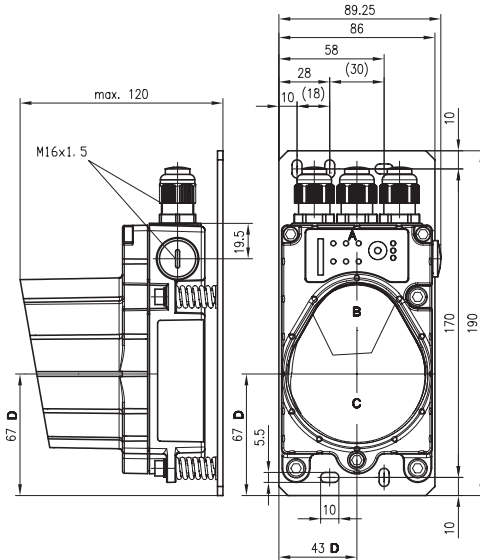


3 Technical Data

3.1 General technical data

Electrical data	
Supply voltage V_{in}	18 ... 30 V DC
Current consumption without optics heating	approx. 200 mA with 24 V DC (no load at switching output)
Current consumption w. optics heating	approx. 800 mA with 24 V DC (no load at switching output)
Optical data	
Sensing distance	0.2 ... 120 m (DDL5 200/120...) 0.2 ... 200 m (DDL5 200/200...)
Transmission diode	infrared light, wavelength 880 nm
Opening angle	$\pm 0.5^\circ$ to optical axis
Ambient light	> 10000 Lux acc. to EN 60947-5-2 (2000)
Laser safety class	1 acc. to EN 60825-1 (2001)
Input/output	
Input	0 ... 2 V DC: transmitter/receiver deactivated 18 ... 30 V DC: transmitter/receiver activated
Output	0 ... 2 V DC: normal operation $V_{in} - 2$ V DC: limited performance reserve output current max. 100 mA, short-circuit proof, protected against surge voltage, transients and overheating
Operating and display elements	
Membrane buttons	change the operating mode
Individual LEDs	indicate voltage supply, operating mode, data traffic
LED strip	bar graph display of the receiving level
Mechanical data	
Housing	aluminium diecast; light inlet/outlet, glass
Weight	approx. 1200 g
Protection class	IP 65 acc. to EN 60529
Environmental conditions	
Operating temperature	-5 °C ... +50 °C without optics heating -30 °C ... +50 °C with optics heating (non-condensing)
Storage temperature	-30°C ... +70°C
Air humidity	max. 90% rel. humidity, non-condensing
Vibrations	acc. to EN 60068-2-6
Noise	acc. to EN 60068-2-64
Shock	acc. to EN 60068-2-27 and EN 60068-2-29
EMC	acc. to EN 61326 (1998) + A1 (1999)

3.2 Dimensioned drawing

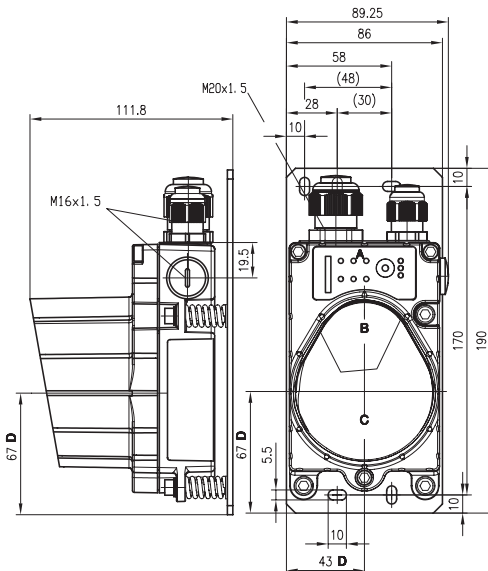


Permissible cables:

M16 x 1.5:
round cable \varnothing 5 ... 10 mm

- A control panel
- B transmission optics
- C reception optics
- D optical axis

Figure 3.1: Dimensioned drawing DDLS 200 for **copper cable**



Permissible cables:

M16 x 1.5:
round cable \varnothing 5 ... 10 mm

M20 x 1.5:
round cable \varnothing 7 ... 12 mm

- A control panel
- B transmission optics
- C reception optics
- D optical axis

Figure 3.2: Dimensioned drawing DDLS 200 for **fibre optic cable**

The connection compartment in the housing base with the screwed cable glands is now freely accessible.

