Data sheet

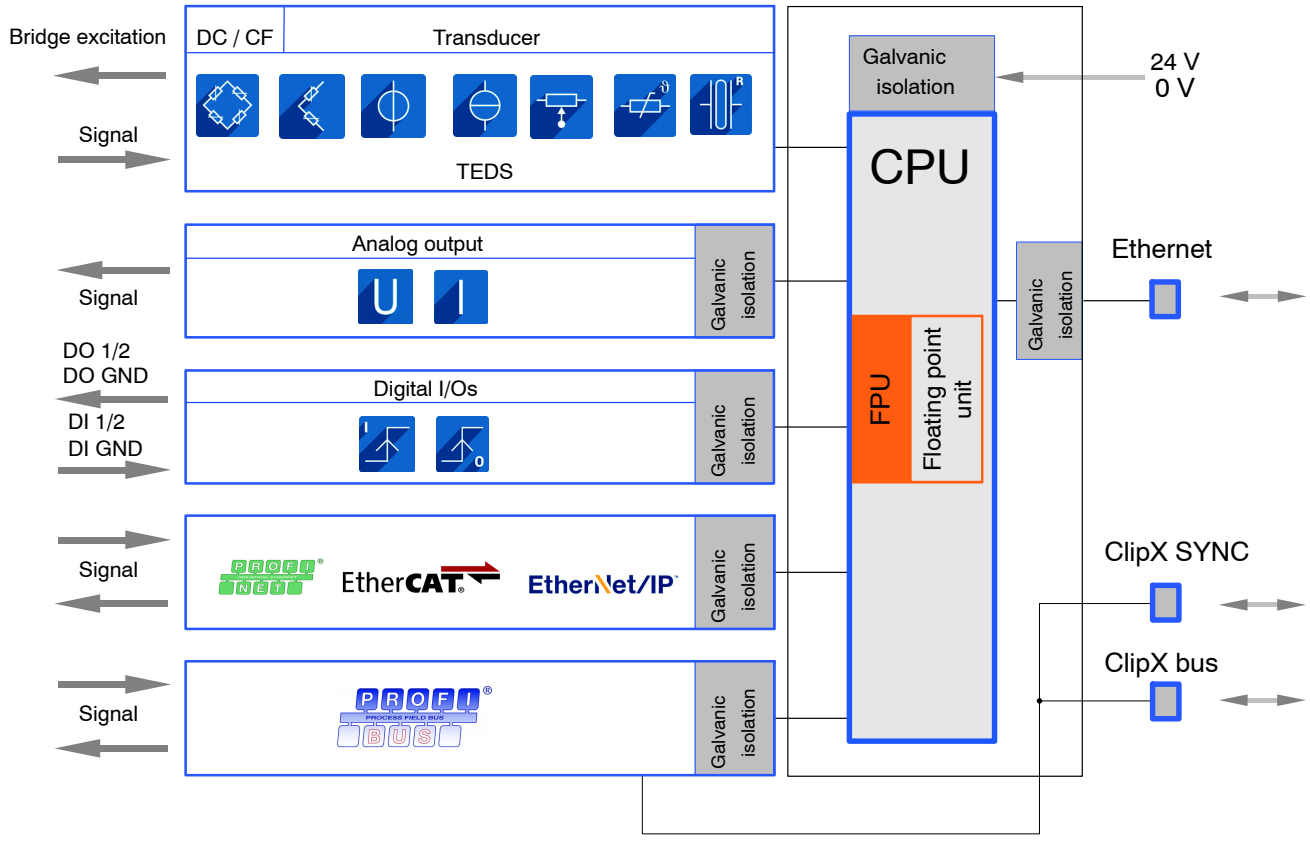
# ClipX®

## BM40, BM40PB, BM40IE
## Industrial amplifier


### Special features

- **Freely configurable measurement channel with TEDS channel parameterization**
- **Connection of 7 transducer technologies with a 19.2 KHz sample rate**
- **Accuracy class up to 0.01 with 24-bit A/D conversion**
- **4 digital I/Os and 1 analog output (Voltage/Current) reversible**
- **Modular up to 6 modules via ClipX bus with transmission of measured values**
- **Internal calculation channels (smart functions)**
- **PROFINET(IRT/RT), EtherCAT®, EtherNet/IP, PROFIBUS (DPV1)**
- **Simple operation via integrated web server with 3 levels of user guidance**
- **Rugged and compact metal housing for attachment to DIN rail**

### Block diagram



## Specifications for ClipX

| General specifications | | BM40, BM40PB, BM40IE |
|---|---|---|
| **Measurement input** | Number | 1, galvanically isolated to supply |
| **Transducer technologies** | | Strain gage full and half bridge, piezoresistive sensors (voltage-fed), potentiometric transducers, resistance thermometers (PT100), voltage (±10V), electric current (±20mA) |
| **A/D conversion** | bit | 24 delta-sigma converter |
| **Sample rate** | S/s | 19,200 |
| **Signal bandwidth** | Hz | Direct voltage bridge excitation (DC): 3,500 Hz when filter off<br>Carrier frequency sensor excitation (CF): 200 Hz |
| **Active low-pass filter** | Hz | Bessel or Butterworth<br>DC: 0.02 … 3,000; filter OFF<br>CF: 0.02 … 200 |
| **Transducer identification** | | |
| TEDS module distance, max. (IEEE 1415.1) | m | 100 |
| **Supply voltage range** | $V_{DC}$ | 10 … 30 (nominal (rated) voltage 24 V) |
| **Supply voltage interruption** (based on PLC standard DIN EN 61131-2) | | |
| 24 V (- 10 %) | ms | 10 |
| 12 V (- 10 %) | ms | 1 |
| **Power consumption** at 24 V supply voltage, max. | W | 5 |
| **Galvanic isolation** | V | 60<br>Between voltage supply, sensor input, ClipX bus, analog output, all digital I/Os, and fieldbuses except PROFIBUS |
| **Fuses** | | None |
| Automatic current limiter | | For all input and output signals |
| Short-circuit resistance | | Input/output signals, synchronization and fieldbus are short-circuit proof and coding elements can be used to safeguard the connector plugs, so they are not transposed. |
| **Ethernet** (data link) | | 10Base-T / 100Base-TX |
| Protocol/addressing | | TCP/IP (direct IP address or DHCP) |
| Plug connection | | RJ45, 8-pin |
| Cable type | | Standard LAN, CAT5, SFTP |
| Max. cable length to device | m | 100 |
| **ClipX bus (data transfer)** | | |
| Number of devices, max. | | 6 |
| Data transfer | | 1 data value (measured value, calculated value, etc.) with status |
| Transmission speed | kHz | 1, with automatic synchronization |
| Protocol / addressing | | RS485, node 1 … 6 |
| Cabling | | Wires, twisted in pairs and shielded |
| Distance between 2 modules, max. | cm | 30 |

