



SEW
EURODRIVE

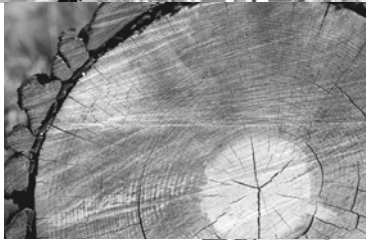


MOVIDRIVE® MDX61B
Fieldbus Interface DFS22B
PROFINET IO with PROFIsafe

Edition 04/2008

11616210 / EN

Manual





1	General Notes	5
1.1	Structure of the safety notes	5
1.2	Right to claim under limited warranty	5
1.3	Exclusion of liability	5
1.4	Copyright.....	6
2	Safety Notes	7
2.1	Other applicable documentation	7
2.2	General safety notes for bus systems	7
2.3	Safety functions	7
2.4	Hoist applications	7
2.5	Product names and trademarks	7
2.6	Waste disposal.....	8
3	Introduction	9
3.1	Content of the manual.....	9
3.2	Additional documentation.....	9
3.3	Features	9
3.3.1	MOVIDRIVE [®] and PROFINET	9
3.3.2	Access to all information.....	10
3.3.3	Monitoring functions.....	10
3.3.4	Diagnostics	10
3.3.5	Fieldbus monitor	10
4	Integrated Safety Technology	11
4.1	Safety concept DFS22B in combination with DCS21B	11
4.2	MOVIDRIVE [®] B safety concept without option DCS21B	12
4.2.1	Limitations.....	12
4.2.2	Schematic representation of the safety concept using MOVIDRIVE [®] B as an example.....	13
5	Safety Conditions	14
6	Assembly and Installation Instructions	15
6.1	Installing option card DFS22B in MOVIDRIVE [®] MDX61B	15
6.2	Installing option card DFS22B/DCS21B in MOVIDRIVE [®] MDX61B	16
6.2.1	Before you begin.....	17
6.2.2	Basic procedure for installing and removing an option card (MDX61B, sizes 1 - 6).....	18
6.3	Connection and terminal description for option DFS22B	19
6.4	Pin assignment	20
6.5	Shielding and routing bus cables	21
6.6	TCP / IP addressing and subnets	22
6.7	Setting IP address parameters via the DCP	24
6.8	Procedure after replacing the unit.....	25
6.9	Operating displays of the DFS22B option	25
6.9.1	PROFINET LEDs	25





7	Configuration and Startup	27
7.1	Configuring the PROFINET IO controller	27
7.1.1	Assigning the PROFINET device name	28
7.1.2	Configuring the PROFINET IO connection DFS22B	30
7.1.3	Configuration example for the process data configuration of MOVIDRIVE® B	35
7.2	Setting the MOVIDRIVE® MDX61B inverter	36
7.3	Configuring PROFIsafe with STEP 7	37
7.3.1	Description of the F parameters	38
7.3.2	Safety diagnostics via PROFINET	40
8	Operating Characteristics on PROFINET	41
8.1	Introduction	41
8.2	The integrated Ethernet switch	43
8.3	Process data configuration	44
8.4	Controlling the MOVIDRIVE® MDX61B inverter	45
8.4.1	Control example for SIMATIC S7 with MOVIDRIVE® MDX61B	46
8.4.2	PROFINET timeout (MOVIDRIVE® MDX61B)	46
8.4.3	Fieldbus timeout response (MOVIDRIVE® MDX61B)	46
8.5	SIMATIC S7 program example	47
8.6	PROFINET alarms taking the example of MOVIDRIVE® B	48
9	Parameter Setting via PROFIdrive Database 47	50
9.1	Introduction to PROFINET records	50
9.1.1	Properties of PROFINET devices from SEW-EURODRIVE	51
9.2	Structure of the PROFINET parameter channel	52
9.2.1	Configuration sequence via database 47	53
9.2.2	Processing sequence for controller / supervisor	54
9.2.3	Addressing lower-level inverters	55
9.2.4	MOVILINK® parameter requests	56
9.2.5	PROFIdrive parameter requests	61
9.3	Reading or writing parameters via database 47	66
9.3.1	Sample program for SIMATIC S7	66
9.3.2	PROFINET technical data for MOVIDRIVE® DFS22B	66
9.3.3	Error codes of PROFINET services	67
10	Integrated Web Server	68
10.1	Software requirements	68
10.2	Security settings	68
10.3	Structure of the MOVIDRIVE® MDX61B with option DFS22B homepage	69
10.4	Structure of the diagnostic applet	70
10.5	Access protection	73
11	MOVITOOLS® MotionStudio via Ethernet	74
11.1	Overview	74
11.2	Workflow for device configuration	75
11.3	Communication with external devices	78
12	Error Diagnostics	80
12.1	Diagnostic procedures	80
13	Technical Data	83
13.1	DFS22B for MOVIDRIVE® B	83
14	Index	84










1 General Notes

1.1 Structure of the safety notes

The safety notes in this manual are designed as follows:

Pictogram 	 SIGNAL WORD!
	Type and source of danger. Possible consequence(s) if the safety notes are disregarded. <ul style="list-style-type: none"> • Measure(s) to prevent the danger.

Pictogram	Signal word	Meaning	Consequences in case of disregard
Example:  General danger	 DANGER!	Imminent danger	Severe or fatal injuries
 Specific danger, e.g. electric shock	 WARNING!	Possible dangerous situation	Severe or fatal injuries
	 CAUTION!	Possible dangerous situation	Minor injuries
	STOP!	Possible damage to property	Damage to the drive system or its environment
	NOTE	Useful information or a tip Simplifies the handling of the drive system	

1.2 Right to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the manual before you start working with the unit!

Make sure that the manual is available to persons responsible for the plant and its operation, as well as to person who work independently on the unit. You must also ensure that the documentation is legible.

1.3 Exclusion of liability

You must comply with the information in the MOVIDRIVE® B documentation to ensure safe operation and to achieve the specified product characteristics and performance. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of the operating instructions. In such cases, any liability for defects is excluded.



1.4 Copyright

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Unauthorized reproduction, copying, distribution or any other use of the whole or any part of this documentation is strictly prohibited.



2 Safety Notes

2.1 Other applicable documentation

- Only trained personnel observing the relevant accident prevention regulations and the following documents are permitted to install and startup the unit!
 - "MOVIDRIVE® MDX60B/61B" operating instructions
 - "MOVIDRIVE® MDX61B Safety Module Option DCS21B/31B" manual
- Read through this documentation carefully before you start installation and startup of the option DFS22B.
- As a prerequisite to fault-free operation and fulfillment of warranty claims, you must adhere to the information in the documentation.

2.2 General safety notes for bus systems

This communication system allows you to match the MOVIDRIVE® B inverter to the specifics of your application. As with all bus systems, there is a danger of invisible, external (as far as the inverter is concerned) modifications to the parameters which give rise to changes in the unit behavior. This may result in unexpected (not uncontrolled) system behavior.

2.3 Safety functions

The MOVIDRIVE® MDX61B inverter may not perform safety functions without higher-level safety systems. Use higher-level safety systems to ensure protection of personnel and equipment.

Ensure that the data in the following documentation is observed for safety applications.

- Safe Disconnection for MOVIDRIVE® B

Use only those components in safety applications that were explicitly delivered in this design by SEW-EURODRIVE!

2.4 Hoist applications

MOVIDRIVE® MDX60B/61B may not be used as a safety device in hoist applications.

Use monitoring systems or mechanical protection devices as safety equipment to avoid possible damage to property or injury to people.

2.5 Product names and trademarks

The brands and product names in this manual are trademarks or registered trademarks of the titleholders.



2.6 *Waste disposal*



Please follow the current national regulations.

Dispose of the following materials separately in accordance with the country-specific regulations in force:

- Electronics scrap
 - Plastics
 - Sheet metal
 - Copper
- etc.



3 Introduction

3.1 *Content of the manual*

This user manual describes the

- installation of the DFS22B option card PROFINET IO with PROFIsafe in the MOVIDRIVE[®] MDX61B inverter.
- startup of the MOVIDRIVE[®] unit on the PROFINET IO RT fieldbus system
- configuration of PROFINET using GSD files
- operation of MOVITOOLS[®] MotionStudio via PROFINET.

3.2 *Additional documentation*

For information on how to connect MOVIDRIVE[®] B easily and effectively to the PROFINET IO fieldbus system, you should request the following publications about fieldbus technology in addition to this user manual:

- MOVIDRIVE[®] Fieldbus Unit Profile manual
- MOVIDRIVE[®] B system manual
- MOVIDRIVE[®] MDX61B Safety Monitor DCS21B/31B manual

The MOVIDRIVE[®] Fieldbus Unit Profile manual and the MOVIDRIVE[®] B system manual describe the fieldbus parameters and their coding, and explains the whole range of control concepts and application options in the form of brief examples.

The "MOVIDRIVE[®] Fieldbus Unit Profile" manual contains a list of all inverter parameters that can be read or written via the various communication interfaces, such as system bus, RS485 and also via the fieldbus interface.

3.3 *Features*

The MOVIDRIVE[®] MDX61B inverter enables you to use the option DFS22B PROFINET IO with PROFIsafe to connect to higher-level automation systems via PROFINET IO RT thanks to its powerful, universal fieldbus interface.

3.3.1 **MOVIDRIVE[®] and PROFINET**

The unit behavior of the inverter which forms the basis of PROFINET operation is referred to as the unit profile. It is independent of any particular fieldbus and is therefore a uniform feature. This feature allows the user to develop applications independent of the fieldbus in operation. This makes it much easier to change to other bus systems, such as DeviceNet (option DFD).



3.3.2 Access to all information

MOVIDRIVE[®] MDX61B offers digital access to all drive parameters and functions via the PROFINET interface. The drive inverter is controlled via fast, cyclic process data. You can use this process data channel to enter setpoints, such as the setpoint speed, ramp generator time for acceleration/deceleration, etc., and to trigger various drive functions such as enable, controller inhibit, normal stop, rapid stop, etc. At the same time you can also use this channel to read back actual values from the drive inverter, such as actual speed, current, unit status, error number or reference signals.

3.3.3 Monitoring functions

Using a fieldbus system requires additional monitoring functions for the drive technology, for example, time monitoring of the fieldbus (fieldbus timeout) or rapid stop concepts. You can, for example, adapt the monitoring functions of MOVIDRIVE[®] specifically to your application. You can determine, for instance, which of the drive inverter's fault responses should be triggered in the event of a bus error. It is a good idea to use a rapid stop function for many applications. However you can also freeze the last setpoints so that the drive continues to operate with the most recently valid setpoints (for example, conveyor belt). As the functions of the control terminals are still active in fieldbus operation, you can still implement fieldbus-independent emergency stop concepts via the inverter terminals.

3.3.4 Diagnostics

The MOVIDRIVE[®] inverter offers numerous diagnostic options for startup and service. For example, you can use the integrated fieldbus monitor to control setpoint values sent from the higher-level controller and the actual values. The integrated Web server allows you to access the diagnostic values using a standard browser.

3.3.5 Fieldbus monitor

You are also supplied with a range of additional information on the status of the fieldbus interface. In conjunction with the MOVITOOLS[®] MotionStudio PC software, the fieldbus monitor function offers you an easy-to-use diagnostic tool for setting all drive parameters (including the fieldbus parameters) and for displaying the fieldbus and device status information in detail.




4 Integrated Safety Technology

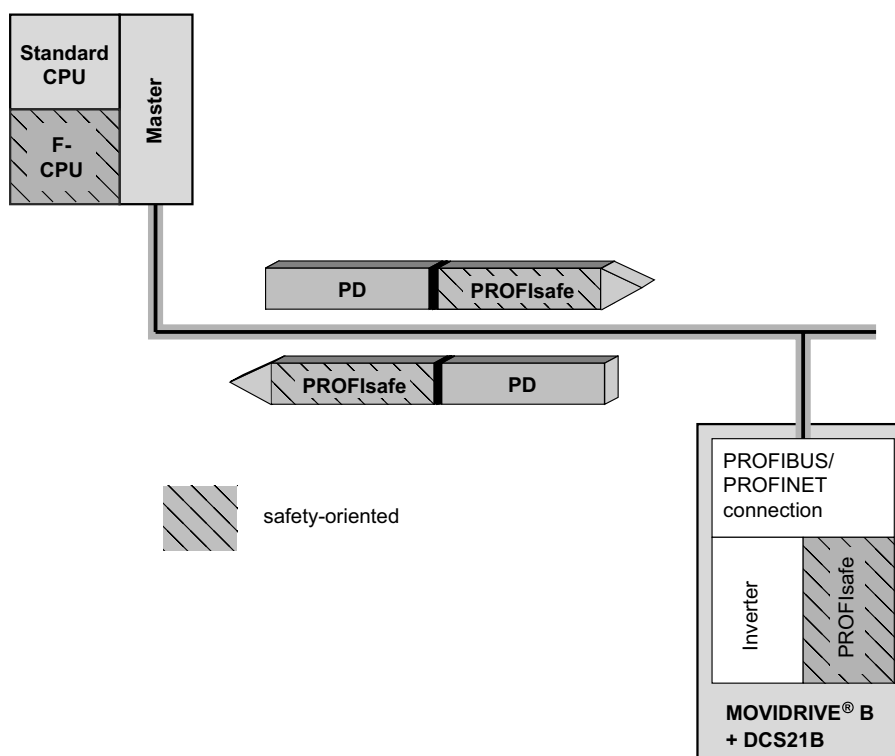
4.1 Safety concept DFS22B in combination with DCS21B

- The PROFIsafe fieldbus interface DFS22B has an integrated CAN interface. The DFS22B filters the safe communication and sends it safely to the option DCS21B via the integrated CAN interface.
- The following requirements are met by a 2-channel redundant system structure of the DCS21B safety subassembly with the help of suitable monitoring mechanisms:
 - SIL3 to EN 61508
 - Category 4 to EN 954-1
 - Performance level e to EN ISO 13849-1

When the system detects an error, it responds by switching to the safe state. In this way, the safety function is realized in the form of safety inputs and outputs with connection to a higher-level safety control via PROFIsafe communication. The safe inputs / outputs of DCS21B are not evaluated locally or processed logically. They are evaluated in the higher-level safety-oriented PLC.

- In conjunction with option DCS21B, the DC 24 V safe stop input at X17 of the MOVIDRIVE® inverter can be disconnected, thus bringing the drive to a safe stop. In this context, observe the following safety concept of the MOVIDRIVE® drive inverter and all safety notes, conditions and installation regulations in this documentation.

	STOP!
	The safety function of the MOVIDRIVE® B is only permitted for applications up to category 3 according to EN 954-1.



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4.2 MOVIDRIVE® B safety concept without option DCS21B


- In case of danger, any potential risk to a machine must be eliminated as quickly as possible. Standstill with restart prevention is generally the safe condition for preventing dangerous movements.
- The MOVIDRIVE® MDX60B/61B inverter is characterized by the option of connecting an external fail-safe, approved emergency stop relay (according to safety category 3, EN 954-1). This device disconnects all active elements (disconnection of the safety-oriented DC 24 V power supply of the output stage control) that generate the pulse trains to the power output stage (IGBT) when a connected control device (e.g. E-STOP button with latching function) is activated.
- Disconnecting the DC 24 V at the positive and negative pole ensures that the supply voltages required for operating the frequency inverter and consequently for generating a rotating field of pulse patterns (which allow the generation of a rotating field) are safely interrupted, thus preventing automatic restart.
- Instead of galvanic separation of the drive from the power supply by means of relays or switches, the disconnection of the DC 24 V supply described here safely prevents the control of the power semiconductors in the frequency inverter. This process disconnects the rotating field generation for the respective motor. The individual motor cannot develop any torque in this state even though the mains voltage is still present.
- The requirements for the emergency stop relay are clearly defined in the following sections and must be strictly observed.

Using a suitable external circuit via an emergency stop relay with

- approval for at least safety category 3
- disconnection for at least safety category 3

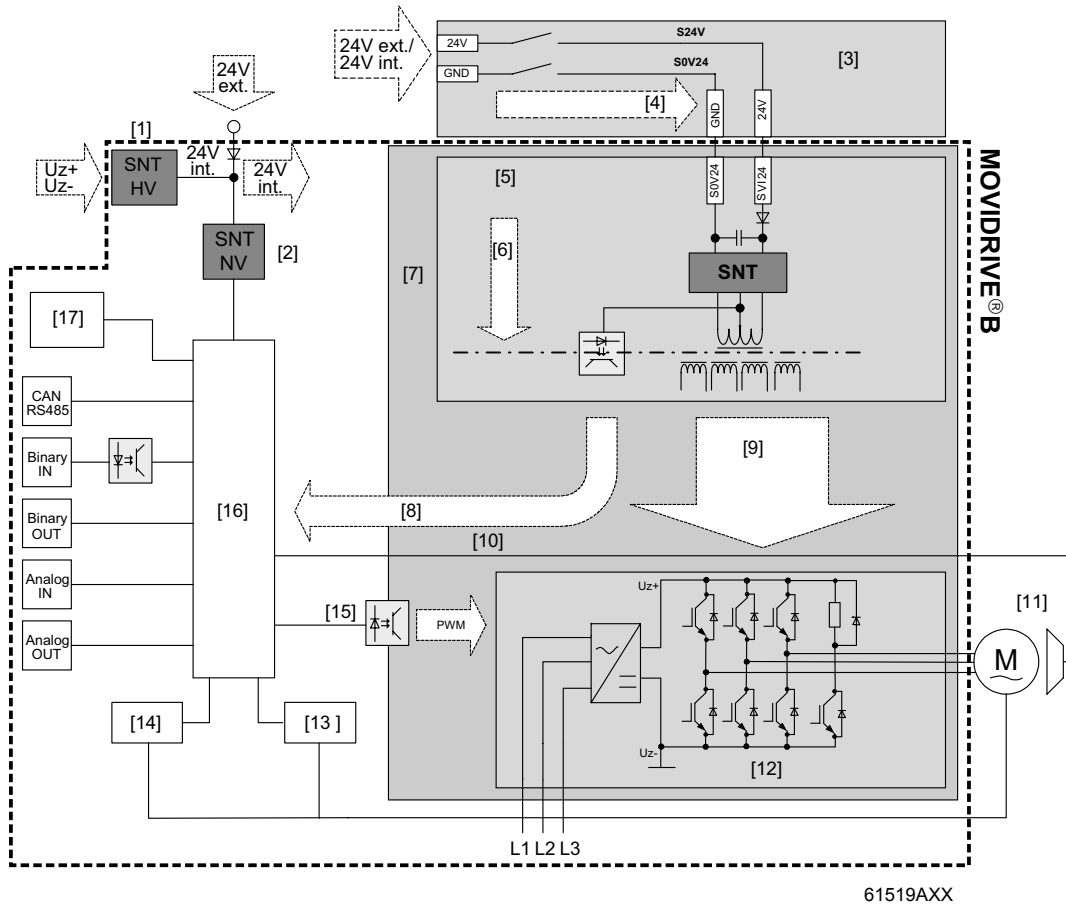
allows for operation of the MOVIDRIVE® MDX60B/61B inverter with safe disconnection to stop category 0 or 1 (to EN 60204-1) and ensures protection against restart according to safety category 3 (to EN 954-1).

