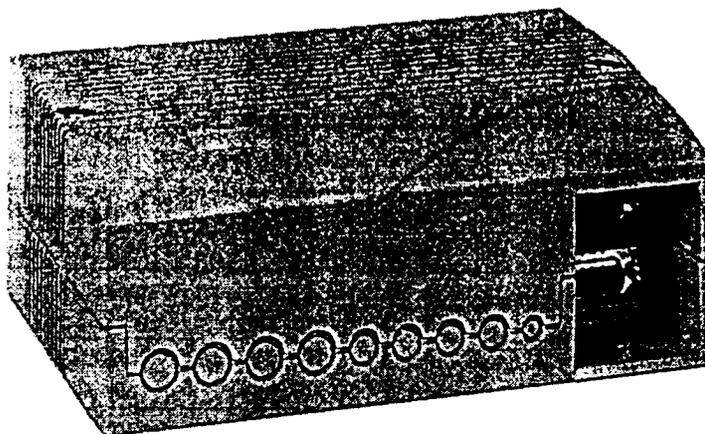


AMV/AMS 40

Connection Modules

for one CLV 210, CLV 220 or CLV 410



The AMV 40 and AMS 40 connection modules, referred to as AMV/AMS below, are used to connect SICK bar code scanners in the series CLV 210, CLV 220 or CLV 410 to peripheral devices (host/PLC/sensor) and the necessary power supply for industrial applications. The modules are suitable for implementing a direct connection a host (point-to-point) as well as simple bus structures (e.g. SICK network). The devices support all host interface variants of the bar code scanner as well as its functional inputs and outputs. They also provide direct access to the terminal interface of the bar code scanner. The AMS is equipped with an integrated power pack in addition to the terminal strips.

1. Scope of delivery (per unit)

- AMV 40 or AMS 40 connection module in wall-mounted housing without connection cables
- Accessory set (screws, insulation tube, spare fuse if necessary)
- Notes to device
- One or more of the following, depending on the number of devices ordered:
AMV/AMS 40 Operating Instructions in English or German

2. System requirements

To set up the AMV/AMS, you require:

- ♦ **(AMV 40)** a 24 V DC supply voltage to IEC 742 (functional extra-low voltage)
- ♦ **(AMS 40)** a 230 V AC or 115 V AC supply voltage, depending on the device type
- ♦ **(CLV 210/CLV 220)** a terminal or PC with terminal emulation program (e.g. Term from SICK) to access the terminal interface as well as the RS 232 data connection cable no. 2 014 054
- ♦ **(CLV 410)** a PC with Windows-based "CLV Setup" user interface and the RS 232 data connection cable no. 2 020 319

3. Assembly

- ▶ Mount the AMV/AMS near the bar code scanner. The two holes with elongated slots in the screw shafts under the device cover are used for this purpose (*Fig. 1*). The hole diameters are shown in *Fig. 8*, Page 7. Matching screw diameter: up to 6 mm.

- ▶ In order to fulfill the requirements of enclosure rating IP 54, the housing (IP 30) must be mounted vertically so that the cable outlets are routed downwards. The matching cable glands on the front of the device must be used accordingly.
- ▶ Wiring aid: the lug on the cover (with connection diagram) can be inserted in the groove on the rear of the underside of the housing. This also applies to covers with optional display.
- ▶ Note the recommended maximum cable length between the bar code scanner and the host.

Interface type	Transmission rate	Distance from host
CL 20 mA	max. 9600 bits/s	max. 1000 m
RS-232	bis 19 200 bits/s 38 400...57600 bits/s	max. 10 m max. 3 m
RS-422/485 ¹⁾	max. 38 400 bits/s max. 57 600 bits/s	max. 1200 m max. 500 m

1) with suitable line termination

Table 1

4. Design

Terminal assignment ⑩:

Terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Signal	GND	RxD_	TxD_	TERM	GND	RD+	RD-	TD+	TD-	RxD_	TxD_	Dev.Rdy.	Read	Sens	Sens_	GND	GND	24V
(CLV410)		Term/	Term/	RS422		Host	Host	Host	Host	Host	Host	Result1	Result2		GND			
		Sens2	Result3															

Key:

- ① Screw shaft with elongated hole \varnothing 6.5 mm
- ② Terminal strip for 230 V AC supply voltage (AMS)
- ③ Jumpers for connecting host interface
- ④ Plug-in fuse (provided)
- ⑤ 9-pin D-Sub connector AUX (access to terminal interface of CLV 210/CLV 220)
- ⑥ Jumper GND-SENSGND
- ⑦ LED monitors for connectable power sources (CL 20 mA active)
- ⑧ 15-pin D Sub HD socket for connecting the bar code scanner
- ⑨ Cable grip (shield)
- ⑩ Terminal strips for connecting the data and functional interfaces
- ⑪ Cable glands
- ⑫ Terminal strip for 24 V DC supply voltage (AMV)
- ⑬ 2-line display (optional)

Fig. 1. Layout of AMV/AMS 40

5. Function of the display (optional, in conjunction with CLV 210 and CLV 220 only)

The optional LCD in the cover of the device comprises 2 lines, each with up to 16 characters, and is connected to the terminal interface of the barcode scanner. When the scanner is set to Reading Mode, the read result is output on the display. The result consists of the code, code type, read quality and status (Fig. 2). The read result is only displayed when the terminal interface is set to Reading Diagnosis.

<p>Power-up display:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> CLV-DISPLAY Soft.Vers. Vx.xx </div>	<p>Good read:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> 1234567890 _25IL 100% ST=0 </div>	<p>Where:</p> 1234567890= Code 25IL ¹⁾ = Code type 100%= Read quality ST=0 Read status (OK)
<p>After connection of bar code scanner:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> CLV 210 </div>	<p>No read:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> No code! </div>	1) 25IL= 2/5 Interleaved, C39= Code 39, 25IN= 2/5 Industrial, 25IB= 2/5 Industrial B, CBAR= Codabar, C128= Code 128, C93= Code 93, E128= EAN 128, EAN= EAN PHRM= Pharmacode, UPC= UPC

Fig. 2. Example: read result on optional display

6. Electrical Installation

The connection diagram in the housing cover and the connection plans and instructions in this chapter are provided as a connection aid.



The AMV/AMS should be installed by trained personnel only. Observe the applicable safety specifications at all times when carrying out work on electrical equipment!

- The continuous power output of the external power pack that supplies the AMV with the required 24 V DC voltage at the rated voltage should be as follows:

Bar code scanner	Power output ¹⁾	Required core cross-section
CLV 21x/22x	approx. 6 W	min. 0.09 mm ²
CLV 410	approx. 5 W	min. 0.09 mm ²

1) Includes: connected sensor and interface wiring

Table 2



IMPORTANT!
 The output circuit of the external power pack must be reliably electrically isolated from the input circuit by means of double insulation and a safety isolating transformer to IEC 742.

- **AMS:** the output voltage is not protected against short circuits. The device is not suitable for supplying bar code scanners with integrated heater.
- SICK recommends that you apply the cable shield on one side

6.1 Connection procedure

1. Configuring the AMV/AMS:



IMPORTANT!
 Incorrect configuration of the jumpers (host interface) Ⓢ can cause irreparable damage to the interface modules in the connected bar code scanner.

Default jumper setting: RS 232/RS 422/CL 20 mA passive

- ▶ Configure the internal connections of the host interface on the CLV (variants!) in the AMV/AMS using the jumpers Ⓢ (see connection diagrams).

2. Connect the AMV/AMS to the host/PLC and external sensor:

- Connect the host interface of the barcode scanner to the host using shielded cables only (to fulfill the EMC requirements). See *Table 1*, page 2 for the maximum cable lengths.
- To prevent interference, do not lay the data cables over a long distance parallel to the power supply and motor cables, e.g. in cable ducts.
- Apply double insulation to the cable wires for the power connection using the transformer to protect it against accidental contact. Use the insulation tube supplied!
- ▶ Loosen the screws on the cable clamp Ⓢ and remove the clamp.
- ▶ Strip the cables to be connected to the backplane by approx. 50 mm and remove approx. 5 mm of insulation. Locate the glands Ⓢ on the front of the housing that match the respective cable diameters and remove the round plastic lugs.
- ▶ Connect the cables to the terminals as shown in the connection diagrams.
- ▶ Shorten the cable shields and align them with upwards so that they come into contact when the clamp is replaced.
- ▶ Secure the cable clamps behind the cable glands using the screws in the accessory set supplied so that all of the cables are locked in position.

Screw the grounding strip firmly to the board again.

Note on PE conductor:

For shielding purposes, the PE conductor of the supply voltage can be connected to the input terminal Ⓢ of the power supply. The cable clamp is electrically connected to the terminal Ⓢ.