## Specifications for ClipX (continued)

| | | |
|---|---|---|
| **Real time calculation in device** | | |
| Calculation channels | Number | 6 |
| Update rate | ms | 1 |
| Functions | | Algebra (+ - * /), 2x2.. 6x6 matrix compensation, logic functions (AND, OR, …) |
| **Peak-value memory** | | |
| Number | | 3 (min., max., peak-to-peak) |
| Reference level | | All measurement signals, all calculation channels, data from ClipX bus, fieldbus and Ethernet, Analog output |
| Response time, typical | µs | 52 |
| **Limit value switch** | | |
| Number | | 4 |
| Reference level | | All measurement signals, all calculation channels, data from ClipX bus, fieldbus and Ethernet, Analog output |
| Function | | Exceeding or falling below a level<br>Inside / outside a tolerance band |
| Response tim, typical | µs | 300 |
| **Digital inputs** | | |
| Number | | 2 |
| Function | | Zero, tare, reset limit value, digital output, parameter set selection (bit-coded), flags from calculation channels |
| Response time, typical | ms | 1 |
| **Digital outputs** | | |
| Number | | 2, designed as high-side switches |
| Function | | Limit value, digital input, measured value/system status, fieldbus flag, current parameter set number (bit-coded), calculation channel flags and Ethernet API flags |
| Response time, typical | ms | 1 |
| **Parameter sets** | | |
| Number | | 10, sensor settings, measurement acquisition incl. calculation channels, limit values, digital input/output settings, analog output settings |
| Device “cloning” | | All the device settings can be saved in full to a PC as a backup and reloaded, either with or without Ethernet and fieldbus settings |
| **Nominal (rated) temperature range** | °C | 0 … 50 |
| **Operating temperature range** (no condensation allowed/module not immune to water condensation) | °C | -20 … + 60 |
| **Storage temperature range** | °C | -25 … +75 |
| **Rel. humidity** | % | 5 … 95 (non-condensing) |
| **Class** (height up to 2,000 m, degree of contamination 2) | | III (as per EN 61140) |
| **Equipment protection level** | | IP20 (as per EN 60529) |
| **Mechanical tests** (Device switched of, in compliance with EN61131-2 PLC hardware standard) | | |
| Oscillation (90 min in each direction) | g | 2 (20 m/s$^2$); 8,4 … 200 Hz (constant acceleration); 5…8,4 Hz (constant amplitude 14 mm); |
| Impact (3 times in each direction) | g | 35 (350 m/s$^2$); sinusoidal; impact duration 6 ms |
| **EMC requirements** | | Compliance with Class B according to EN 55011 (emissions) Group 1.<br>For ESD and surge, compliance with criterion B according to EN 61326-1) (immunity) |
| **Proof of quality** | | Manufacturer’s certificate 2.1 as per EN 10204 and the HBM factory calibration certificate can be downloaded from https://www.hbm.com/ClipX |

## Specifications for ClipX (continued)

| | | |
|---|---|---|
| **Long-term stability** | | All devices are pre-aged in an oven run to improve long-term stability. |
| **Dimensions, (H x W x D),** including DIN rail mounting material | mm | 100 x 25 x 118 |
| **Weight** approx. | g | 360 |

| **Strain gage full bridge** | | **BM40, BM40PB, BM40IE** |
|---|---|---|
| **Accuracy class** | | 0.01 |
| **Transducers that can be connected** | | Strain gage full bridges |
| **Transducer impedance** | Ω | 80 … 5,000 |
| **Measurement ranges (at 5 V bridge excitation)** | mV/V | 2.5 or 5, reversible |
| **Bridge excitation voltage** | V | 5 (± 10 %), direct voltage (DC) or carrier frequency (CTF) 1200 Hz reversible |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500<br>CF: 0 … 200 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; either 1-wire® technology with separate TEDS chip or HBM 0-wire technology with TEDS chip in the sense leads of the sensor |
| **Noise (peak-to-peak)at 25 °C, 5 V bridge excitation (DC), 350 Ohm full bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.04 |
| with 10 Hz Bessel filter | µV/V | 0.12 |
| with 100 Hz Bessel filter | µV/V | 0.4 |
| with 1 kHz Bessel filter | µV/V | 1.2 |
| **Noise (peak-to-peak)at 25 °C, 5 V bridge excitation (CF), 350 Ohm full bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.05 |
| with 10 Hz Bessel filter | µV/V | 0.16 |
| with 100 Hz Bessel filter | µV/V | 0.5 |
| with 200 Hz Bessel filter | µV/V | 0.8 |
| **Non-linearity** | % | 0.005 of full scale value |
| **Zero drift (bridge excitation 5 V)** | % / 10 K | 0.01 of full scale value |
| **Full-scale drift (bridge excitation 5 V)** | % / 10 K | 0.01 of measured value |
| **Strain gage half bridge** | | **BM40, BM40PB, BM40IE** |
| **Accuracy class** | | 0.01 |
| **Transducers that can be connected** | | Strain gage half bridges |
| **Transducer impedance** | Ω | 80 … 5,000 |
| **Measurement ranges (at 5 V bridge excitation)** | mV/V | 2.5 or 5; reversible |
| **Bridge excitation voltage** | V | 5 (± 10 %), direct voltage (DC) or carrier frequency (CF) 1200 Hz reversible |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500<br>CF: 0 … 200 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; either 1-wire technology with separate TEDS chip or HBM 0-wire technology with TEDS chip in the sense leads of the sensor |
| **Noise (peak-to-peak)at 25 °C, 5 V bridge excitation (DC), 350 Ohm half bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.08 |
| with 10 Hz Bessel filter | µV/V | 0.24 |
| with 100 Hz Bessel filter | µV/V | 0.8 |
| with 1 kHz Bessel filter | µV/V | 2.4 |

