MA 90 — Connector Unit for BCL 90

18 - 30 V DC

RS 232
Service

- MA 90 is an interface module for the product family BCL 90 for user-friendly wiring and parameterization.
- RS 232 service interface
- Voltage supply terminals in twin design for wiring through
- Provided with double RS 485 interfaces for wiring through of the Leuze multiNet plus
- Hardware addressing in Leuze multiNet plus
- 6 switching inputs and 4 switching outputs
- 4 LEDs for equipment visualisation
- Hardware reset
- Large wiring terminal space

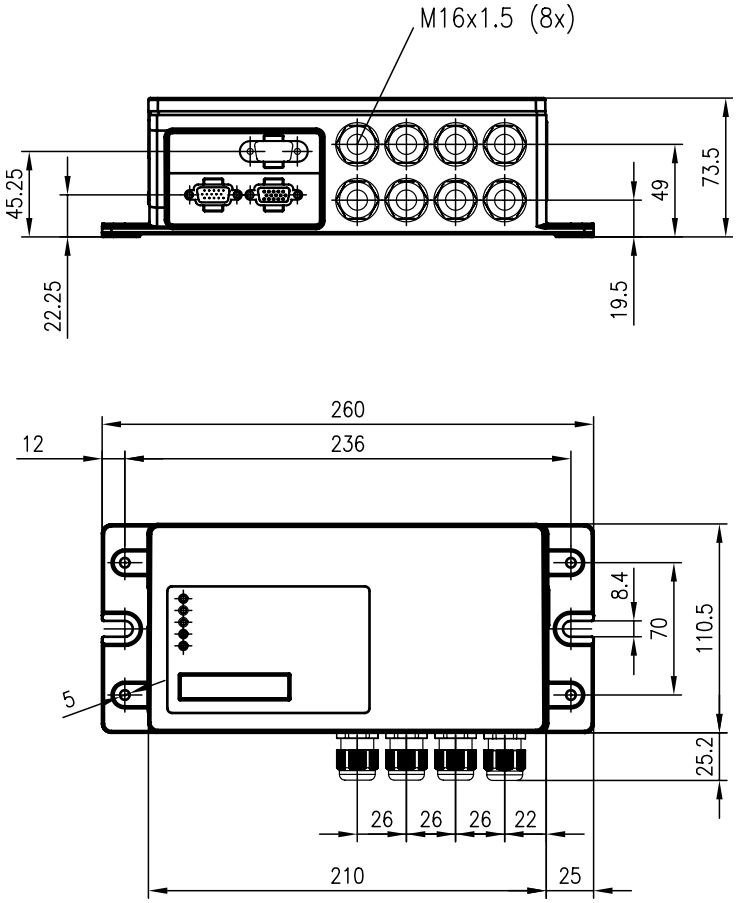
IP 54

IEC 801...

Accessories

- **KB 090-3000** Order No. 500 35319
  connection line BCL90/MA90
  (3 m, 15-pin Sub-HD)
- **KB 090-3000 P** Order No. 500 35322
  External parameter memory
  (IP 65 with 2 x 3m cable, 15-pin Sub-HD)
- **KB 090-3000 H** Order-No. 500 35324
  2 x plug cover
  (IP 65 with 2 x 3m cable for heaters)

Dimensioned Drawing



Technical data

Electrical data

Operating voltage U_B	18 … 30 V DC
Power consumption	1.20 VA (without BCL 90 / sensors)
Current consumption	50 mA (without BCL 90 / sensors)
Switching inputs	18 … 30 V DC
Switching outputs	I_{max} = 100 mA

Indicators

LED green 1	PWR	supply voltage present
LED green 2	device ready / SWO 1	switching output 1 of the BCL 90
LED red	ACT	switching input 1 of the BCL 90
LED yellow	good read / SWO 2	switching output 2 of the BCL 90

Mechanical data

Housing	diecast aluminium
Housing cover	impact-proof plastic
Dimensions	260 x 110 x 72 mm (HxWxD)
Weight	1.08 kg
Connection type MA 90 / BCL 90	2 cables with connectors

Environmental data

Ambient temp. (operation/storage)	0°C … +40°C / -20°C … +70°C
Protection class	IP 54 (installed and with lower cable outlet)
Air humidity	max. 90% rel. humidity, non-condensing
Electromagnetic compatibility	according to IEC 801

Interface

Host interface	RS 232, RS 422, RS 485 (optional in BCL 90)
Service interface	RS 232