- ▶ **Before applying the supply voltage to the AMV/AMS, check whether the wiring is correct!**

3. Connect the bar code scanner to the AMV/AMS:

- ▶ Connect the connector on the bar code scanner to the 15-pin D Sub HD socket Ⓢ and secure it tightly.

4 a. Connect the PC/terminal to the AMV/AMS (CLV 210 and CLV 220 only):

- ▶ Connect the terminal/PC (COM x port) to the 9-pin D-Sub connector AUX Ⓢ on the AMV/AMS to access the terminal interface of the barcode scanner (DOS-based operating menu).

Set the following communication parameters on the terminal/PC:
2400 bits/s, 8 data bits, no parity, 1 stop bit

4 b. Connect the PC to the AMV/AMS (CLV 410 only):

Since the CLV 410 is not equipped with a terminal interface, the function of the connector AUX Ⓢ on the AMV/AMS is not relevant here.

- ▶ The PC can be connected via the terminals 5, 10 and 11 using the cable no. 2 020 319 to access the RS 232 host interface and monitor data traffic in the terminal emulator of the "CLV Setup" user interface.

Set the following communication parameters on the PC:
9600 bits/s, 8 data bits, no parity, 1 stop bit



Note:

If the CLV 410 is to be parametrized via this interface, **the AMV/AMS and the host must be disconnected first!**