4.2.1 Limitations

	STOP!
	<ul style="list-style-type: none"> • If the DC 24 V voltage supply is only disconnected safely at the positive pole, do not generate any test pulses here when the drive is disconnected. • Important: The safety concept is only suitable for performing mechanical work on system/machine components. • Important: A system/machine-specific risk analysis must be carried out by the system/machine manufacturer and taken into account for the use of the MOVIDRIVE® B drive inverter. • Danger of fatal injury: If the 24 V voltage supply is disconnected, voltage is still present at the inverter DC link. • Important: If work is carried out on the electrical section of the drive system, the supply voltage must be disconnected using an external maintenance switch.



4.2.2 Schematic representation of the safety concept using MOVIDRIVE® B as an example



- [1] High-voltage switched-mode power supply
- [2] Low-voltage switched-mode power supply
- [3] Emergency stop relay (external) approved for at least category 3 according to EN 954-1
- [4] Safety-oriented DC 24 V voltage supply
- [5] Safety switched mode power supply (SNT)
- [6] Electrical isolation
- [7] Safety circuit
- [8] Feedback to the central processing unit: Voltage supply for output stage control OK (not in safety circuit)
- [9] Voltage supply for control of the power transistors
- [10] DC 24 V safety switched-mode power supply disconnected / Brake applied (not in safety circuit)
- [11] Motor
- [12] Power section
- [13] Temperature detection
- [14] Position detection
- [15] Pulse width modulated signals for the output stage
- [16] Central processing unit
- [17] Fieldbus connection

**Safety Conditions**MOVIDRIVE® B safety concept without option DCS21B

5 Safety Conditions**NOTE**

For information on the safety-relevant conditions, please refer to the following publications:

- Manual: "MOVIDRIVE® MDX60B/61B Safe Disconnection-Conditions"
- Manual: "MOVIDRIVE® MDX61B Safety Monitor DCS21B/31B"

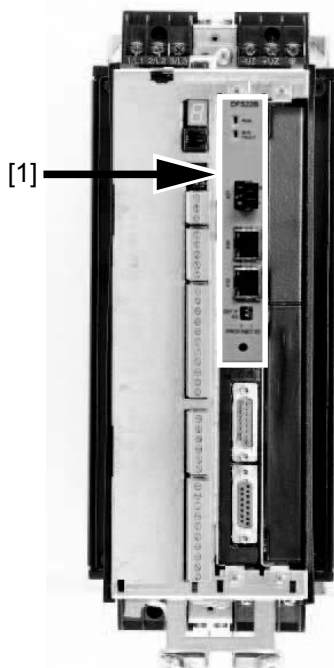


6 Assembly and Installation Instructions

This section provides you with information on installing the option card DFS22B PROFINET IO with PROFIsafe in MOVIDRIVE® MDX61B.

6.1 Installing option card DFS22B in MOVIDRIVE® MDX61B

	NOTES
	<ul style="list-style-type: none">• Only SEW-EURODRIVE personnel may install or remove option cards for MOVIDRIVE® MDX61B size 0.• Users may only install and remove options cards for MOVIDRIVE® MDX61B sizes 1 to 6.• You must insert the option DFS22B PROFINET IO with PROFIsafe into the fieldbus slot [1] .• Use only connectors and cables approved for PROFINET IO for the wiring.



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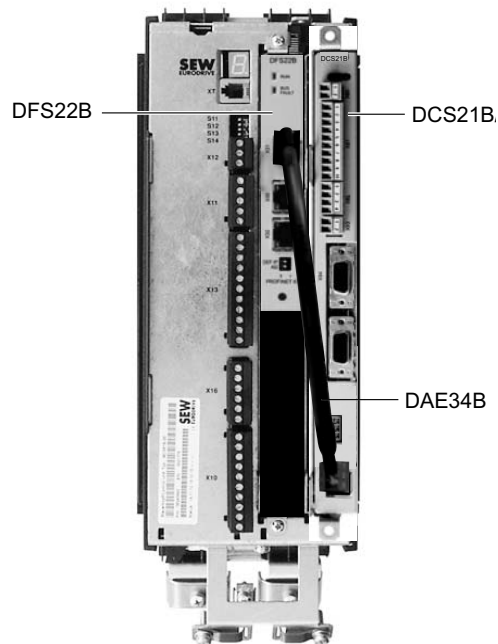
Assembly and Installation Instructions

Installing option card DFS22B/DCS21B in MOVIDRIVE® MDX61B

6.2 Installing option card DFS22B/DCS21B in MOVIDRIVE® MDX61B

	<p>NOTES</p> <ul style="list-style-type: none"> • Option DCS21B can only be used in combination with the fieldbus interface DFS22B. In this case, option DCS21B must be plugged into the expansion slot and option DFS22B into the fieldbus slot. • The DCS21B option can only be installed in MOVIDRIVE® MDX61B sizes 1 to 6, not in size 0. • The prefabricated cable DAE34B (part number 1821 307 3) is used for the CAN bus connection between terminal X86 of DCS21B and terminal X31 of option DFS22B. Cable DAE34B is included in the scope of delivery for option DCS21B.
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MOVIDRIVE® MDX61B



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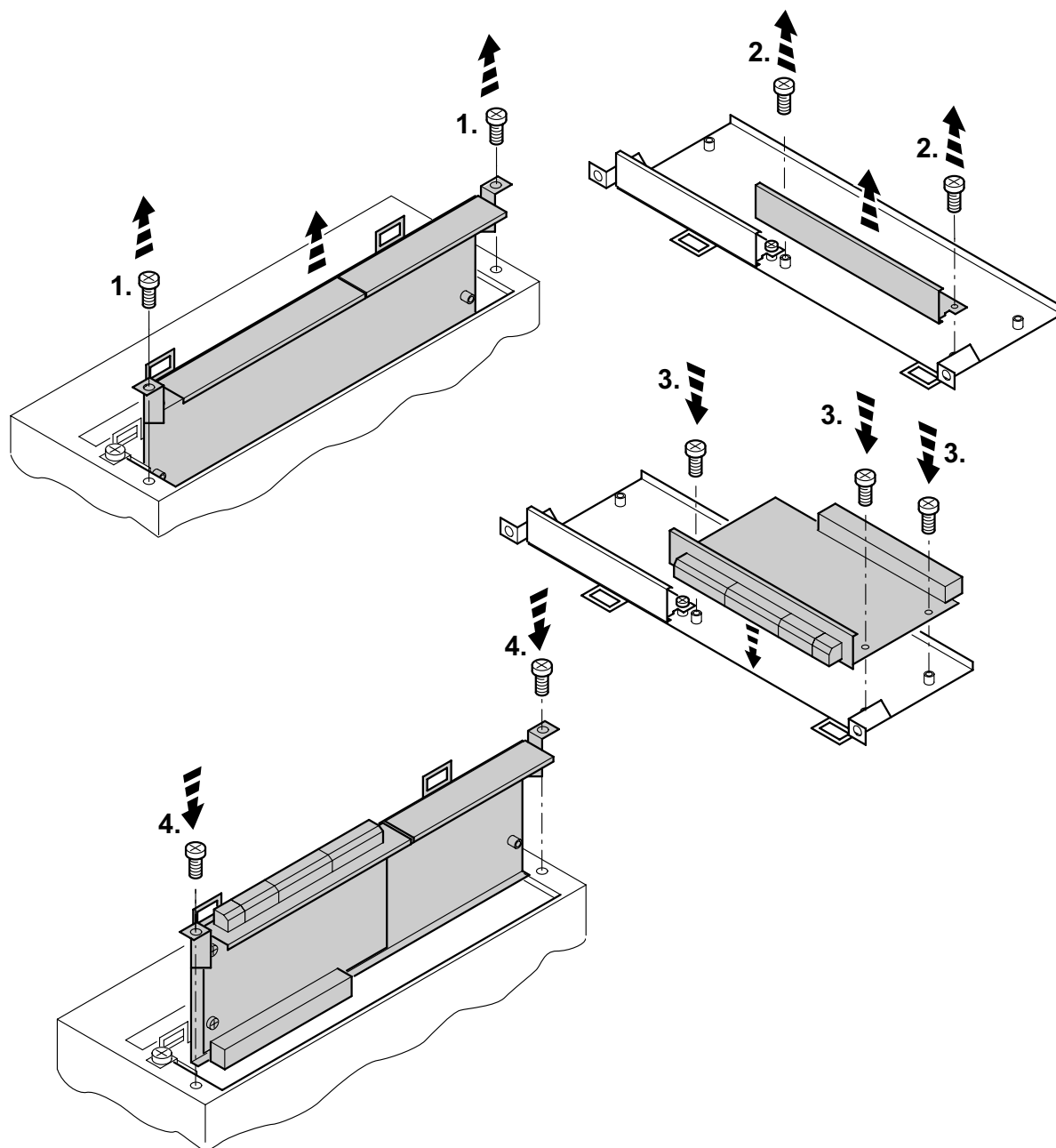
6.2.1 Before you begin

Read the following notes before installing or removing an option card:

- Disconnect the inverter from the power. Switch off the DC 24 V and the supply voltage.
- Take appropriate measures (discharge strap, conductive shoes, etc.) to protect the option card from electrostatic charge before touching it.
- **Before installing** the option card, remove the keypad and the front cover (see the MOVIDRIVE® MDX60B/61B operating instructions, Sec. "Installation").
- **After installing** the option card, replace the front cover and the keypad (see the MOVIDRIVE® MDX60B/61B operating instructions, Sec. "Installation").
- Keep the option card in its original packaging until immediately before you are ready to install it.
- Hold the option card by its edges only. Do not touch any of the subassemblies.



6.2.2 Basic procedure for installing and removing an option card (MDX61B, sizes 1 - 6)



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1. Remove the two retaining screws holding the card retaining bracket. Pull the card retaining bracket out evenly from the slot (do not twist!).
2. Remove the 2 retaining screws from the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the retaining bracket so that the 3 retaining screws fit into the corresponding holes on the card retaining bracket.
4. Insert the retaining bracket with installed option card into the slot, pressing slightly so it is seated properly. Secure the card retaining bracket with the two retaining screws.
5. To remove the option card, follow the instructions in reverse order.



6.3 Connection and terminal description for option DFS22B

Part number DFS22B PROFINET IO fieldbus interface with PROFIsafe 1821 1844

	<p>NOTES</p> <ul style="list-style-type: none"> The "DFS22B PROFINET IO fieldbus interface with PROFIsafe" option is only possible in conjunction with MOVIDRIVE[®] MDX61B, not with MDX60B. Plug the DFS22B option into the fieldbus slot.
--	---

Front view of DFS22B	Description	Terminal/ DIP switch	Function
<p style="font-size: small; margin-top: 10px;">62186AXX</p>	<p>LED RUN (red/yellow/green)</p> <p>LED BUS FAULT (red/yellow/green)</p>	<p>X31: CAN bus connection</p> <p>X31:3 GND X31:2 CL X31:1 CH</p>	<p>Shows the current status of the DFS22B.</p> <p>Shows the status of the PROFINET IO connection.</p> <p>DGNDCAN Low CAN High</p>
<p>X30: Ethernet connection</p> <p>LED Link (green) LED Activity (yellow)</p> <p>X32: Ethernet connection</p> <p>LED Link (green) LED Activity (yellow)</p>	<p>DIP switch</p>	<p>AS DEF IP</p>	<p>Auto setup for gateway operation (without function) Resets the address parameters to the following default values:</p> <ul style="list-style-type: none"> IP address: 192.168.10.4 Subnet mask: 255.255.255.0 Gateway: 1.0.0.0 PROFINET device name: PNETDeviceName_MACID



6.4 Pin assignment

Use prefabricated, shielded RJ45 plug connectors to ISO/IEC 11801 edition 2.0, category 5.

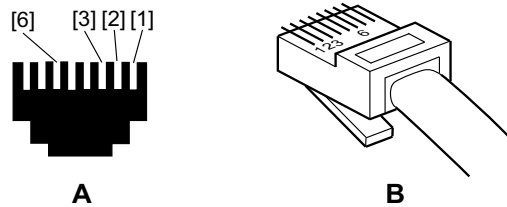


Figure 1: Pin assignment of an RJ45 plug connector

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A = Front view

B = View from back

[1] Pin 1 TX+ Transmit Plus

[2] Pin 2 TX– Transmit Minus


[3] Pin 3 RX+ Receive Plus

[6] Pin 6 RX– Receive Minus

MOVIDRIVE® B – PROFINET connection

To connect the DFS22B option, connect the PROFINET interface X30 or X32 (RJ45 connector) with a shielded twisted-pair cable to category 5, class D in accordance with IEC 11801 edition 2.0.

The integrated switch helps you implement a line topology and provides an auto-crossing functionality

	NOTES
	<ul style="list-style-type: none"> • In accordance with IEEE 802.3, the maximum permitted cable length for 10/100 MBaud Ethernet (10BaseT / 100BaseT), e.g. between DFS22B and a switch, is 100 m. • With PROFINET IO, prioritized Ethernet frames with the frame ID 8892_{hex} are used for real-time data exchange via the VLAN tag. You must, therefore, use switched networks. The switches must support prioritization. Hubs are not permitted. Data transfer takes place in a full-duplex mode with 100 MBit. For detailed information on the cabling, please refer to the "PROFINET Installation Guideline" documentation, which is published by the PROFINET User Organization.



6.5 Shielding and routing bus cables

Only use shielded cables and connection elements that meet the requirements of category 5, class D to ISO/IEC 11801 edition 2.0.

Correct shielding of the bus cable attenuates electrical interference that may occur in industrial environments. The following measures ensure the best possible shielding:

- Manually tighten the mounting screws on the connectors, modules, and equipotential bonding conductors.
- Use only connectors with a metal housing or a metallized housing.
- Connect the shielding in the connector over a wide surface area.
- Apply the shielding of the bus cable on both ends.
- Route signal and bus cables in separate cable ducts. Do not route them parallel to power cables (motor leads).
- Use metallic, grounded cable racks in industrial environments.
- Route the signal cable and the corresponding equipotential bonding close to each other using the shortest possible route.
- Avoid using plug connectors to extend bus cables.
- Route the bus cables closely along existing grounding surfaces.

An octagonal sign with a thick black border and the word "STOP" in bold, black, sans-serif capital letters in the center.	STOP!
	In case of fluctuations in the ground potential, a compensating current may flow via the bilaterally connected shield that is also connected to the protective earth (PE). In such a case, make sure you supply adequate equipotential bonding in accordance with relevant VDE regulations.



6.6 TCP / IP addressing and subnets

Introduction

The settings for the address of the IP protocol are made using the following parameters:

- IP address
- Subnet mask
- Standard gateway

The addressing mechanisms and subdivision of the IP networks into subnets are explained in this chapter to help you set the parameters correctly.

IP address

The IP address is a 32-bit value that uniquely identifies a station in the network. An IP address is represented by four decimals separated by decimal points.

Example: 192.168.10.4

Each decimal stands for one byte (= 8 bits) of the address and can also be represented using binary code (→ following table).

Byte 1		Byte 2		Byte 3		Byte 4
11000000	.	10101000	.	00001010	.	00000100

The IP address comprises a network address and a station address (→ following table).

Network address	Station address
192.168.10	4

The part of the IP address that denotes the network and the part that identifies the station is determined by the network class and the subnet mask.

Station addresses cannot consist of only zeros or ones (binary) because they represent the network itself or a broadcast address.

Network classes

The first byte of the IP address determines the network class and as such represents the division into network addresses and station addresses.

Value range Byte 1	Network class	Complete network address (Example)	Meaning
0 ... 127	A	10.1.22.3	10 = Network address 1.22.3 = Station address
128 ... 191	B	172.16.52.4	172.16 = Network address 52.4 = Station address
192 ... 223	C	192.168.10.4	192.168.10 = Network address 4 = Station address

This rough division is not sufficient for many networks. They also use an explicit, adjustable subnet mask.

Subnet mask

A subnet mask is used to divide the network classes into even finer sections. The subnet mask is represented by four decimals separated by decimal points, in the same way as the IP address. Every decimal stands for one byte.

Example: 255.255.255.128

Each decimal stands for one byte (= 8 bits) of the subnet mask and can also be represented using binary code (see following table).

Byte 1		Byte 2		Byte 3		Byte 4
11111111	.	11111111	.	11111111	.	10000000

If you compare the IP address with the subnet mask, you can see that in the binary representation of the subnet mask all ones determine the network address and all the



zeros determine the station address (see the following table).

		Byte 1	.	Byte 2	.	Byte 3	.	Byte 4
IP address	decimal	192	.	168.	.	10	.	128
	Binary	11000000	.	10101000	.	00001010	.	10000000
Subnet mask	decimal	255	.	255	.	255	.	128
	Binary	11111111	.	11111111	.	11111111	.	10000000

The class C network with the address 192.168.10. is further subdivided into 255.255.255.128 using the subnet mask. Two networks are created with the addresses 192.168.10.0 and 192.168.10.128.

