Rexroth
Bosch Group

PROFIBUS-DP bus module
series BDC type V-Design
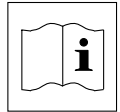
Pneumatics

Table of Contents

Notes on safety

Please observe the notes on safety and familiarise yourself thoroughly with the contents of the operating instructions before installing the valve block system and connecting it to the compressed air or electrical systems.

The RMVDP/F [1] bus module is exclusively designed for operation as a slave on a PROFIBUS-DP bus system (EN 50170 part 2).

Systems with the RMVDP/F [1] bus module may only be used for industrial applications.

An individual license must be obtained from the authorities or an inspection centre for systems with RMVDP/F components that are to be used in a residential area (residen-tial, business and commercial areas). [2]

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[1] Order code   Order number
     RMVDP/F   1 827 030 166
     RMVDP/F_7/8"   1 827 030 205
[2] In Germany, these individual licenses are issued by the Regulating Agency for Telecommunications and Post (Regulierungsbehörde für Telekommunikation und Post RegTP).

- Installation may only be performed in a voltage-free and pressure-free state and by a qualified technician. In order to avoid accidents, electrical start-up is to be carried out only in a pressure-free state.

- Ground the valve block system. Please observe the following standards with the installation of the system:
  – VDE 0160 (DIN EN 50178)
  – VDE 0100

- Before connecting or disconnecting the plugs, switch off the operating voltage to prevent damage to the electrical system.

- Do not put the valve block system into operation before it is completely assembled as well as correctly wired and tested.

Validity

These operating instructions apply to
– the PROFIBUS-DP bus module (RMVDP/F and RMVDP/F_7/8") series BDC type V-Design in conjunction with a series VTS 02, HF 03 / HF 02, MC valve block system with a multiple plug connector.

1   System architecture

The versatility and flexibility of this valve block system enables Bosch Rexroth to support your automation tasks. The valves are completely assembled and tested according to your requirements; the electrical connection is made via decentralised bus modules. The valve block system in the local and external pilot control versions is then ready for use. Its modular construction allows existing systems to be expanded or converted at any time.

The valve block system's operating instructions are composed of individual components.

Valve Block systems with a multiple plug connector:
– series VTS 02, HF 03 / HF 02, MC
– Bus modules series BDC type V-Design: PROFIBUS-DP INTERBUS CANopen DeviceNet type A-Design: AS Interface
– Modules series DDL type V-Design: DDL / DDL-E
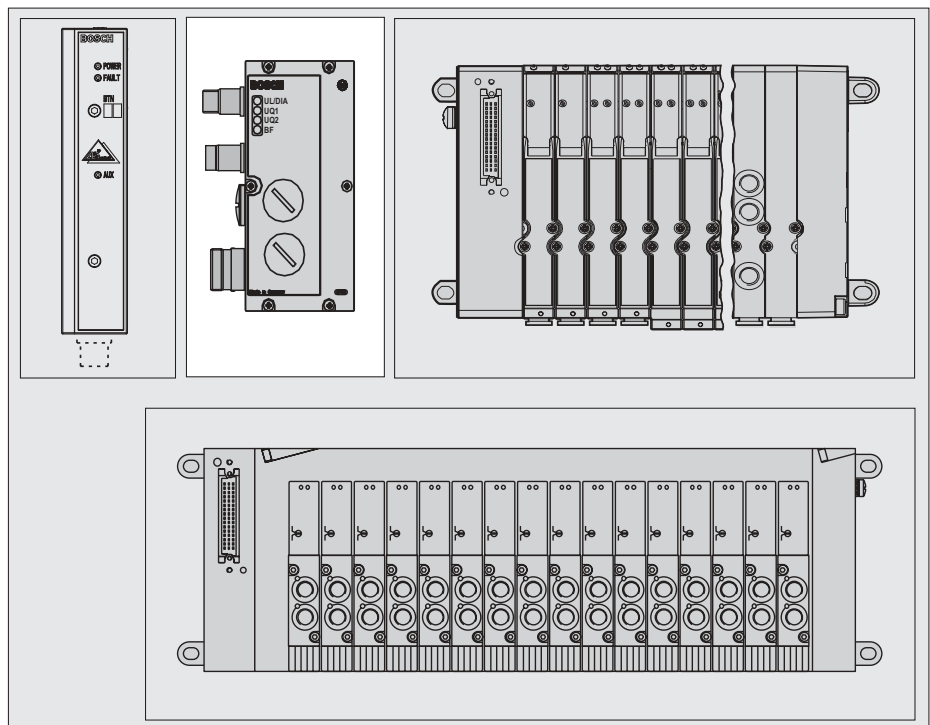
Figure 1-1: System architecture

BDC = Bus Direct Control
DDL = Drive & Diagnostics Link

1.1   Construction and design

**BUS IN X71 and
BUS OUT X72**

Connections for the field bus PROFIBUS-DP, for control of the valves.

1.1.1   Version RMVDP/F, 1 827 030 166

**POWER X10
plug 6-pin M23**

Electrical connection for
– valve solenoids and
– logic.

Control elements

– 2 rotary switches, S1 and S2, for setting the DP station address.
– 8-position DIL switch S3 for mode settings.
– 4 slide switches, S4 to S7, for assigning valves to the supply voltage in groups (before or after the emergency off).
– 2 slide switches, S8 and S9, for terminating the bus.
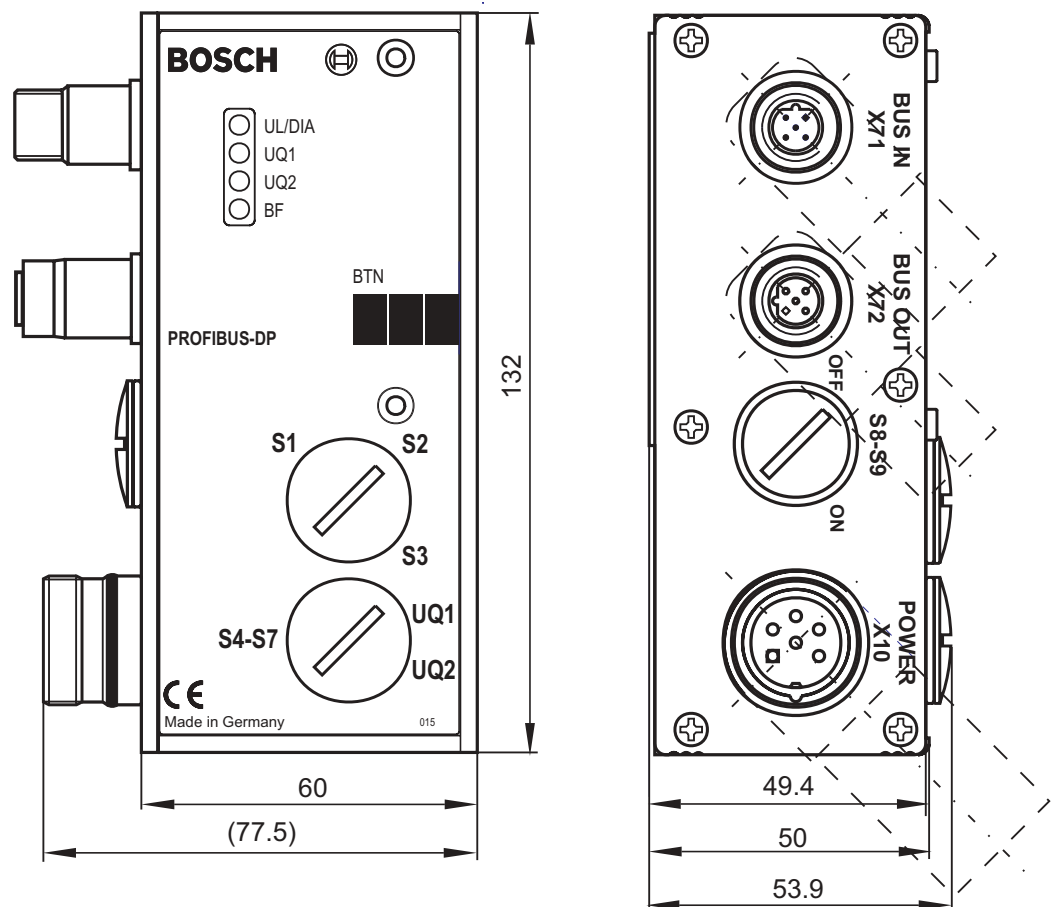
*Figure 1-2: PROFIBUS-DP bus module RMVDP/F
dimensioned drawing*

1.1.2   Version RMVDP/F_7/8",
1 827 030 205

**POWER X10
plug 5-pin 7/8"**

Electrical connection for
– valve solenoids and
– logic.

