M8
IP1002-B520 B528	Compact Box, 8 digital inputs 24 V DC, 3.0 ms filter	M12
IP1010-B520 B528	Compact Box, 8 digital inputs 24 V DC, 0.2 ms filter	8 mm
IP1011-B520 B528	Compact Box, 8 digital inputs 24 V DC, 0.2 ms filter	M8
IP1012-B520 B528	Compact Box, 8 digital inputs 24 V DC, 0.2 ms filter	M12
IP1502-B520 B528	Compact Box, 2 up/down counter, 24 V DC, 100 kHz	M12
Digital output		
IP2000-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 0.5 A	8 mm
IP2001-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 0.5 A	M8
IP2002-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 0.5 A	M12
IP2020-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	8 mm
IP2021-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M8
IP2022-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M12
IP2040-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 12 A)	8 mm
IP2041-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 12 A)	M8
IP2042-B520 B528	Compact Box, 8 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 12 A)	M12
IP2512-B520 B528	Compact Box, 2 digital pulse width outputs 24 V DC, I _{MAX} = 2.5 A	M12
Digital combi		
IP2300-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	8 mm
IP2301-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	M8
IP2302-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	M12
IP2310-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	8 mm
IP2311-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	M8
IP2312-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 0.5 A	M12
IP2320-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	8 mm
IP2321-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M8
IP2322-B520 B528	Compact Box, 4 digital inputs 24 V DC, 3 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M12
IP2330-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	8 mm
IP2331-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M8
IP2332-B520 B528	Compact Box, 4 digital inputs 24 V DC, 0.2 ms filter, 4 digital outputs 24 V DC, I _{MAX} = 2 A (Σ 4 A)	M12
IP2400-B520 B528	Compact Box, 16 digital combination inputs/outputs 24 V DC, 3 ms filter, I _{MAX} = 0.5 A	8 mm
IP2401-B520 B528	Compact Box, 16 digital combination inputs/outputs 24 V DC, 3 ms filter, I _{MAX} = 0.5 A	M8
Analog input		
IP3102-B520 B528	Compact Box, 4 differential analog inputs ±10 V, 16 bit	M12
IP3112-B520 B528	Compact Box, 4 differential analog inputs 0/4...20 mA, 16 bit	M12
IP3202-B520 B528	Compact Box, 4 analog inputs for resistance thermometer (RTD), PT100...1000, Ni100, 16 bit	M12
IP3312-B520 B528	Compact Box, 4 analog inputs for thermocouple, types J, K, L, B, E, N, R, S, T, U, 16 bit	M12
Analog output		
IP4112-B520 B528	Compact Box, 4 analog outputs 0/4...20 mA, 16 bit	M12
IP4132-B520 B528	Compact Box, 4 analog outputs ±10 V, 16 bit	M12
Special functions		
IP5009-B520 B528	Compact Box, 1 SSI encoder interface	M23
IP5109-B520 B528	Compact Box, 1 incremental encoder interface with complementary inputs, 1 MHz	M23
IP5209-B520 B528	Compact Box, 1 SinCos encoder interface, 1 V _{SS}	M23
IP6002-B520 B528	Compact Box, 1 serial interface RS232C	M12
IP6012-B520 B528	Compact Box, 1 serial interface, 0...20 mA (TTY)	M12
IP6022-B520 B528	Compact Box, 1 serial interface, RS422, RS485	M12

Coupler Box

The Coupler Box for DeviceNet has four digital inputs and four digital outputs, optionally with snap type 8 mm diameter connectors, screw type M8 or M12 connectors. Up to 120 Extension Box modules can be connected via the IP-Link communication facility.

IL230x-B520 B528	Coupler Box for DeviceNet systems	Plug
Digital combi		
IL2300-B520 B528	Coupler Box, 4 digital inputs 24 V, 3 ms filter, 4 digital outputs 24 V, 0.5 A	8 mm
IL2301-B520 B528	Coupler Box, 4 digital inputs 24 V, 3 ms filter, 4 digital outputs 24 V, 0.5 A	M8
IL2302-B520 B528	Coupler Box, 4 digital inputs 24 V, 3 ms filter, 4 digital outputs 24 V, 0.5 A	M12

System overview