The following station addresses are permitted in the two networks:

- 192.168.10.1 ... 192.168.10.126
- 192.168.10.129 ... 192.168.10.254

The network stations use a logical AND operation for the IP address and the subnet mask to determine whether there is a communication partner in the same network or in a different network. If the communication partner is in a different network, the standard gateway is addressed.

Standard gateway

The standard gateway is also addressed via a 32-bit address. The 32-bit address is represented by four decimal separated by decimal points.

Example: 192.168.10.1

The standard gateway establishes a connection to other networks. In this way, a network station that wants to address another station can use a logical AND operation with the IP address and the subnet mask to decide whether the desired station is located in the same network. If this is not the case, the station addresses the standard gateway (router), which must be part of the actual network. The standard gateway then takes on the job of transmitting the data packages.



6.7 Setting IP address parameters via the DCP

Initial startup

The IP address parameters are specified by PROFINET IO via the "DCP (**D**iscovery and **C**onfiguration **P**rotocol). DCP works with device names. The device name uniquely identifies a PROFINET IO station in the network. It is familiarized with the PROFINET IO controller during the configuration of the station and set to the PROFINET IO device using the configuration software. The controller identifies the device during startup using the device name and transfers the corresponding IP address parameters. Therefore, settings no longer have to be made directly on the slave. The basic procedure is described in the section "Configuration and startup" using the example of SIMATIC STEP 7.

Resetting IP address parameters

If you do not know the IP address parameters and cannot access the inverter using the serial interface or the DBG60B keypad, you can reset the IP address parameters to the default values using the DIP switch "Def IP".

This action resets the DFS22B option to the following default values:

- IP address: 192.168.10.4
- Subnet mask: 255.255.255.0
- Default gateway: 1.0.0.0
- PROFINET device name: PNETDeviceName_MACID

Proceed as follows to reset the IP address parameters to the default values:

- Switch off the 24 V DC supply voltage and the mains voltage.
- Set the DIP switch "Def IP" on the DFS22B option to "1."
- Switch the 24 V DC supply voltage and the mains voltage back on.
- Wait until the DFS22B option boots up. The "RUN" LED lights up green when the option is ready.


You can now access the inverter via the IP address 192.168.10.4. Proceed as follows to set new IP address parameters:

- Change your PC's IP address using the Windows network settings so that the PC and DFS22B are located in one subnetwork (e.g. changed IP address is 192.168.10.5).
- Start a web browser and call up the homepage of option DFS22B or start MOVITOOLS® MotionStudio.
- Set the address parameters as required.
- Set the DIP switch "Def IP" on the DFS22B option to "0."
- The new address parameters are adopted once the device is restarted



6.8 Procedure after replacing the unit

When you plug the memory card of the replaced MOVIDRIVE® B into the new MOVIDRIVE® B, the PROFINET IO controller identifies the new device immediately.

	<p>NOTE</p> <p>If you do not plug the memory card of the replaced MOVIDRIVE® B into the new MOVIDRIVE® B unit, you must perform startup for the inverter again or load the saved parameters into the new MOVIDRIVE® B unit. You also have to reassign the PROFINET IO device names using the configuration software. Proceed as specified for initial startup (see section "PROFINET configuration").</p>
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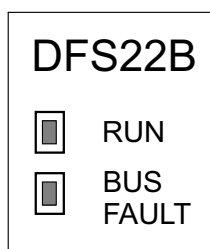
If it is only option DFS22B that is replaced, no further action is required.

Note the information in the "MOVIDRIVE® MDX61B Safety Module DCS21B/31B" manual when replacing the DCS21B option.

6.9 Operating displays of the DFS22B option

6.9.1 PROFINET LEDs

There are two LEDs on the DFS22B option card that display the current status of the DFS22B option and the PROFINET system.



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LED RUN

The **RUN** LED signals that the bus electronics are operating correctly.

States of the RUN LED	Cause of error	Remedy
Green	<ul style="list-style-type: none"> DFS22B hardware OK. Correct operation 	–
Off	<ul style="list-style-type: none"> DFS22B is not ready for operation. 	<ul style="list-style-type: none"> Restart the unit. Consult SEW service if the error occurs repeatedly.
Red	<ul style="list-style-type: none"> Fault in the DFS22B hardware 	
Flashes green	<ul style="list-style-type: none"> DFS22B hardware is not booting up. 	<ul style="list-style-type: none"> Restart the unit. Set the default IP address parameter via the DIP switch "DEF IP". Consult SEW service if the error occurs repeatedly.
Flashes yellow		<ul style="list-style-type: none"> Restart the unit. Consult SEW service if the error occurs repeatedly.
Yellow		



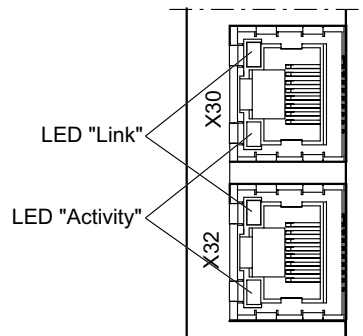
Assembly and Installation Instructions

Operating displays of the DFS22B option

LED BUS FAULT The LED **BUS FAULT** shows the status of the PROFINET IO system.

States of the LED BUS FAULT	Cause of error	Remedy
Off	<ul style="list-style-type: none"> The PROFINET IO device is exchanging data with the PROFINET master. 	-
Flashes green Flashes green/red	<ul style="list-style-type: none"> The flash check in the PROFINET IO controller configuration was activated to visually localize the station. 	-
Red	<ul style="list-style-type: none"> Connection to the PROFINET IO controller has failed The PROFINET IO device cannot detect a link Bus interruption The PROFIBUS IO controller is not in operation. 	<ul style="list-style-type: none"> Check the PROFINET connection of the DFS22B option Check the PROFINET IO controller Check the cabling of your PROFINET network
Yellow Flashes yellow	<ul style="list-style-type: none"> An invalid module has been plugged into the STEP 7 hardware configuration. 	<ul style="list-style-type: none"> Switch the STEP 7 hardware configuration to ONLINE and analyze the subassembly statuses of the PROFINET IO device slots.

LED Link/Activity The two LEDs **Link (green)** and **Activity (yellow)** integrated into the RJ45 plug connectors show the status of the Ethernet connection.



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LED / status	Meaning
Link / green	There is an Ethernet connection.
Link / off	There is no Ethernet connection.
Activity / yellow	Data is currently being exchanged via Ethernet.



NOTES

- As the firmware of the DFS22B option card takes approximately 10 seconds to initialize, the status "0" (inverter not ready) is displayed in the 7-segment display of MOVIDRIVE® B unit during this time.
- The "RUN" LED on the DFS22B option card lights up green.



7 Configuration and Startup

This section describes how you configure the MOVIDRIVE[®] B inverter with the DFS22B option. The following GSD file is used for the configuration of DFS22B with MOVIDRIVE[®] B:

GSDML-V2.1-SEW-DFE-DFS-2Ports-yyyymmdd.xml

This GSD file contains a unit description for operation of the DFS22B integrated in MOVIDRIVE[®] B.

7.1 Configuring the PROFINET IO controller

This section describes the process of configuring MOVIDRIVE[®] B with PROFINET using the current GSD file. The configuration is explained using the SIMATIC Manager configuration software with a SIMATIC CPU 315F 2 PN/DP as an example.

Initializing the GSDML file

- Start the STEP 7 HWCONFIG and choose [Extras] / [Install new GSD file].
- In the dialog box that appears, choose the file "GSDML-V2.1-SEW-DFE-DFS-2Ports-YYYYMMDD.xml" from the "Software ROM 7" CD. "YYYYMMDD" (year/month/day) is the date of the file. Click the "Browse" button to navigate to the required directory. Confirm your selection with [OK].
- The SEW-PROFINET IO connection DFS22B can be found under [Other field devices] / [Drives] / [SEW] / [DFE/DFS(2Ports)].

	NOTE
	You can download the latest edition of the GSD file from the SEW homepage (www.sew-eurodrive.de) under "Software".

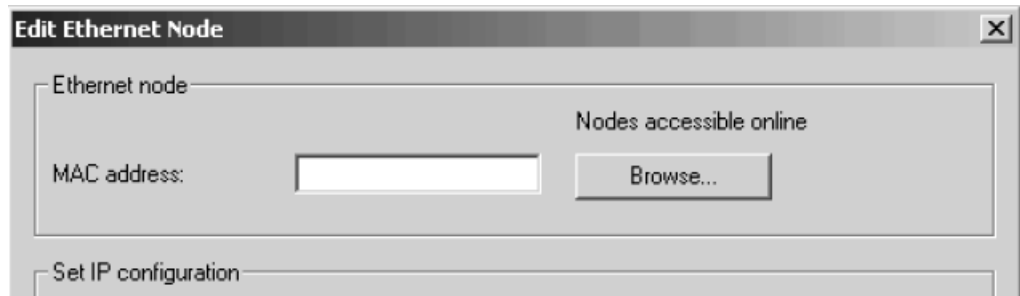


7.1.1 Assigning the PROFINET device name

Before a PROFINET IO device can be addressed by a PROFINET IO controller, it must be assigned a device name.

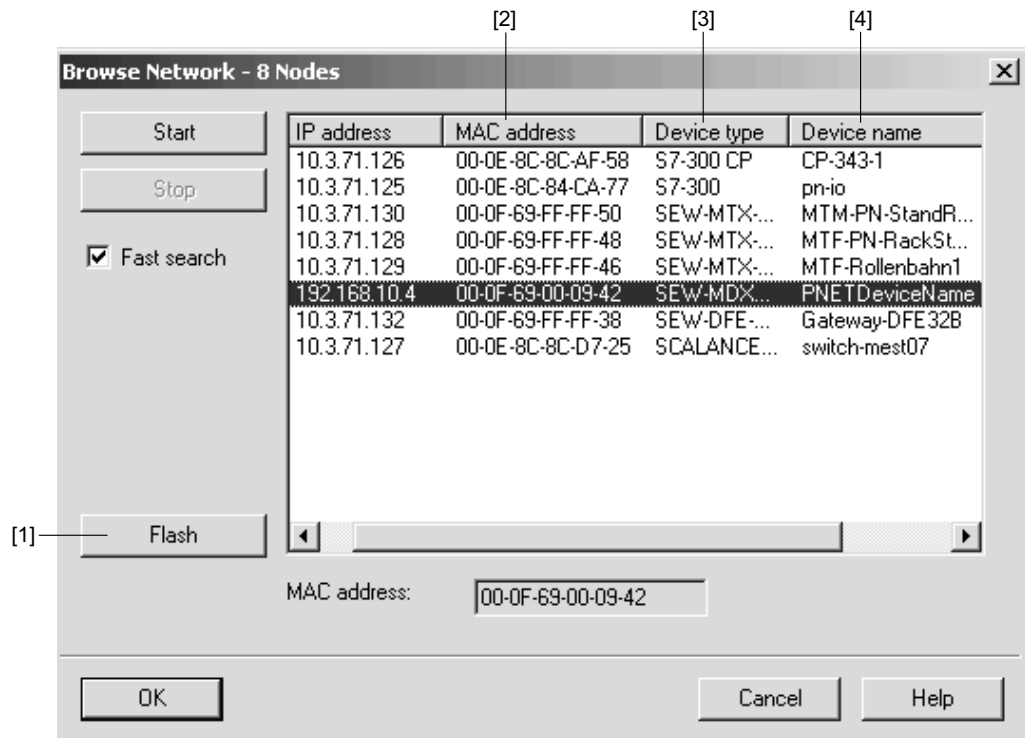
The basic procedure is described using the example of SIMATIC STEP 7.

- In the STEP 7 HWCONFIG, choose [Target system] / [Ethernet] / [Edit Ethernet station ...]



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- Click the "Browse" button. An overview of all PROFINET IO stations that you can access online with your configuration tool is displayed.
- Choose the required station. The SEW station is displayed under device type [2] as "SEW-MDX61B+DFS22B" (→ following figure). The device name [3] is set ex works to "PNETDeviceName". You can adjust it to suit your application requirements. You can differentiate between several MDX61B units using the MAC addresses shown. The MAC address can be found on the DFS22B option. Click the [Flash] button [1] to activate the status LED and make it flash green for the selected DFS22B in order to check your selection.



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[1]	"Close" button
[2]	"Device name" input field
[3]	"Assign IP configuration" button
[4]	"Subnet mask" input field
[5]	"IP address" input field
[6]	"Browse" button
[7]	"Router address" input field
[8]	"Assign name" button
[9]	"Reset" button

- Enter the device name in the "Device name" input field [2] and click the [Assign name] button [8]. The device name is now transferred to the station and saved there. The name can be up to 255 characters long.
- Assign an IP address [5], a subnet mask [4], and, if necessary, a router address [7]. Click the [Assign IP configuration] button [3]. Alternatively, the IP address can be taken from the DHCP server.



NOTE

At this point, the IO controller may not exchange data cyclically with the IO devices.

- Click the [Browse] button [6] again to check whether the settings have been adopted. Click the [Close] button [1].
- You can reset the device names of the DFS22B online by clicking the [Reset] button [9]. In this case, you must restart the DFS22B.

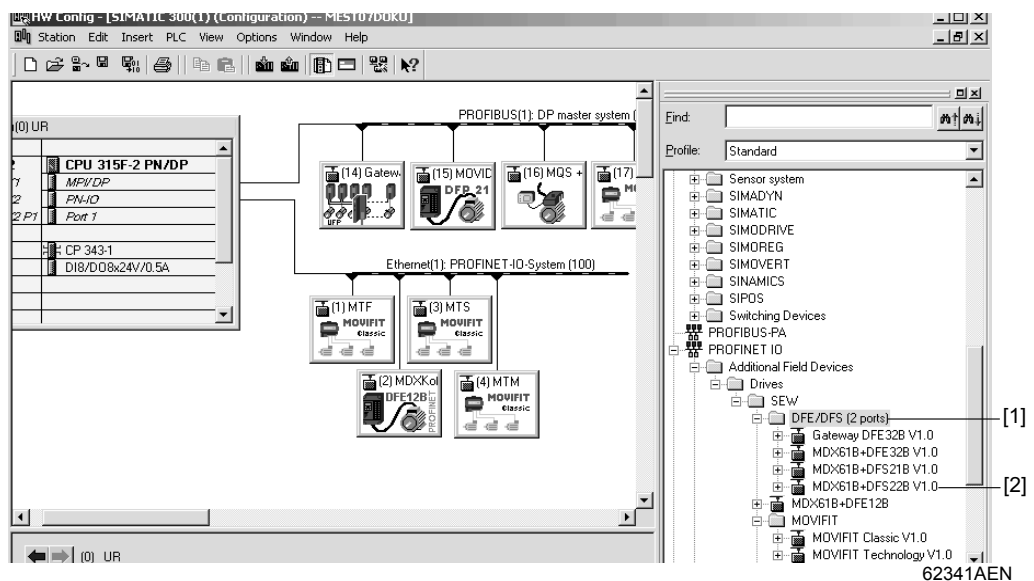
7.1.2 Configuring the PROFINET IO connection DFS22B

Creating a new project

Start the SIMATIC Manager and create a new project. Choose your control type and add the required blocks. It is a good idea to add the operational blocks OB82, OB86 and OB122.


Operational block OB82 ensures that the controller does not switch to "STOP" when diagnostic alarms are triggered. Operational block OB86 signals the failure of decentralized peripherals. Operational block OB122 is called up if the controller cannot access the data of a station in the decentralized peripherals. This can happen, for example, if the DFS22B is ready for operation later than the controller.

- Start STEP 7 HWCONFIG and choose the PROFINET IO slot from the controller rack.
- Add a PROFINET IO system from the context menu by clicking the right mouse button. Assign an IP address for the PROFINET IO controller. Use the [Ethernet] button to add a new PROFINET subsystem.
- In the hardware catalog, choose [PROFINET IO] / [Additional FIELD DEVICES] / [Drives] / [SEW] / [DFE/DFS(2Ports)] [1].

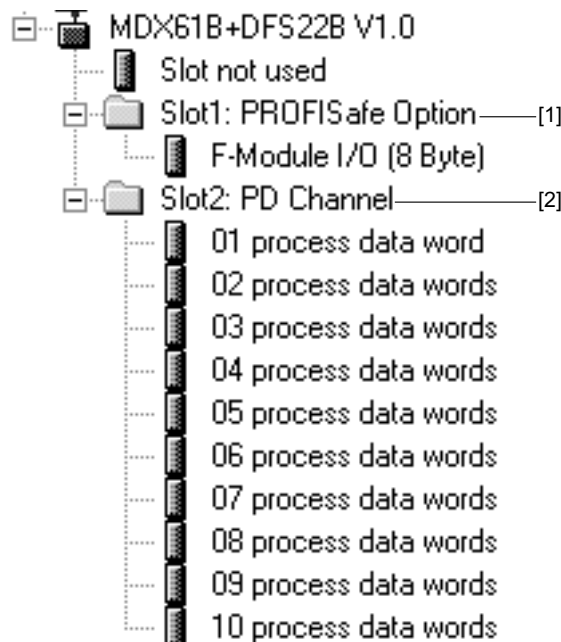




- Use the mouse to pull the entry "MDX61B+DFS22B" [2] to the PROFINET IO system and assign the PROFINET station name.
This name must be identical to the PROFINET device name specified in the DFS22B.
- Delete the entry in slot 2 so that your application can be configured. Select the process data configuration required for your application.

	<p>NOTE</p> <ul style="list-style-type: none"> • The PROFIsafe option can only be configured using the options DFS21B and DFS22B. • Slot 1 of option DFS22B can only be configured in conjunction with the DCS21B option.
---	--

- Enter the I/O and periphery addresses for the configured data widths and save the configuration.
- Extend your application program to include data exchange with the new units.
- Process data transfer is consistent. The system functions SFC14 and SFC15 can be used for the process data transfer.
- The slot model is used for configuration with PROFIBUS. Each slot is assigned to a DFS22B communication interface.



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Slot 1: PROFIsafe option [1] (only in conjunction with the DFS22B option). When using DFS22B in conjunction with the DCS21B option, the "F module I/O (8 bytes)" must be configured.

Slot 2: Process data channel [2]. Number of process data items that are exchanged cyclically between the PROFINET IO controller and the PROFINET IO device.