Control elements

– 2 rotary switches, S1 and S2, for setting the DP
  station address.
– 8-position DIL switch S3 for mode settings.
– 2 slide switches, S8 and S9, for terminating the
  bus.
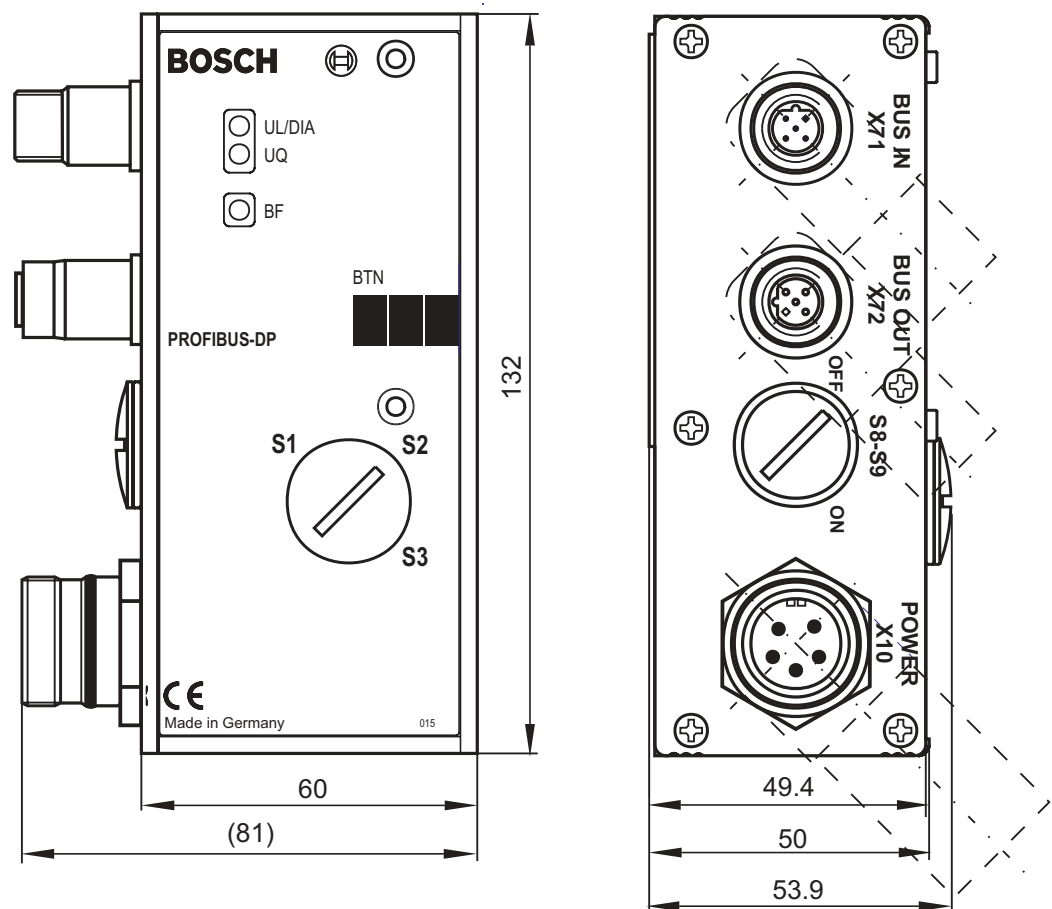
*Figure 1-3: PROFIBUS-DP bus module
RMVDP/F_7/8" dimensioned drawing*

1.2   Function

The bus module PROFIBUS-DP (RMVDP/F and RMVDP/F_7/8") is exclusively designed for operation as a bus participant (slave) on a PROFIBUS-DP bus system according to EN 50170.

A twisted, shielded pair of wires is used as a field bus cable. The bus length can be up to 1.2 km (without a repeater) depending on the transfer rate. Without a repeater, 32 bus particpants (slaves) per segment are connectable. With repeaters, it is expandable up to 127 bus partcipants (slaves).

Station address   The DP station address of the bus module is set using the two rotary switches, S1 and S2.

Baud rate   The bus module automatically adjusts to the bus speed between 9.6 kBaud and 12 MBaud.

Diagnosis   The supply voltage for logic and valve control is monitored. If the value falls below the set threshold, an error signal is generated and the diagnostic information is reported via LEDs.

LED	Signal	Error	Description
U_L/DIA	**green**		**Logic supply U_L present.**
		off	No logic supply U_L available.
		red	Valve driver overload (DIA group diagnosis). This display only occurs as long as the overloaded output is triggered.
U_{Q1}	**green**		**Valve supply U_{Q1} is OK.**
		red	Low voltage ($12\,V < U_{Q1} < 18.5\,V$)
		off	Valve supply $U_{Q1} < 12\,V$
U_{Q2} [1]	**green**		**Valve supply U_{Q2} is OK.**
		red	Low voltage ($12\,V < U_{Q2} < 18.5\,V$)
		off	Valve supply $U_{Q2} < 12\,V$
BF	**off**		**Baud rate was synchronised.** RUN: cyclical data exchange
		red	Bus error: bus module baud rate is being determined, or wiring error.

Table 1-1: Bus module diagnostic display

[1] Only for RMVDP/F - 1 827 030 166

2   Presettings

2.1   Baud rate

The bus module automatically sets itself to the baud rate given by the busmaster. The maximum permissible baud rates are:

Permissible baud rates

kBaud	kBaud	MBaud
9.6	187.5	3
19.2	500	6
93.75	1.500	12

Table 2-1: Permissible baud rates

2.2   Setting the bus module address

See figure 2-1

After the PG screw cap on the bus module is opened, both rotary switches, S1 and S2, become accessible for defining the station address for the valve block system in PROFIBUS-DP. Using S1 and S2, the station address can be assigned as desired from 1 to 99.

☞

- The bus module is delivered with a factory-set station address of "0". If the bus module's ASIC recognises the non-permitted value "0" when connected, the station address 126 is assigned automatically until the user sets the station address to the desired value using S1 and S2.

- Double occupancies are not allowed within the PROFIBUS-DP.

!

- The set address is read once by the bus module's ASIC when the power supply U$_L$ is connected.

- If address changes are made, the power supply must be disconnected and then reconnected.

The setting of the S1 rotary switch determines the tens place (set value * 10). The setting of the S2 rotary switch determines the ones place (set value * 1). The sum of the two settings provides the station address.

Address switch (rotary switches S1 and S2)

Rotary switch	S1	S2
Setting range	0 ... 9	0 ... 9
Grading	10	1
Address range	0 ... 90	0 ... 9

Table 2-2: Address switch S1 and S2 assignment
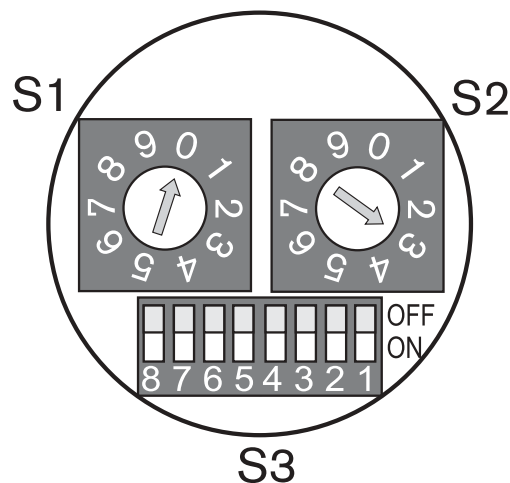
Figure 2-1: Address switches S1, S2 and mode switch S3

2.3 Setting the operating modes (mode switch)

See figure 2-1   The S3 mode switch for setting the diagnostic messages is located below the PG screw cap.

> ☞ All switches are in the OFF position on delivery.

Switches S3.8 to S3.6 are not assigned.

S3.5	S3.4	S3.3	S3.2	S3.1	Message	Diagnosis
				OFF	off	Valve driver overload
				ON	on	
			OFF		off	Low voltage U_{Q1}
			ON		on	
		OFF			off	Low voltage U_{Q2} [1]
		ON			on	
	OFF				off	Emergency off U_{Q1}
	ON				on	
OFF					off	Emergency off U_{Q2} [1]
ON					on	

Table 2-3: Mode switch S3 for diagnostic messages to the master

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[1] Only for RMVDP/F - 1 827 030 166

If a particular switch is ON, the diagnostic message described is sent to the bus.

Valve driver overload message Switch S3.1

Diagnostic message if a valve incorrectly shows a short circuit. The diagnostic message is only on as long as this valve is being triggered.

Low voltage message [1] Switch S3.2 U_{Q1} Switch S3.3 U_{Q2} [2]

The switching voltage must be 18 V in order to guarantee safe switching! Low voltage for the valves means that the U_Q voltage must lie between 12 V and 18.5 V.

Emergency off message Switch S3.4 U_{Q1} Switch S3.5 U_{Q2} [2]

If a voltage lower than 12 V occurs, this is reported as an emergency off message.

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[1] After approx. 10 ms when turning on.
After approx. 20 ms when turning off.
[2] Only for RMVDP/F - 1 827 030 166

**Only for RMVDP/F
1 827 030 166**

2.4   Assigning the valve supply

Switches S4-S7 for assigning the valve supply are located below the PG screw cap. 4 valve positions (each with solenoids 12 and 14) are assigned to each switch.

Each valve group can be assigned one of the two supply voltages, U_{Q1} and U_{Q2}, via the position of the switches S4-S7.

Example

If, for example, the supply voltage U_{Q1} is fed through the emergency off and U_{Q2} is not, the valves that are supplied by U_{Q2} remain functioning in case of an emergency off.

☞

All switches are in the U_{Q1} position on delivery, meaning that all valve positions are assigned to supply voltage U_{Q1}.

⚠

Switches S4-S7 may only be switched in an idle state!

