



## **MV4 – PLC Communication via SUCOM-A, Suconet K, PROFIBUS-DP**

### **MV4 Communication Cards and Configuration of MV4 and PLC**

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#### **07/01 AWB-C2700-1349GB**

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See list of revisions on page II

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**Caution!**

**Dangerous Electrical Voltage!**

### **Before commencing the installation**

- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally restarted.
- Verify isolation from the supply.
- Earth and short circuit.
- Cover or enclose neighbouring units that are live.
- Follow the engineering instructions (AWA) of the device concerned.
- Only suitably qualified personnel may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference do not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the
- I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.
- Ensure a reliable electrical isolation of the low voltage for the 24 volt supply. Only use power supply units complying with IEC 60 364-4-41 or HD 384.4.41 S2.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.
- Emergency stop devices complying with IEC/EN 60 204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause uncontrolled operation or restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.

## List of modifications to the manual AWB-C2700-1349GB

<b>Edition</b>	<b>Page</b>	<b>Description</b>	<b>New</b>	<b>Modification</b>	<b>Omitted</b>
07/01	14	Note		×	

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# About This Manual

## Contents

This manual contains all the information you will need for linking MV 4 devices to Moeller PLCs. Special information, particularly for the connection of non-Moeller PLCs, can be found in the “MV4 Hardware and Engineering” manual (AWB-C 2700-1347 GB) and in the “MV 4-CFG-1 Configurator” (Galileo).

Chapter 1 describes the MV 4 communication cards that enable data to be exchanged with the PLC.

The various communication cables required are described in Chapter 2.

Chapter 3 contains an overview of all the possible communication links and illustrates the principle used to exchange data between the MV 4 and the PLC.

Chapters 4, 5 and 6 describe the software configuration steps required to link the MV 4 display and operator panel to a type PS 4/PS 416 controller.

Notes on commissioning the communication between the MV 4 and PLC are contained in Chapter 7.

## Target group

This manual is intended for use by planners, programmers and commissioning engineers.

General familiarity with the Sucosoft S 40 PLC programming software and the MV 4-CFG-1 (Galileo) configurator is required.

# 1 Communication Cards

The communication cards can be used in any device from the MV 4 series.



ALWAYS switch off the power supply before inserting or removing cards.

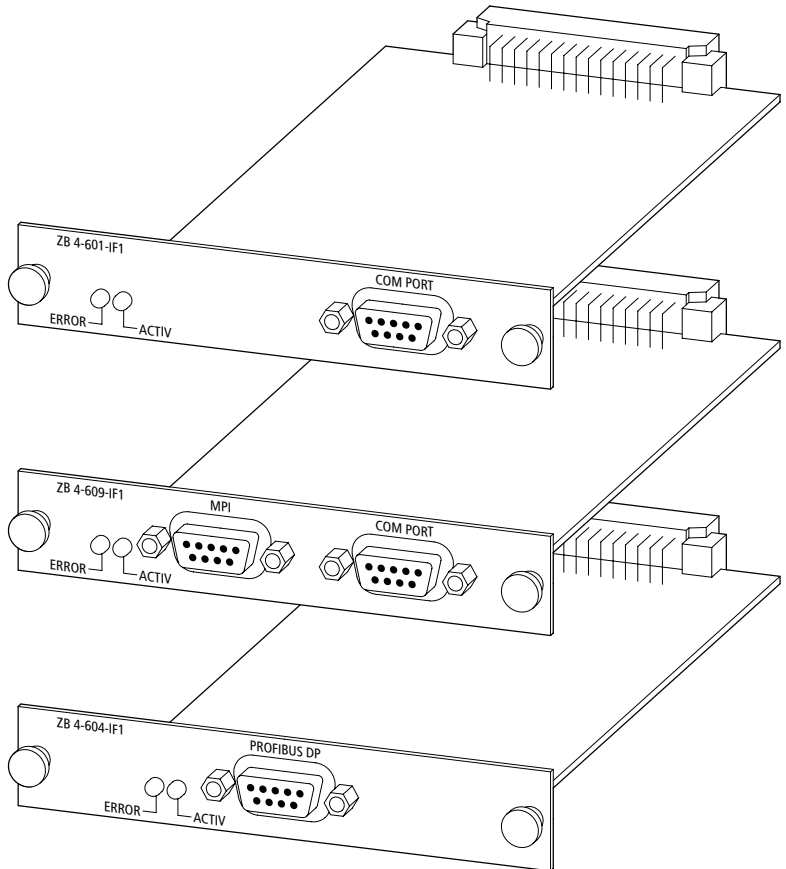


Figure 1: Front view of the communication cards

**ZB 4-601-IF1/  
ZB 4-609-IF1**

**Setup**

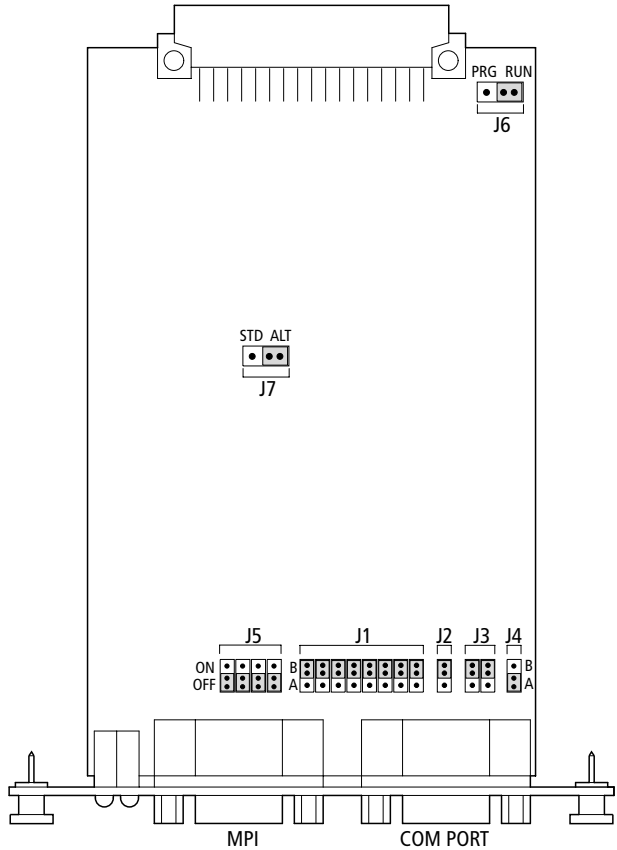


Figure 2: Communication card setup

- J1 to J4: For setting the interface type (page 6)
- J5: For setting the bus terminating resistors (page 8)
- J6: For activating/loading a driver (page 9)
- J7: For setting the driver (AWB-C 2700-1348 GB)
- COM: Interface for connection to a PLC (page 6)
- MPI: On ZB 4-609-IF1 only: interface for connection to a Siemens SIMATIC S7 (page 7)

## Setting the interface type

### COM PORT

The COM PORT is used for connection to programmable controller. A list of all the drivers that are supported (Moeller drivers and drivers for other PLC systems) is given in the “MV 4 Hardware and Engineering” manual (AWB-C 2700-1347 GB).