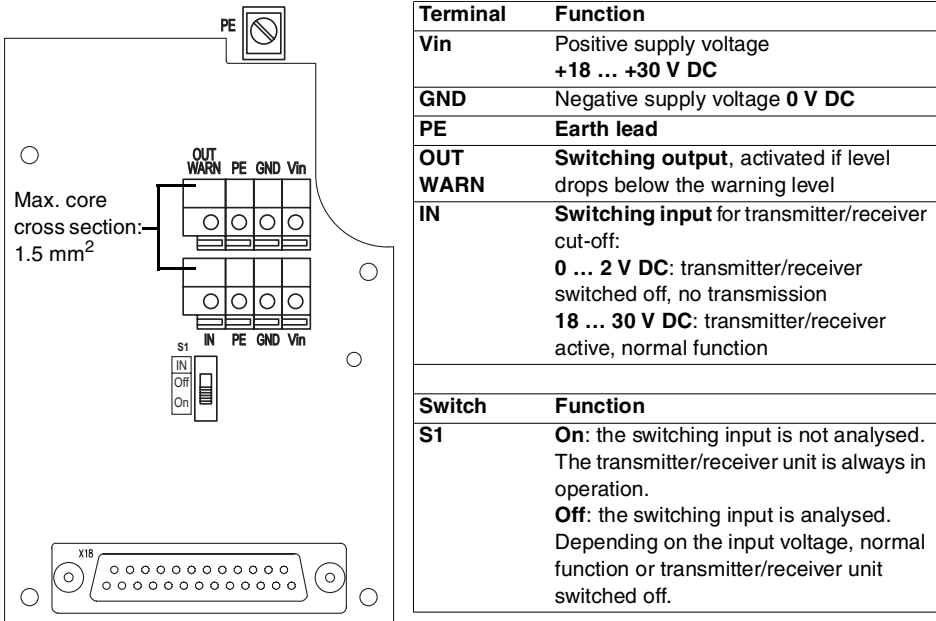


Figure 4.4: Positions of the general, non-bus-specific terminals and switches

4.3.1 Supply voltage

Connect the supply voltage, including the earth lead, to the spring terminals labelled **Vin**, **GND** and **PE** (see figure 4.4).



Note

The connection terminals **Vin**, **GND** and **PE** are provided double to simplify wiring through the supply voltage to other devices.

The earth lead can alternatively be connected at the screw terminal in the housing base (max. core cross section 2.5 mm²)

If you would like to wire through the supply voltage, you should replace the filler plugs on the right side of the housing base with an M16 x 1.5 screwed cable gland and guide the continuing supply voltage cable through this gland. The housing seal is, in this way, ensured (Protection Class IP 65).

The housing top can be removed and replaced while under voltage.

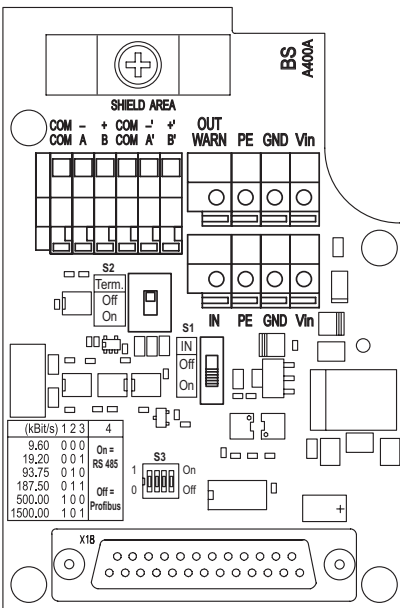
5 PROFIBUS / RS 485

The PROFIBUS model of the DDLS 200 has the following features:

- Electrically isolated interface
- The DDLS does not occupy a PROFIBUS address
- Integrated repeater function (signal processing), can be switched off
- Protocol-independent data transmission, i.e. transmission of the FMS, DP, MPI, FMS/DP mixed operation protocols
- Connectable bus terminator (termination)
- 6 baud rates can be set

5.1 Electrical connection PROFIBUS

The electrical connection to the PROFIBUS is made at the terminals **A**, **B**, and **COM**. The terminals **A'**, **B'** and **COM** are provided for wiring through the bus.