## Specifications for ClipX (continued)

| | | |
|---|---|---|
| **Noise (peak-to-peak) at 25 °C, 5 V bridge excitation (CF), 350 Ohm half bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.1 |
| with 10 Hz Bessel filter | µV/V | 0.32 |
| with 100 Hz Bessel filter | µV/V | 1 |
| with 200 Hz Bessel filter | µV/V | 1.6 |
| **Non-linearity** | % | 0.05 of full scale value |
| **Zero drift (bridge excitation 5 V)** | % / 10 K | 0.1 of full scale value |
| **Full-scale drift (bridge excitation 5 V)** | % / 10 K | 0.1 of measured value |
| **Resistive full bridge** | | **BM40, BM40PB, BM40IE** |
| **Accuracy class** | | 0.01 |
| **Transducers that can be connected** | | Resistive full bridge, voltage-fed |
| **Transducer impedance** | Ω | 80 … 5,000 |
| **Measurement ranges (at 5 V bridge excitation)** | mV/V | 100 or 800, reversible |
| **Bridge excitation voltage** | V | 5 (± 10 %), direct voltage (DC) |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; either 1-wire technology with separate TEDS chip or HBM 0-wire technology with TEDS chip in the sense leads of the sensor |
| **Noise (peak-to-peak) at 25 °C, at 100 mV/V, 5 V bridge excitation (DC), 350 Ohm full bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.2 |
| with 10 Hz Bessel filter | µV/V | 0.4 |
| with 100 Hz Bessel filter | µV/V | 1.5 |
| with 1 kHz Bessel filter | µV/V | 5 |
| **Noise (peak-to-peak)at 25 °C, at 800 mV/V, 5 V bridge excitation (DC), 350 Ohm full bridge** | | |
| with 1 Hz Bessel filter | µV/V | 0.6 |
| with 10 Hz Bessel filter | µV/V | 1.2 |
| with 100 Hz Bessel filter | µV/V | 4.5 |
| with 1 kHz Bessel filter | µV/V | 15 |
| **Non-linearity** | % | 0.05 of full scale value |
| **Zero drift (bridge excitation 5 V)** | % / 10 K | 0.01 of full scale value |
| **Full-scale drift (bridge excitation 5 V)** | % / 10 K | 0.01 of measured value |
| **Potentiometric transducers / potentiometers** | | **BM40, BM40PB, BM40IE** |
| **Accuracy class** | | 0.1 |
| **Transducers that can be connected** | | Potentiometric transducers |
| **Transducer impedance** | Ω | 80 … 5,000 |
| **Measurement ranges (at 5 V bridge excitation)** | mV/V | 500, corresponding to 0 … 100 % |
| **Bridge excitation voltage** | V | 5 (± 10 %), direct voltage (DC) |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; 1-wire technology with separate TEDS chip |
| **Noise (peak-to-peak) at 25 °C , Potentiometric transducer, 5 V bridge excitation (DC), 10k Poti, middle position** | | |
| with 1 Hz Bessel filter | % | 0.00008 |
| with 10 Hz Bessel filter | % | 0.00025 |
| with 100 Hz Bessel filter | % | 0.001 |
| with 1 kHz Bessel filter | % | 0.003 |
| **Non-linearity** | % | 0.05 of full scale value |
| **Zero drift (bridge excitation 5 V)** | % / 10 K | 0.1 of full scale value |
| **Full-scale drift (bridge excitation 5 V)** | % / 10 K | 0.1 of measured value |

| Resistance thermometer (Pt100) | | BM40, BM40PB, BM40IE |
|---|---|---|
| **Accuracy** | °C | 0.5 |
| **Transducers that can be connected** | | Pt100 (connected in a 3-wire configuration) |
| **Linearization range** | °C | -200 … +850 |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; 1-wire technology with separate TEDS chip |
| **Noise (peak-to-peak) at 25 °C, Pt100 at 100 Ohm** | | |
| with 1 Hz Bessel filter | K | 0.008 |
| with 10 Hz Bessel filter | K | 0.012 |
| with 100 Hz Bessel filter | K | 0.06 |
| with 1 kHz Bessel filter | K | 0.2 |
| **Non-linearity** | % | < 0.5 |
| **Zero drift** | K / 10 K | < 0.2 |
| **Full-scale drift** | K / 10 K | < 1 |
| **Voltage** | | **BM40, BM40PB, BM40IE** |
| **Accuracy class** | | 0.05 |
| **Transducers that can be connected** | | Voltage sources |
| **Transducer impedance** | MΩ | > 1 |
| **Measurement range** | V | ± 10 |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; 1-wire technology with separate TEDS chip |
| **Noise voltage input ±10 V** | | |
| with 1 Hz Bessel filter | µV | 0.000050 |
| with 10 Hz Bessel filter | µV | 0.000100 |
| with 100 Hz Bessel filter | µV | 0.000250 |
| with 1 kHz Bessel filter | µV | 0.000750 |
| **Common-mode rejection** | | |
| at DC common mode | dB | > 120 |
| at 50/60 Hz common mode, typical | dB | > 80 |
| **Common-mode voltage** (to housing and supply ground) | V | ±30 |
| **Non-linearity** | K | 0.05 of full scale value |
| **Zero drift** | K / 10 K | 0.05 of full scale value |
| **Full-scale drift** | K / 10 K | 0.05 of measured value |
| **Signal current** | | **BM40, BM40PB, BM40IE** |
| **Accuracy class** | | 0.05 |
| **Transducers that can be connected** | | Transducers with current output |
| **Measuring resistance value, typical** | Ω | < 15 |
| **Measurement range** | mA | 4 … 20, ± 20 mA, reversible |
| **Signal bandwidth (-3 dB)** | Hz | DC: 0 … 3,500 |
| **Permissible cable length between ClipX and transducer** | m | < 100 |
| **Transducer identification** | | TEDS, IEEE 1415.1; 1-wire technology with separate TEDS chip |
| **Noise current input** | | |
| with 1 Hz Bessel filter | mA | 0.000050 |
| with 10 Hz Bessel filter | mA | 0.000100 |
| with 100 Hz Bessel filter | mA | 0.000500 |
| with 1 kHz Bessel filter | mA | 0.002000 |