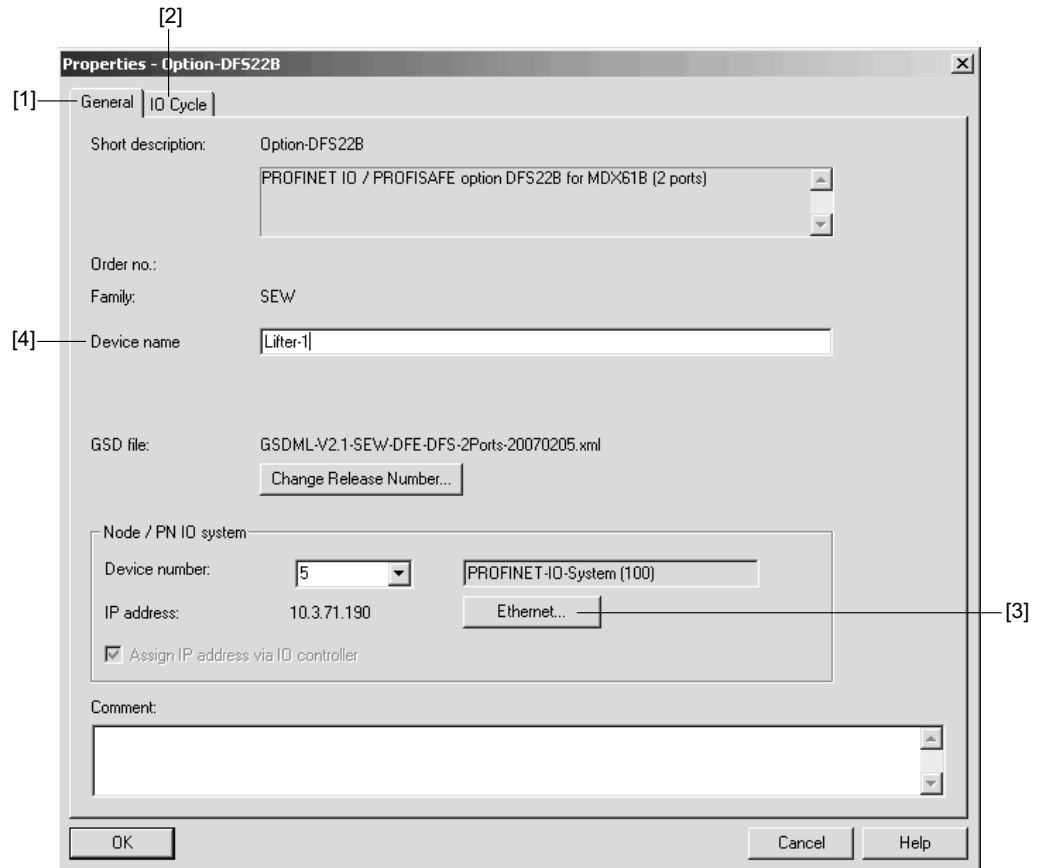


Configuration and Startup

Configuring the PROFINET IO controller

Station configuration

After configuring the individual slots, additional settings must be configured for the newly-added station. Double-click on the device symbol of the new station to open the following dialog box.



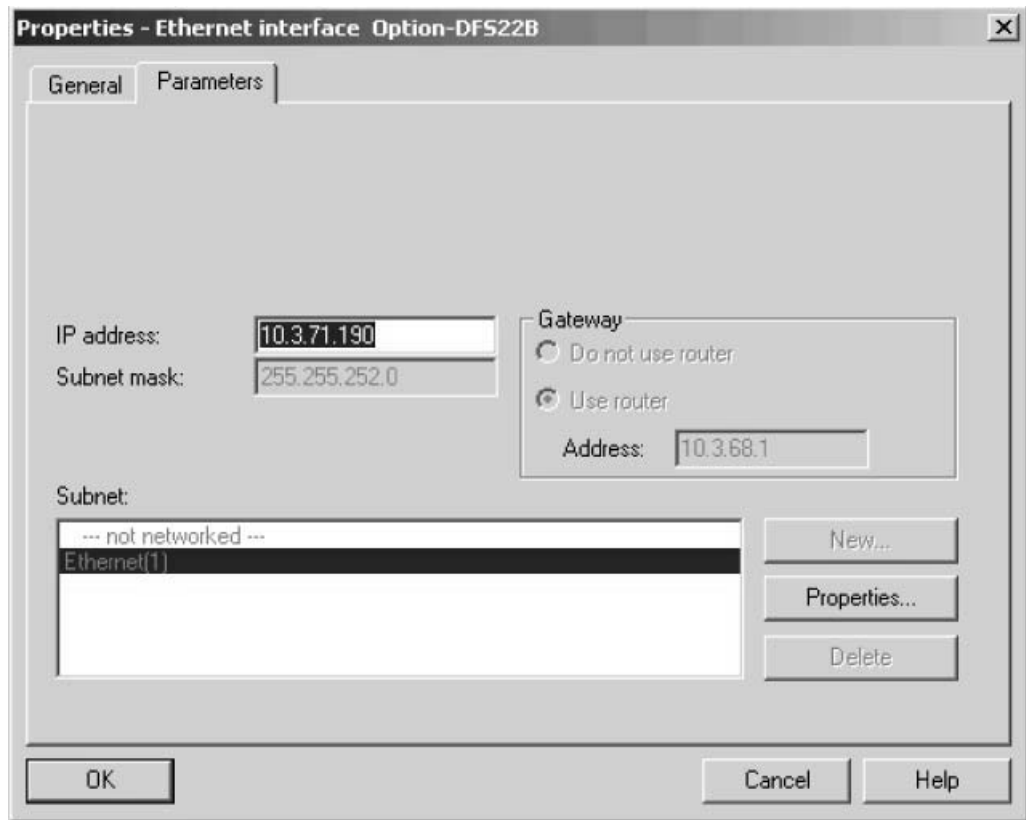
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[1]	"General" tab page
[2]	"IO cycle" tab page
[3]	"Ethernet" input field
[4]	"Device name" button

- On the "General" [1] enter the previously assigned device name in the "Device name" input field [4]. The field is case-sensitive.

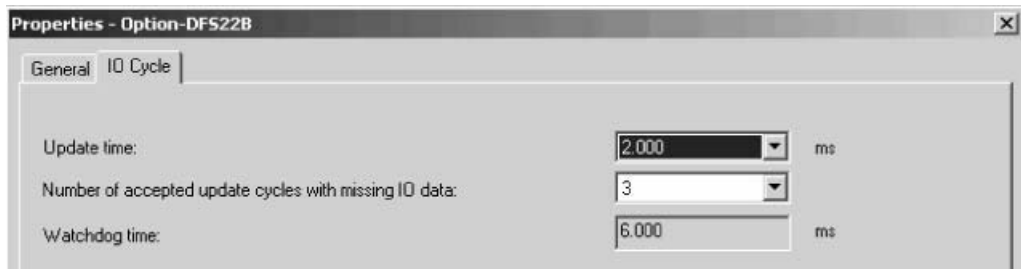


- To enter the previously assigned IP address (see previous figure), click on the [Ethernet] button [3] in the "Station / PN-IO System" group box.



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- On the "IO cycle" tab page [2], you can set the update time in which the station updates its process data. Option DFS22B, integrated in MOVIDRIVE® B, supports a minimum update time of 2 ms (see following figure).



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Configuration and Startup

Configuring the PROFINET IO controller

Starting the controller

Load the configuration to SIMATIC S7 and start the component. The controller's Fault LED should go out.

The LED of option DFS22B should have the following statuses:

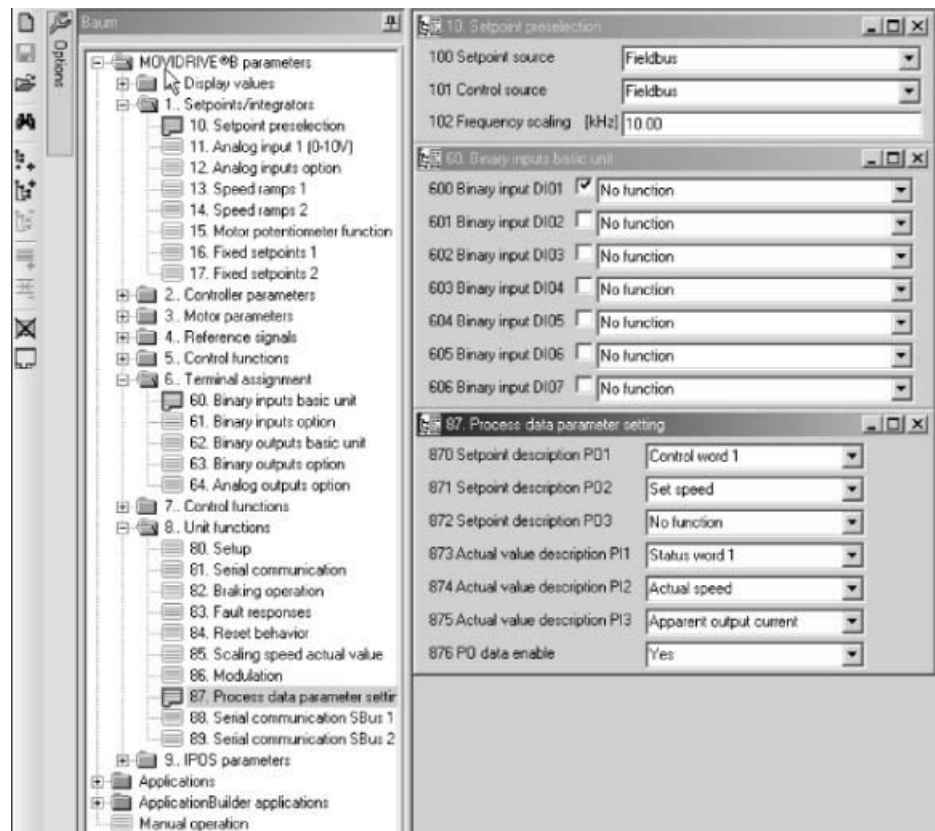
- LED RUN: Lights up green
- LED BUS FAULT: Off
- LED Link and Activity: Flickers

If this is not the case, check the configuration, particularly the device names and IP address of the station.



7.2 Setting the MOVIDRIVE® MDX61B inverter

The following settings must be made for simple fieldbus operation.



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However, for control via PROFINET IO, you must first switch the MOVIDRIVE® B unit to control signal source (P101) and setpoint source (P100) = FIELDBUS. The FIELDBUS setting means that the MOVIDRIVE® B parameters are set for setpoint transfer from PROFINET IO. The MOVIDRIVE® B unit now responds to the process output data transmitted from the master programmable controller.

The parameters of MOVIDRIVE® B can be set via PROFINET IO without any further action once the PROFINET IO option card has been installed. For example, all parameters can be set by the master programmable controller after power-on. Activation of the control signal source and setpoint source FIELDBUS is signaled to the machine controller using the "Fieldbus mode active" bit in the status word.

For safety reasons, you must also enable the MOVIDRIVE® B unit at the terminals for control via the fieldbus system. Consequently, you must wire and program the terminals in such a way that the drive inverter is enabled via the input terminals. The simplest way of enabling MOVIDRIVE® B on the terminal side is e.g. to set the DI00 (/CONTROLLER INHIBIT) input terminal to a +24 V signal and to program the input terminals DI01 ... DI07 to NO FUNCTION.

Additional parameter settings during operation of DCS21B

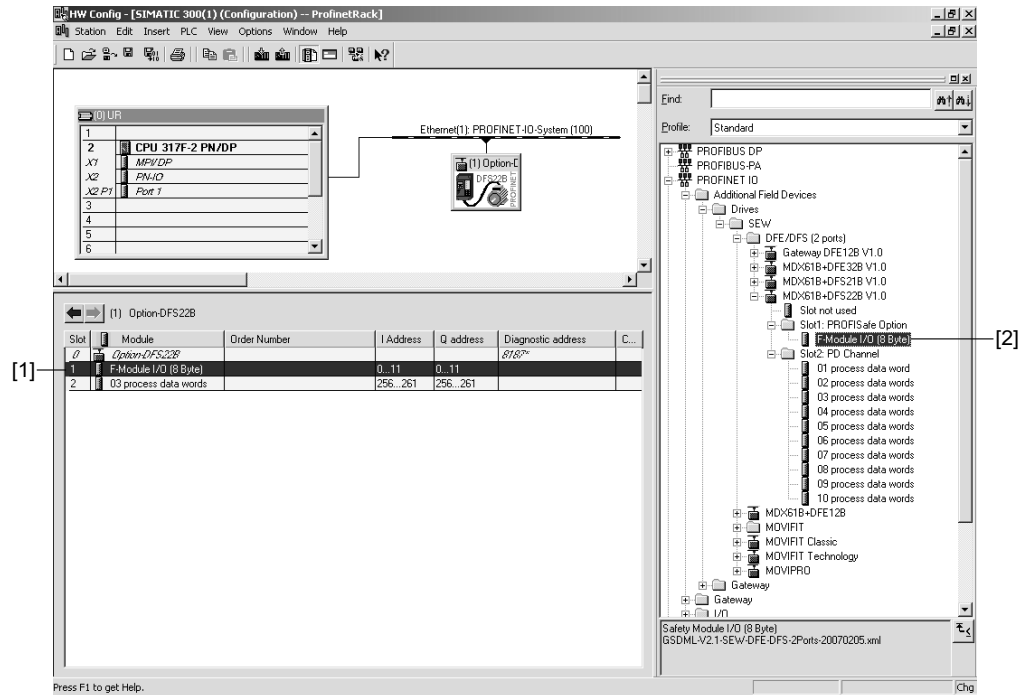
	<p>NOTE</p> <p>More information can be found in the "MOVIDRIVE® MDX61B Safety Module DCS21B/31B" manual.</p>
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7.3 Configuring PROFIsafe with STEP 7

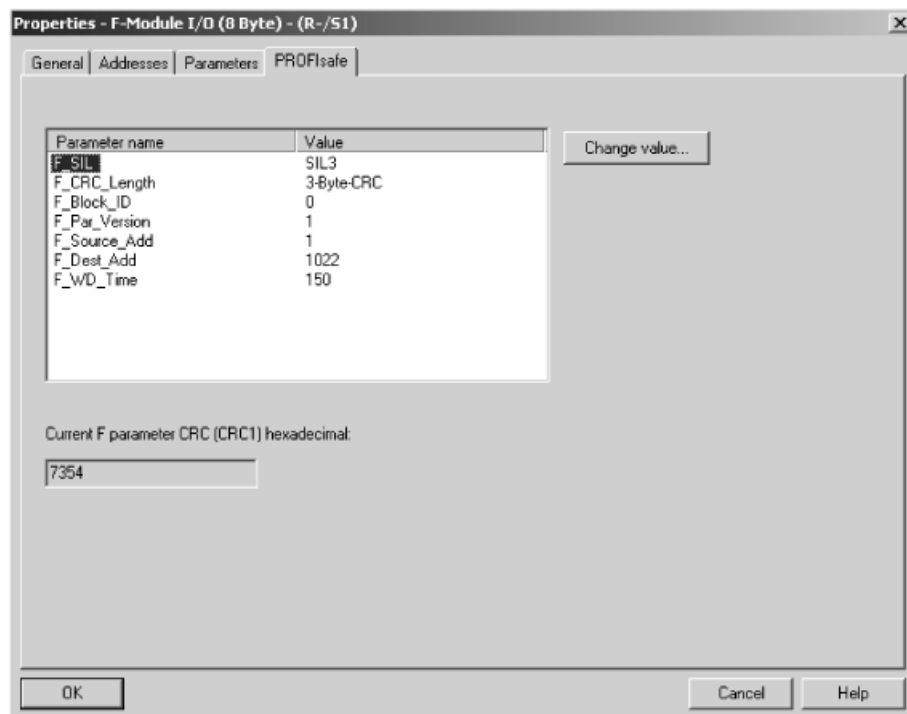
Configuring PROFIsafe properties

- You must configure an "F module I/O (8 bytes)" in slot 1 to be able to use the safety functions of the DFS22B/DCS21B combination.
- Mark slot 1 and delete the entry "Empty slot". Drag the "F module I/O (8 bytes)" entry [2] to slot 1 [1].



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- You can configure the PROFIsafe properties (see following figure) in the hardware configuration. Double-click on the "F module I/O (8 bytes)" entry in slot 1 [1].



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7.3.1 Description of the F parameters

Option DFS22B transfers PROFIsafe protocol information to option DCS21B via a CAN bus (DAE34B cable). The safety-oriented protocol evaluation of PROFIsafe takes place in option DCS21B.

	NOTE
	More information can be found in the "MOVIDRIVE® MDX61B Safety Module DCS21B/31B" manual.

During startup of the fieldbus or network system, the safety-relevant parameters for PROFIsafe operation are sent from the bus master to the PROFIsafe option DCS21B of MOVIDRIVE® B in an F parameter block. These are checked for plausibility in the option. Once the plausibility of the F parameter block has been confirmed, the PROFIsafe option starts data exchange with the bus master. Below is a list of the safety-oriented parameters that are transferred to PROFIsafe option DCS21B.

The following parameters are available, depending on the bus system that is in operation:

PROFIsafe F-parameters	Bus system PROFINET IO
F_Check_SeqNo	Not available
F_SIL	Fixed
F_CRC_Length	Fixed
F_Par_Version	Fixed
F_Source_Add	Fixed
F_Dest_Add	Adjustable
F_WD_Time	Adjustable

"F_SIL" *parameter*

With this parameter, the F stations are able to check the agreement between the safety class and the F host. Safety circuits with different safety classes SIL 1 to SIL 3 (SIL = safety integrity level) are available for these safety-relevant cases according to the risk.

DCS21B supports the following setting:

- F_SIL = SIL 3

"F_CRC_Length" *parameter*

The length of the CRC test value must be adjusted depending on the length of the F user data (process values) and the PROFIsafe version. This parameter informs the F components of the expected length of the CRC2 key in the safety telegram.

Option DCS21B uses a user data length of less than 12 bytes, which means that a 3-byte CRC is used with PROFIsafe V2.