6.2 Functional input/output, supply voltage and terminal interface connections

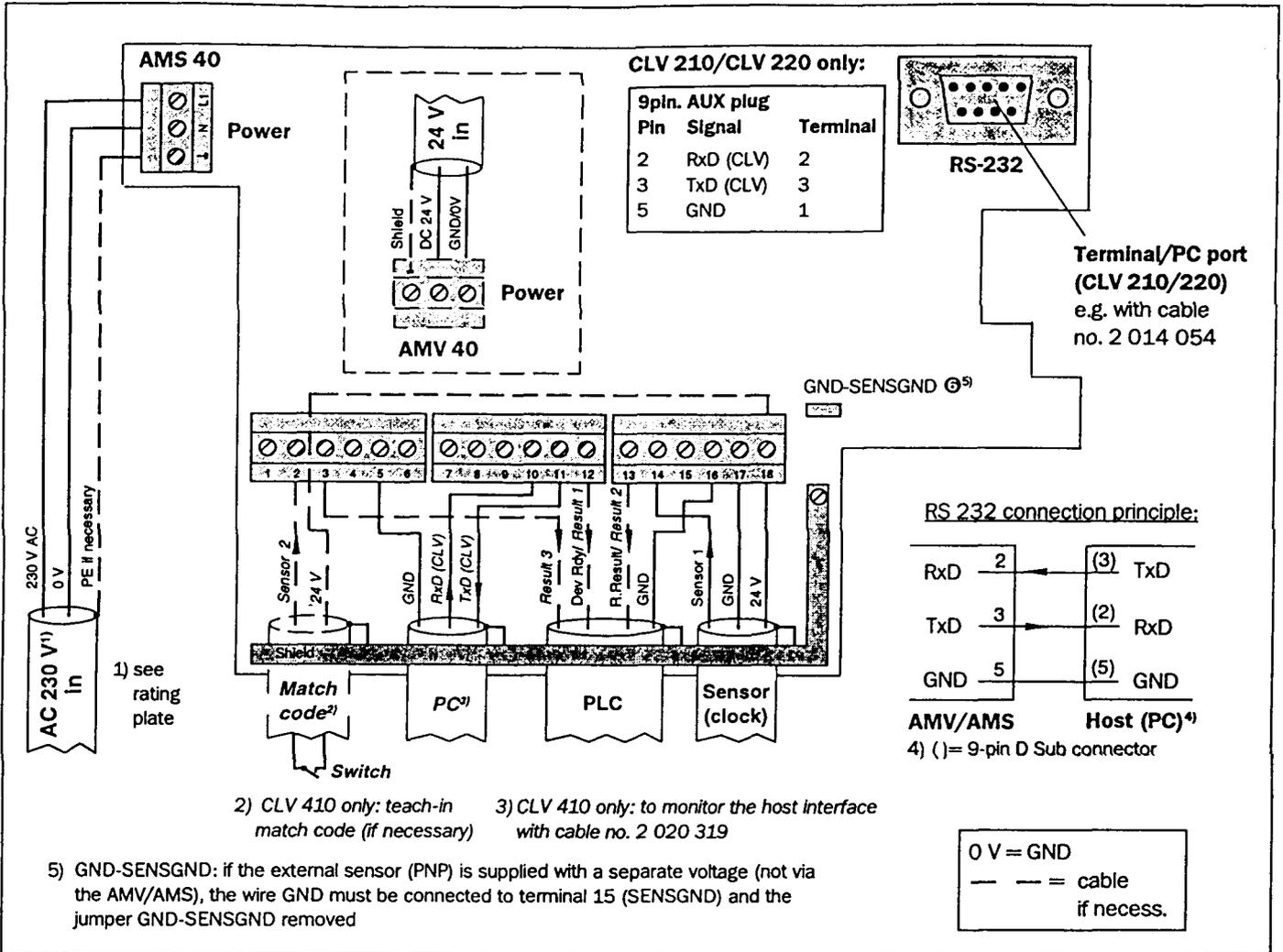


Fig. 3. AMV/AMS 40: terminal assignment for the functional interfaces/power supply/terminal interface

6.3 Connecting and configuring the host interface

RS 232 interface

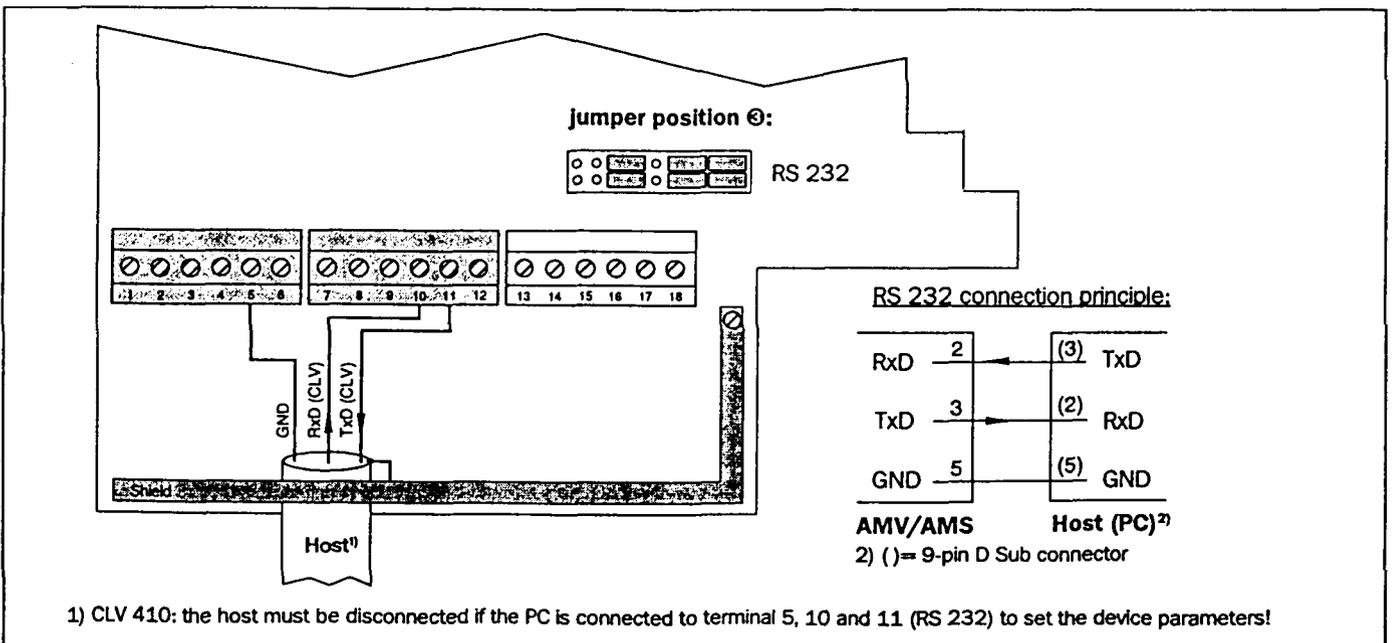


Fig. 4. AMV/AMS 40: terminal assignment/jumpers for the host interface of the bar code scanner (RS 232)