## Specifications for ClipX (continued)

| | | |
|---|---|---|
| **Common-mode rejection** | | |
| at DC common mode | dB | > 120 |
| at 50/60 Hz common mode, typical | dB | > 80 |
| **Common-mode voltage** (to housing and supply ground) | V | ± 30 |
| **Non-linearity** | % | 0.05 of full scale value |
| **Zero drift** | K / 10 K | 0.05 of full scale value |
| **Full-scale drift** | K / 10 K | 0.05 of measured value |

## Specifications for ClipX (continued)
## Input / Output

| Analog output | | BM40, BM40PB, BM40IE |
|---|---|---|
| **Voltage output** | | |
| **Accuracy class** | | 0.1 |
| **Number** | | 1 |
| **Signal sources** | | All measurement signals, all calculation channels, data from ClipX bus, fieldbus and Ethernet |
| **Output signal** | V | ± 10; reversible, short-circuit proof |
| **D/A converter resolution** | bit | 16 |
| **Output rate, max.** | kHz | 19.2 |
| **Cut-off frequency (-3 dB)** | kHz | 2 |
| **Output resistance** | Ω | < 320 |
| **Permissible input impedance** | | 10 kΩ II 20 nF |
| **Permissible cable length,** max. | m | 100 |
| **Noise (peak-to-peak)** | mV | < 10 |
| **Non-linearity (INL)** Integral Non Linearity | LSB | < ±27 |
| **Zero drift** rel. to full scale | mV / 10 K | < 2 |
| **Full-scale drift** rel. to output value | mV / 10 K | < 2 |
| **Current output** | | |
| **Accuracy class** | | 0.1 |
| **Number** | | 1 |
| **Signal sources** | | All measurement signals, all calculation channels, data from ClipX bus, fieldbus and Ethernet |
| **Output signal** | mA | 4 … 20 mA, reversible, short-circuit proof |
| **D/A converter resolution** | bit | 16 |
| **Output rate, max.** | kHz | 19.2 |
| **Cut-off frequency (-3 dB)** | kHz | 2 |
| **Permitted burden** | Ω | < 400 |
| **Permissible cable length,** max. | m | 100 |
| **Noise (peak-to-peak)** | µA | < 60 |
| **Non-linearity (INL)** Integral Non Linearity | LSB | < ±27 |
| **Zero drift** rel. to full scale | µA / 10 K | < 5 |
| **Full-scale drift** rel. to output value | µA / 10 K | < 10 |
| **Digital inputs** | | **BM40, BM40PB, BM40IE** |
| **Number** | | 2 |
| **Functions** | | Zero, tare, reset limit value, digital output, parameter set selection (bit-coded), flags from calculation channels |
| **Switching time** | ms | < 1 |
| **Input signal range** | V | 0 … 30 |
| Maximum permitted input signal range | V | 30 |
| Low state input | V | 0 … 5 (or open) |
| High state input | V | 10 … 30 |
| **Input resistance (nominal)** | kΩ | 2.4 |
| **Cable length,** max. | m | 100 |
| **Cable type** (required in the event of interference) | | shielded |

## Specifications for ClipX (continued)

| Digital outputs | | BM40, BM40PB, BM40IE |
|---|---|---|
| **Number** | | 2, short-circuit proof |
| **Functions** | | Limit value, digital input, measured value/system status, fieldbus flag, current parameter set number (bit-coded), calculation channel flags |
| **Switching time** | ms | < 1 |
| **Input voltage** | V | Operating voltage |
| **Output current per output, max.** | mA | 200 |
| **Output current (outputs total), max.** | mA | 400 |
| **Output impedance** | Ω | < 1 |
| **Start-up characteristics** | | Low until the ClipX transmits the required level |

## Fieldbuses

| PROFIBUS | | BM40PB |
|---|---|---|
| **Bit rate** | kBit/s | 9.6 … 12,000 auto-detect |
| **Node address** | | 3 - 126<br>adjustable via the web user interface<br>Factory setting: 126 |
| **Configuration data, max.** | bytes | 244 |
| **Logical slots** | | 30 |
| **Cyclic output data (master -> ClipX), max.** | bytes | 160 |
| **Cyclic input data (ClipX -> master), max.** | bytes | 160 |
| **Cycle time (slave interval), min.** | ms | 0.6 |
| **Acyclic data protocol** | | DP V1 Class 1 and Class 2<br>A list with the data objects can be downloaded via the web user interface |
| **Acyclic data, max.** | bytes | 240 |
| **Male connector** | | 9-pin DSub; galvanically isolated from supply and measurement ground |
| **PROFIBUS Ident No.** | | 0x1015 |

| Industrial Ethernet IE | | BM40IE |
|---|---|---|
| **In the BM40IE device, the operator can toggle between fieldbus types using the ClipX Web Server** | | |
| **EtherCAT®[1)]** | | |
| **Type** | | EtherCAT complex slave |
| **Cable type** | | Standard CAT-5, shielded |
| **Cable length, max.** | m | 100 |
| **Connector socket** | | 2x RJ45 (IN / OUT) |
| **Input data, max.** | bytes | 166 |
| **Output data, max.** | bytes | 44 |
| **Online device description** | | CAN over EtherCAT Object Dictionary (ESI file not required) |
| **Offline device description** | | ESI file stored in the device |
| **Data rate, max.** | kHz | 4 |
| **Distributed clocks** | | Supported, 32 bits |
| Minimum cycle time | µs | 250 |