Assigning switches to valve groups

Assigning switch positions to the supply voltages U_{Q1} and U_{Q2}
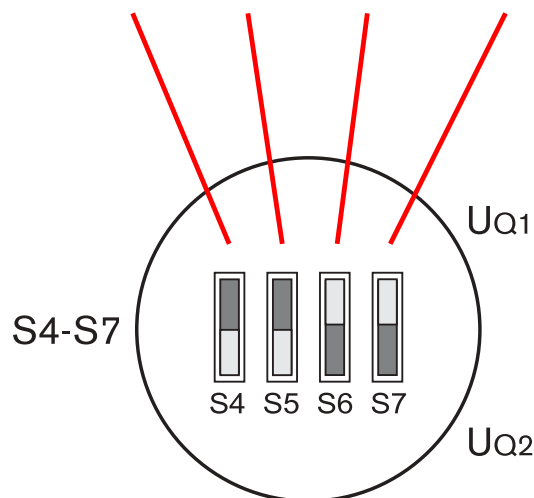

Figure 2-2: Switches S4-S7

2.5   Setting the bus terminator

In order to minimise wire reflection and ensure a defined idle level in the PROFIBUS-DP transmission line, the transmission line must be equipped with a bus terminator at both ends.
The bus terminator is integrated in the equipment for bus module RMVDP/F. Switches S8-S9 are located below the PG screw cap.

☞ | Both switches are in the OFF position on delivery, meaning that the bus terminator is not activated.

If the bus module is attached at the end of the transmission line, the bus terminator must be activated.

Bus terminator, switch positions S8-S9

Switch position		Bus terminator
S8	S9	
OFF	OFF	Deactivated
ON	OFF	Not allowed
OFF	ON	Not allowed
ON	ON	Activated

Table 2-4: Bus terminator, switches S8-S9

Switches S8-S9

Figure 2-3: Switches S8-S9

3 Installation

3.1 Marking and identification

The address provided/used for the bus module is inscribed on the bus module in the bus participant's (slave) field.

3.2 Bus module mounting

The bus module is placed on the multiple plug connector of the valve block system and screwed tight.

Check the gasket to ensure it is intact and make sure that it is in the correct position.

0.7 Nm

- The bus module should only be assembled (attaching to and removing from the valve block system) when the voltage is switched off!

- Once the bus module has been mounted, the IP 65 seal needs to be checked in accordance with EN 60529.
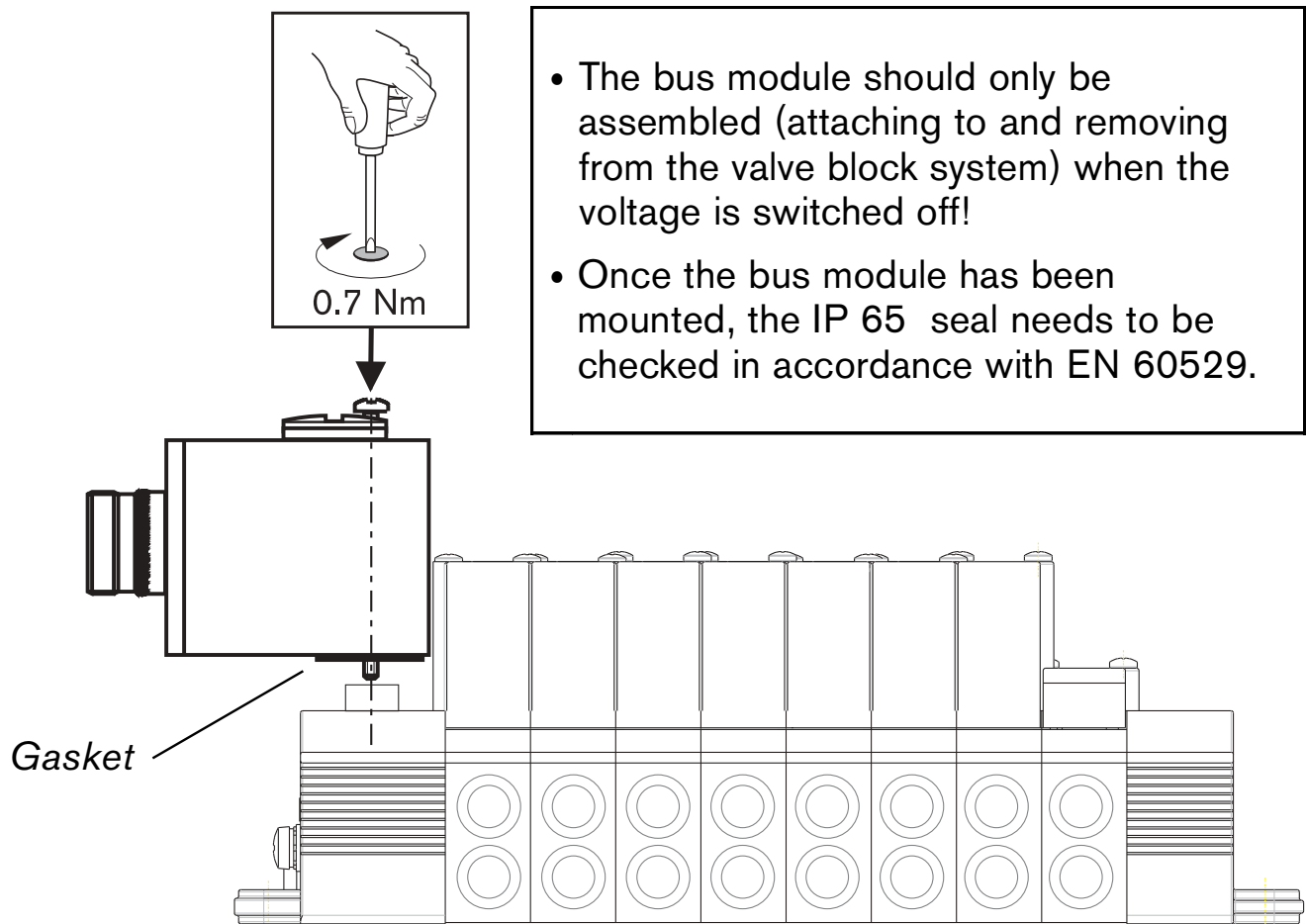
Gasket

Figure 3-1: Bus module mounting on the valve block system's multiple plug connector

3.3   Electrical connections

3.3.1   Field bus connection

*See table 3-1
BUS IN X71 and
BUS OUT X72
assignment*

– The BUS INX71 plug for connecting the incoming field bus cable and
– the BUS OUTX72 socket for connecting the outgoing field bus cable

are located on the RMVDP/F bus module.

*See section 2.5
Bus terminator*

If it is the last station in the field bus connection, the remote bus is only connected to BUS IN X71 and closed via switches S8-S9 using the bus terminator supplied internally. A PG protective cap is put on the BUS OUTX72 socket.
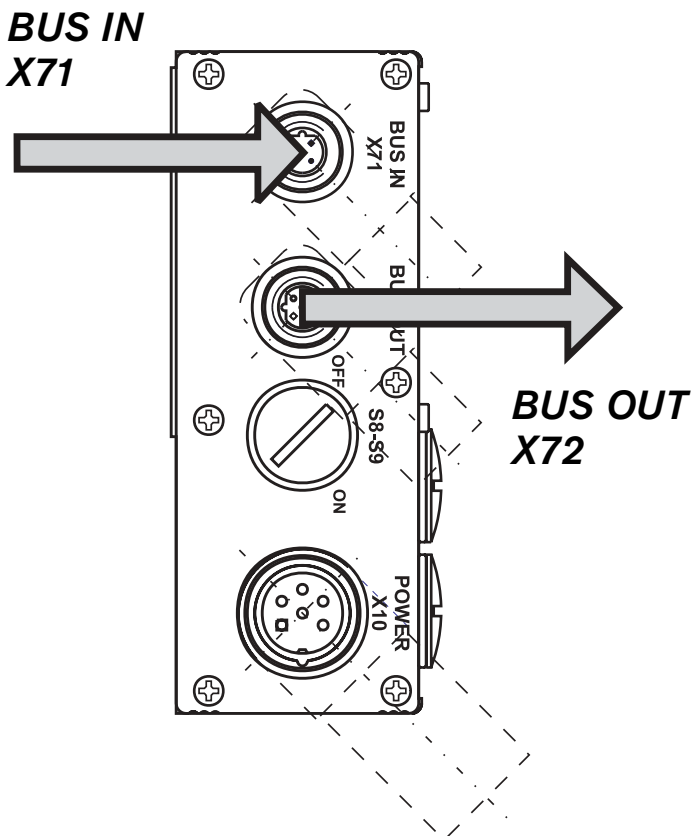
**BUS IN
X71**

**BUS OUT
X72**

**BUS IN
X71**

*PG
protective
cap*

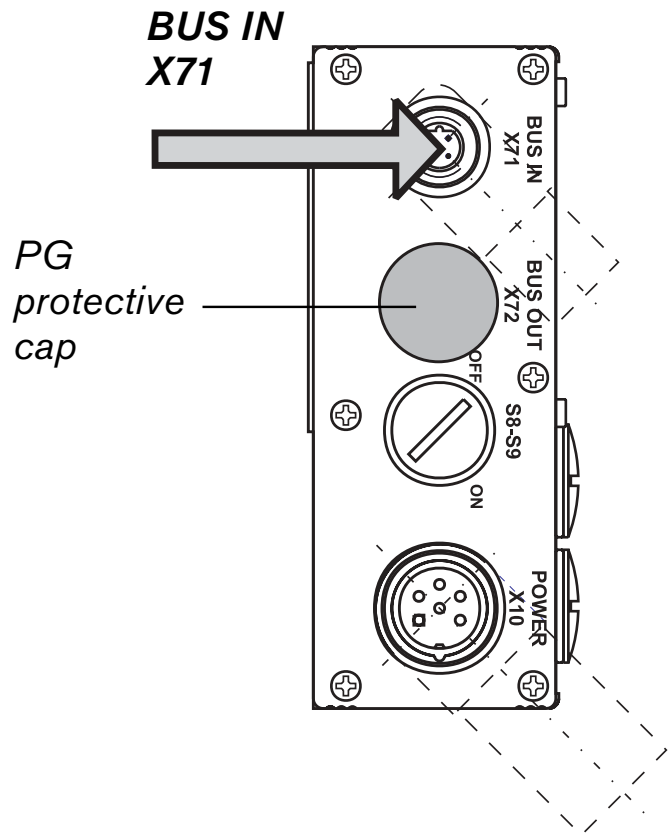*Figure 3-2: Two-way field bus
connection*

*Figure 3-3: Field bus
connection as the last
station*

!