RS 422 interface

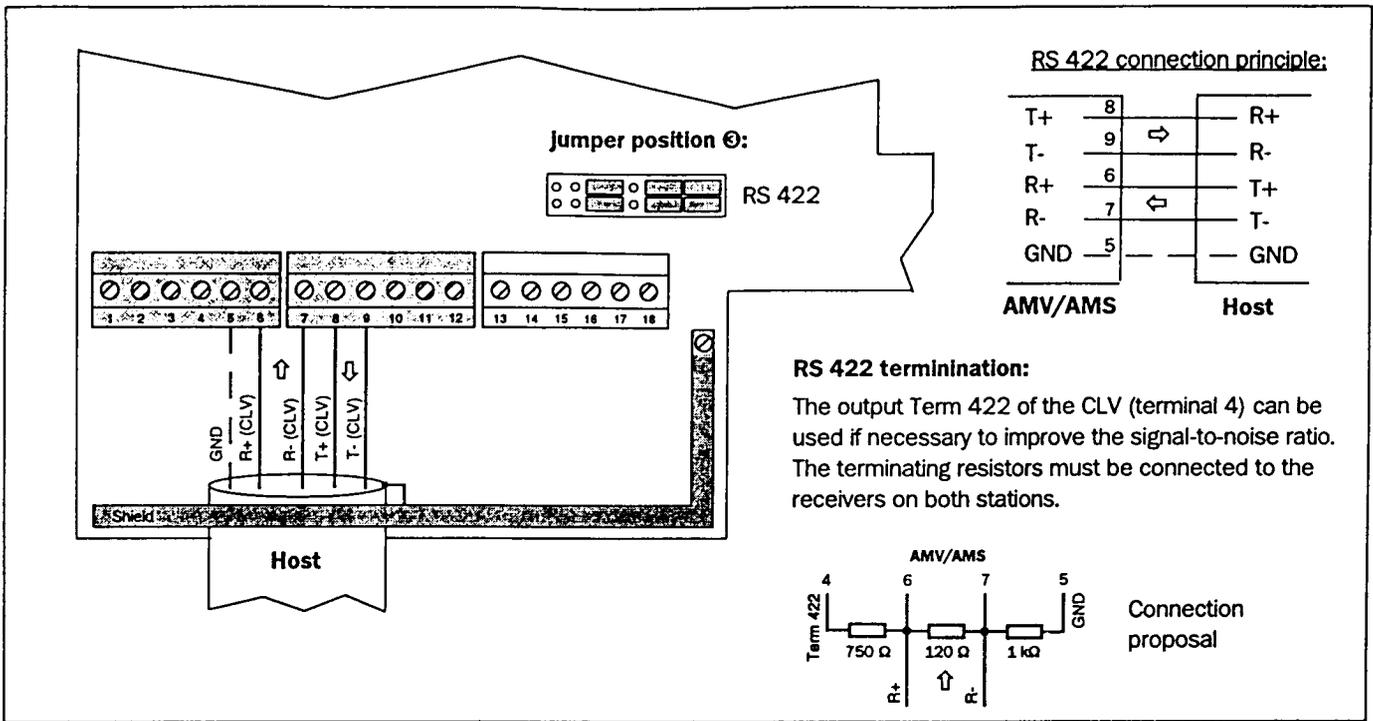


Fig. 5. AMV/AMS 40: terminal assignment/jumpers for the host interface of the bar code scanner (RS 422)

CL 20 mA Interface (CLV 210 and CLV 220 only)