- Configure the COM PORT by setting the jumpers to RS 232, TTY, RS 422 or RS 485 (the factory default is RS 485):

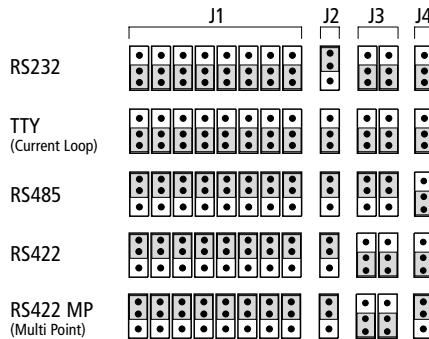


Figure 3: Setting the interface type

Table 1: COM PORT assignment

Pin	RS 232	TTY	RS 485	RS 422	RS 422 MP
1	–	IN	–	DTR+	–
2	RxD	–	–	TxD+	TxD+
3	TxD	–	A	RxD+	RxD+
4	DTR	–	–	DTR–	–
5	GND	GND	GND	GND	GND
6	DSR	–	–	DTR–	–
7	–	–	B	TxD–	TxD–
8	–	–	–	RxD–	RxD–
9	–	OUT	–	DSR–	–

### MPI PORT

The ZB 4-609-IF1 also has an MPI interface, enabling it to be linked to a Siemens Simatic S7. However, ONLY the COM PORT or the MPI interface may be connected at any given time.

For further information on the MPI interface, see the “MV 4 Hardware and Engineering” manual (AWB-C 2700-1347 GB).

## Setting the bus terminating resistors

- Switch on the bus terminating resistors at the first and last stations on the network. To be able to do this, the switches of jumper J5 – LINE TERMINATION must be set to ON.


ON   
OFF

Figure 4: Bus terminating resistors switched on



The bus terminating resistors in point-to-point links (just two stations) are generally switched on.

## MV 4 communication drivers

The drivers are loaded into flash ROM and it is important to differentiate between a standard and an alternative set of drivers.

The Moeller PS 40 drivers (PS40.Bin) are included in the alternative set of drivers that was pre-loaded on the ZB4-601-IF1 module when the card left the factory (jumper J7 set to ALT). The drivers can be updated using the configuration software (Galileo).

### Loading the drivers

The selected communication driver is loaded onto the MV 4 when you download the project.

- ▶ Set jumper J6 to the “PRG” position in order to load the new set of drivers onto the communication card.

PRG RUN



Figure 5: Jumper J6: “PRG” active



The J7 setting has no effect in “PRG” mode.

### Activating the drivers

- ▶ Set jumper J6 to “RUN” in order to activate the drivers. Jumper J7 must be set to “ALT”.

PRG RUN



Figure 6: Factory default for jumper J6: “RUN” active

## LED display

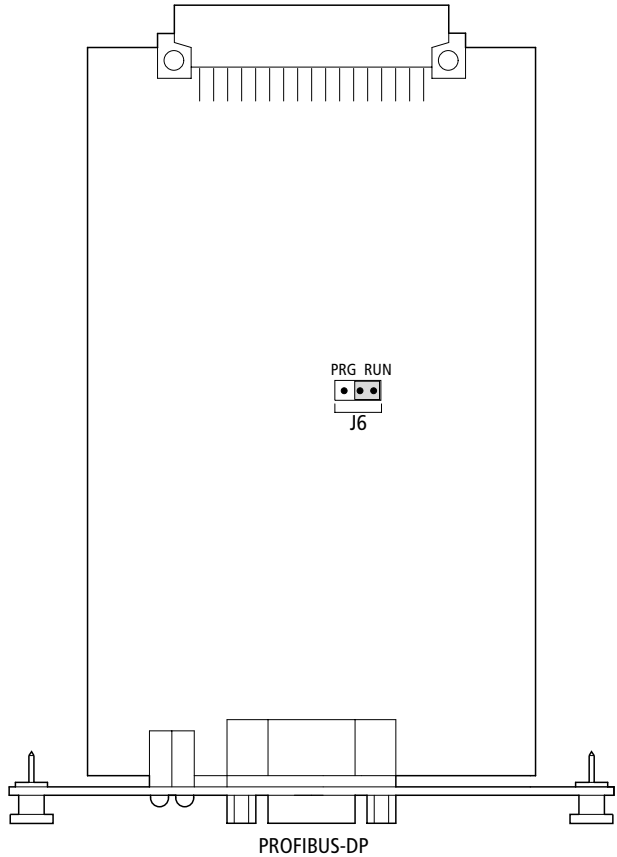
The ERROR and ACTIV LED displays indicate the card's status (see also the "Commissioning" chapter):

Table 2: LED displays

ERROR	If the (red) "ERROR" LED lights up, the previous data transmission to the PLC was not completed correctly. The LED will not go out again until the next data transmission to the PLC has ended successfully. This LED should never light up during normal operation.
ACTIV	This (green) LED lights up while data is being transmitted between the ZB 4-601/609-IF1 and PLC. In normal operation, this LED flashes briefly during every transmission (for approximately 50 ms).

**ZB 4-604-IF1**

The ZB 4-604-IF1 communication card supports the PROFIBUS-DP protocol. The MV 4 is linked to the DP master as a slave.

**Setup**

*Figure 7: PROFIBUS-DP communication card*

- J6:** Activate/load the driver (page 12)  
**PROFIBUS-DP:** Interface for connection to PROFIBUS-DP (page 13)

## MV 4 communication drivers

The drivers are loaded into FLASH ROM. They are located in the file PDP-TP-M.Bin. This file is pre-loaded when the card leaves the factory.