If not otherwise specified, the installation guidelines for PROFIBUS-DP/FMS (PROFIBUS guideline, PNO order no. 2.111) must be observed.

Only a cable that meets the field bus specifications as well as the connection speed and length requirements should be used. In order to assure both the degree of protection and the required strain relief, the cable and plug assembly should be performed specifically according to the assembly instructions.

This connection technology and plug assignment meet the specifications of the technical guideline for "Connection technology for PROFIBUS-DP/FMS/PA" (Draft 2.0, April 1999).

BUS IN X71 and BUS OUT X72 assignment

Pin	Signal	Meaning
1	VP	Supply voltage plus (P5V)
2	RxD/TxD-N	Received/transmitted data data line A (green)
3	DGND	Data reference potential, 0V
4	RxD/TxD-P	Received/transmitted data data line B (red)
5	Shield	Shield or protective ground
Casing		Shield or protective ground

Table 3-1: BUS IN X71 and BUS OUT X72 assignment
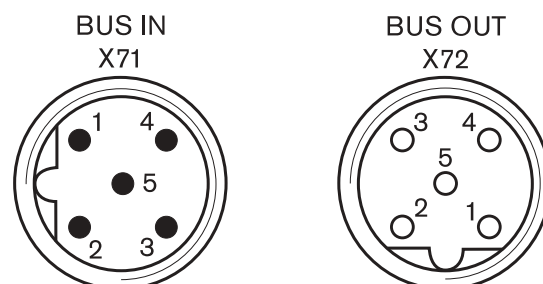
3.3.2   Logic and load supply with RMVDP/F, 1 827 030 166

POWER X10

The valves and the bus module are all powered via the plug POWER X10.

See section 6.2

The bus module operating voltages must be connected via the coupling socket (accessories) in accordance with Table 3-2.

See section 6.1

The operating voltages given in the electrical data characteristics must be adhered to.

⚠️

The 24-V supply can be obtained from a common power supply unit.

This power supply must stem from a power supply unit which is electrically isolated according to DIN EN 60742, classification VDE 0551.

POWER X10 plug pin assignments (bus module RMVDP/F)

Pin	POWER X10	Assignment
1	PE	Protective ground (protruding contact)
2	U_{Q1}	First supply voltage,Valves
3	$0VU_Q$	Ground for U_{Q1}
4	U_L	Supply voltage Bus module logic
5	$0VU_L$	Ground for U_L
6	U_{Q2}	Second supply voltage, Valves

Table 3-2: POWER X10 plug assignment on the bus module RMVDP/F

Voltages U_Q and U_L are galvanically isolated from each other but can be obtained from a common power supply.

The following current levels must be provided. The cable cross-sections must be selected according to the cable length and the operating current:

POWER X10 power consumption (bus module RMVDP/F)

Signal	Assignment	Total current
U_L	Logic	max. 0.2 A
U_{Q1}	Valves	max. 2.25 A
U_{Q2}	Valves	max. 2.25 A

Table 3-3: POWER X10 power consumption
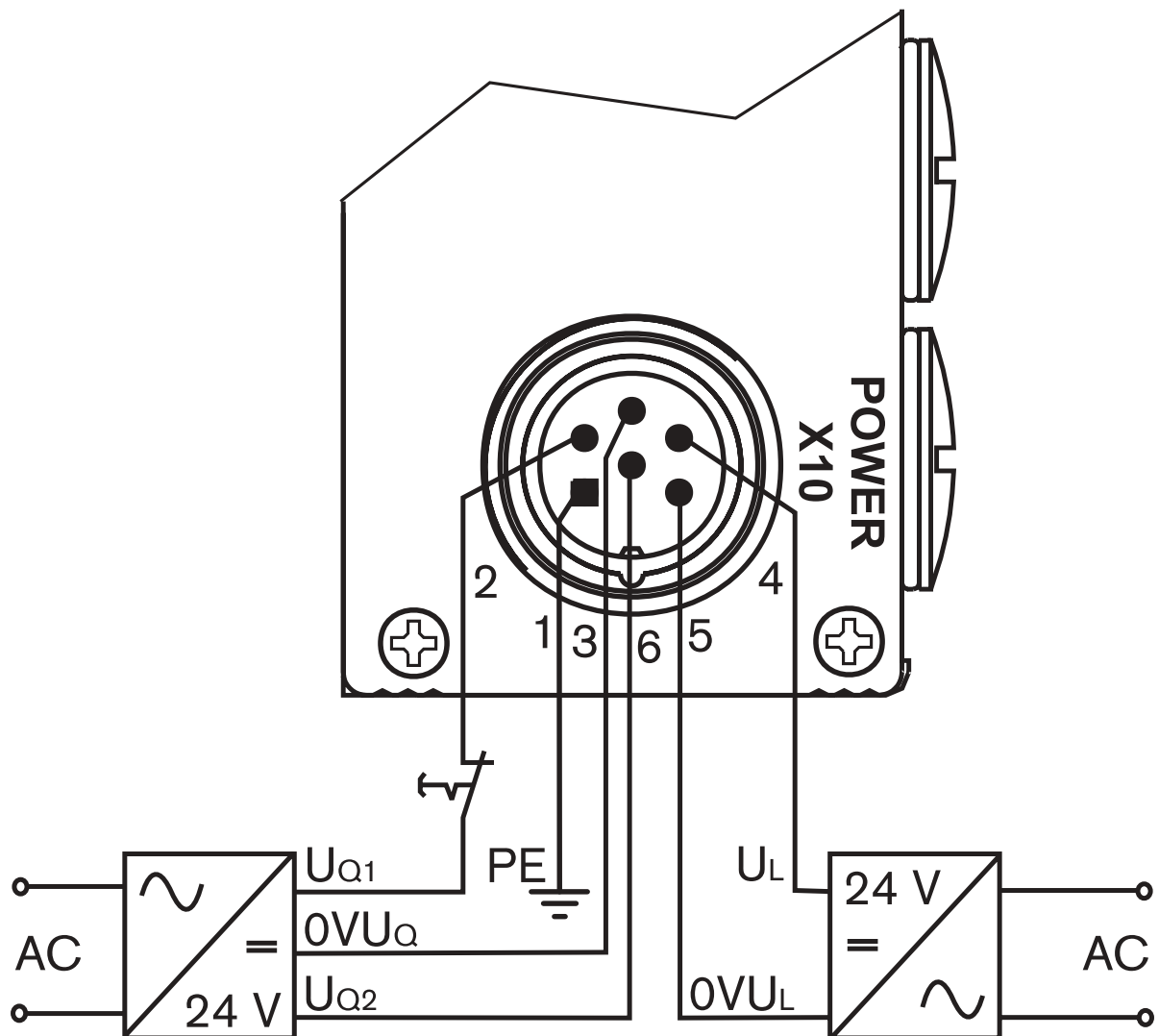
Figure 3-4: POWER X10 on the bus module RMVDP/F

3.3.2 Logic and load supply with RMVDP/F_7/8", 1 827 030 205

POWER X10

The valves and the bus module are all powered via the plug POWER X10.

See section 6.2

The bus module operating voltages must be connected via the coupling socket (accessories) in accordance with Table 3-4.

See section 6.1

The operating voltages given in the electrical data characteristics must be adhered to.

> The 24-V supply can be obtained from a common power supply unit.
>
> **This power supply must stem from a power supply unit which is electrically isolated according to DIN EN 60742, classification VDE 0551.**

POWER X10 plug pin assignments (bus module RMVDP/F_7/8")

Pin	POWER X10	Assignment
1	0VU$_Q$	Ground for U$_Q$
2	0VU$_L$	Ground for U$_L$
3	PE	Protective ground (protruding contact)
4	U$_L$	Supply voltage Bus module logic
5	U$_Q$	Supply voltage,Valves

*Table 3-4: POWER X10 plug assignment on the bus module RMVDP/F_7/8"*

Voltages U$_Q$ and U$_L$ are galvanically isolated from each other but can be obtained from a common power supply.