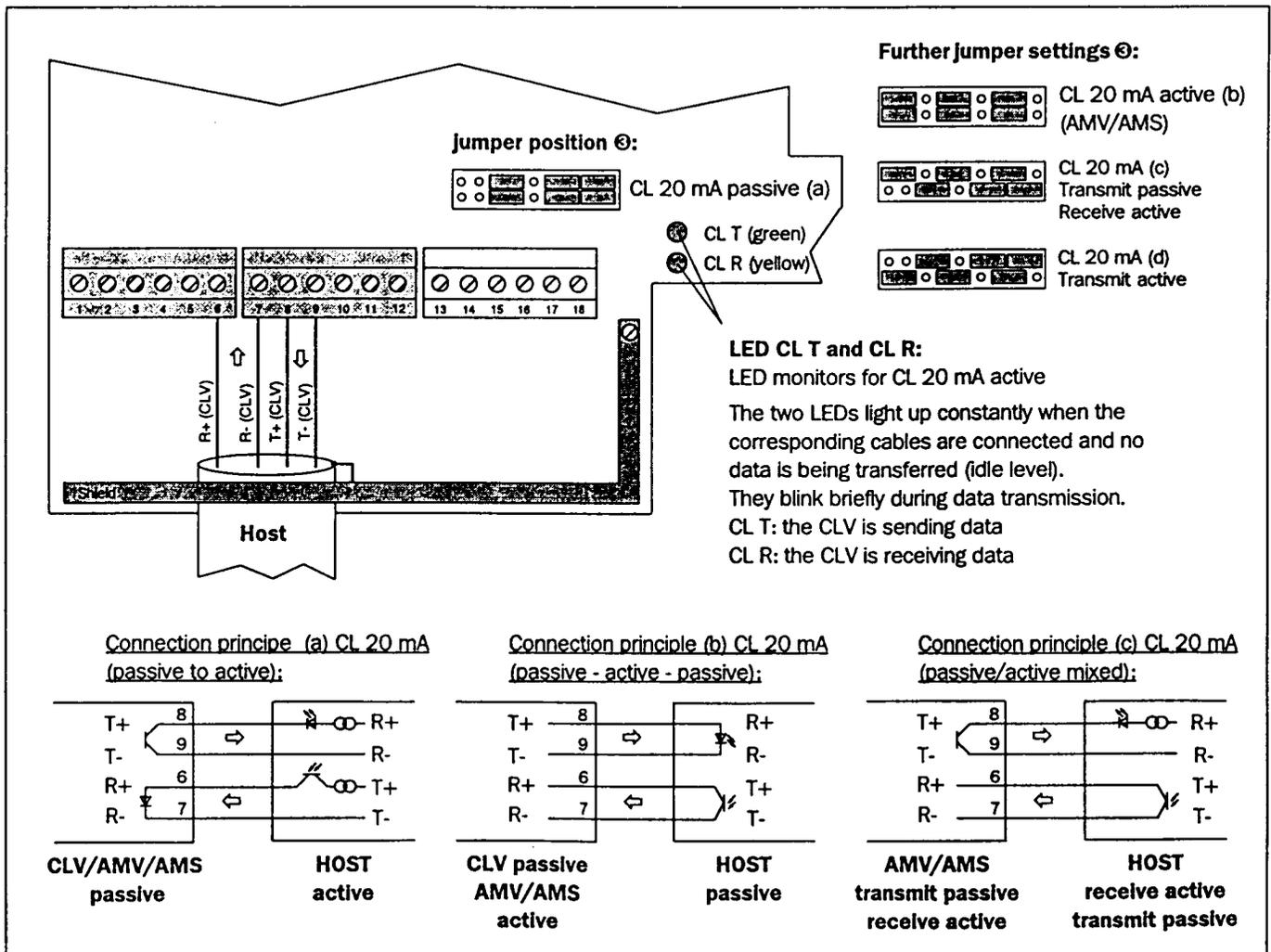


Fig. 6. AMV/AMS 40: Terminal assignment/jumpers for the host interface of the bar code scanner (CL 20 mA)

RS 485 Interface (2-wire, SICK Network)