A software update of the drivers can be undertaken. The procedure is described in the “MV 4-CFG-1 Configurator” (Galileo).

### Loading the drivers

The selected communication driver is loaded onto the MV 4 when you download the project.

- ▶ Set jumper J6 to the “PRG” position in order to load the PROFIBUS-DP drivers onto the communication board.

PRG RUN



Figure 8: Jumper J6: “PRG” active

### Activating the drivers

- ▶ Set jumper J6 to the “RUN” position to activate the PROFIBUS-DP driver.

PRG RUN



Figure 9: Default setting for jumper J6: “RUN” active

## PROFIBUS-DP interface

Table 3: Pin assignment for the PROFIBUS-DP interface (SUB-D, 9-pin socket)

Pin	Signal	Meaning
3	RxD/TxD-P	Receive/Transmit Data P (Non-Inv. Data)
4	CNTR-P	Control-P (Rep. Control)
5	DGND	Data Ground (Gnd, Termination)
6	VP	Voltage-Plus (+5 V, Termination)
8	RxD/TxD-N	Receive/Transmit Data-N (Inv. Data)

## LED display

Two LED displays indicate the card's status:

Table 4: LED displays

ERROR	If the (red) "ERROR" LED lights up, the previous data transmission to the PLC was not completed correctly. The LED will not go out again until the next data transmission to the PLC has ended successfully. This LED should never light up during normal operation.
ACTIV	This (green) LED lights up while data is being transmitted between the ZB 4-601/609-IF1 and PLC. In normal operation, this LED flashes briefly during every transmission (for approximately 50 ms).

## 2 Communication Cables

### Overview

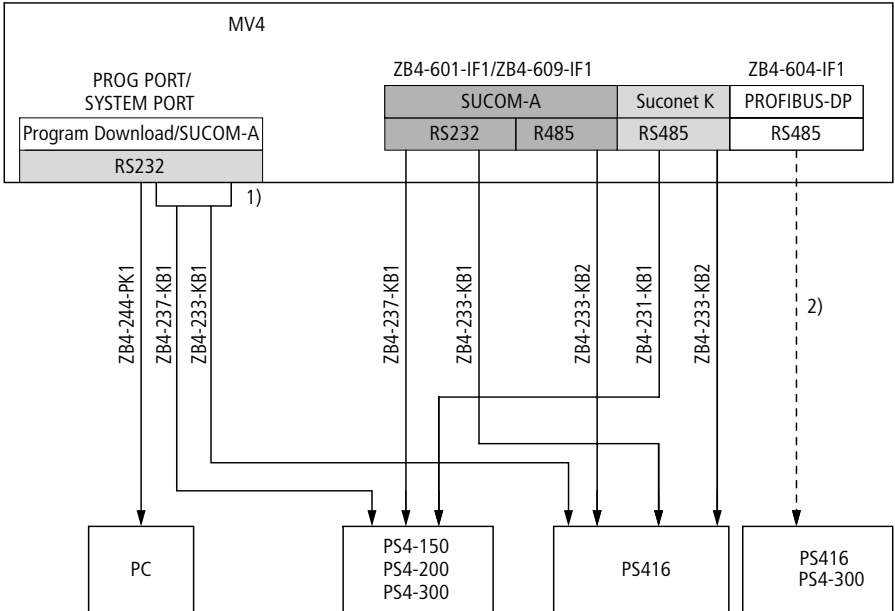


Figure 10: Overview of the communication cables

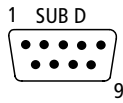
- 1) Adapter (9-pole SUB-D socket and 9-pole SUB-D socket).
- 2) There are no pre-fabricated cables for PROFIBUS-DP (see page 18).



The PROG PORT/SYSTEM PORT can be used in addition to the Download/Upload program to download drivers and for communication via SUCOM-A.

With the MV 4-600 series devices, project upload or download is undertaken via the Ethernet interface.

**MV 4 – PC (configuration)**



2	RxD
3	TxD
4	DTR
5	GND
6	DSR

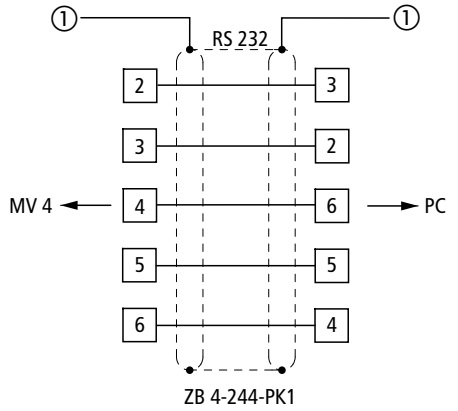


Figure 11: Pin assignment for cables between MV 4 and PC

Ⓛ Earthing via the connector casing

**MV 4 – PLC via SUCOM-A**

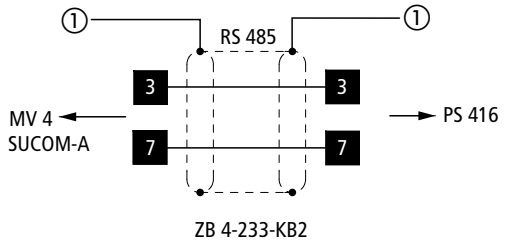
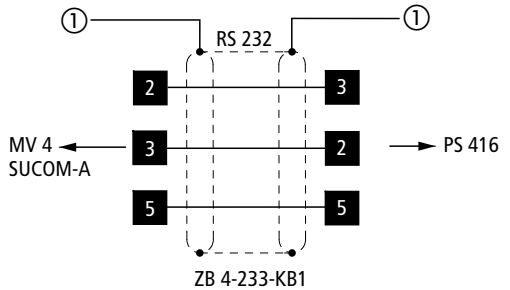
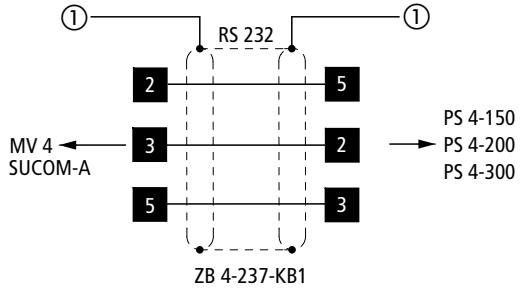
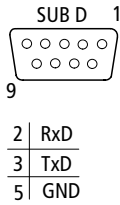