DCS21B supports the following settings:

- F_CRC_Length = 3-byte CRC (only for PROFIsafe V2)

"F_Par_Version" *parameter*

This parameter identifies the PROFIsafe version supported in option DCS21B. Only PROFIsafe V2 is supported for a MOVIDRIVE® unit in PROFINET design.

"F_Source_Add" *parameter*


The PROFIsafe addresses are used for unique identification of source (F_Source_Add) and target (F_Dest_Add). The combination of source and target address must be unique across the network and all stations. The source address F_Source_Add is assigned



automatically via STEP7 depending on the master configuration.
Values between 1 and 65534 can be set for the parameter "F_Source_Add".
The parameters cannot be changed directly in the STEP7 HW Config.

**"F_Dest_Add"
parameter**

The PROFIsafe address of option DCS21B - which was previously entered in MOVISAFE® ASSIST - is set in this parameter.
Values between 1 and 65534 can be set for the parameter "F_Dest_Add".

	NOTE
	<p>More information can be found in the "MOVIDRIVE® MDX61B Safety Module DCS21B/31B" manual.</p>

**"F_WD_Time"
parameter**

This parameter defines a monitoring time in the DCS21B option.
A valid safety telegram must arrive from the F-CPU within this monitoring time. Otherwise the DCS21B option switches to the safe state.
Set the monitoring time high enough so that telegram delays are tolerated by the communication but low enough so that your safety application can operate without restrictions.
For the DCS21B option, you can set parameter "F_WD_Time" in increments of between 1 ms and 10 s.



7.3.2 Safety diagnostics via PROFINET

The status of the PROFIsafe communication and error messages of option DFS are reported at the PROFINET IO controller and can be diagnosed there.

Diagnostic messages of the PROFIsafe layer

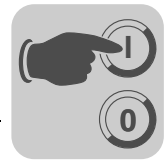
The following table shows the diagnostic messages of the PROFIsafe layer:

Byte 11	PROFINET diagnostic text (German)	PROFINET diagnostic text (English)
0hex / 0dec	Kein Fehler	---
40hex / 64dec	F_Dest_Add stimmt nicht überein	Mismatch of F_Dest_Add
41hex / 65dec	F_Dest_Add ist ungültig	F_Dest_Add not valid
42hex / 66dec	F_Source_Add ist ungültig	F_Source_Add not valid
43hex / 67dec	F_WD_Time ist 0 ms	F_WD_Time is 0 ms
44hex / 68dec	F_SIL Level größer max SIL Level	F_SIL exceeds SIL f. application
45hex / 69dec	Falsche F_CRC_Length	F_CRC_Length does not match
46hex / 70dec	Falsche F-Parameter Version	F-Parameter set incorrectly
47hex / 71dec	Fehler im CRC1-Wert	CRC1-Fault



NOTE

For more information on the meaning and remedy of error messages, refer to the manuals on the PROFIBUS IO controller.



8 Operating Characteristics on PROFINET

8.1 Introduction

With PROFINET IO, the classical communication is increased to fast Ethernet technology as the physical transfer medium. PROFINET supports real-time capable process communication and open communication via Ethernet TCP/IP. PROFINET delivers three communication classes that differ in terms of efficiency and functionality.

Three communication classes

- **TCP/IP**
Open Ethernet TCP/IP communication without real-time requirements (e.g. web technology).
- **RT (Real-Time)**
IO data exchange between automation units in real time (> 1 ms).
- **IRT (Isochronous Real-Time)**
Isochronous real-time communication for synchronized IO data exchange (e.g. for motion control applications; not available with option DFS22B).

Option DFS22B meets the requirements of the PROFINET RT class and provides open communication via TCP/IP or UDP/IP.

Three device types

PROFINET IO distinguishes between three device types "IO controller", "IO device" and "IO supervisor".

- **IO controller**
The IO controller takes on the master function for cyclic IO data exchange with the decentralized field devices and is usually implemented as the communication interface of a controller. It is comparable with a PROFIBUS-DP master class 1. There can be several IO controllers in a PROFINET IO system.
- **IO device**
IO devices include all field devices in a PROFINET IO system that are controlled by an IO controller, e.g. I/Os, drives, valve terminals, etc. IO devices are comparable with PROFIBUS DP slave stations. Option DFS22B is a PROFINET IO device.
- **IO supervisor**
IO supervisors are programming units / PCs with the appropriate engineering / diagnostic tools. IO supervisors have access to process and parameter data as well as alarm and diagnostic information.



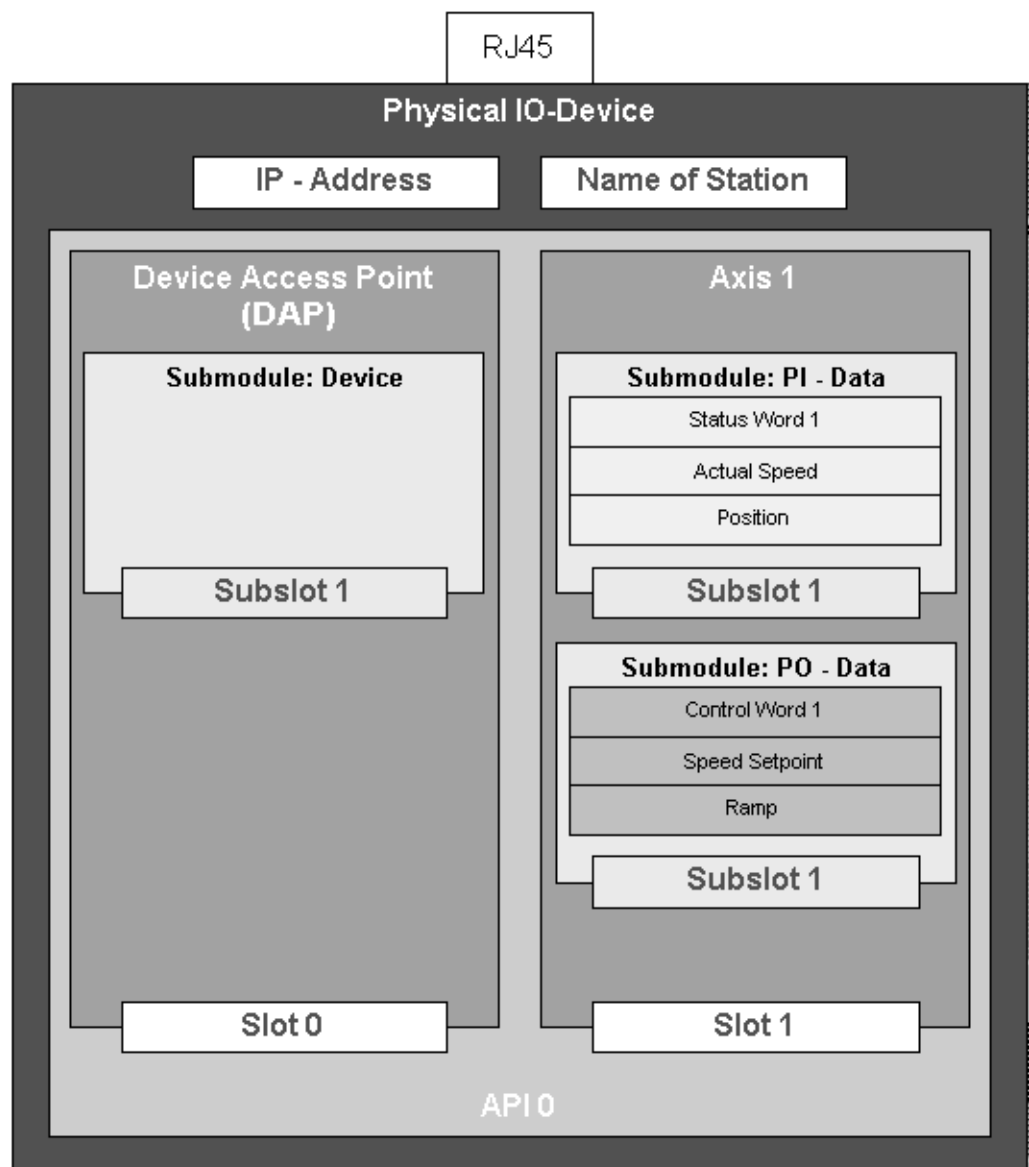
Communication model

The communication model of PROFINET IO is based on the many years of experience resulting from PROFIBUS DP-V1. The master/slave access procedure was mapped on a provider/consumer model.

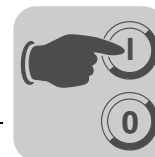
Different communication channels are used for data transfer between the IO controller and IO devices. Cyclical IO data and event-driven alarms are transferred via the real-time channel. The standard channel based on UDP/IP is used for parameter settings, configuration and diagnostic information.

Device model

The perspective of decentralized periphery familiar from PROFIBUS DP was extended for this device model. The device model is based on slot and subslot mechanisms that can be used to implement modular units with slots for modules and submodules. Modules are represented by the slot and submodules by the subslot. These mechanisms also enable logical modularization e.g. for a drive system (see following figure).




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A single drive axis is represented as a module in PROFINET IO. Different submodules can be plugged into this module. The submodules define the process data interface with the IO controller or the lateral communication partner. In this way, they take on the role of provider or consumer. For multi-axis systems that have a joint PROFINET IO interface, the model provides the opportunity of plugging several modules into a single IO device. In this case, too, each module represents a single axis. Slot 0 is designed as a Device Access Point (DAP) and always represents the IO device.


8.2 The integrated Ethernet switch

You can use the integrated Ethernet switch to implement line topologies familiar from fieldbus technology. Other bus topologies such as star or tree are, of course, also possible. Ring topologies are not supported.

	NOTES
	<p>The number of Industrial Ethernet switches connected in the line impacts on the telegram run time. If a telegram runs through the units, the telegram run time is delayed by the Store & Forward function of the Ethernet switch:</p> <ul style="list-style-type: none"> • By approximately 10 μs (at 100 Mbit/s) for a telegram 64 bytes in length • By approximately 130 μs (at 100 Mbit/s) for a telegram 1500 bytes in length <p>This means, the more units that the telegram has to run through, the longer the telegram run time.</p>

Autocrossing The two ports of the Ethernet switch that lead outwards have an autocrossing functionality. This means that they can use both patch and cross-over cables to connect to the next Ethernet stations.

Autonegotiation When a connection is established with the next station, both Ethernet stations negotiate the baud rate and the duplex mode. For this purpose, both Ethernet ports of the PROFINET application support an autonegotiation functionality and work with a baud rate of either 100 Mbit or 10 Mbit in full duplex or half duplex mode.

	NOTE
	<p>PROFINET IO networks must be operated with a baud rate of 100 Mbit in full duplex mode.</p>

Monitoring the LINK status The LINK status can be monitored via both ports. You can set this function as follows via the STEP 7 hardware configuration:

- In STEP 7, choose slot 0.
- In the context menu, select the [Object properties] menu item.
- Select the "Parameters" tab page.

Set the monitoring function for the port that only sends data packages to additional stations, not the controller. If a LINK DOWN is detected when the monitoring function is activated, the PROFINET device sends a diagnostic alarm to the controller via the other port (see section "Alarms").



8.3 Process data configuration

Option DFSxxB supports the PROFIsafe functionality in slot 1. Modules with 1 to 10 process data words I/O can be configured in slot 2. Once the unit has been switched on and before communication has been established by the IO controller, the configuration is set to 3 process data words I/O. It can be changed by the IO controller while communication is being established. The current configuration is displayed at *P090 PD configuration*.

Permitted configurations

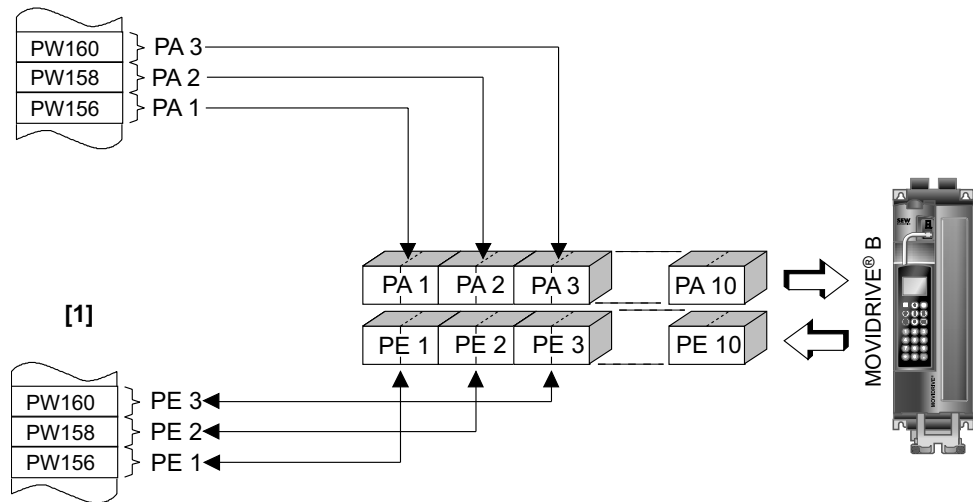
ID	Process data length
101	1 process data word I/O
102	2 process data words I/O
103	3 process data words I/O
104	4 process data words I/O
105	5 process data words I/O
106	6 process data words I/O
107	7 process data words I/O
108	8 process data words I/O
109	9 process data words I/O
110	10 process data words I/O

The DAP (Device Access Point) has the ID 100 (slot 0, subslot 1)



8.4 Controlling the MOVIDRIVE® MDX61B inverter

The drive inverter is controlled via the process data channel which is up to 10 I/O words in length. These process data words can, for example, be mapped in the I/O or peripheral area of the controller if a programmable controller is used as the PROFINET IO controller and can thus be addressed as usual.



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Figure 2: Mapping PROFINET data in the PLC address range

[1] PLC address range

PI1 ... PI10 Process input data
PO1 ... PO10 Process output data



NOTE

For more information on controlling via the process data channel, in particular the coding of the control and status words, refer to the MOVIDRIVE® Fieldbus Unit Profile manual.



8.4.1 Control example for SIMATIC S7 with MOVIDRIVE® MDX61B

The drive inverter is controlled using SIMATIC S7 in accordance with the selected process data configuration either directly using load and transfer commands or by means of special system functions *SFC 14 DPRD_DAT* and *SFC15 DPWR_DAT*.

In principle, with SIMATIC S7, data lengths with 3 or more bytes are transferred via the system functions SFC14 and SFC15.

Newer SIMATIC controls can also support consistent data transfer without using the SFC14/15 system functions.

Consequently, the data in the following table applies:

Process data configuration	STEP 7 access via
1 PD	Load / transfer commands
2 PD	Load / transfer commands
3 PD	System functions SFC14/15 (length 6 bytes)
6 PD	System functions SFC14/15 (length 12 bytes)
10 PD	System functions SFC14/15 (length 20 bytes)

8.4.2 PROFINET timeout (MOVIDRIVE® MDX61B)

If data transfer via PROFINET is disturbed or interrupted, the response monitoring time counts down in MOVIDRIVE® (if configured in the IO controller). The **BUS FAULT** LED lights up or flashes to indicate that no new user data is being received. At the same time, MOVIDRIVE® performs the fault response selected with *P831 Fieldbus timeout response*.

P819 Fieldbus timeout displays the response monitoring time specified by the IO controller during the PROFINET startup. The timeout can only be changed via the IO controller. Although modifications made using the keypad or MOVITOOLS® are displayed, they do not have any effect and are overwritten when PROFINET is next started up.

8.4.3 Fieldbus timeout response (MOVIDRIVE® MDX61B)

Parameter *P831 Response Fieldbus Timeout* is used to set the fault response that is triggered via the fieldbus timeout monitoring function. The setting made here must correspond to the setting in the master system (S7: response monitoring).



8.5 SIMATIC S7 program example

	<p>NOTE</p> <p>This example is a special and free service that demonstrates only the basic procedure for generating a PLC program. SEW is not liable for the contents of the sample program.</p>
--	---

In this example, MOVIDRIVE® is configured using the process data configuration "3 PD" on input addresses PIW576... and output addresses POW576....

A data block DB3 is created with some 50 data words.

When the system function SFC14 is called, the process input data is copied to data block DB3, data words 0, 2 and 4. When the system function SFC15 is called after the control program has been processed, the process output data is copied from data words 20, 22 and 24 to the output address POW 576 ...

Note the length information in bytes for the RECORD parameter. The length information must correspond to the configured length.

Refer to the online help for STEP 7 for further information about the system functions.

```
//Start of cyclical program processing in OB1
BEGIN
NETWORK
TITLE =Copy PI data from inverter to DB3, word 0/2/4
CALL SFC 14 (DPRD_DAT) //READ IO Device Record
  LADDR := W#16#240 //Input address 576
  RET_VAL:= MW 30 //Result in flag word 30
  RECORD := P#DB3.DBX 0.0 BYTE 6 //Pointer

NETWORK
TITLE =PLC program with application
// PLC program uses the process data in DB3 for
// drive control

L DB3.DBW 0//Load PI1 (status word 1)
L DB3.DBW 2 //Load PI2 (actual speed value)
L DB3.DBW 4 //Load PI3 (no function)

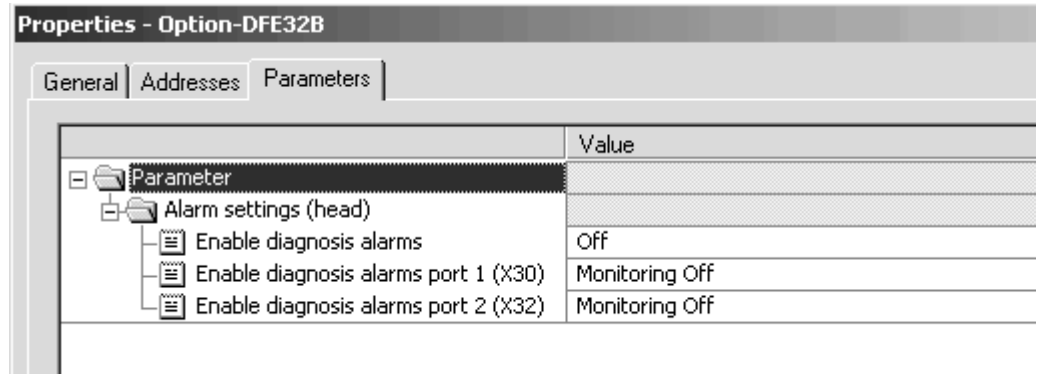
L W#16#0006
T DB3.DBW 20//Write 6hex to PO1 (control word = enable)
L 1500
T DB3.DBW 22//Write 1500dec to PO2 (speed setpoint = 300 1/min)
L W#16#0000
T DB3.DBW 24//Write 0hex to PO3 (has no function)

//End of cyclical program processing in OB1
NETWORK
TITLE =Copy PO data from DB3, word 20/22/24 to the inverter
CALL SFC 15 (DPWR_DAT) //WRITE IO Device Record
  LADDR := W#16#240 //Output address 576 = 240hex
  RECORD := P#DB3.DBX 20.0 BYTE 6 //Pointer to DB/DW
  RET_VAL:= MW 32 //Result in flag word 32
```



8.6 PROFINET alarms taking the example of MOVIDRIVE® B

Option DFS22B supports diagnostic alarms in the event of a device fault. These diagnostic alarms are switched off on delivery. Proceed as follows to activate the alarms in STEP 7 HWCONFIG (see following figure).