The following current levels must be provided. The cable cross-sections must be selected according to the cable length and the operating current:

POWER X10 power consumption (bus module RMVDP/F_7/8")

Signal	Assignment	Total current
U_L	Logic	max. 0.2 A
U_Q	Valves	max. 2.25 A

Table 3-5: POWER X10 power consumption
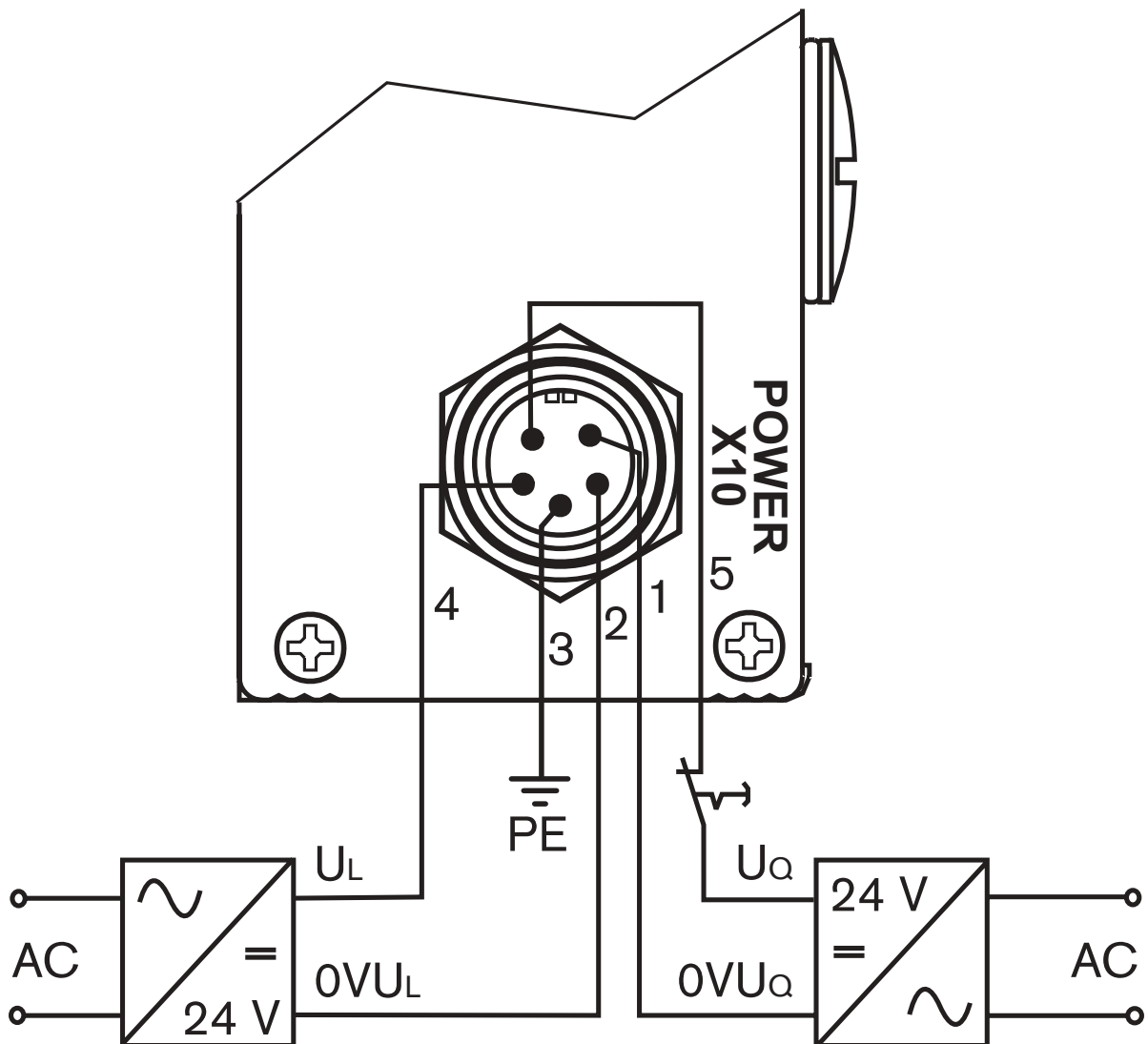
Figure 3-5: POWER X10 on the bus module RMVDP/F_7/8"

4   Configuration

☞ | The description in this section refers to the software WinDP, Version 1.94, running under Windows 95, 98 and NT.
Bosch order no. 1 070 077 945.

4.1   Loading Device database

The *Device database* includes the performance characteristics of the DP slave or DP master. The *Device database* is standardised in accordance with EN 50170, part 2, PROFIBUS. In this way, DP components from different vendors can be implemented with one planning software package.

Each valve block system is equipped with valves as ordered and it must now be configured as a DP slave using the WinDP programme (Bosch).

To plan with the valve block system using Bosch WinDP the *Device database* files must be copied to the subdirectory GSD, ex.:
\Device database (GSD)\PROFIBUS\DP\GSD.
For more details, see the "README" file on the *Device database* diskette.

The diskette with the *Device database* or type files, Bosch order no. 1 070 075 547, includes all module data for the valve block systems.

4.2 Presetting WinDP

The WinDP utility programme runs on top of WinSPS. Only existing PLC projects can be worked on with the WinDP software. Therefore, after start up, WinDP searches for the directory where the PLC project is located. The project name found there is then put into the "*Presets*" field. The directory that the *Device database* was copied to must also be identified (see section 4.1).
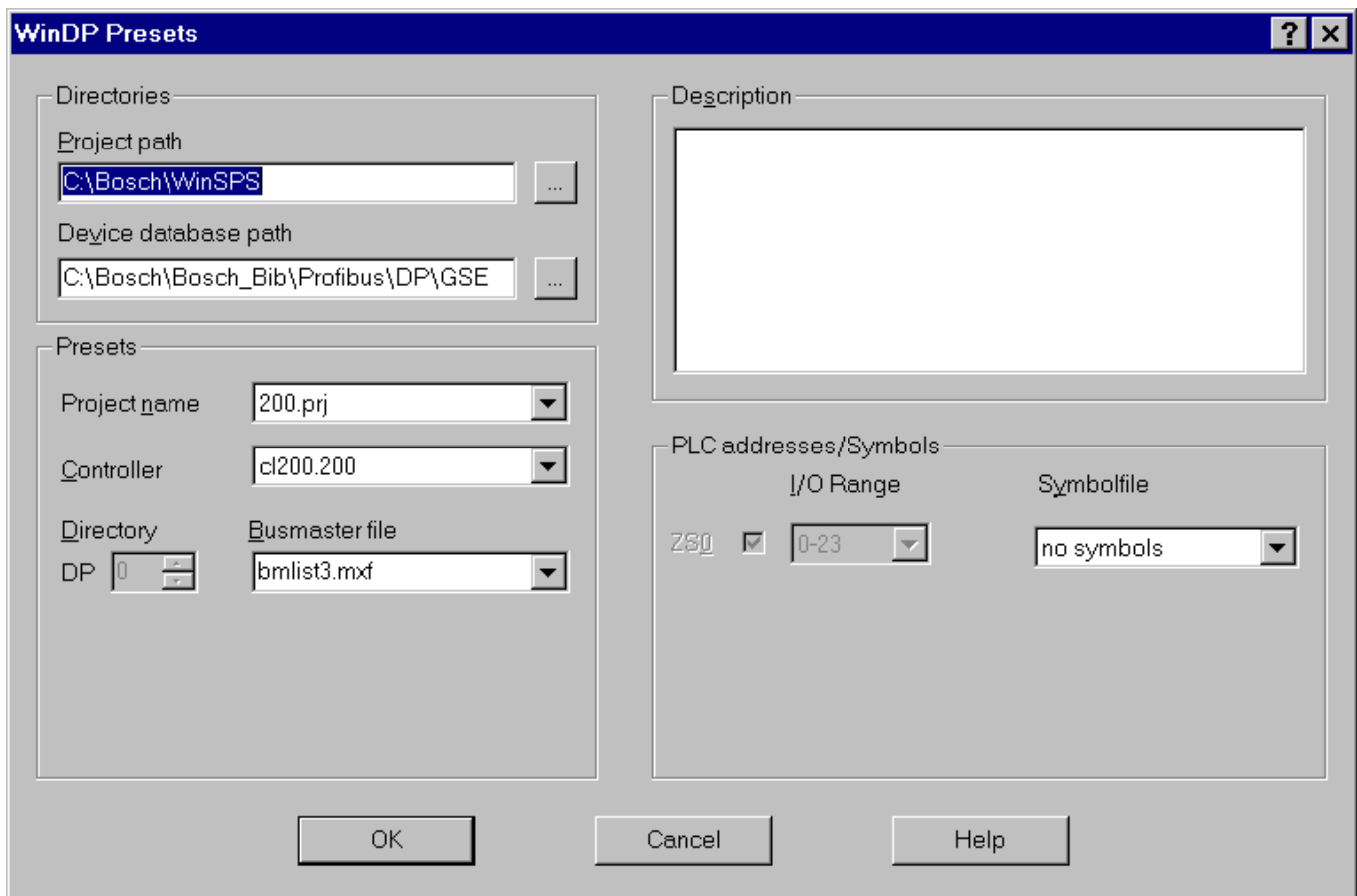