1) EtherCAT® is a registered brand and patented technology, licensed by Beckhoff Automation GmbH, Germany

## Specifications for ClipX (continued)

| EtherNet/IP | | |
|---|---|---|
| **Type** | | Communication adapter |
| **Cable type** | | Standard CAT-5, shielded |
| **Cable length, max.** | m | 100 |
| **Connector socket** | | 2 x RJ45 |
| **Input data, max.** | bytes | 166 |
| **Output data, max.** | bytes | 44 |
| **IO connection types** | | Exclusive owner, Listen only, Input only |
| **IO connection trigger types** | | Cyclic, minimum 1 ms[1)],<br>Application triggered, minimum 1 ms[1)],<br>Change of state, minimum 1 ms[1)] |
| **Explicit messages connections** | | 10 |
| **Implicit messages connections** | | 5 |
| **Unconnected Message Manager (UCMM)** | | 10 |
| **Configuration control** | | STATIC, BOOTP, DHCP |
| **Bit rates** | Mbit/s | 10, 100 |
| **Duplex modes** | | Half, full, auto negotiation |
| **Data transport layer** | | Ethernet II, IEEE 802.3 |
| **Address collision detection** | | supported |
| **Device level ring** | | supported |
| **Integrated switch** | | supported |
| **Reset services** | | Type 0, type 1 |
| **Quick connect** | | not supported |
| **Tags** | | not supported |
| **CIP Sync** | | not supported |

1) Depends on the number of connections and the IO quantities

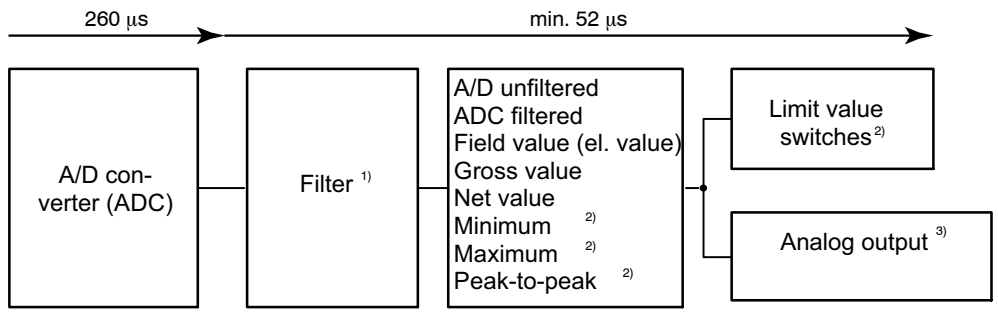
## Specifications for ClipX (continued)

| PROFINET | | |
|---|---|---|
| **Cable type** | | Standard CAT-5, shielded |
| **Cable length, max.** | m | 100 |
| **Connector socket** | | 2x RJ45 (port1 / port 2) |
| **Real time classes** | | 1 (“RT”) / 3 (“IRT”) |
| **Device access point “slow”** | | |
| Cycle time Class 1 | ms | 1 / 2 / 4 |
| Cycle time Class 3 | ms | 1 / 2 / 4 |
| Slots / max. number of modules | - | 30 |
| Input data, max. | bytes | 180 |
| Output data, max. | bytes | 100 |
| **Device access point “fast”** | | |
| Cycle time Class 1 | ms | 1 / 2 / 4 |
| Cycle time Class 3 | ms | 0.25 / 0.5 / 1 / 2 / 4 |
| Slots / max. number of modules | | 6 |
| Input data, max. | bytes | 60 |
| Output data, max. | bytes | 40 |
| **Supported protocols** | | RTC (Real Time Cyclic)<br>Class 1, unsynchronized<br>Class 3, synchronized |
| | | RTA - Real Time Acyclic |
| | | DCP - Discovery and Configuration |
| | | DCE/RPC - Distributed Computing Environment - Connectionless Remote Procedure Calls |
| | | LLDP - Link Layer Discovery Protocol |
| | | PTCP - Precision Transparent Clock Protocol |
| | | SNMP - Simple Network Management Protocol |
| **Media redundancy** | | MRP client |
| **Identification & Maintenance** | | I&M0 … I&M3 read and write |

## Specifications for ClipX (continued)

## Signal transit times (ms)

### Group 1: Measured values



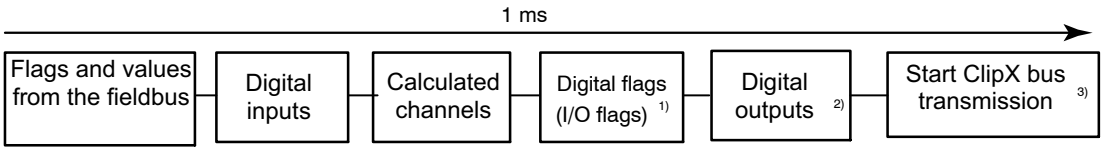

1) Filter off: 0 s; Bessel filter: 0.43/fg ; Butterworth filter: 0.66/fg ; The result is time in seconds for an output signal of 50% of the full scale value with a jump at the input
.

2) These signals can also use other sources. The phase delays of the source signals must then be added.

3) If the analog output is to transmit a value from this group, you must add an additional 52 µs. If you are using a source from a different group, you must add the phase delay of the source signal to the 52 µs.

**Fig.1: Minimum transit times for group 1: 52 µs plus A/D converter conversion time**

### Group 2: Flags, digital I/O, calculated values, ClipX bus




1) The changes in digital flags are analyzed in the following order: Zero, tare, clear zero balance, clear tare balance; reset limit value switches; reset peak values; hold held values; clear held values.

2) The digital outputs have an additional response time of max. 0.25 ms.

3) Asynchronous transfer of the values on the ClipX bus is complete after max. 1 ms, i.e. on the next cycle.