Figure 12: Pin assignment for SUCOM A cables between MV 4 and PLC

① Earthing via the connector casing

**MV 4 – PLC via Suconet K**

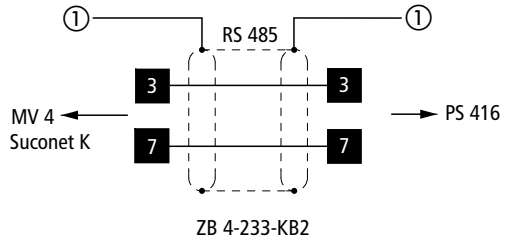
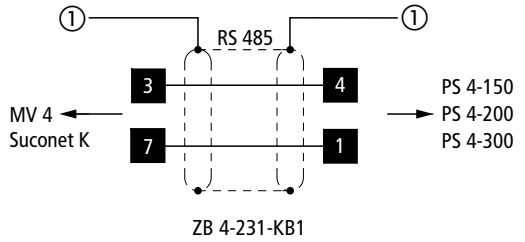
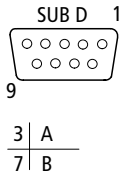


Figure 13: Pin assignment for Suconet K cables between MV 4 and PLC

① Earthing via the connector casing

**MV 4 – PLC via  
PROFIBUS-DP**



The cables and connectors must be ordered and made up separately (see table).

Order designation	Order type	Order number
Cable	ZB 4-900-KB1	206983
Connector	ZB 4-209-DS2	206982

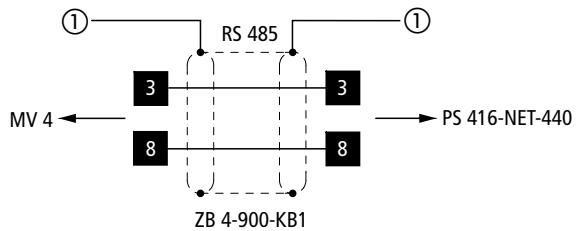
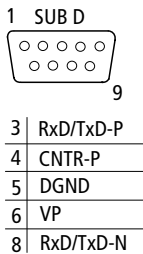


Figure 14: Pin assignment for cables between the MV 4 and PROFIBUS-DP card

- ① Earthing via the PS 416-NET-440 connector casing

### 3 Principle of Communication

#### Communication links

MV 4 display and operator panels can communicate with the PLC in the following ways:

#### **MV 4 – PLC via SUCOM A**

The PRG interface on any PLC must be used to exchange data via SUCOM A.

#### **MV 4 – PLC via Suconet K**

Use the Suconet K interface to exchange data between master and slave (MV 4) via Suconet K. The data is transmitted using the Suconet K protocol.

#### **MV 4 – PLC via PROFIBUS-DP**

Use the PROFIBUS-DP interface to exchange data between master and slave (MV 4) via PROFIBUS-DP. The data is transmitted using the PROFIBUS-DP protocol.

*Table 5: Protocols supported by the various masters*

<b>PLC</b>	<b>SUCOM A</b>	<b>Suconet K</b>	<b>PROFIBUS-DP</b>
PS 4-150	x	x	–
PS 4-200	x	x	–
PS 4-300	x	x	x
PS 416	x	x	x

## Data exchange principle

Data is generally exchanged between the MV 4 and PLC via the physical marker range %M... from the PLC, regardless of which communication link is selected.

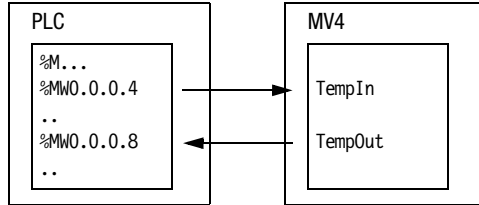
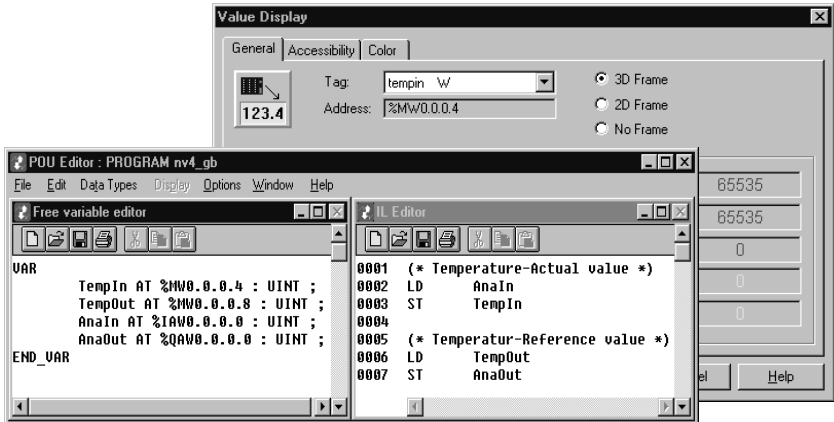


Figure 15: Principle by which data is exchanged

The variables in the MV 4 are compiled to form a message and are linked with physical markers %M... from the PLC. When the image is defined, the dynamic elements are assigned to the variables and thus to the linked markers from the PLC.





The MV 4 uses the physical PLC marker range directly as a data interface which is also accessed by the PLC user program.

Enter the physical markers as address operators (e. g. %MW0.0.0.4, %M...) in the declaration part of the PLC program.

## 4 MV 4 – PLC via SUCOM A

### Device interfaces

Use one of the following interfaces for exchanging data between the PLC and MV 4.

Table 6: Device interfaces

PLC type	PLC interface	MV 4 type	MV 4 interface
PS 4-150	PRG	MV 4-xxx-xxx	ZB 4-601-IF1 or ZB 4-609-IF1 multi-protocol board
PS 4-200	PRG		
PS 4-300	PRG		
PS 416	PRG		



For exchanging data via SUCOM A please set the MV4 interface type on the multi-protocol board to RS232 (see page 6).

### Data ranges

The MV 4 uses the physical PLC marker range directly as a data interface which is also accessed by the PLC user program.

The available marker ranges vary according to which PLC is used:



For the compact PLC, configure the marker range in Sucosoft S 40.