PROFIBUS - terminals and switches

Terminal	Function
A, -	(N) PROFIBUS or (-) RS 485
B, +	(P) PROFIBUS or (+) RS 485
COM	Potential equalisation
A', -'	(N) PROFIBUS or (-) RS 485 of the wired-through bus
B', +'	(P) PROFIBUS or (+) RS 485 of the wired through bus
Switch	Function
S2	Termination On/Off
S3-1 ... S3-3	Setting the baud rate of the PROFIBUS segment
S3-4	Changeover PROFIBUS (Off) / RS 485 (On)

Figure 5.1: Connection circuit board of the PROFIBUS model



Attention!

Please be sure to observe the installation requirements (bus cables, cable lengths, shielding, etc.) defined in the PROFIBUS standard EN 50170 (Vol. 2).

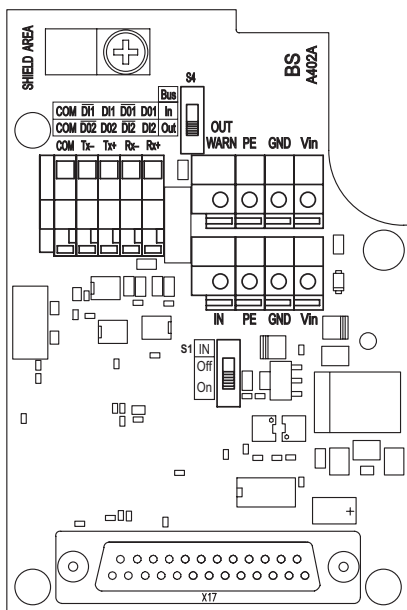
6 INTERBUS 500 kBit/s / RS 422

The INTERBUS model of the DDLS 200 has the following features:

- Electrically isolated interface
- The DDLS 200 is **not an** INTERBUS subscriber
- Protocol-independent data transmission, transparent compared to other RS 422 protocols
- 500 kBit/s fixed transmission rate with INTERBUS, with RS 422 generally lower transmission rates as well

6.1 Electrical connection INTERBUS 500 kBit/s

The electrical connection to the INTERBUS is made at terminals **DO...** / **DI...** and **COM** as shown in figure 6.1.



INTERBUS - terminals and switches

Terminal	Function
DO1 / DI2, Rx+	Reception line +
$\overline{DO1} / \overline{DI2}$, Rx-	Reception line -
DI1 / DO2, Tx+	Transmission line +
$\overline{DI1} / \overline{DO2}$, Tx-	Transmission line -
COM	Potential equalisation
Switch	Function
S4	Position In : incoming bus with shielding connection via RC circuit
	Position Out : outgoing bus with direct shielding connection

Figure 6.1: Connection circuit board of the INTERBUS model



Attention!

Please be sure to observe the installation requirements (bus cables, cable lengths, shielding, etc.) defined in the INTERBUS standard EN 50254

7 INTERBUS 2 MBit/s Fibre Optic Cable

The INTERBUS fibre optic cable model of the DDLS 200 has the following features:

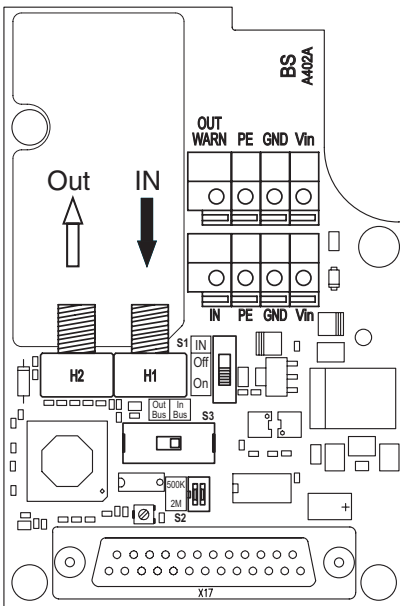
- Transmission protected against interference through the use of fibre optic cables
- Bus connection by means of polymer-fibre cable with FSMA connector
- The DDLS 200 is an INTERBUS subscriber (Ident-Code: 0x0C = 12_{dec}), but does not occupy data in the bus
- Adjustable transmission rate 500 kBit/s or 2 MBit/s

7.1 Fibre optic cable connection INTERBUS 2 MBit/s

The connection to the INTERBUS is by means of the FSMA connectors **H1** and **H2** as shown in figure 7.1.

Recommended fibre optic cable:

- PSM-LWL-KDHEAVY... (Phoenix Contact)
- PSM-LWL-RUGGED... (Phoenix Contact)



INTERBUS - terminals and switches

Fibre optic cable socket	Function
H1	Receiver fibre optic cable
H2	Transmitter fibre optic cable
Switch	
S2	Setting 500k : INTERBUS fibre-optic-cable transmission rate 500 kBit/s
	Setting 2M : INTERBUS fibre-optic-cable transmission rate 2 MBit/s
S3	Setting In Bus : incoming bus fibre optic cable
	Setting Out Bus : outgoing bus fibre optic cable

Figure 7.1: Connection circuit board of the INTERBUS model

8 Data Highway + (DH+) / Remote I/O (RIO)

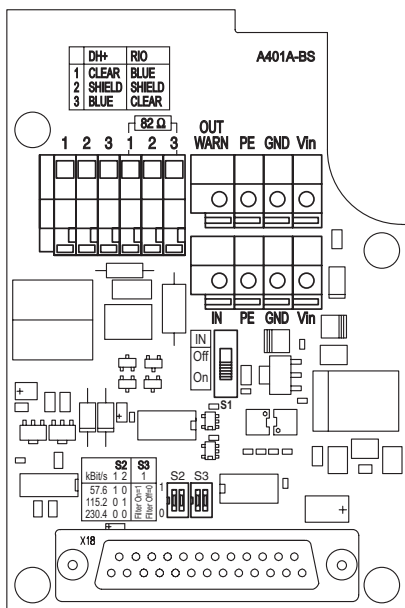
The DH+/RIO model of the DDLS 200 has the following features:

- Electrically isolated interface
- Direct connection to the Data Highway + and Remote I/O bus from Rockwell Automation (Allen Bradley)
- Adjustable transmission rate 57.6 / 115.2 or 230.4 kBit/s

8.1 Electrical connection DH+ / RIO

The electrical connection to the DH+ / RIO bus is made in accordance with the table on the connection circuit board at the terminals **1**, **2** and **3**. These terminals are provided double for wiring through the bus.

Cable to be used: Bluehouse Twinax (Belden 9463 or Allen Bradley 1770-CD)



DH+/RIO - terminals and switches

Terminal	Assignment DH+	Assignment RIO
1	CLEAR	BLUE
2	SHIELD	SHIELD
3	BLUE	CLEAR

Switch	Function
S2-1, S2-2	Setting the transmission rate (see table on the connection circuit board), default: 230.4 kBit/s
S3-1	Filter for interference-peak rejection. Setting On (1): filter switched on (default) Setting Off (0): filter switched off
S3-2	Not used

Figure 8.1: Connection circuit board of the DH+ / RIO model



Attention!

The right DH+ / RIO connections 1 and 3 are equipped standard with an 82 Ω resistor for terminating the bus. Remove this terminating resistor when the bus cable in the DDLS 200 is to be wired through to another bus subscriber, i.e. the DDLS 200 is not the last device on the bus cable. The use of the DDLS 200 is limited to bus systems with 82 Ω termination.