**Fig.2: Maximum transit time for group 2: 1 ms**

## Specifications for ClipX (continued)

### Group 3: Data from fieldbus master to ClipX

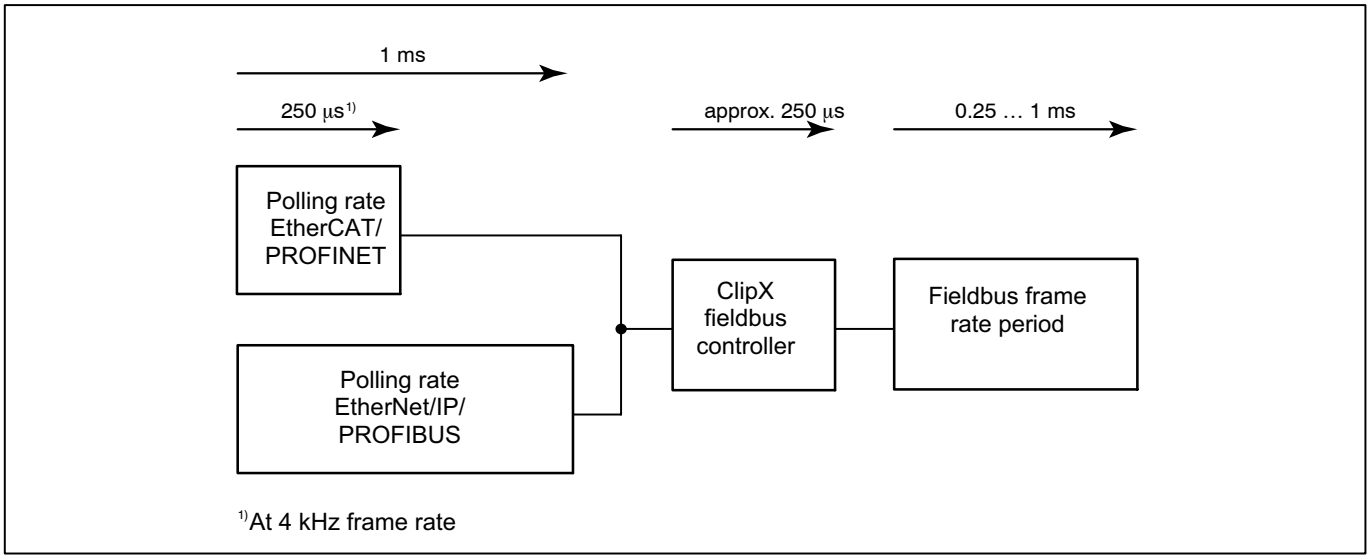



**Fig.3: Transit time for group 3**

### Group 4: Data from ClipX to fieldbus master

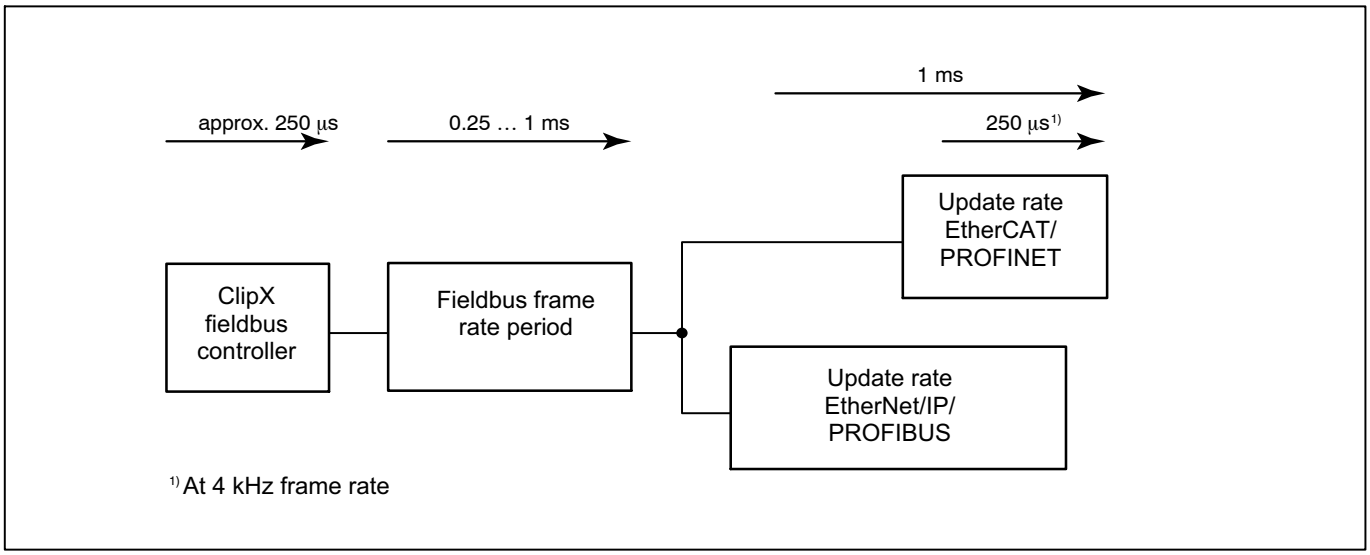
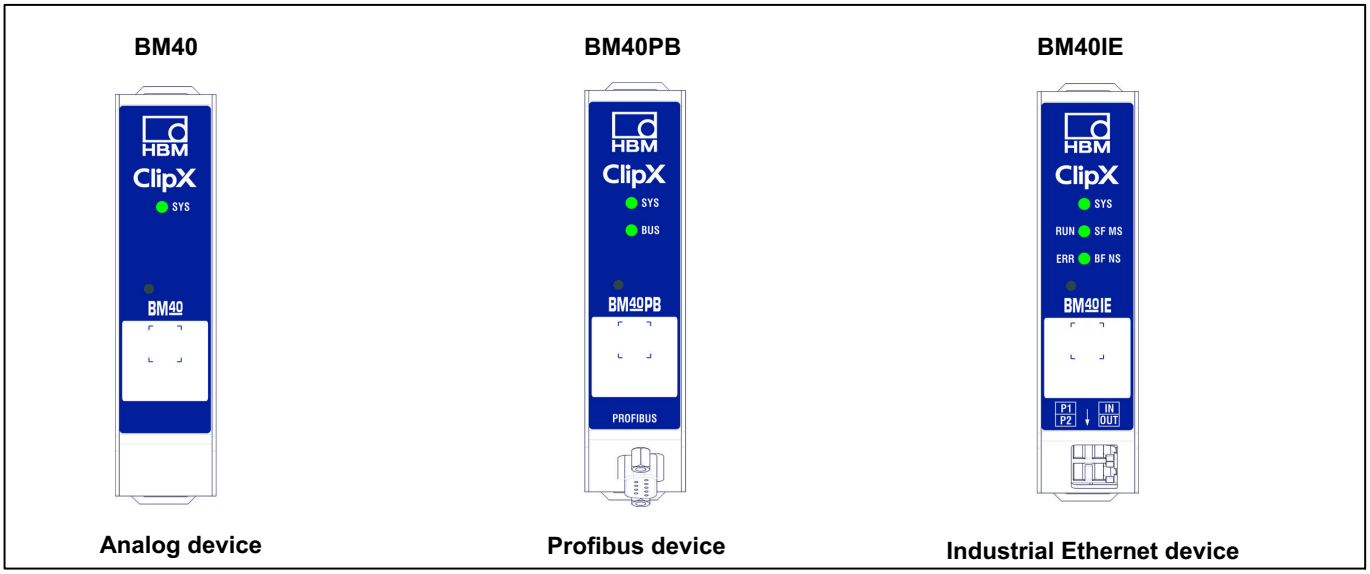