Table 7: Marker ranges

PLC	BOOL	BYTE/USINT/SINT	WORD/UINT/INT	DWORD/UDINT/DINT
PS 4-150	%M0.0.0.0.0 to %M0.0.0.16383.7	%MB0.0.0.0 to %MB0.0.0.16383	%MW0.0.0.0 to %MW0.0.0.16382	–
PS 4-200	%M0.0.0.0.0 to %M0.0.0.16383.7	%MB0.0.0.0 to %MB0.0.0.16383	%MW0.0.0.0 to %MW0.0.0.16382	–
PS 4-300	%M0.0.0.0.0 to %M0.0.0.14999.7	%MB0.0.0.0 to %MB0.0.0.14999	%MW0.0.0.0 to %MW0.0.0.14998	%MD0.0.0.0 .. %MD0.0.0.14996
PS 416	%M0.0.2.0.0 to %M0.0.2.4345.7	%MB0.0.2.0 to %MB0.0.2.4345	%MW0.0.2.0 to %MW0.0.2.4344	%MD0.0.2.0 .. %MD0.0.2.4340



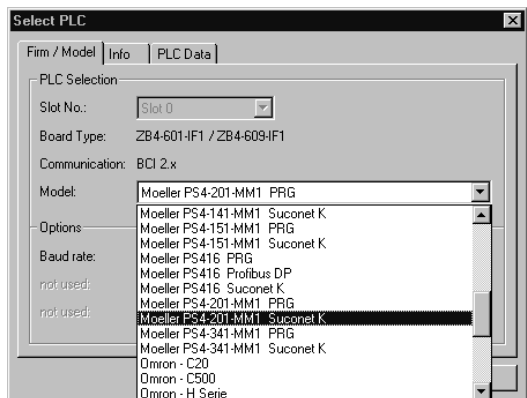
Further notes on exchanging data are given under “Data exchange principle” on page 20.

## Defining the communication link

Use the MV 4 configurator and the Sucosoft S 40 tools to define the communication link between the MV 4 and PLC:

### MV 4 configurator

- ▶ Switch to the < PLC → Select PLC> menu and select the PLC type (PS 4-201-MM1 PRG in this example)



## **Sucosoft S 40**

### **Topology configurator**

No additional configuration is required.

### **POU editor**

- ▶ Declare the markers used in the application.

No function block is needed for the PRG interface.

### **Code generation**

- ▶ Enable the marker range used on the compact PLC.

## **Online diagnostics**

### **MV 4**

The information text is overlaid on the current screen. You can also call up the text via a special function from the system info screen.

### **PLC**

- ▶ Evaluate the status message word from the MV 4 in the marker range.

## 5 MV 4 – PLC via Suconet K

The MV 4 is connected as a slave to a Suconet K master controller or unit. The data is transmitted using the Suconet K protocol.

### Device interfaces

Data is exchanged between the MV 4 and PLC via the Suconet K fieldbus using the following device interfaces:

Table 8: Device interfaces

PLC type	PLC interface	MV 4 type	MV 4 interface
PS 4-150	Suconet K	MV 4-xxx-xxx	Multi-protocol board ZB 4-601-IF1 or ZB 4-609-IF1
PS 4-200	Suconet K or LE 4-501-BS1		
PS 4-300	Suconet K or LE 4-501-BS1		
PS 416	Suconet K (PS 416-CPU-300/-400) or PS 416-NET-400		

### Data ranges

The data is transferred via Suconet K by means of a communication driver on the PLC (the manufacturer-defined function block “MI4netK”). It is then multiplexed and automatically assigned to the PLC markers.

In this way, the user can see in practice how the MV 4 uses the physical PLC marker range as a data interface which is also accessed by the PLC user program.

The available marker ranges differ according to which PLC is used.



For the compact PLC, the marker range should be configured in Sucosoft S 40.

Table 9: Marker ranges

	<b>BOOL</b>	<b>BYTE/USINT/SINT</b>	<b>WORD/UINT/INT</b>	<b>DWORD/UDINT/DINT</b>
PS 4-150	%M0.0.0.0.0 to %M0.0.0.16383.7	%MB0.0.0.0 to %MB0.0.0.16383	%MW0.0.0.0 to %MW0.0.0.16382	
PS 4-200	%M0.0.0.0.0 to %M0.0.0.16383.7	%MB0.0.0.0 to %MB0.0.0.16383	%MW0.0.0.0 to %MW0.0.0.16382	
PS 4-300	%M0.0.0.0.0 to %M0.0.0.14999.7	%MB0.0.0.0 to %MB0.0.0.14999	%MW0.0.0.0 to %MW0.0.0.14998	%MD0.0.0.0 .. %MD0.0.0.14996
PS 416	%M0.0.2.0.0 to %M0.0.2.4345.7	%MB0.0.2.0 to %MB0.0.2.4345	%MW0.0.2.0 to %MW0.0.2.4344	%MD0.0.2.0 .. %MD0.0.2.4340



Further notes on exchanging data are given under “Data exchange principle” on page 20.

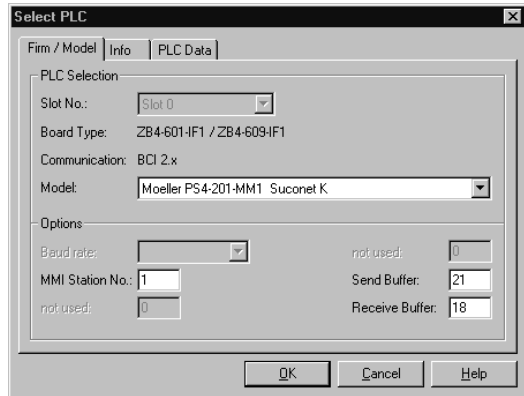
## Defining the communication link

### MV 4 configurator

- ▶ Switch to the ‹ PLC → Select PLC › menu.
- ▶ Select the PLC type from the “Type” box (PS 4-201-MM1 Suconet K in this example).
- ▶ Set the slave number in the “MMI station no. :” box (1st slave on the Suconet line in this example).
- ▶ Set the MV 4 Suconet send data in the “Send buffer” box (in this example a total of 21 Suconet data bytes are sent from the MV 4 to the PLC, 16 bytes of which are for the largest data block).
- ▶ Set the MV 4 Suconet receive data in the “Receive buffer” box (in this example a total of 18 Suconet data bytes are sent from the PLC to the MV 4, 16 bytes of which are for the largest data block).