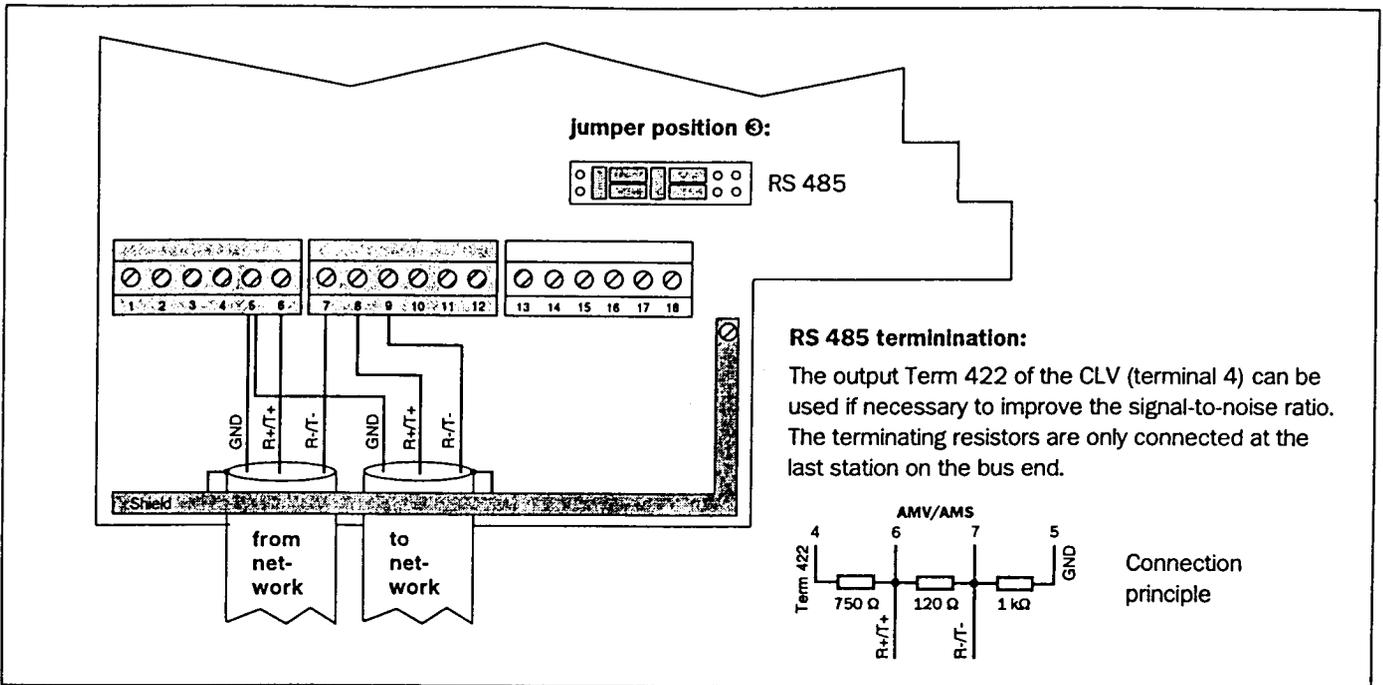


Fig. 7. AMV/AMS 40: terminal assignment/jumpers for the host interface of the bar code scanner (RS 485)