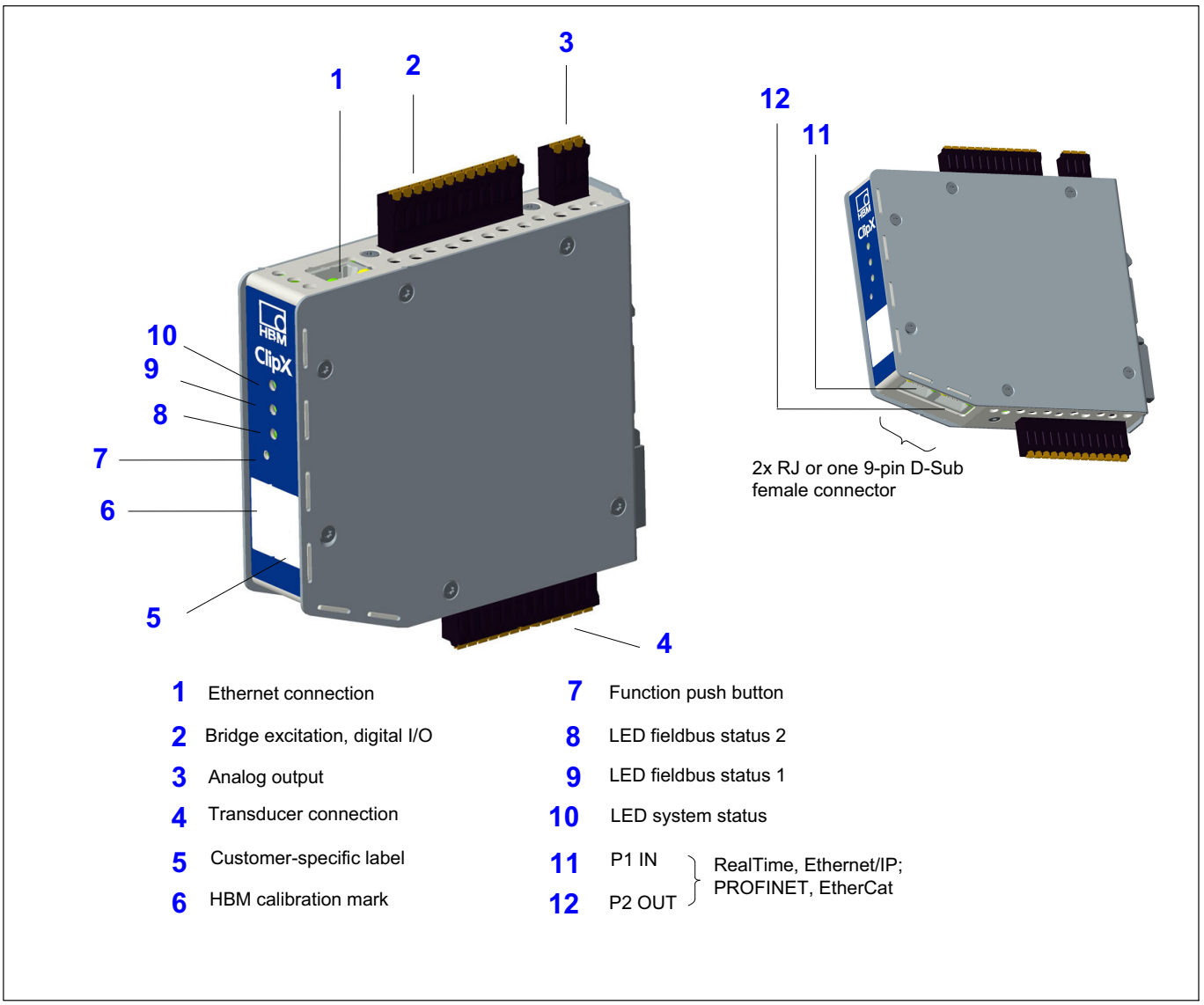

**Fig.4: Transit time for group 4**

## Specifications for ClipX (continued)

### ClipX variants




### Function overview



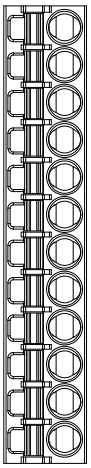
## PIN assignment

**1** **Ethernet (communication); RJ45**

Standard assignment

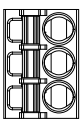

**Plug terminals :**

**2** **Supply, digital I/O, ClipX bus, 12-pin** (Phoenix MC1.5/12-G-3.5)



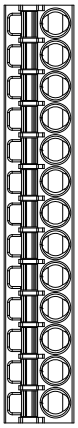
| | |
|---|---|
| 24 V | Power supply |
| 0 V | Power supply / Digital Out GND |
| DO1 | Digital Out 1 |
| DO2 | Digital Out 2 |
| DI1 | Digital In 1 |
| DI2 | Digital In 2 |
| ⊥ 0I | Digital In GND |
| Sync | |
| CxB | ClipX bus B (RS485-) |
| ⊥ X | ClipX bus GND |
| CxA | ClipX bus A (RS485+) |
| ⏚ | |