Figure 4-1: WinDP Presets menu

After confirming with OK, you must select the busmaster built into your control in the "*Busmaster selection*" window. You then enter the WinDP editor, where you configure the PROFIBUS-DP. In the work space of the editor, the first hierarchical level contains the busmaster you specified, assigned to bus address 1.
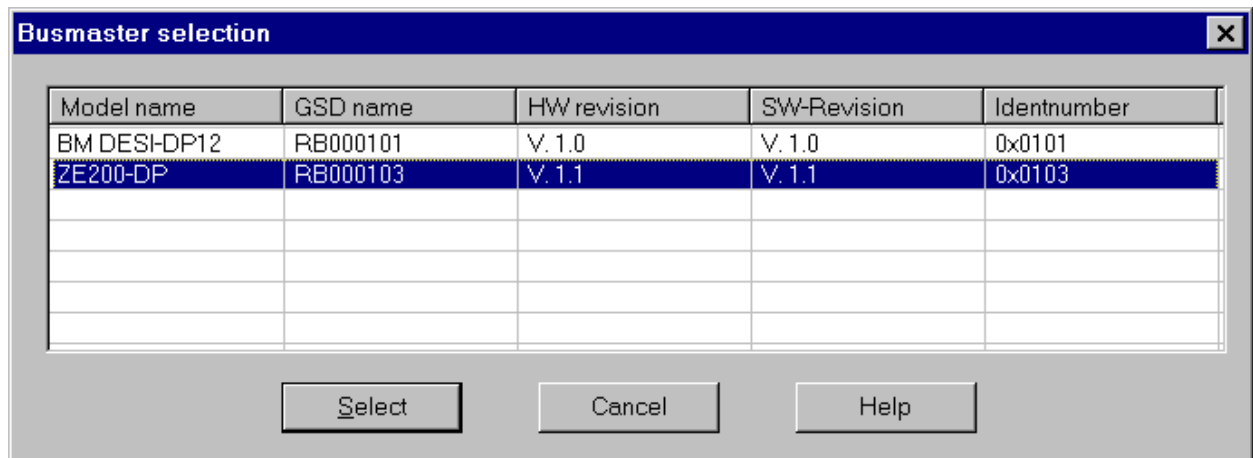

Model name	GSD name	HW revision	SW-Revision	Identnumber
BM DESI-DP12	RB000101	V. 1.0	V. 1.0	0x0101
ZE200-DP	RB000103	V. 1.1	V. 1.1	0x0103

Figure 4-2: Busmaster selection menu

4.3   Bus slave configuration

See figure 4-3   In the bus slave window all slaves are displayed whose *Device database* files lie in the directory that was entered into the "*Device database path*" in the section "*WinDP Presets*" (see 4.2). In order to configure the valve block system as a slave in the PROFIBUS-DP, select the valve block system bus module in the "Bus slave" window.

The bus module is designated as "RMVDP/F". [1]

Click on the bus slave "RMVDP/F", and hold down the left mouse button dragging the bus slave toward the left to the busmaster and into the work area. As soon as a square with a + appears under the mouse pointer, release the left mouse button and the bus slave is then dropped. WinDP draws the bus line from the master to the new bus slave "RMVDP/F" and assigns it to the next available bus address.

If the bus address does not agree with the address on the bus module (the address assigned in section 2.2), the address field in the work area can be opened by double clicking and the addresses can be corrected there.

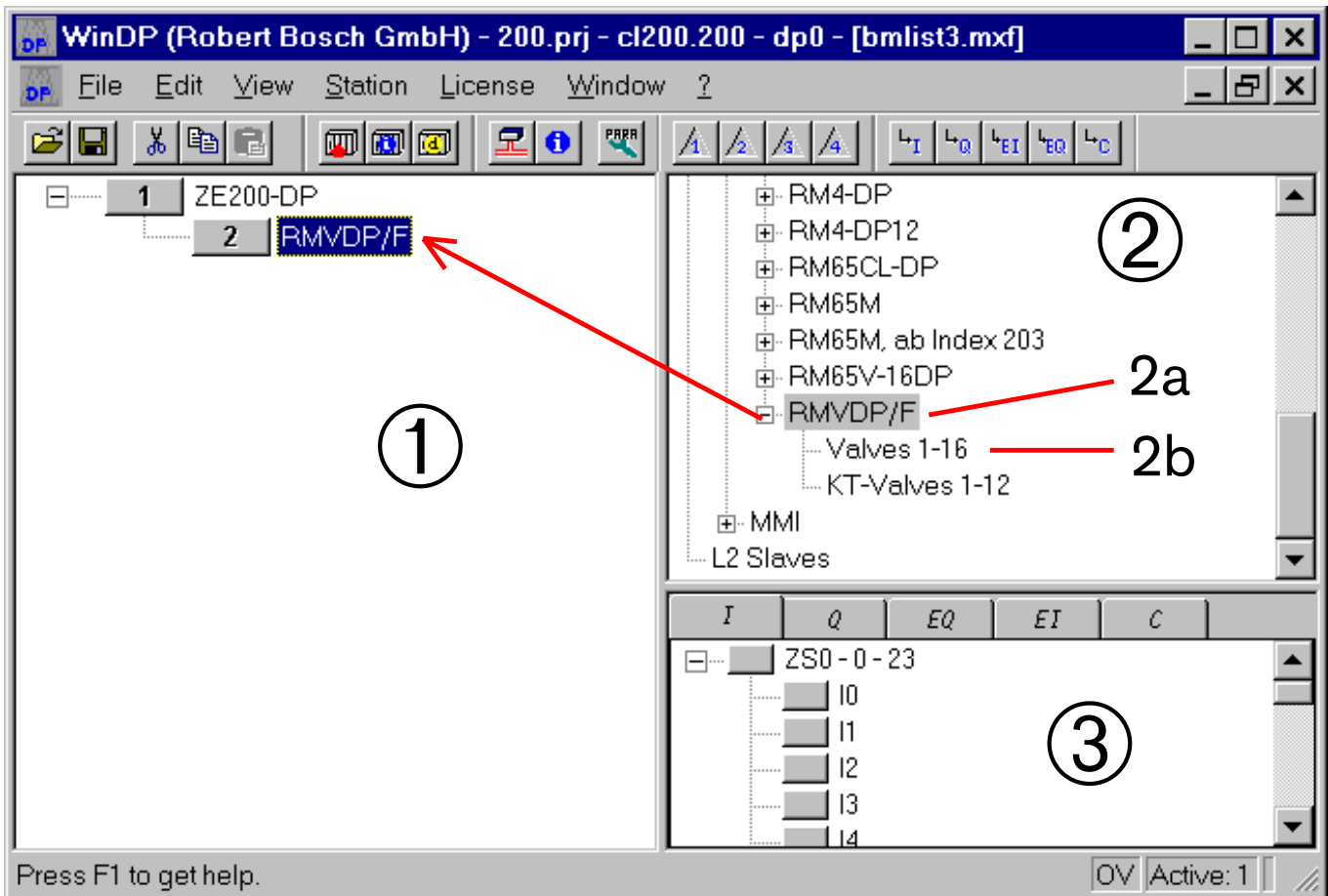[1] For RMVDP/F and RMVDP/F_7/8"

Figure 4-3: WinDP Editor menu, configuring the DP slave RM, window designations

① Work area

②   Bus slave window

   2a   Bus module designation

   2b   Valve block system

③   I/Q window

4.4   Valve block configuration

Because the valve block system is a modularly con-structed slave, the valve block must now be added to the bus module. By double clicking on the "RMVDP/F" bus slave in the bus slave window, all available modules for this bus slave are displayed. By clicking and then dragging, set the valve block "valves 1-16" on the bus module in the working window.

☞

Only the maximum number of available valve positions (connection plates) on the valve block is the deciding factor for choosing the module. The number of valves is not significant!

The valve block must always have the module number M0.

Configurations with more than one valve block on one bus module are not permissible.

In order to activate the valves, you must assign PLC outputs to the output bytes. WinDP automatically shows the number of bytes that will be transferred on the PROFIBUS-DP. There are always 4 output bytes with HF valves. The byte transfer on the PROFIBUS-DP does not depend on whether these bytes are allocated to PLC outputs.