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Diagnostic alarm for safety option

Only in conjunction with options DFS21B and DFS22B.

- Select slot 1 of DFS22B.
- Click the right mouse button and select the menu item [Object properties] or double-click on the slot. The window "DFS22B properties" is called up.
- Select the "Parameters" tab page.
- Set the alarms to "ON" and confirm your entry by clicking [OK].

Diagnostic alarm for MOVIDRIVE®

- Mark slot 2 of DFS22B.
- Click the right mouse button and select the menu item [Object properties] or double-click on the slot. The window "DFS22B properties" is called up.
- Select the "Parameters" tab page.
- Set the diagnostic alarms to "ON" and confirm your entry by clicking [OK].

In the event of a fault on MOVIDRIVE®, a diagnostic alarm is generated in order to be able to read the MOVIDRIVE® error message in plain text.

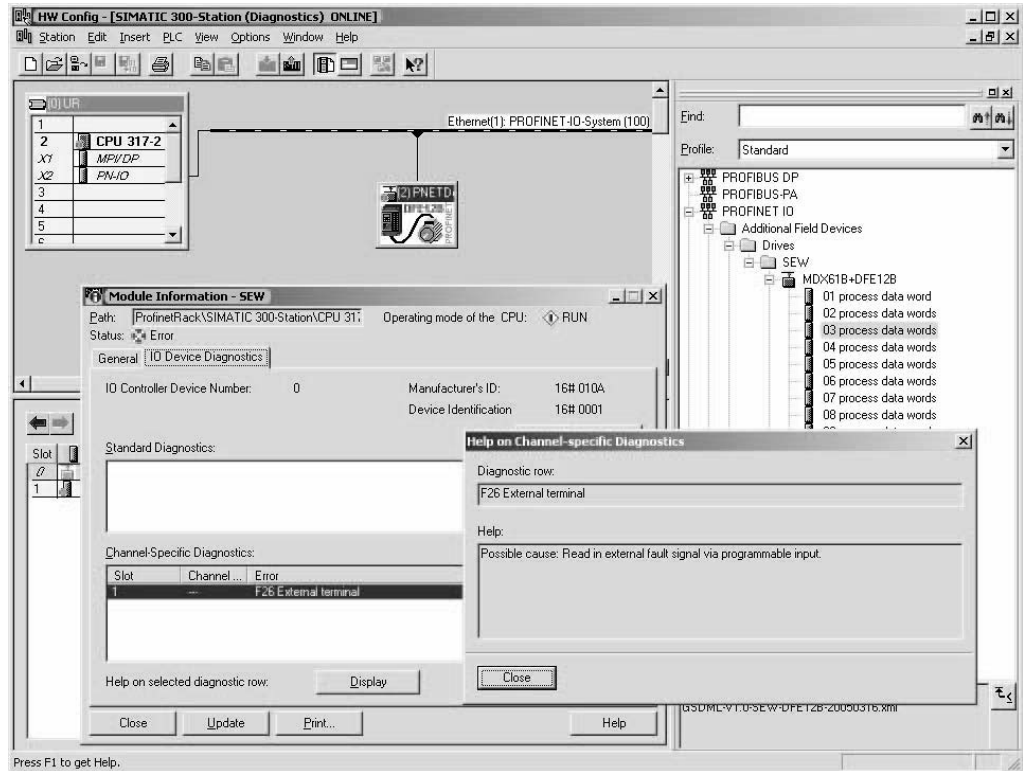
Diagnostic alarm for the integrated switch

- Mark slot 0 of DFS22B.
- Click the right mouse button and select the menu item [Object properties] or double-click on the slot. The window "DFS22B properties" is called up.
- Select the "Parameters" tab page. Set "Alarm Port1" and "Alarm Port 2" to "ON" and confirm your entries by clicking [OK]. In a line topology, the port of the Ethernet station that leads to the port of the following Ethernet station (starting from the PLC) must be monitored.

This setting ensures that the DFS22B monitors device communication with the neighboring stations. A diagnostic alarm is generated when the DFS22B detects an inactive partner at either port 1 or port 2.



A device error on MOVIDRIVE® B, the safety option or the integrated switch causes a diagnostic alarm to be sent to the SIMATIC controller as an "incoming event". The controller's "SF" LED lights up red. You can determine the cause of the error in the STEP 7 HWCONFIG. To do so, go ONLINE, select the symbol for DFS22B, and use the context menu (right mouse button) to query the status of the subassembly.



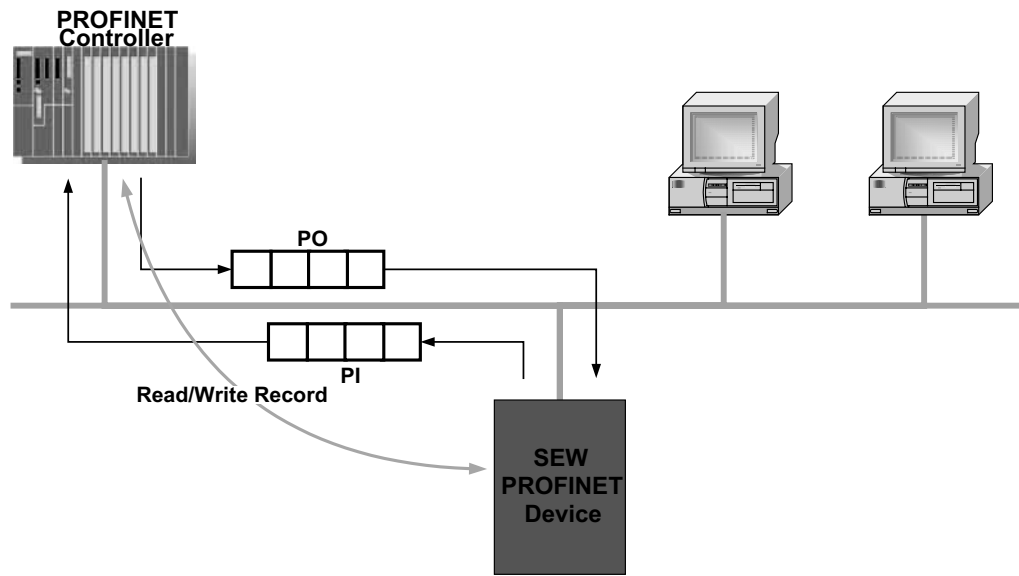
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9 Parameter Setting via PROFIdrive Database 47

9.1 Introduction to PROFINET records

The PROFINET services "Read record" and "Write record" are acyclical services that can be used to transfer parameter data between the PROFINET controller or supervisor (master) and a PROFINET device (slave). This data exchange is handled via a UDP (User Datagram Protocol) with a lower priority than process data exchange.



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The user data transported via a PROFINET service is grouped in a record. Each record is addressed uniquely by the following features:

- API
- Slot number
- Subslot number
- Index

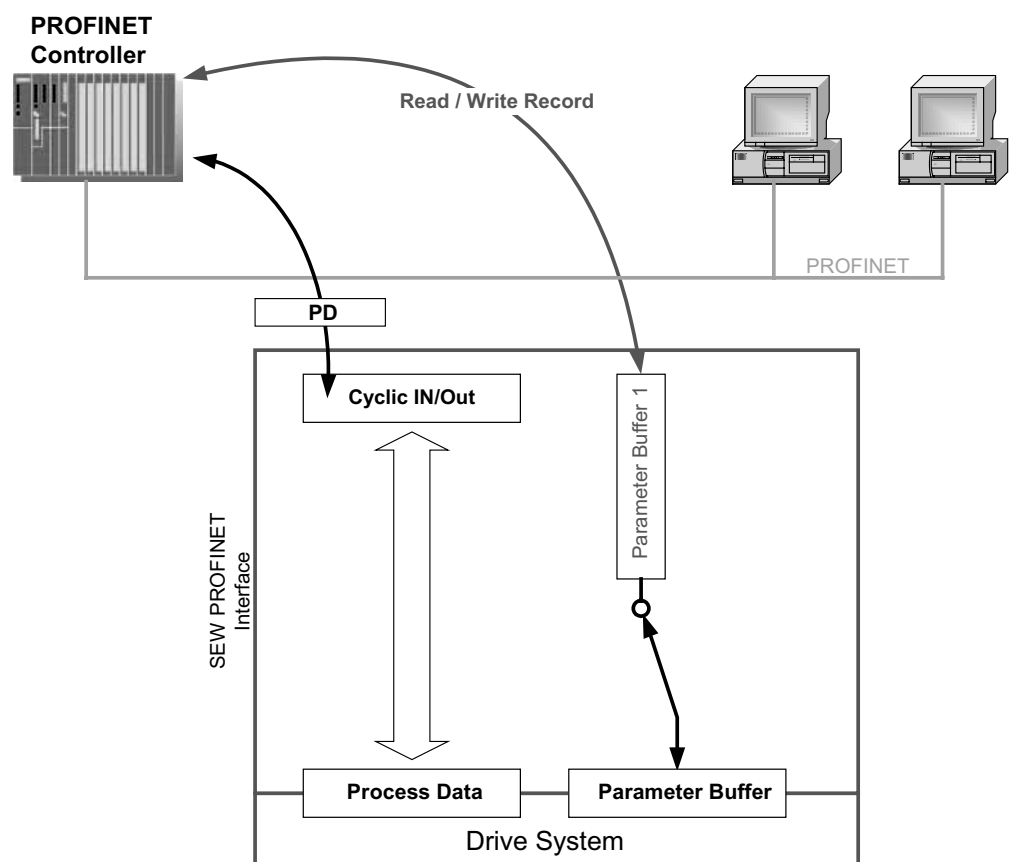
The structure of database 47 is used to exchange parameters with PROFINET devices from SEW-EURODRIVE. The structure of database 47 is defined as the PROFINET parameter channel for drives in the as of V4.0 in the PROFIdrive profile drive engineering of the PROFIBUS user organization. Different procedures for accessing parameter data in the PROFINET device from SEW-EURODRIVE are provided via this parameter channel.



9.1.1 Properties of PROFINET devices from SEW-EURODRIVE

PROFINET devices from SEW-EURODRIVE that support acyclical Read record and Write record services all have the same communication features. In principle, the devices are controlled via a PROFINET controller with cyclical process data. This controller (usually a PLC) can also access the parameters of the PROFINET device from SEW-EURODRIVE using the Read record and Write record functions.

In parallel to this parameter setting connection, two connections can be established via which the first supervisor, for example, can read parameter data in the form of a visualization unit and the second supervisor can configure the PROFINET device via the engineering software in the form of a notebook.

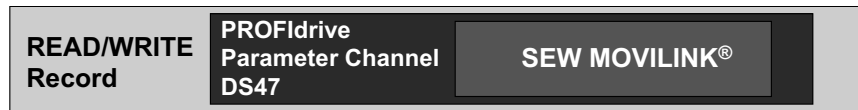


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9.2 Structure of the PROFINET parameter channel

Generally, database 47 is used to perform parameter setting for the drives in accordance with the PROFIdrive-Base Mode Parameter Access of profile version 4.0. The *Request ID* entry is used to distinguish between parameter access based on the PROFIdrive profile or via SEW-MOVILINK[®] services. The following table shows the possible codes of the individual elements. The record structure is the same for PROFIdrive and MOVILINK[®] access.



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The following MOVILINK[®] services are supported:

- 8-byte MOVILINK[®] parameter channel with all the services supported by the inverter, such as
 - READ parameter
 - WRITE parameter
 - WRITE parameter volatile
 - etc.

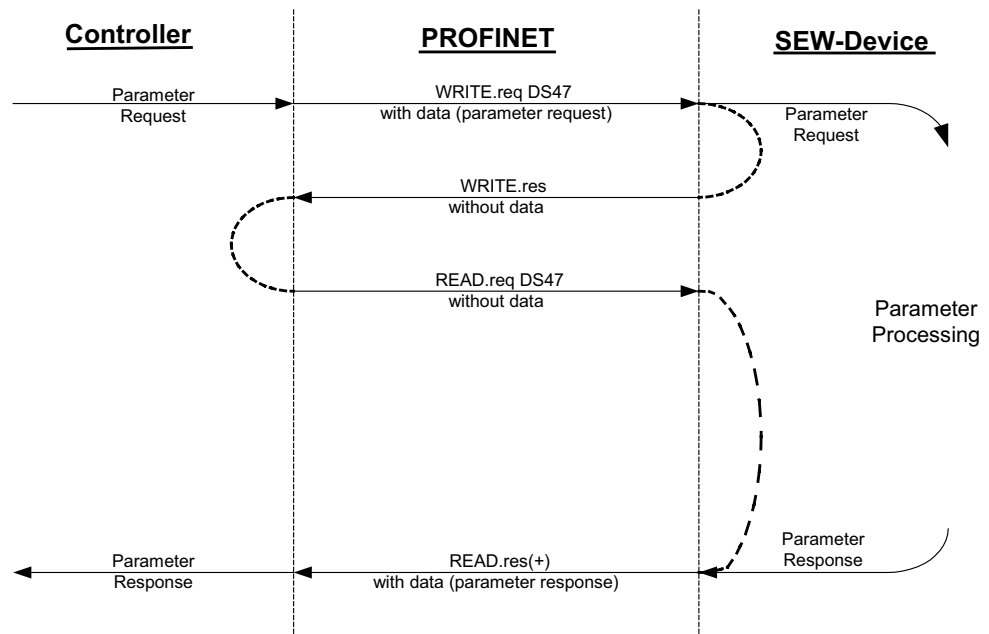
Field	Data type	Values
	Unsigned8	0x00 Reserved 0x01 ... 0xFF
Request ID	Unsigned8	0x40 SEW MOVILINK[®] service 0x41 SEW data transport
Response ID	Unsigned8	<u>Response (+):</u> 0x00 Reserved 0x40 SEW MOVILINK[®] service (+) 0x41 SEW data transport <u>Response (-):</u> 0xC0 SEW MOVILINK[®] service (-) 0x41 SEW data transport
	Unsigned8	0x00 ... 0xFF Number of axes (0 to 255)
No. of parameters	Unsigned8	0x01 ... 0x13 1 ... 19 DWORDs (240 DP-V1 data bytes)
Attributes	Unsigned8	For SEW MOVILINK[®] (Request ID = 0x40): 0x00 No service 0x10 READ parameter 0x20 WRITE parameter 0x40 Read minimum 0x50 Read maximum 0x60 Read default 0x80 Read attribute 0x90 Read EEPROM 0xA0 ... 0xF0 Reserved SEW data transport: 0x10 Value
No. of elements	Unsigned8	0x00 For non-indexed parameters 0x01 ... 0x75 Quantity 1 ... 117
Parameter number	Unsigned16	0x0000 ... 0xFFFF MOVILINK [®] parameter index
Subindex	Unsigned16	0x0000 SEW: Always 0
Format	Unsigned8	0x43 Double word 0x44 Error
No. of values	Unsigned8	0x00 ... 0xEA Quantity 0 ... 234
Error Value	Unsigned16	0x0080 + MOVILINK [®] AdditionalCode Low For SEW MOVILINK[®] 16 Bit error value



9.2.1 Configuration sequence via database 47

Parameter access takes place with the combination of the PROFINET services *WRITE RECORD* and *READ RECORD*. The parameter request is transferred to the IO device using the *WRITE.req*, followed by slave-internal processing.

The controller or supervisor now sends a *READ.req* to pick up the parameter response. The device answers with a positive response *READ.res*. The user data now contains the parameter response of the parameter request that was previously sent with *WRITE.req* (see following figure). This sequence applies for both the PROFINET controller and supervisor.



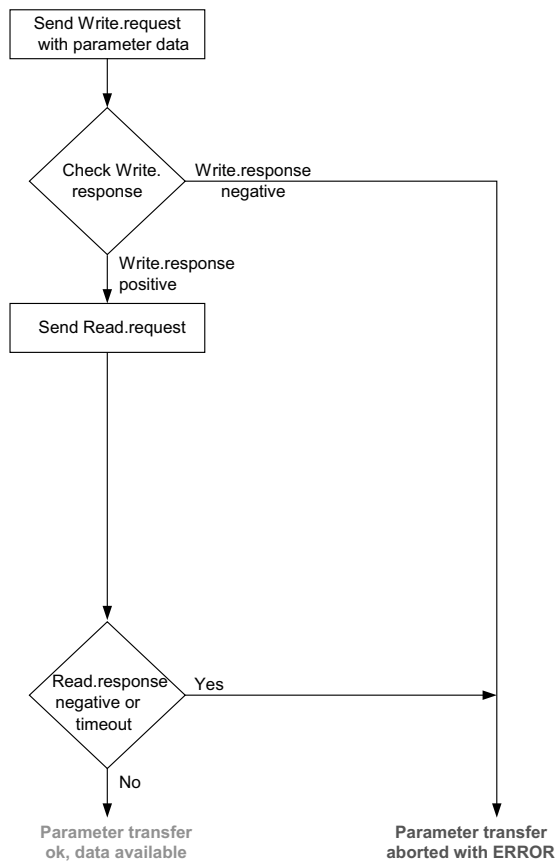
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Figure 3: Telegram sequence for parameter access via Read/Write record



9.2.2 Processing sequence for controller / supervisor

If the bus cycles are very short, the request for the parameter response arrives before the SEW device has completed the parameter access internally. This means that the response data from the SEW device is not yet available. In this case, the device delays the response to the *Read record request*.