Tables

Diagrams

Order guide

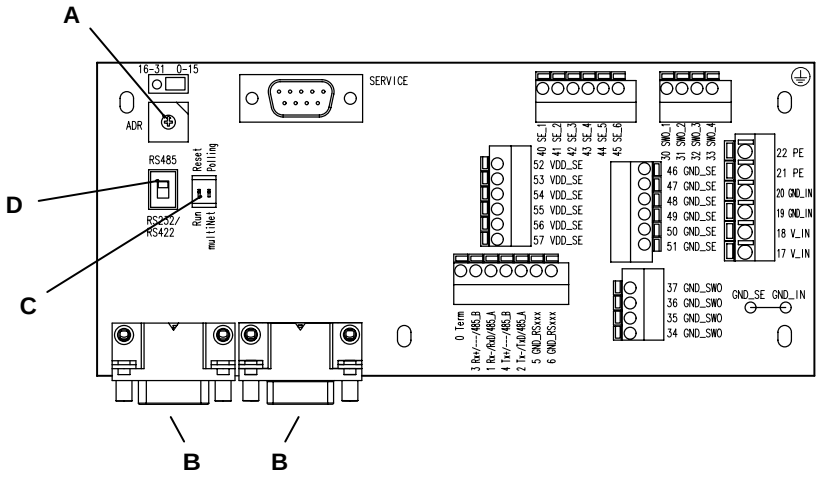
	Type	Order code
Interface module for BCL 90	MA 90	500 35348
Bar code scanner BCL 90		
BCL 90 **optic N** (for small modules)		
Line scanner	BCL 90 CAT N 100	500 35507
Oscillating mirror	BCL 90 CAT ON 100	500 35508
Line scanner with heating	BCL 90 CAT N 100 H	500 35509
Oscillating mirror with heating	BCL 90 CAT ON 100 H	500 35510
BCL 90 **optic M** (for small to medium-size modules)		
Line scanner	BCL 90 CAT M 100	500 35314
Oscillating mirror	BCL 90 CAT OM 100	500 35315
Line scanner with heating	BCL 90 CAT M 100 H	500 35316
Oscillating mirror with heating	BCL 90 CAT OM 100 H	500 35317
BCL 90 **optic F** (for medium-size to large modules)		
Line scanner	BCL 90 CAT F 100	500 35318
Oscillating mirror	BCL 90 CAT OF 100	500 35511
Line scanner with heating	BCL 90 CAT F 100 H	500 35512
Oscillating mirror with heating	BCL 90 CAT OF 100 H	500 35513

Remarks

Control elements

Element	Function
Network address setting	Setting the respective unit address at the coding switch or coding jumper
Control knob	Position 0: if no address is desired(BCL 90 / MA 90 stand alone) Position 1: multiNet plus slave address
Jumper	Right: low address range 0 … 15 Left: high address range 16 … 31
Service interface	RS 232 interface for service/setup operation
9-pin Sub-D connector	Pin 2 = RxD, Pin 3 = TxD, Pin 5 = GND
Host interface	The host interface is selected in BCL 90.
Terminals 0 to 6	In MA 90, the correct terminals have to be assigned by means of the **interface selector switch** RS 485 or RS 232 / RS 422.
Interface selector switch	RS 485: network interface Leuze multiNet plus or host interface RS 232 / RS 422: host interface to the PC or PLC
Operation selector switch	
2-pole DIP switch	Switch 1: Run = Operation mode Reset = Setting Leuze factory parameters Switch 2: multiNet = Leuze multiNet plus network protocol active Polling = reserved The respective switch position is taken over when applying the supply voltage.
Switching input	Connection terminals for the 6 switching input signals of BCL 90 +18 … +30 V DC, one end of switching input connected to GND
Terminals 40 to 57	SE 1: activation signal SE 2: focussing SE 3: focussing SE 4: focussing SE 5: focussing or one-shot function SE 6: focussing, one-shot function or band increment signal
Switching output	Connection terminals for the 4 switching output signals of BCL 90
Terminals 30 to 37	SWO 1: device ready (not adjustable) SWO 2: good read (adjustable in BCL 90) SWO 3: no read (adjustable in BCL 90) SWO 4: match 1 (adjustable in BCL 90) **The load has to be connected to GND_SWO on one end!**
Operating voltage	Connection terminal for operating voltage of MA 90 (18 … 30 V DC) and the BCL used
Terminals 17 to 22	**Attention! PE has to be connected to avoid electromagnetic interference!**

Electrical connection



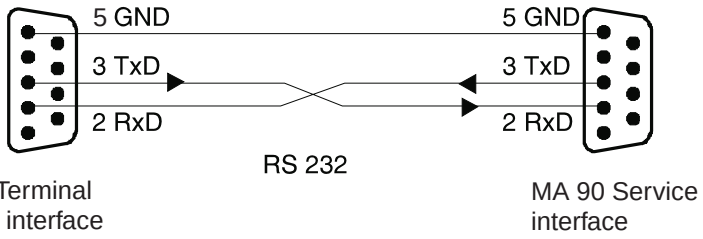
A address setting
B connection BCL 90
C operation selector switch
D interface selector switch

Technical description

Service interface

The connector unit MA 90 offers a 9-pin Sub-D plug as service interface for commissioning the reading station as stand-alone unit or within a network. It is accessible when the housing cover is lifted off and is used independently of the selected host interface.