4.5   PLC address allocation
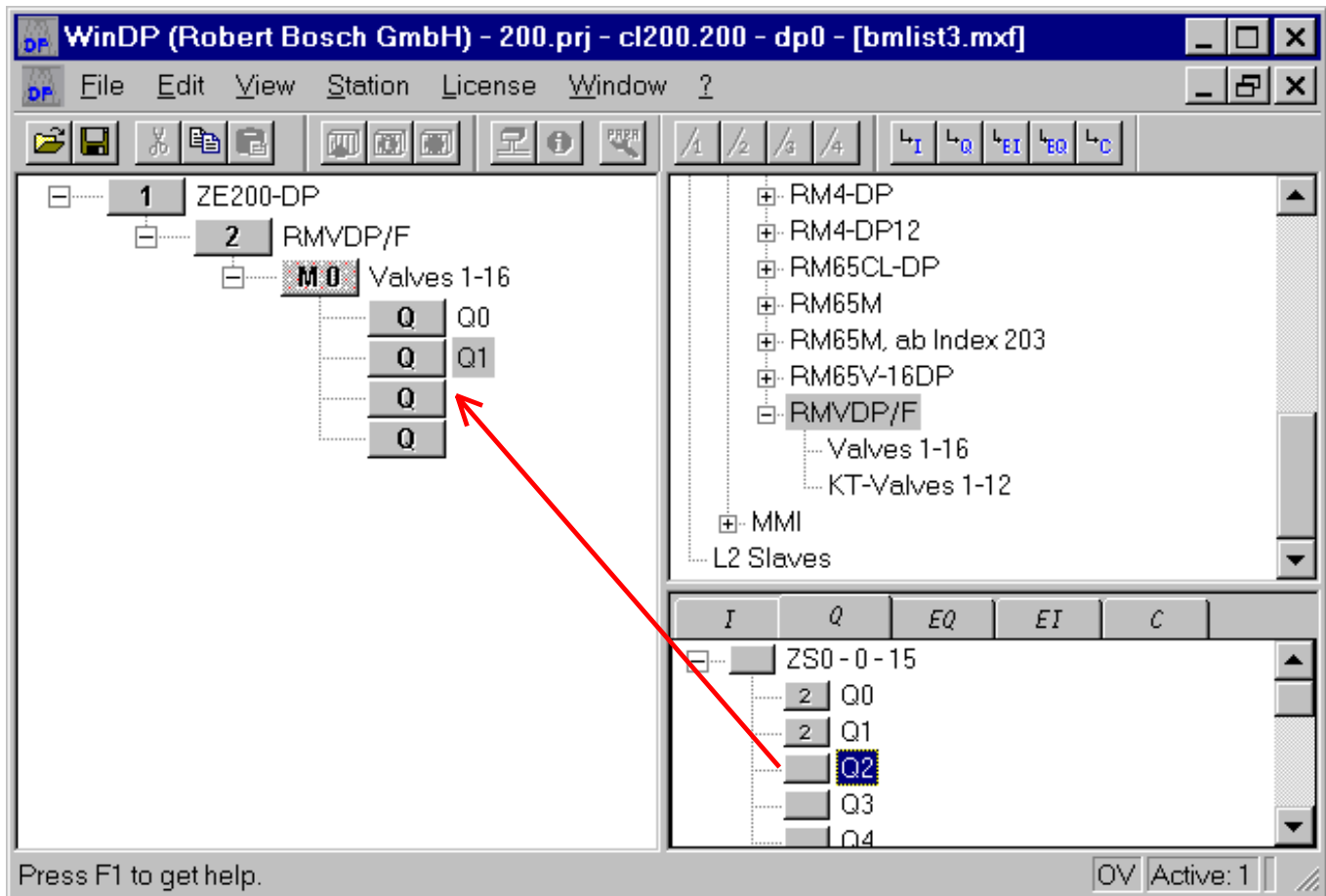
See figure 4-4

All
– Inputs (I),
– Outputs (Q),
– Extended Inputs (EI) and
– Extended Outputs (EQ),
as well as special channels are listed in the I/Q window of WinDP. The selection of the PLC address space was taken into account in the presetting stage. If symbol files are defined there, the symbols and symbol comments of all inputs and outputs are displayed.

Select field Q for outputs and then a free PLC output and click on it in the I/Q window. By holding down the left mouse button, the output can be dragged and dropped on a valve block output byte in the work space.

In the example, the PLC output Q0 was allocated to the first output byte of the valve block system, Q1 to the second, etc.

Figure 4-4: WinDP Editor menu, assigning PLC addresses

After the drop, WinDP assigns the address of the bus slave to the PLC output in the I/Q window. You can immediately see which PLC addresses are still available.

If a change-over valve is later replaced by an impulse valve, the bus module must be newly configured, in case the necessary PLC outputs are not occupied.

We recommend that PLC addresses be allocated to all input and output bytes!

4.6   Loading of master parameter set

Only for
BM DESI-DP12
See section 2.2.2

Before you make a connection to the busmaster, you must check and, if required, adjust the busmaster DIP switch positions. The busmaster coupling field is set by the DIP switch S4.

After all PROFIBUS-DP slaves are configured, the information in the busmaster file must be transferred together with the bus parameters set in WinDP (baud rate, etc.) to the busmaster. To do this, select the menu item *"File, Load"*. WinDP prepares the master parameter set MPS, containing all data needed for operation of the busmaster, slave and bus system PROFIBUS-DP and then transfers this information to the busmaster.

See figure 4-5

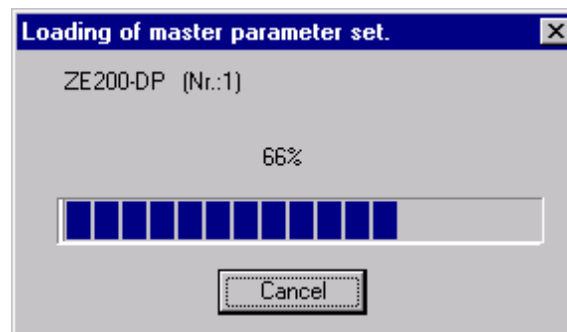*Figure 4-5: WinDP Editor menu,*
Loading of master parameter set

The busmaster is stopped during the loading process. A dialogue window appears with a prompt. Select "Yes" to execute the loading process. After the loading process is complete, the busmaster is restarted, again based on a prompt.

After the MPS is read, all of the PLC input and output adresses of the slaves are recognised by the busmaster.

Now the U$_L$/DIA LED on the valve block system's bus module must illuminate continuously and the BF LED should be off. The status display on the busmaster must extinguish (see the busmaster handbook).

4.7   Address assignments

Valve block address assignment

To be able to activate specific valves, it is necessary to allocate the bits of a PLC output to the individual valve positions on the valve block.

Also see table 4-1a and table 4-1b

If you have allocated a 12-position valve block to PLC addresses Q0 to Q2, the individual bits of these 3 bytes should be set up according to tables 4-1a and 4-1b.

☞
> Valve block systems with up to 8 valve positions occupy only 2 byte addresses, Q0 and Q1.

Connection 0 corresponds to bit 0.

Address assignment on the valve block, valve positions 1-8

Valve position	Solenoid/ LED	Byte	Address
1	14	0	Q0.0
	12		Q0.1
2	14		Q0.2
	12		Q0.3
3	14		Q0.4
	12		Q0.5
4	14		Q0.6
	12		Q0.7
5	14	1	Q1.0
	12		Q1.1
6	14		Q1.2
	12		Q1.3
7	14		Q1.4
	12		Q1.5
8	14		Q1.6
	12		Q1.7

Table 4-1a: Address assignment on a valve block for valve positions 1-8

Change-over valves only use solenoid 14.

Address assignment on the valve block, valve positions 9-16

Valve position	Solenoid/ LED	Byte	Address
9	14	2	Q2.0
	12		Q2.1
10	14		Q2.2
	12		Q2.3
11	14		Q2.4
	12		Q2.5
12	14		Q2.6
	12		Q2.7
13	14	3	Q3.0
	12		Q3.1
14	14		Q3.2
	12		Q3.3
15	14		Q3.4
	12		Q3.5
16	14		Q3.6
	12		Q3.7

Table 4-1b: Address assignment on a valve block for valve positions 9-16

☞ | Change-over valves only use solenoid 14.

4.8   Diagnosis with WinDP

See section 5
Diagnostic display

Diagnosis with WinDP and the diagnostic display on the bus module can provide information on errors if the LEDs U_L/DIA on the bus module do not illuminate continuously or one of the U_{Q1} or U_{Q2} LEDs is lit or if there is a message on the status display of the busmaster.

To use the diagnosis in WinDP click on the menu option *"View, Diagnostic"*. Detailed error and diagnostic messages from the busmaster and slaves are logged in the diagnosis output.

Here the PROFIBUS-DP along with the programmer (address 0), the busmaster (address 1) and the fields for the slaves (bus slaves with addresses 2 to 125) are displayed in the upper half of the window.

See figure 4-6

In the example in figure 4-6, the slave at address 2 reports an error and address field 2 has a red background. If the bus slave is clicked on, the corresponding diagnostic message is received in the text window: "Bus station can not be reached."