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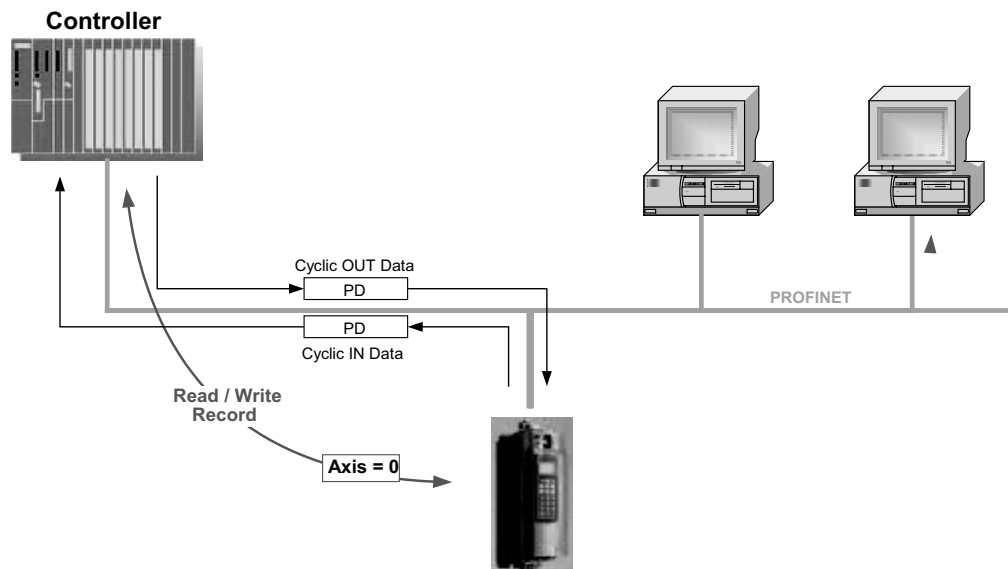


9.2.3 Addressing lower-level inverters

The structure of the DS47 record defines an *Axis* element. This element is used to reach multi-axis drives that are operated via one PROFINET interface. The *Axis* element addresses one of the devices connected via the PROFINET interface. This mechanism is used e.g. with the SEW bus modules type MOVIFIT[®] for MOVIMOT[®] or the DFE gateway for MOVITRAC[®].

Addressing a MOVIDRIVE[®] B unit on PROFINET

With the setting *Axis = 0*, parameters of the MOVIDRIVE[®] B inverter can be accessed directly. As there are no lower-level drive devices connected to MOVIDRIVE[®] B, access with *Axis > 0* is rejected with an error code.



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9.2.4 MOVILINK® parameter requests

The MOVILINK® parameter channel of the SEW inverter is directly mapped in the structure of database 47. The Request ID 0x40 (SEW MOVILINK® service) is used for exchanging MOVILINK® parameter setting requests. Parameter access with MOVILINK® services usually takes place according to the structure described below. The typical message sequence for database 47 is used.

Request ID: 0x40 SEW MOVILINK® service

In the MOVILINK® parameter channel, the actual service is defined by the *Attribute* record element. The high nibble of this element corresponds to the MOVILINK® service code.

Example for reading a parameter via MOVILINK®

The following tables give an example of the structure of the *WRITE.request* and *READ.response* user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending parameter requests

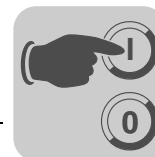
The table shows the coding of the user data for the PROFINET *WRITE.request* service. The *WRITE.request* service is used to send the parameter setting request to the inverter. The firmware version is read.

The following version shows the WRITE request header for transferring the parameter setting request.

Service	WRITE.request	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	10	10 byte user data for parameter request

The following table shows the WRITE.request user data for MOVILINK® "Read parameter".

Byte	Field	Value	Description
0		0x01	Individual reference number for the parameter setting request is reflected in the parameter response
1	Request ID	0x40	SEW MOVILINK® service
2		0x00	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x10	MOVILINK® service 'READ parameter'
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter number	0x206C	MOVILINK® index 8300 = "Firmware version"
8, 9	Subindex	0x0000	Subindex 0



Query parameter response

The following table shows the coding of the READ.request USER DATA including the PROFINET header.

Service	READ.request	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	240	Maximum length of response buffer in the master

Positive MOVILINK[®] parameter setting response

The table shows the READ.response USER DATA with positive response data of the parameter setting request. The parameter value for index 8300 (firmware version) is returned as an example.

Service	READ.request	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	10	Maximum length of response buffer in the master

Byte	Field	Value	Description
0		0x01	Reflected reference number from the parameter setting request
1	Response ID	0x40	Positive MOVILINK [®] response
2		0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x43	Parameter format: Double word
5	No. of values	0x01	1 value
6, 7	Value High	0x311C	Higher-order part of the parameter
8, 9	Value Low	0x7289	Lower-order part of the parameter
			Decoding: 0x 311C 7289 = 823947913 dec >> firmware version 823 947 9.13



Example for writing a parameter via MOVILINK®

The following tables show the structure of the *WRITE* and *READ* services for volatile writing of the value 12345 to the IPOS^{plus}® variable H0 (parameter index 11000) as an example. The MOVILINK® service *WRITE Parameter volatile* is used for this purpose.

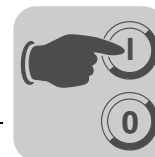
Send 'WRITE parameter volatile' request

Service	WRITE.request	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	16	16 byte user data for order buffer

The following table shows the WRITE.request user data for MOVILINK® "Write parameter volatile".

Byte	Field	Value	Description
0		0x01	Individual reference number for the parameter setting request is reflected in the parameter response
1	Request ID	0x40	SEW MOVILINK® service
2		0x00	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x30	MOVILINK® service "WRITE parameter volatile"
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter number	0x2AF8	Parameter index 11000 = 'IPOS variable H0'
8, 9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12, 13	Value High word	0x0000	Higher-order part of the parameter value
14, 15	Value Low word	0x0BB8	Lower-order part of the parameter value

After sending this WRITE.request, the WRITE.response is received. If there was no status conflict in processing the parameter channel, a positive WRITE.response is sent. Otherwise, the status error is located in Error_code_1.



Query parameter response

The following table shows the coding of the READ.req USER DATA including the PROFINET header.

Service	READ.request	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	240	Maximum length of the response buffer in the master

Positive response to 'WRITE parameter volatile'

Service	READ.response	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	4	4 byte user data in response buffer

Byte	Field	Value	Description
0		0x01	Reflected reference number from the parameter setting request
1	Response ID	0x40	Positive MOVILINK® response
2		0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter

Negative parameter response

The following table shows the coding of a negative response of a MOVILINK® service. Bit 7 is entered in the the response ID if the response is negative.

Service	WRITE.response	Description
API	0	Fixed to 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed to 1
Index	47	Index of the record for the parameter request; constant index 47
Length	8	8 byte user data in response buffer

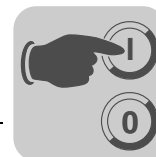
Byte	Field	Value	Description
0		0x01	Reflected reference number from the parameter setting order
1	Response ID	0xC0	Negative MOVILINK® response
2		0x00	Reflected axis number; 0 for single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Error
5	No. of values	0x01	1 error code
6, 7	Error value	0x0811	MOVILINK® return code e. g. ErrorClass 0x08, add. code 0x11 (see the section "MOVILINK® return codes for PROFINET parameter settings" on page 60)



MOVILINK®
return codes for
PROFINET
parameter
settings

The following table shows the return codes that are returned by the SEW PROFINET interface in case of an error in the PN parameter access.

MOVILINK® Return code (hex)	Description
0x0810	Invalid index, parameter index does not exist in the unit
0x0811	Function / parameter not implemented
0x0812	Read access only
0x0813	Parameter lock activated
0x0814	Factory setting is active
0x0815	Value for parameter too large
0x0816	Value for parameter too small
0x0817	Required option card not installed
0x0818	Error in system software
0x0819	Parameter access only via RS485 process interface
0x081A	Parameter access only via RS485 diagnostics interface
0x081B	Parameter is access-protected
0x081C	Controller inhibit is required
0x081D	Invalid value for parameter
0x081E	Factory setting was activated
0x081F	Parameter was not saved in EEPROM
0x0820	Parameter cannot be changed with output stage enabled/reserved
0x0821	Reserved
0x0822	Reserved
0x0823	Parameter may only be changed at IPOS program stop
0x0824	Parameter may only be changed when auto setup is deactivated
0x0505	Incorrect coding of management and reserved byte
0x0602	Communication error between inverter system and fieldbus interface
0x0502	Timeout of secondary connection (e.g. during reset or with Sys-Fault)
0x0608	Incorrect coding of format field




9.2.5 PROFIdrive parameter requests

The PROFIdrive parameter channel of SEW drive inverters is directly mapped in the structure of database 47. Parameter access with PROFIdrive services usually takes place according to the structure described below. The typical telegram sequence for database 47 is used. PROFIdrive only defines the two request IDs

Request ID:0x01request parameter (PROFIdrive)

Request ID:0x02change parameter (PROFIdrive)

This means there is restricted data access in comparison with the MOVILINK® services.

	NOTE
	<p>The request ID = 0x02 = Change Parameter (PROFIdrive) results in remanent write access to the selected parameter. Consequently, the internal flash/EEPROM of the inverter is written with each write access. Use the MOVILINK® service "WRITE Parameter volatile" if parameters must be written cyclically at short intervals. With this service, you only alter the parameter values in the RAM of the inverter.</p>

Example for reading a parameter via PROFIdrive

The following tables show an example of the structure of the WRITE.request and READ.res user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending parameter requests

The table shows the coding of the user data for the WRITE.req service specifying the PROFINET header. The WRITE.req service is used to send the parameter setting request to the inverter.

Service:	WRITE.request	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	10	10 byte user data for parameter request

Byte	Field	Value	Description
0		0x01	Individual reference number for the parameter setting order that is reflected in the parameter response
1	Request ID	0x01	Request parameter (PROFIdrive)
2		0x00	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x10	Access to parameter value
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter number	0x206C	MOVILINK® index 8300 = "Firmware version"
8, 9	Subindex	0x0000	Subindex 0



Query parameter response

The following table shows the coding of the READ.req USER DATA including the PN header.

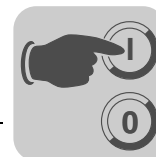
Service:	READ.request	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	240	Maximum length of the response buffer in the PROFINET controller

Positive PROFIdrive parameter response

The table shows the READ.res user data with the positive response data of the parameter setting request. The parameter value for index 8300 (firmware version) is returned as an example.

Service:	READ.request	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	10	10 byte user data in response buffer

Byte	Field	Value	Description
0		0x01	Reflected reference number from the parameter setting order
1	Response ID	0x01	Positive response for „Request Parameter“
2		0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x43	Parameter format: Double word
5	No. of values	0x01	1 value
6, 7	Value Hi	0x311C	Higher-order part of the parameter
8, 9	Value Lo	0x7289	Lower-order part of the parameter
			Decoding: 0x 311C 7289 = 823947913 dec >> firmware version 823 947 9.13



Example for writing a parameter via PROFIdrive

The following tables show an example of the structure of the *WRITE* and *READ* services for the **remanent** writing of the internal setpoint n11 (see "Example for writing a parameter via MOVILINK[®]" on page 58). The PROFIdrive service *Change Parameter* is used for this purpose.

Send „WRITE parameter “request

The following table shows the PN header of the *WRITE.request* with the parameter setting request.

Service:	WRITE.request	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	16	16 byte user data for order buffer

The following table shows the *WRITE.req* user data for the PROFIdrive service "Change Parameter".

Byte	Field	Value	Description
0		0x01	Individual reference number for the parameter setting order is reflected in the parameter response
1	Request ID	0x02	Change parameter (PROFIdrive)
2		0x01	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x10	Access to parameter value
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter number	0x7129	Parameter index 8489 = P160 n11
8, 9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12, 13	Value HiWord	0x0000	Higher-order part of the parameter value
14, 15	Value LoWord	0x0BB8	Lower-order part of the parameter value

After sending this *WRITE.request*, the *WRITE.response* is received. If there was no status conflict in processing the parameter channel, a positive *WRITE.response* is sent. Otherwise, the status error is located in *Error_code_1*.



Query parameter response

The following table shows the coding of the WRITE.req user data including the PN header.

Field	Value	Description
Function_Num		READ.req
Slot_Number	X	Slot_Number not used
Index	47	Index of the record
Length	240	Maximum length of the response buffer in the PN controller

Positive response to "WRITE Parameter"

The table shows the PN header of the positive READ.response with the parameter setting response.

Service:	READ.response	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	4	4 byte user data in response buffer

The following table shows the positive response for the PROFIdrive service "Change Parameter".

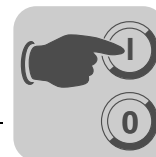
Byte	Field	Value	Description
0		0x01	Reflected reference number from the parameter setting order
1	Response ID	0x02	Positive PROFIdrive response
2		0x01	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter

Negative parameter response

The following table shows the coding of a negative response of a PROFIdrive service. Bit 7 is entered in the Response ID if the response is negative.

Service:	READ.response	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the data set; constant index 47
Length	8	8 byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0x810x82	Negative response for "Request Parameter" Negative response for "Change Parameter"
2		0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Error
5	No. of values	0x01	1 error code
6, 7	Error value	0x0811	MOVILINK [®] return code e. g. ErrorClass 0x08, add. code 0x11 (see the section "MOVILINK [®] return codes for PROFINET" on page 60)



**PROFIdrive
return codes for
PROFINET**

This table shows the coding of the error number in the PROFIdrive parameter response according to PROFIdrive profile V3.1. This table applies if you use the PROFIdrive services "Request Parameter" and/or "Change Parameter."

Fault no.	Meaning	Used for
0x00	Invalid parameter number	Access to parameters that are not available
0x01	Parameter value cannot be changed	Change access to a parameter value that cannot be changed
0x02	Minimum or maximum value exceeded	Change access to a value that lies outside the limit values
0x03	Incorrect subindex	Access to a subindex that is not available
0x04	No assignment	Subindex used to access non-indexed parameters
0x05	Incorrect data type	Replace access with a value that does not correspond with the data type of the parameter
0x06	Setting not permitted (can only be reset)	Set access to a value greater than 0 where this is not permitted
0x07	Descriptive element cannot be changed	Access to a descriptive element that cannot be changed
0x08	Reserved	(PROFIdrive Profile V2: PPO Write request not available for IR)
0x09	No description available	Access to an inaccessible description (parameter value exists)
0x0A	Reserved	(PROFIdrive Profile V2: Incorrect access group)
0x0B	No operation priority	Change access without authorization to change parameters
0x0C	Reserved	(PROFIdrive Profile V2: Incorrect password)
0x0D	Reserved	(PROFIdrive Profile V2: Text cannot be read in in cyclical data transfer)
0x0E	Reserved	(PROFIdrive Profile V2: Name cannot be read in in cyclical data transfer)
0x0F	No text assignment available	Attempt to access text assignment that is not available (parameter value exists)
0x10	Reserved	(PROFIdrive Profile V2: No PPO Write)
0x11	Request cannot be executed due to operating mode	Access not possible at present; no details given
0x12	Reserved	(PROFIdrive Profile V2: Other error)
0x13	Reserved	(PROFIdrive Profile V2: Data cannot be read in in cyclical exchange)
0x14	Invalid value	Change access with a value that lies in the permitted range, but cannot be changed for other reasons (parameter with fixed individual values)
0x15	Response is too long	The length of the current response exceeds the maximum transferable length
0x16	Invalid parameter address	Invalid value or value that is not permitted for this attribute, number of elements, parameter number, subindex, or a combination of these factors
0x17	Incorrect format	Write request: Invalid format or format that is not supported for the parameter data
0x18	Number of values is not consistent	Write request: The number of values for the parameter data does not correspond with the number of elements in the parameter address
0x19	Axis not available	Access to an axis that does not exist
Up to 0x64	Reserved	–
0x65..0xFF	Varies according to manufacturer	–



9.3 Reading or writing parameters via database 47

9.3.1 Sample program for SIMATIC S7

The STEP 7 code stored in the GSD file shows how parameters are accessed via the STEP 7 system function blocks SFB 52/53. You can copy the STEP 7 code and import/compile it as a STEP 7 source.

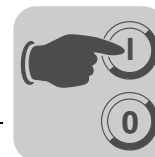


NOTES

- You can download a sample function block for SIMATIC S7 controllers from the SEW homepage (www.sew-eurodrive.de) in the "Software" section.
- This example is a special and free service that demonstrates only the basic procedure for generating a PLC program. SEW is not liable for the contents of the sample program.

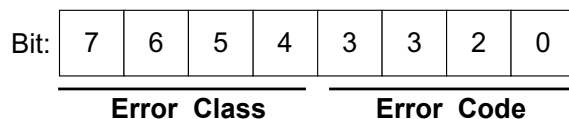
9.3.2 PROFINET technical data for MOVIDRIVE® DFS22B

GSD file for PROFINET:GSDML-V2.1-SEW-DFE-DFS-2Ports-yyyy.mm.dd.xml	
Module name for configuration:	MOVIDRIVE DFS22
Number of parallel C2 connections:	2
Supported record:	Index 47
Supported slot number:	Recommendation: 0
Manufacturer code:	10A hex (SEW-EURODRIVE)
Profile ID:	0
C2 response timeout	1 s
Max. length C1 channel:	240 bytes
Max. length C2 channel:	240 bytes



9.3.3 Error codes of PROFINET services

The table below shows the possible error codes of PROFINET services that may occur in the event of faulty communication on the PN telegram level. This table is relevant if you want to write your own parameter assignment block based on the PROFINET services, because the error codes are returned directly on the telegram level.