You can use it to connect a PC or terminal to MA 90 via the serial interface RS 232/V.24 and to parameterise BCL 90. The connection is made using a crossed RS 232 connection cable that establishes the RxD, TxD and GND connections. The hardware handshake at the service interface is via RTS. A CTS handshake is not supported.



Connecting the service interface of MA 90 with a PC or terminal

Notice!

The service interface has a fixed transmission protocol with the following parameters:

- Transmission rate 9600 baud, 8 data bits, no parity, 1 stop bit
- Frame format: Prefix: STX, postfix: CR, LF

Host interface

Communication with the higher-level system or within the Leuze network multiNet plus takes place via the host interface. The interface is selected in BCL 90 by means of the user interface **BCL Config**. Three different interfaces are available: RS 232, RS 422 and RS 485.

In MA 90, the correct terminals (terminals 0 to 6) have to be assigned by means of the **interface selector switch** RS 485 or RS 232/RS 422.

The host interface has the following terminal assignments depending on the selection of the interface:

RS 232 interface	RS 422 interface	RS 485 interface
Terminal 0: -----	Terminal 0: termination	Terminal 0: termination
Terminal 1: RxD	Terminal 1: Rx-	Terminal 1: RS 485 A
Terminal 2: TxD	Terminal 2: Tx-	Terminal 2: RS 485 A
Terminal 3: not connected	Terminal 3: Rx+	Terminal 3: RS 485 B
Terminal 4: not connected	Terminal 4: Tx+	Terminal 4: RS 485 B
Terminal 5: GND	Terminal 5: shielding	Terminal 5: shielding
Terminal 6: not connected	Terminal 6: not connected	Terminal 6: shielding

Termination of RS 422 or RS 485 host interface

In order to avoid electromagnetic interference, the serial connection should be provided with terminating resistors.

A terminating resistor of 750 Ω is installed between terminal 0 against the RS 485 A cable. The RS 485 B cable should be terminated with a 1 KΩ resistor against terminals 5/6. A resistor of 120 Ω is needed between the RS 485 A and RS 485 B cables.

Notice!

The **operation selector switch** 2 has to set at **multiNet**, and the **interface selector switch** at the selected interface **RS 485** or **RS 232 / RS 422**.

Network Leuze multiNet plus

When BCL 90 is operated with MA 90 in Leuze multiNet plus, the device address is set in MA 90 by means of a rotary coding switch. Through this hardware address, the scanner automatically recognises itself as a network node and is initiated by a connected master. The slave adjusts automatically to a RS 485 interface and takes over the set hardware address.

The respective addresses have the following functions:

Device address 0:	BCL 90 / MA 90 work as a stand-alone unit with a point-to-point connection
Device address 1 … 31:	If several BCL 90 / MA 90 unit combinations are operated in a network. Each multiNet plus bus station must have a different device address assigned to it. If the combination BCL 90 / MA 90 is connected to the multiNet plus master (MA 30/31), it automatically becomes a mulitNet plus slave device.

Notice!

The operation selector switch 2 has to be set at **multiNet** and the interface selector switch at **RS 485**.

Termination of the last slave in a multiNet plus network

In order to avoid electromagnetic interference, the last slave in a network should be provided with terminating resistors.

A terminating resistor of 750 Ω is installed between terminal 0 against the RS 485 A cable. A terminating resistor of 1 KΩ has to be installed between terminals 5/6 against the RS 485 B cable. A resistor of 120 Ω is needed between the RS 485 A and RS 485 B cables.

Operation selector switch

Through the operation selector switch, the functions described below can be activated.

Switch 1:	Run	= Operation (standard operating mode of BCL 90)
	Reset	= Resetting BCL 90 with Leuze factory setting
Switch 2:	multiNet	= Leuze multiNet plus network protocol active
	Polling	= reserved

Notice!

The respective switch position is only taken over when applying the supply voltage!
Switch 1 has to set at **Run** for standard operating mode and switch 2 at **multiNet**!

Switching inputs and outputs

GND_SE of the switching inputs are connected with **GND_IN** of the supply voltage as a standard design. This connection (jumper) can be disconnected on the PCB. The switching inputs are then isolated from the supply voltage.

GND_SWO of the switching outputs is **permanently** connected with **GND_IN** and cannot be disconnected.