See figure 4-7

In the example in figure 4-7, the slave at address 2 reports an error and address field 2 has a yellow background. The message shows an equipment-related diagnosis: "Low voltage U_{Q1}" and "U_{Q2} not existing".
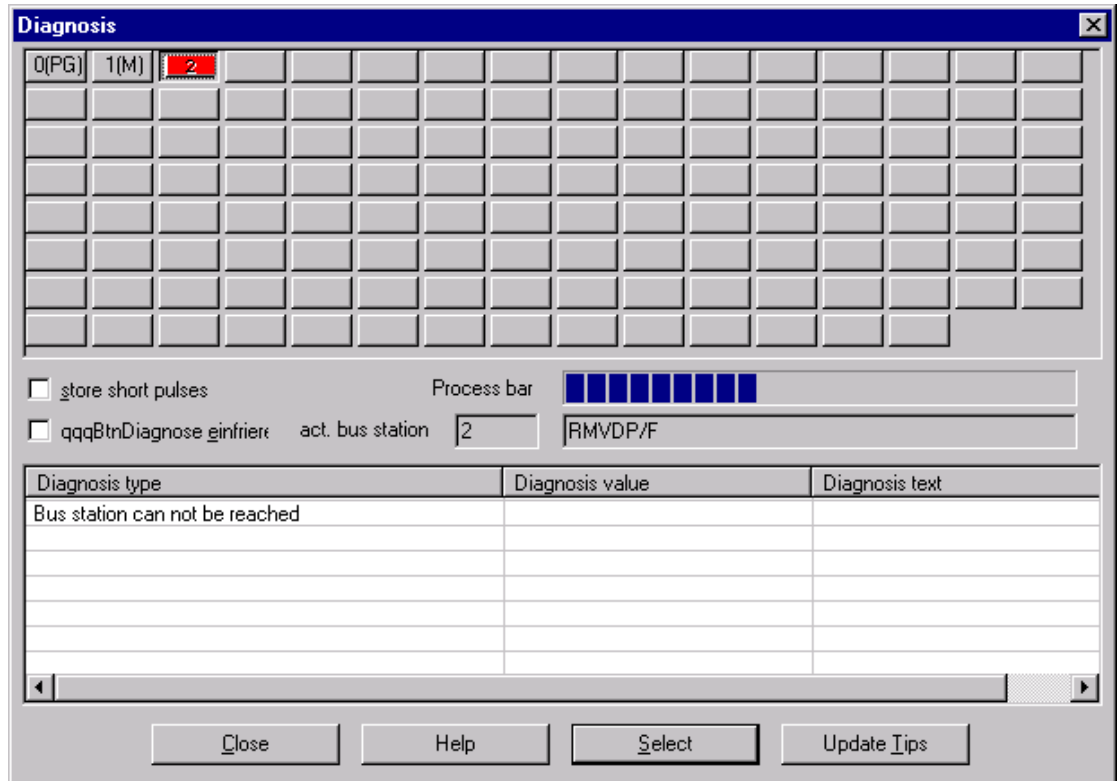
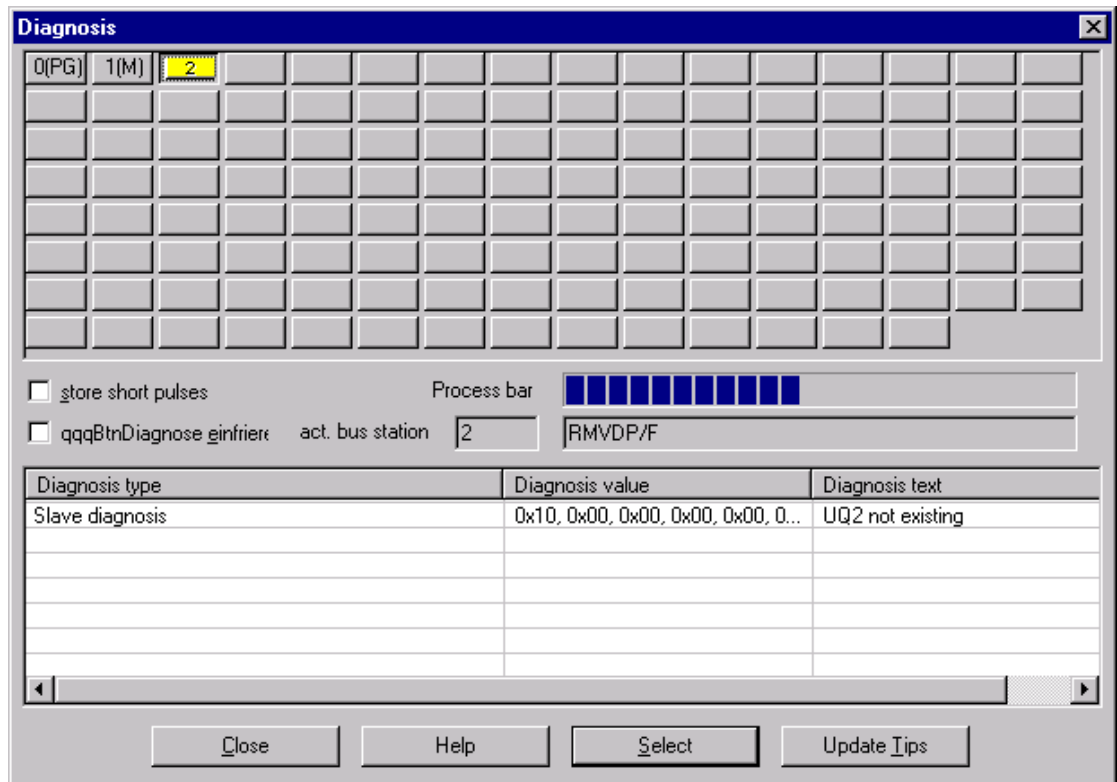*Figure 4-6: Diagnostic window with configuration error*

Figure 4-7: Diagnostic window with voltage error

After the error has been corrected and after the correct master parameter set is loaded into the busmaster, the diagnosis should display an error-free PROFIBUS-DP.

Module data   If you click a module using the right mouse button in the bus slave window in WinDP, the *Module data* window opens and the module's configuration data is displayed.
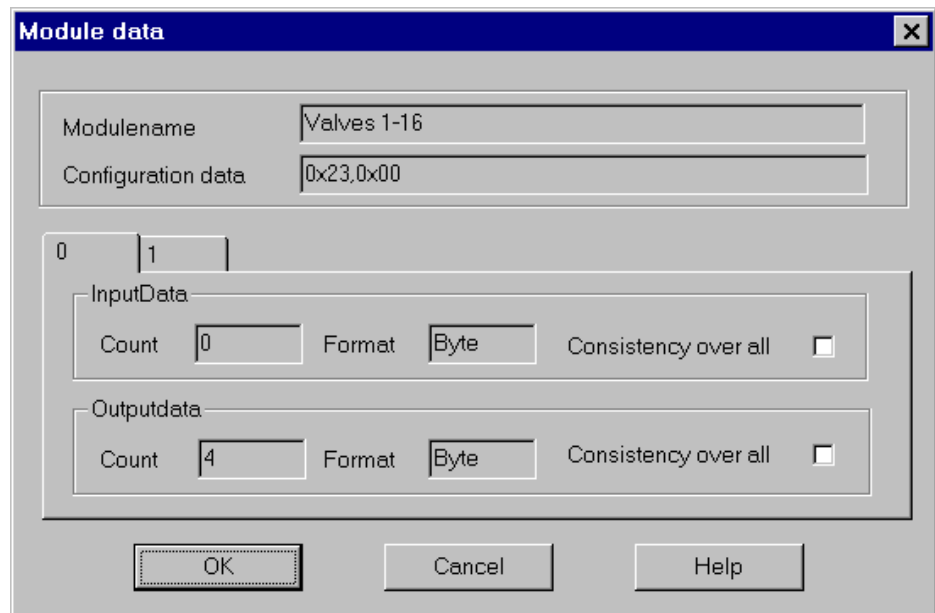

Figure 4-8: Module data window

5   Bus module diagnostic display

The LEDs on the front panel of the bus module show the messages of the following table.
The diagnostic display works independently of the mode switch's settings in section 2.3.

LED	Signal	Error	Description
U_L/DIA	green		**U_L logic supply present.**
		off	No U_L logic supply present.
		red	Valve driver overload (DIA group diagnosis). This display only occurs as long as the overloaded output is triggered.
U_{Q1}	green		**U_{Q1} valve supply is OK.**
		red	Low voltage (12 V $<$ U_{Q1} $<$ 18.5 V)
		off	U_{Q1} valve supply $<$ 12 V
U_{Q2} [1]	green		**U_{Q2} valve supply is OK.**
		red	Low voltage (12 V $<$ U_{Q2} $<$ 18.5 V)
		off	U_{Q2} valve supply $<$ 12 V
BF	off		**Baud rate was synchronised.** RUN: cyclical data exchange.
		red	Bus error: bus module baud rate is being determined, or wiring error.

Table 5-1: Bus module diagnostic display

[1]) Only for RMVDP/F - 1 827 030 166

6   Characteristics, service parts and accessories

6.1   Characteristics

🛈 General

Installation position	Any
Degree of protection EN 60529/IEC 60529	IP 65 when assembled
Ambient temperature	ϑ_U +5 °C to +50 °C

⚡ Electrical

Rated voltage logics	U_n 24 V DC (−15 % / +20 %)
Rated voltage output	U_n 24 V DC (−15 % / +20 %)

Electromagnetic compatibility

Interference immunity	EN 61131-2; 1994
Interference signal	EN 50081-2; 1993

6.2   Service parts and accessories

	Order code	Order number
Bus module for PROFIBUS-DP *	**RMVDP/F**	**1 827 030 166**
	RMVDP/F_7/8"	**1 827 030 205**

* Delivery includes fastening screws and gasket

Accessories		Order number
Plug connection for voltage supply, 6-pin socket **for RMVDP/F**	M23, Soldered contact connection	**1 824 484 053**
	M23, Screwed contact connection	**1 824 484 030**
Plug connection for voltage supply, 5-pin socket **for RMVDP/F_7/8"**	7/8", Screwed contact connection	Supplier 1)
	7/8", Screwed contact connection	Supplier 2)
Plug connection for bus connection, 5-pin plug, screwed contact connection		**1 824 484 026**
Plug connection for bus connection, 5-pin socket, screwed contact connection		**1 824 484 027**
M12 protective cap		**1 823 312 001**
Device database, GSD diskette, 3 1/2"		**1 070 075 547**
Bus cable, solid, PVC		**1 070 917 202**
Bus cable, solid, oil and grease resistant		**1 070 919 661**
Trailing cable, PUR, tensile force 100 N		**1 070 917 201**
Trailing cable, PUR, tensile force 20 N,oil and grease resistant		**1 070 919 660**

Address	Cable way		Order number
1) Franz Binder GmbH & Co. Rötelstrasse 27 D-74172 Neckarsulm	6-8 mm	Socket straight	**92-2444-12-05**
	10-12 mm	Socket straight	**99-2444-32-05**
	6-8 mm	Socket angled	**99-2444-52-05**
2) Murrelektronik GmbH Postfach 11 65 D-71570 Oppenweiler	6-9,5 mm	Socket straight	**00 027 661**

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