### Example

- PS 4-201-MM1 Suconet K
- First slave on the Suconet K line
- 21 Suconet data bytes from the MV 4 to the PLC, 16 bytes of which are for the largest data block
- 18 Suconet data bytes from the PLC to the MV 4, 16 bytes of which are for the largest data block



When you define the MV 4 Send data buffer, make sure that five bytes contain headers for handshake information. The largest data block that can be transferred in this direction is thus five bytes smaller than the “Send buffer”.

For the MV 4 receive data buffer, two bytes of handshake data should be included in the message.

For the sake of simplicity, you can set the send and receive buffers to the same length. In this case, the buffers must be five bytes larger than the largest data block that you have addressed in the MV 4 configurator.

## Sucosoft S 40

### Topology editor

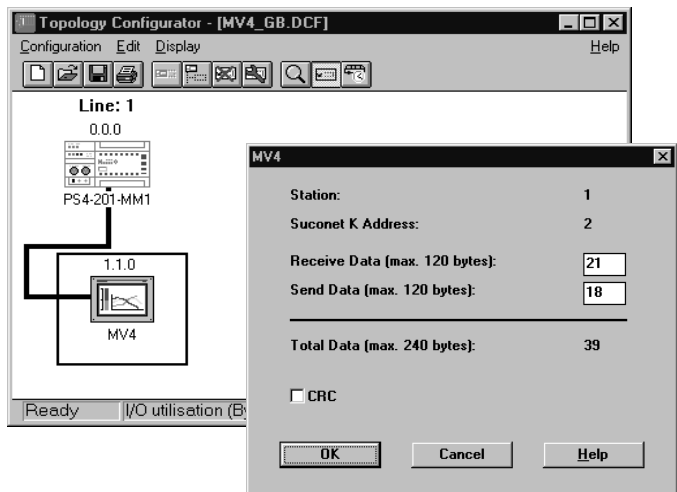
- ▶ Declare the MV 4(s) as (a) slave(s).
- ▶ Configure the receive data as per the “Send buffer” in the PLC configuration in the MV 4 configurator.
- ▶ Configure the send data (as per the “receive buffer” in the PLC configuration in the MV 4 configurator).



The station numbers and Suconet K address are set automatically in the topology configurator according to the position of the device.

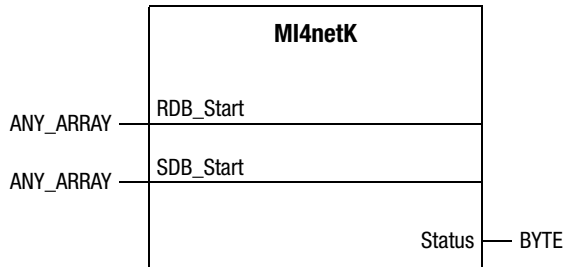
### Example

Master: PS 4-201-MM1 Suconet K  
Slave: MV 4 as the 1st slave on the Suconet line  
Receive data: 21 data bytes from the MV 4 to the PLC  
Send data: 18 data bytes from the PLC to the MV 4



### POU editor

- ▶ Declare the markers used in the application.
- ▶ Declare the communication driver used on the PLC (manufacturer-defined function block “MI4netK”).
- ▶ Call up the function block in the user program and configure it.



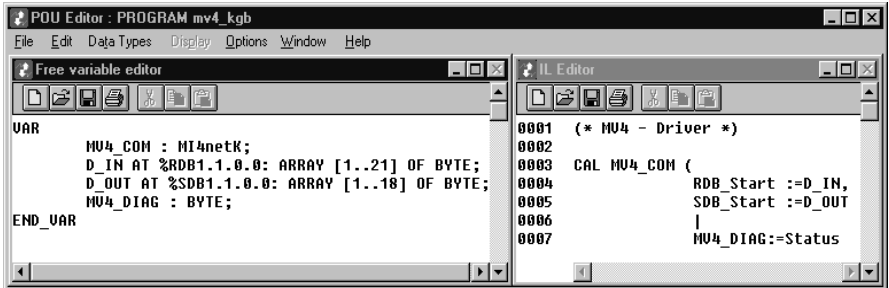
*Prototype function block*

### Significance of the operands:

RDB_Start	Receive buffer (RDB) of the Suconet K data transfer interface. This should be assigned an array [1..x] (where x is the number of PLC receive data bytes specified in the topology) and physically addressed at the first receive data byte. Previous example: “AT %RDB1.1.0.0 : ARRAY [1..21] OF BYTE”
SDB_Start	Send buffer (SDB) of the Suconet K data transfer interface. This should be assigned an array [1..x] (where x is the number of PLC send data bytes specified in the topology) and physically addressed at the first send data byte. Previous example: “AT %SDB1.1.0.0 : ARRAY [1..18] OF BYTE”
Status	For the communication status of the MV 4 (for further information, see under “Online diagnostics” on page 30)

**Example**

Declaration and calling of “MI4netK” in the POU as described above.

**Code generation**

- ▶ Enable the marker range used on the compact PLC.

**Online diagnostics****MV 4**

Diagnostic information can be obtained from

- the information text which is overlaid on the current screen
- or using a special function from the system info screen

## PLC

Diagnostic information can be obtained from

- the MV 4 status message word in the marker range
- the Suconet status byte “ISB”:

Bit 1: Stop

Bit 2: Input length error

Bit 6: No connection

Bit 7: Unknown type

- the “Status” output parameter of the “MI4netK” function block:

Communication OK	01h	PLC sending data packet to MV 4
	02h	PLC receiving data packet from MV 4
	04h	No data request
Communication error	C0h	Input parameter error
	80h	MV 4 sent invalid op-code/communication error
	81h	Marker range exceeded/message length error when reading markers from the PLC
	82h	Marker range exceeded/message length error when writing markers to the PLC

## 6 MV 4 – PLC via PROFIBUS-DP

The MV 4 is linked to the PROFIBUS-DP master module as a slave. Data is transmitted using the PROFIBUS-DP protocol.