7. Dimensioned diagram

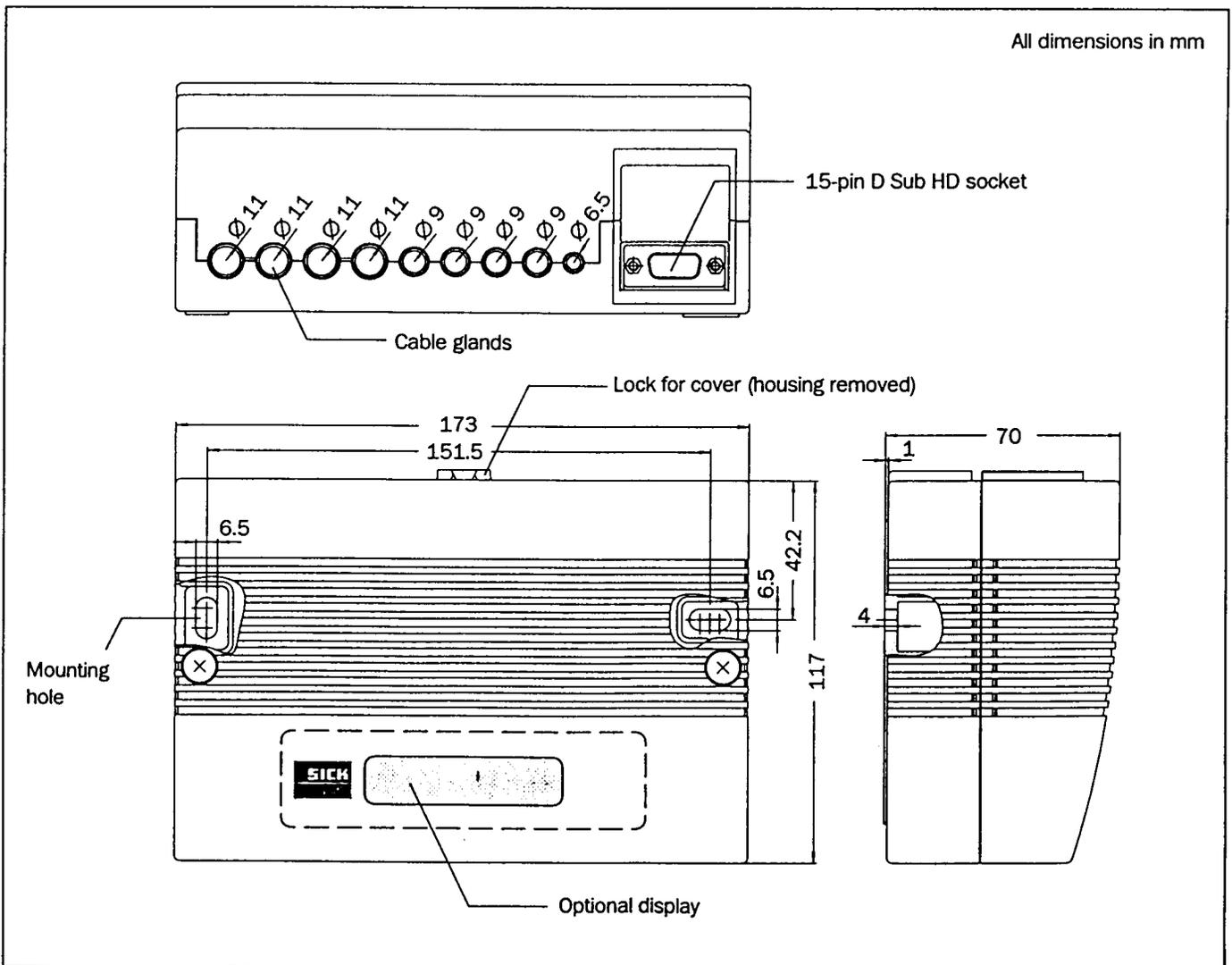


Fig. 8. Dimensions of AMV/AMS 40

8. Technical Data

Typ	AMV 40	AMS 40
LEDs (internal)	2 (power sources for CL 20 mA interface active)	
Electrical connections	15-pin D Sub HD socket/ terminal strips/ cable glands	
Terminal interface (CLV 210/220)	Internal 9-pin D Sub connector/terminal strip	
Input voltage	24 V DC $\pm 20\%$ (to IEC 742)	230 V AC $\pm 10\%$ or 115 V AC $\pm 10\%$
Output voltage	24 V DC $\pm 20\%$ (to IEC 742)	24 V DC (19...30 V) to IEC 742/max. 0.25 A
Power consumption	-	max. 10 VA
Fuses	- Plug-in fuse TR 5, 1.6 A time-delay ²⁾	Transformer fuse, fusing temp. 135°C ¹⁾ Plug-in fuse TR 5, 1.6 A time-delay ²⁾
Housing	Polycarbonate	
Enclosure rating	IP 30 ³⁾ (to DIN 40 050)	
Protection class	Class 2 (to VDE 0106); PE can be connected for shielding purposes	
Weight	approx. 450 g	approx. 900 g
Operating/storage temperature	0 ... +40 °C/ -20 ... +75 °C	
Max. rel. humidity	90%, non-condensing	
1) irreversible 2) provided		
3) IP 54 if mounted vertically (cable outlets downwards) and matching glands for the individual cables are used		

Table 3

9. Ordering Information

Accessories: cables, connectors and fuse

Order no.	Description	Wires	Length	Connection
6 010 075	Extension cable for data and functional interfaces Ø 6.5 mm, shielded, with 15-pin D Sub HD socket and 15-pin D Sub HD connector	15	2 m	CLV 210/220/410 to AMV/AMS 40
2 014 054	RS 232 data connection cable, Ø 5 mm, shielded, with two 9-pin D Sub sockets	3	3 m	Terminal/PC to AMV/AMS 40 (for CLV 210/220)
2 020 319	RS 232 data connection cable, Ø 5 mm, shielded, with 9-pin D Sub socket and one open end (stripped)	3	3 m	Terminal/PC to AMV/AMS 40 (CLV 410 only)
6 005 595	Data cable, Ø 7 mm, twisted pair, shielded, for CL 20 mA, RS 422 and RS 232 interfaces as well as general use	4 x 2 x 0.2 mm ²	Meter-ware	AMV/AMS 40 to Host
6 007 508	Data cable, Ø 8.5 mm, twisted pair, shielded, for RS 485 network	2 x 2 x 0.23 mm ²	Meter-ware	AMV/AMS 40 to network
6 009 438	D Sub connector housing (metal) for 9-pin and 15-pin HD inserts	-	-	-
6 007 335	D Sub plug connection insert, 9-pin socket connector (female)	-	-	-
6 010 019	D Sub plug con. insert, 15-pin HD socket connector (female)	-	-	-
6 010 020	D Sub plug connection insert, 15-pin HD pin connector (male)	-	-	-
6 010 046	Plug-in fuse TR 5; 1.6 A time-delay	-	-	-

Table 4



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