**3** **Analog output, 3-pin** (Phoenix MC1.5/12-G-3.5)



| | |
|---|---|
| ⏚ | |
| ⊥ AO | Analog Out Gnd |
| AO | Analog Out |

**4** **Transducer, 13-pin** (Phoenix MC1.5/13-G-3.5)



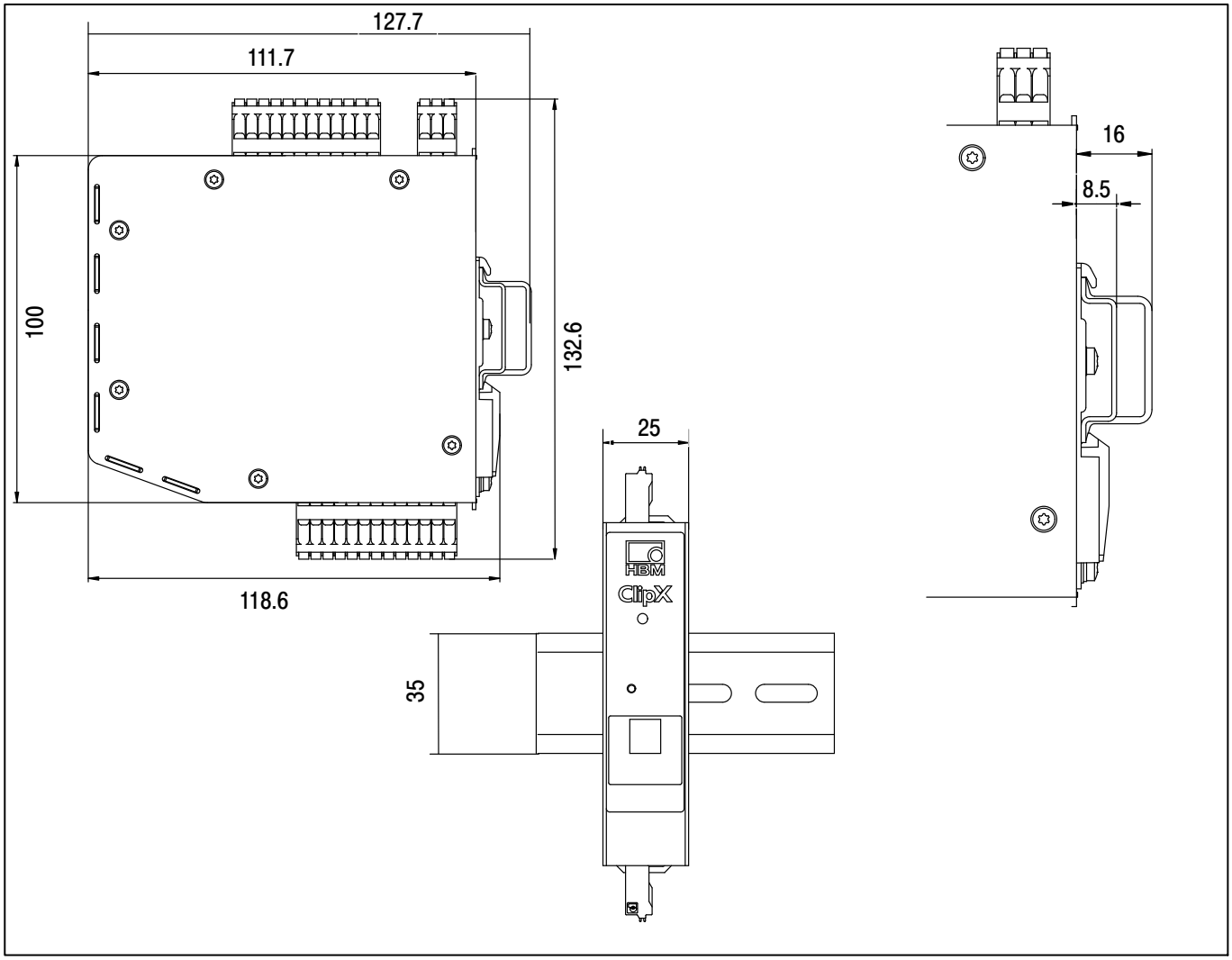
| | |
|---|---|
| Pt100 | |
| TEDS | |
| ⊥ S | |
| 4 | measurement signal - |
| 1 | measurement signal + |
| 2' | sense lead - |
| 2 | bridge excitation voltage - |
| 3' | sense lead + |
| 3 | bridge excitation voltage + |
| ⏚ | Outer shield |
| ⊥ AI | Cable shield |
| I IN | |
| U IN | |

**An alternative to plug terminals:**

Screw terminals, obtained directly from Phoenix

## Specifications for ClipX (continued)

### Dimensions




**Notice**: ClipX devices can be manually fitted to the DIN rail and removed without the need for tools. To help with construction, ready-prepared ePLAN macros (no license required) and 3D STEP files are available free of https://www.hbm.com/ClipX.

### Replacement parts

| Accessories | Ordering number |
|---|---|
| **Ethernet cable**<br>for direct operation of devices on a PC or notebook, length 2 m, type CAT5+ | 1-KAB239-2 |
| **ClipX plug set (3x push-in)**<br>Three-piece plug set for sensor connection, power supply and analog output, including coding pins | 1-CON-S1019 |

**Notice**: A set of plug terminals is already included in the scope of supply



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