### Device interfaces

Data is exchanged between the MV 4 and PLC via the PROFIBUS-DP field bus using the following device interfaces:

Table 10: Device interfaces

PLC	PLC interface	MV 4	MV 4-interface
PS 4-300	DP master LE LE 4-504-BS1	MV 4-xxx-xxx	Communication module ZB 4-604-IF1
PS 416	DP master card PS 416-NET-440		

### Data ranges

The data is transferred via PROFIBUS-DP by a communication driver on the PLC (the manufacturer-defined function block “MI4netK”). It is then multiplexed and automatically assigned to the PLC markers.

In this way, the user can see in practice how the MV 4 uses the physical PLC marker range as a data interface which is also accessed by the PLC user program.

Table 11: Marker ranges

	BOOL	BYTE/USINT/SINT	WORD/UINT/INT	DWORD/UDINT/DINT
PS 4-300	%M0.0.0.0.0 to %M0.0.0.14999.7	%MB0.0.0.0 to %MB0.0.0.14999	%MW0.0.0.0 to %MW0.0.0.14998	%MD0.0.0.0 .. %MD0.0.0.14996
PS 416	%M0.0.2.0.0 to %M0.0.2.4345.7	%MB0.0.2.0 to %MB0.0.2.4345	%MW0.0.2.0 to %MW0.0.2.4344	%MD0.0.2.0 to %MD0.0.2.4340



Further notes on exchanging data are given under “Data exchange principle” on page 20.

## Defining the communication link

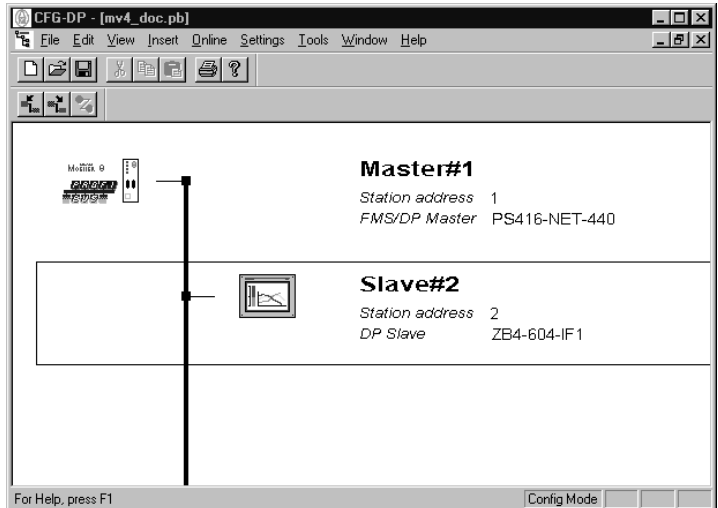
The basic principles of the PROFIBUS-DP master module are described in the “Hardware and Engineering for the PS 416-NET-440” manual (AWB 2700-1330 GB). The information contained in this manual will be very useful for understanding this section.

### PROFIBUS-DP configurator CFG-DP

- In this case, configure the communication card ZB 4-604-IF1 as a slave.

#### Example

MV 4 as slave 2



If you are configuring the MV 4 as a slave on the PROFIBUS-DP line, there is a choice of two modules for the PS 416/PS4-300: module 0 and module 1.

**Module 0:**

Message with 38 input bytes and 38 output bytes (IB/QB)

Net user data = 33 bytes MV 4 → PLC, 35 bytes PLC → MV 4.

**Module 1:**

Message with 70 input bytes and 70 output bytes (IB/QB)

Net user data = 65 bytes (maximum data block size) in each direction.

Module 2 and module 3 are reserved for connecting non-Moeller devices.

**Example**

Module 1: 70 input bytes, 70 output bytes

**Slave Configuration**

General

Device: ZB4-604-IF1 Station address: 2

Description: Slave#2

Activate device in actual configuration

Enable watchdog control GSD file: KMZB4D03.GSD

Max. length of in-/output data	140 Byte	Length of in-/output data	140 Byte
Max. length of input data	70 Byte	Length of input data	70 Byte
Max. length of output data	70 Byte	Length of output data	70 Byte
Max. number of modules	2	Number of modules	1

Module	Inputs	Outputs	In/Out	Identifier
38 Byte Input / 38 Byte Output	16 Byte	16 Byte		0x1F, 0x1F, 0x15,
	16 Byte	16 Byte		0x2F, 0x2F, 0x25
	6 Byte	6 Byte		
70 Byte Input / 70 Byte Output	16 Byte	16 Byte		0x1F, 0x1F, 0x1F,
	16 Byte	16 Byte		0x1F, 0x15, 0x2F,
	16 Byte	16 Byte		0x2F, 0x2F, 0x2F,
	6 Byte	6 Byte		0x25

Slot	dx	Module	Symbol	Type	Addr.	Len.	Type	D Addr.	D Len.
1	1	1) 70 I-Byte / 70 Q-Byte	Module#1	IB	0	16	QB	0	16
1	2	1) 70 I-Byte / 70 Q-Byte	Module#1	IB	16	16	QB	16	16
1	3	1) 70 I-Byte / 70 Q-Byte	Module#1	IB	32	16	QB	32	16
1	4	1) 70 I-Byte / 70 Q-Byte	Module#1	IB	48	16	QB	48	16
1	5	1) 70 I-Byte / 70 Q-Byte	Module#1	IB	64	6	QB	64	6

Assigned master: Station address 1: Master#1: 1 / PS416-NET-440

Actual slave: Station address 2: Slave#2: 2 / ZB4-604-IF1

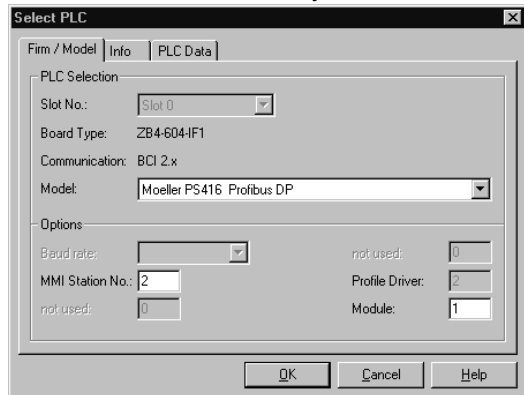
Buttons: OK, Cancel, Parameter Data..., Append Module, Remove Module, Insert Module, Symbolic Names

## MV 4 configurator

- ▶ Switch to the ‹ PLC → Select PLC › menu.
- ▶ In the “Type” box, select the PLC type “Moeller PS 416 Profibus DP” or “Moeller PS 4-341-MM1 Profibus DP”.
- ▶ In the “Module” box, enter the module number 0 or 1 (as specified in the PROFIBUS configurator).

## Example

Slave 2, module 1: 70/70 bytes



## Sucosoft S 40

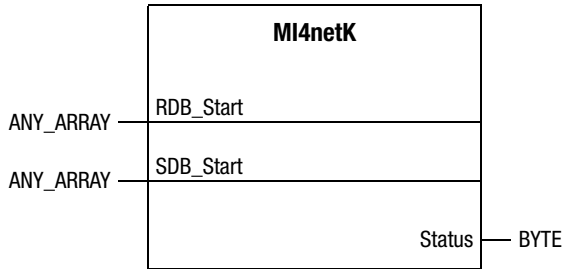
### Topology configurator

- ▶ Declare the PROFIBUS-DP master module.

### POU editor

- ▶ Declare the markers used in the application.
- ▶ Declare the communication driver used on the PLC (manufacturer-defined function block “MI4netK”).

- Call up MI4netK and configure it:



*Prototype function block*

Significance of the operands:

RDB_Start	<p>Receive buffer (IB) of the PROFIBUS-DP data transfer interface. This should be assigned an array [1..x] , where x represents the size of the receive buffer (regardless of which module was selected).            Module 0: x = 38            Module 1: x = 70</p> <p>Since this is a variable of the IN/OUT parameter type, the physical address range (in this example: "AT %IB1.2.0.0 : ARRAY [1..70] OF BYTE") cannot be assigned directly.</p> <p>You should define another ARRAY with this address which will receive the "RDB_Start" input parameter in instruction list (see the following programming example for further details).</p>
SDB_Start	<p>Send buffer (QB) of the PROFIBUS-DP data transfer interface. This should be assigned an array [1..x] , where x represents the size of the send buffer (regardless of which module was selected).            Module 0: x = 38            Module 1: x = 70</p> <p>In this case, the physical address can be assigned directly.            Previous example: "AT %QB1.2.0.0 : ARRAY [1..70] OF BYTE".</p>
Status	<p>Communication status of the MV 4 (for further information, see under "Online diagnostics" on page 37)</p>

**Example**

Declaration and calling of “MI4netK” in the POU as described above:

The screenshot shows two windows from a PLC programming environment. The left window, titled 'Free variable editor', contains the following declarations:

```

VAR
    MU4_COM : MI4netK;
    D_IN_BUFF: ARRAY [1..70] OF BYTE;
    D_IN_AT %IB1.2.0.0: ARRAY [1..70] OF BYTE;
    D_OUT_AT %QB1.2.0.0: ARRAY [1..70] OF BYTE;
    MU4_DIAG : BYTE;
END_VAR
  
```

The right window, titled 'IL Editor', shows the following ladder logic code:

```

0001 (* Copy RDB_Start *)
0002 LD D_IN
0003 ST D_IN_BUFF
0004
0005 (* MU4 - Driver *)
0006 CAL MU4_COM (
0007     RDB_Start :=D_IN_BUFF,
0008     SDB_Start :=D_OUT
0009     |
0010     MU4_DIAG:=Status
0011 )
  
```

**Online diagnostics****MV 4**

Diagnostic information can be obtained from

- information text overlaid on the current screen
- a special function from the system info screen

**PLC**

Diagnostic information can be obtained from:

- the MV 4 status message word in the marker range
- Suconet status byte “ISB”:
  - Bit 4: Further diagnostic data available can be called up via the “PdpStationDiag” function block.
  - Bit 6: Communication error

- Manufacturer-defined function block  
“PdpStationDiag”  
(For further information see the “Hardware and Engineering for the PS 416-NET-440” manual, AWB 2700-1330 GB)
- “Status” output parameter of the “MI4netK” function block:

Communication OK	01h	PLC sending data packet to MV 4
	02h	PLC receiving data packet from MV 4
	04h	No data request
Communication error	C0h	Input parameter error
	80h	MV 4 sent invalid op-code/ communication error
	81h	Marker range exceeded/message length error when reading markers from the PLC
	82h	Marker range exceeded/message length error when writing markers to the PLC

### CFG-DP

Meaning of the 16 bytes under “Extended Device Diagnostic”:

- Byte 1: Station Status 1
- Byte 2: Station Status 2
- Byte 3: Station Status 3
- Byte 4: Assigned Master Address
- Byte 5, 6 GSD Ident Number
- Byte 7 Length
- Byte 8 to 16 Slave specific data (not used in MV 4)

## 7 Commissioning

Please read the following notes on commissioning and communication between the MV 4 and PLC:

- ▶ Connect the COM PORT of ZB 4-601-IF1 or ZB 4-609-IF1 communication cards or the PROFIBUS-DP PORT of the ZB 4-604-IF1 communication card to the corresponding communication interface on the PLC.

Always use the correct communication cables for the PLC (see Chapter 2).

- ▶ Switch on the power. Active communication starts as soon as the first screen of the loaded project appears on the touch-screen operator panel.

The green “ACTIV” LED on the communication card is lit during active communication with the PLC. The “ACTIV” LED goes out as soon as communication ends.

The red “ERROR” LED lights up if data was **not** exchanged correctly with the PLC.



The following commissioning instructions apply only in the event of an error, i.e. if none of the LEDs light up or if the red “ERROR” LED lights up. In all other situations, no further commissioning is required.

### **LED does not light up**

- ▶ Check whether you have selected a driver that is not supported by the current firmware used on the communication card.

If this is the case, ask Support for a more recent version and note any error messages that appear on the destination hardware.

If you are using a ZB 4-601-IF1 or ZB 4-609-IF1 card, check that jumper “J7” (“STD”/“ALT”) has been set correctly for the driver you wish to use.

### Red LED lights up

- ▶ Check that the physical interface on the ZB 4-601-IF1 or ZB 4-609-IF1 communication card matches the interface on the PLC (RS 232, TTY, RS 485, RS 422).

If you are using an ZB 4-609-IF1, check that you are connected to the correct interface (COM PORT) for communication with Moeller controllers).

- ▶ Check the communication cables against the diagram for the PLC.
- ▶ If the red “ERROR” LED lights up sporadically, check that the cable shielding is connected as described.
- ▶ If you are using a ZB 4-609-IF1, make sure that **only one** of the two interfaces is connected!

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