Error_Class (from PN specification)	Error_Code (from PN specification)	PROFINET parameter channel
0x0 ... 0x9 hex = reserved		
0xA = application	0x0 = read error 0x2 = module failure 0x3 to 0x7 = reserved 0x8 = version conflict 0xA to 0xF = user specific	
0xB = access	0x0 = invalid index	0xB0 = No data block Index 47 (DB47); parameter requests are not supported
	0x1 = write length error 0x2 = invalid slot 0x3 = type conflict 0x4 = invalid area	
	0x5 = state conflict	0xB5 = Access to DB47 temporarily not possible due to internal processing status
	0x6 = access denied	
	0x7 = invalid range	0xB7 = WRITE DB 47 with error in the DB 47 header
	0x8 = invalid parameter 0x9 = invalid type 0xA to 0xF = user specific	
0xC = resource	0x0 = read constraint conflict 0x1 = write constraint conflict 0x2 = resource busy 0x3 = resource unavailable 0x4..0x7 = reserved 0x8..0xF = user specific	
0xD...0xF = user specific		



10 Integrated Web Server

Option card DFS22B has a homepage for simple web diagnosis of MOVIDRIVE®. Enter the configured IP address to access the homepage.

The website provides access to all the service and diagnostic information.

10.1 Software requirements

The homepage has been tested with Microsoft® Internet Explorer 5.0 and Mozilla® Firefox 2.0. To display dynamic elements you will need the Java 2 Runtime Environment SE, V1.5.0 or higher.

If Java 2 Runtime is not installed on your computer, the website will connect you to Java and download the required software automatically, if you confirm the action. If problems occur during the download, you can also download Java 2 Runtime from www.sun.com and install it locally.

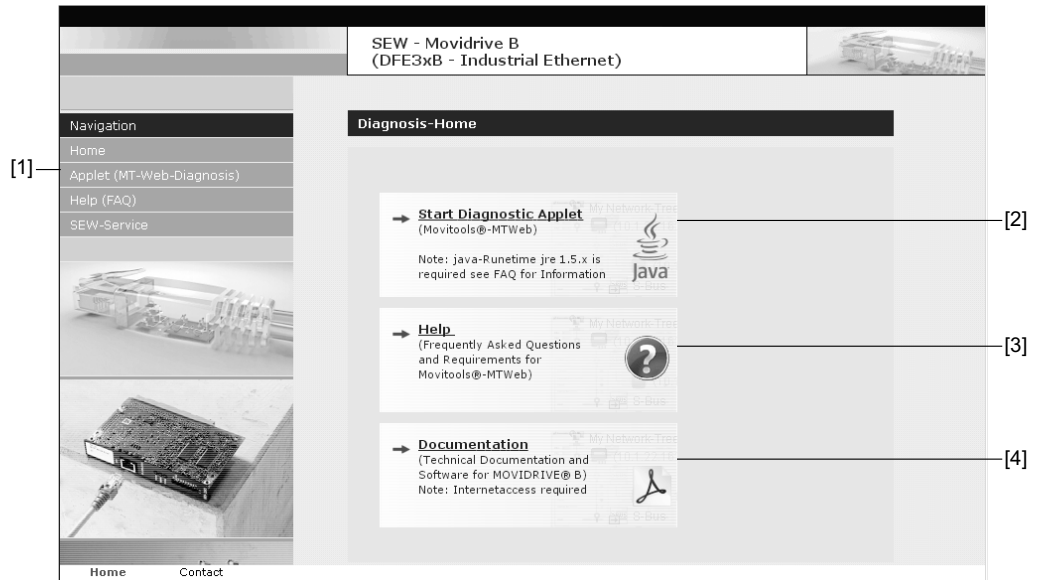
10.2 Security settings

If you use a firewall or have a personal firewall installed on your system, this could block access to the Ethernet devices. To enable access, permit outgoing TCP/IP and UDP/IP communication.

- The "sewAppletsMoviEWeb.JAppletWeb" applet asks you to accept a certificate. To do so, click the button <Execute>. The certificate is imported into the certificate list of Java 2 Runtime.
- To ensure that this dialog box is not displayed each time you execute the program, mark the checkbox "Always trust content from this publisher".



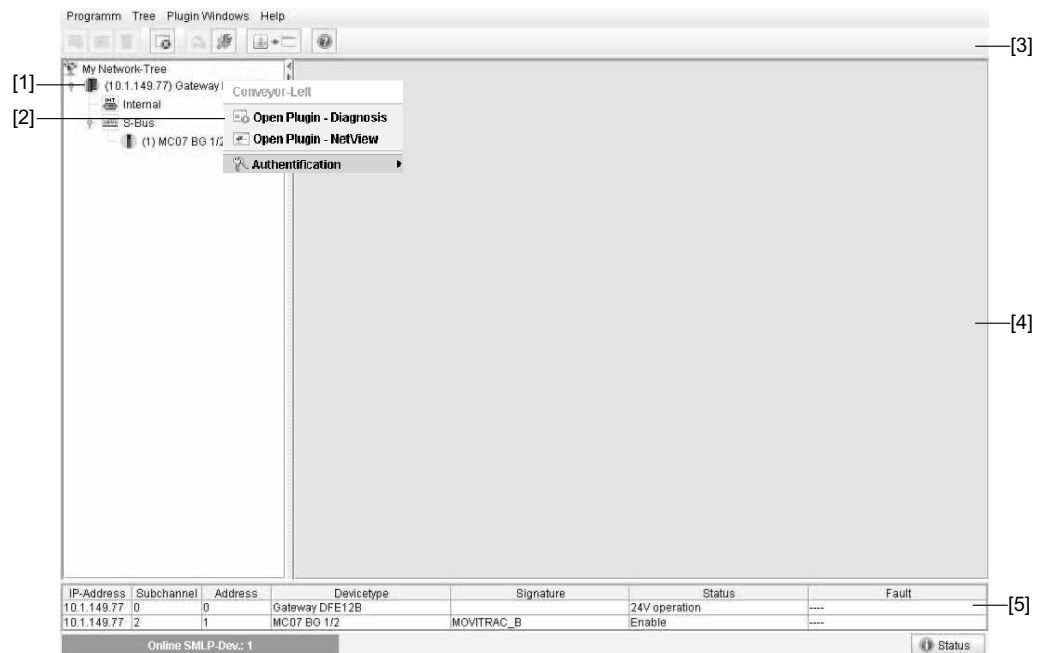
10.3 Structure of the MOVIDRIVE® MDX61B with option DFS22B homepage




[1] Navigation bar	
[2] Main window (Home)	Button to start the diagnostic applet
[3] Main window (Home)	Button to display the homepage help
[4] Main window (Home)	Button to the MOVIDRIVE® B documentation page (required Internet access)



10.4 Structure of the diagnostic applet

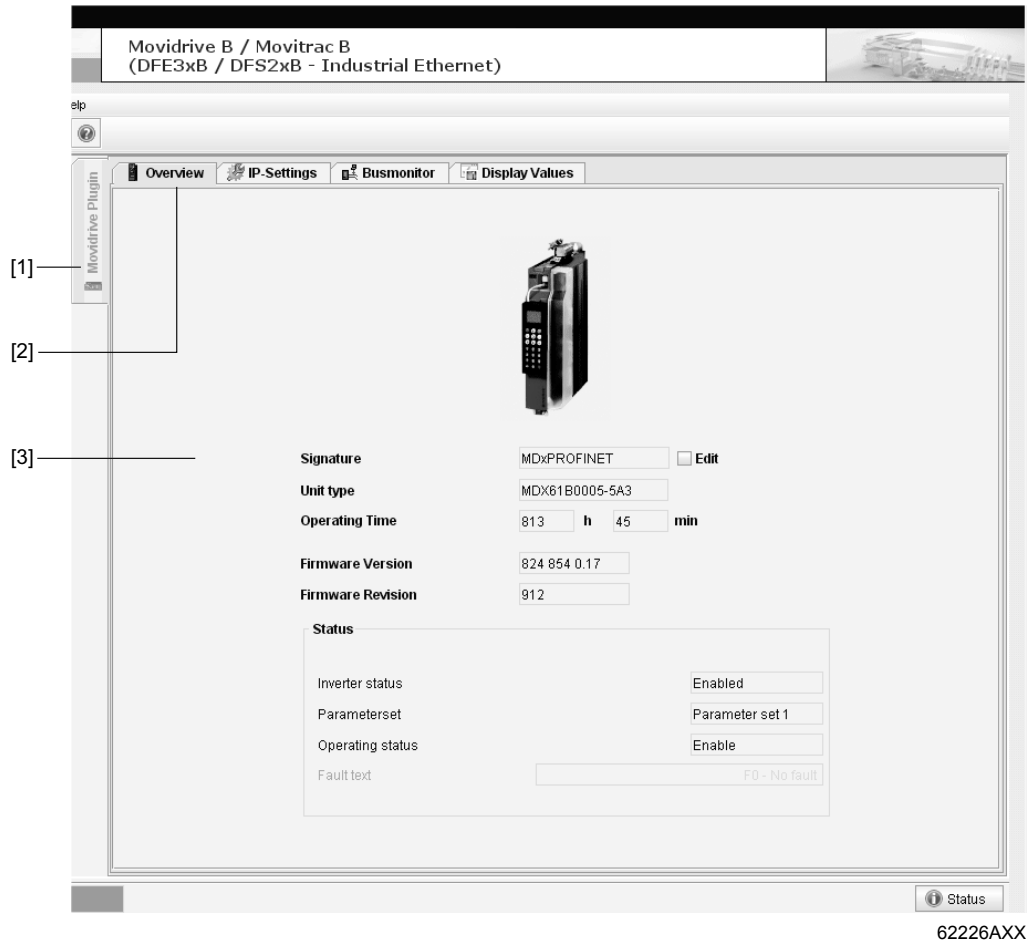


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[1] Tree view / overview	The tree view shows the MOVIDRIVE® B Ethernet devices in the "My Network-Tree" network node. The individual subsystems of the corresponding device variants are shown below - these can contain additional devices.
[2] Popup menu displayed by clicking the right mouse button on a device in the tree	Plug-ins of the individual devices are accessed by clicking the right mouse button on the device in the tree. A popup window appears to take you to the corresponding device plug-ins. You can also edit the access settings for a MOVIDRIVE® B unit (see section "Access protection"). To detect new devices and display them in the tree, click the right mouse button on the network node and choose the option "Scan".
[3] Toolbar (Fast icon selection)	 <p>[a] [b] [c] [d] [e] [f] [g]</p> <p>[a] Scan device tree and show in tree [b] Open plug-in for selected device in the device tree [c] Overview plug-in for selected device in the device tree, see section "Plug-in window (overview)" [d] Close selected plug-in [e] Settings for Ethernet communication and scanner [f] Change to window mode or applet mode [g] Info-dialog display</p>
[4] Plug-in window	See section "Plug-in window".
[5] Status table and device status	The table is shown as standard; all devices and sub-devices found during the scan are listed. As the status table sends parameter requests cyclically to the device, the table can also be closed using the status button (bottom right).



Plug-in window



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<p>[1] Tab page for opened plug-ins</p>	<p>If you have several plug-ins open (e.g. plug-ins for different devices), these will be listed on the tab page.</p>
<p>[2] Tab page within the plug-in (implemented parameters)</p>	<p>If the selected device has several display categories, these are listed on the tab page.</p>
<p>[3] Main window with display values and images</p>	<p>The parameters are visualized appropriately in the main window.</p>

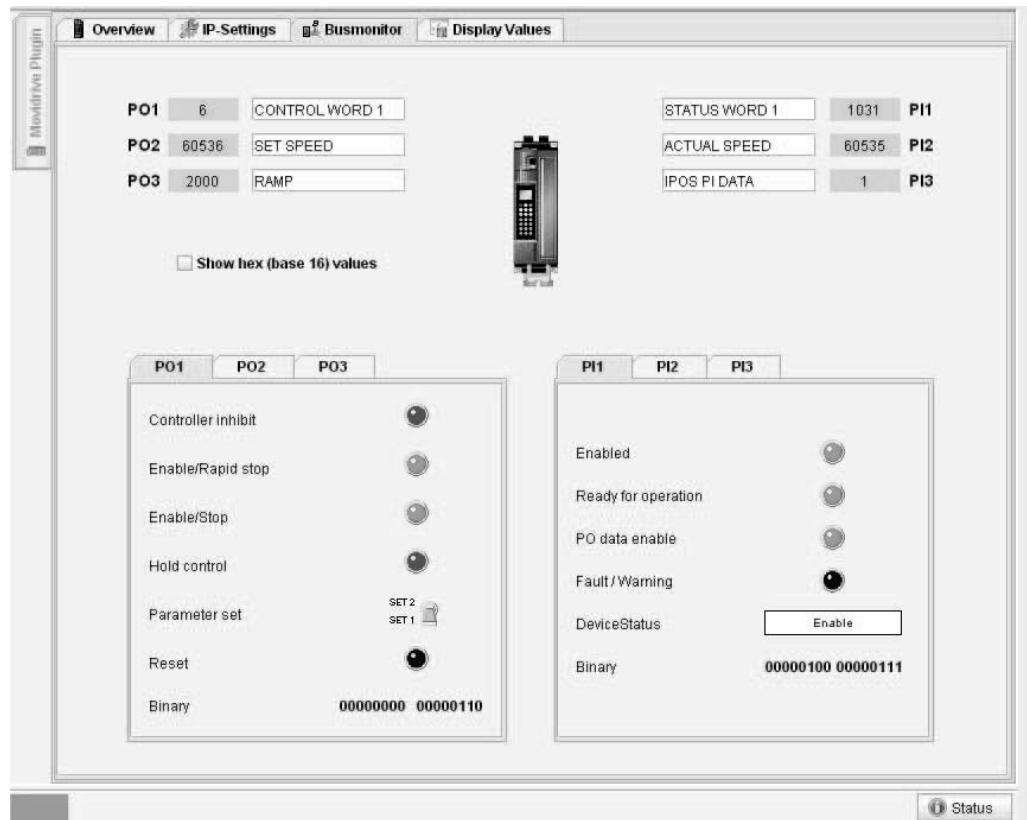


Integrated Web Server

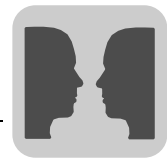
Structure of the diagnostic applet

Example: Bus monitor plug-in for MOVIDRIVE®

This plug-in is used to display the process data between the controller and MOVIDRIVE® B and to diagnose the process data assignment.



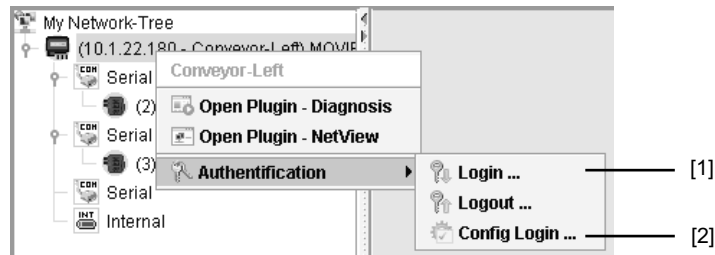
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10.5 Access protection

Access to drive parameters and diagnostic information can be protected by a password. The access protection is deactivated as standard. You can activate access protection by assigning a password [2]. Delete the password to deactivate the function again.

If access protection is activated, a log-in dialog box [1] appears and requests the saved password.



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[1] Log-in



[2] Configuration log-in



In the log-in dialog box, you can choose either "Observer" or "Maintenance" as the user role.

- Observer
 - MOVITOOLS® MotionStudio can be used to read - but not change - the parameters of the drive devices.
 - The current parameter settings can be loaded from the device to the PC (parameter set upload).
 - It is not possible to download a parameter set or an IPOSplus® program.
 - MOVITOOLS® MotionStudio can be used to diagnose the process data, but the Scope settings cannot be changed.

- Maintenance
 - MOVITOOLS® MotionStudio can be operated without restrictions.



11 MOVITOOLS® MotionStudio via Ethernet

The MOVITOOLS® MotionStudio software (version 5.40 or higher) enables straightforward parameter setting, visualization and diagnostics for your drive application. You can use MOVITOOLS® MotionStudio to communicate with the MOVIDRIVE® MDX61B inverter via the DFS22B option card.



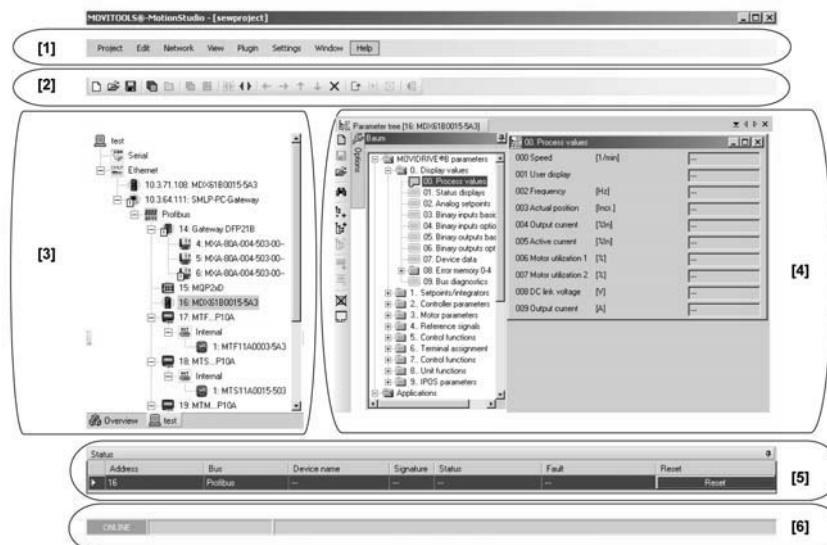
STOP!

Before starting MOVITOOLS® MotionStudio you must enable the installed software components in your firewall.

- Enter all executable programs in your firewall that belong to your installed software components.
- Check your firewall setting. It may block program execution in the background, i.e. without issuing a user message.
- Check whether Ethernet communication can be established between the PC and DFS22B. To do so, use e.g. the command "ping" from the Windows prompt (for example, ping 10.3.71.15).

11.1 Overview

The MOVITOOLS® MotionStudio interface comprises a central framework and the individual "tools". These tools are either started as separate applications from the framework or are integrated in the framework as plug-ins. The following figure shows the different framework areas.



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Areas and their functions

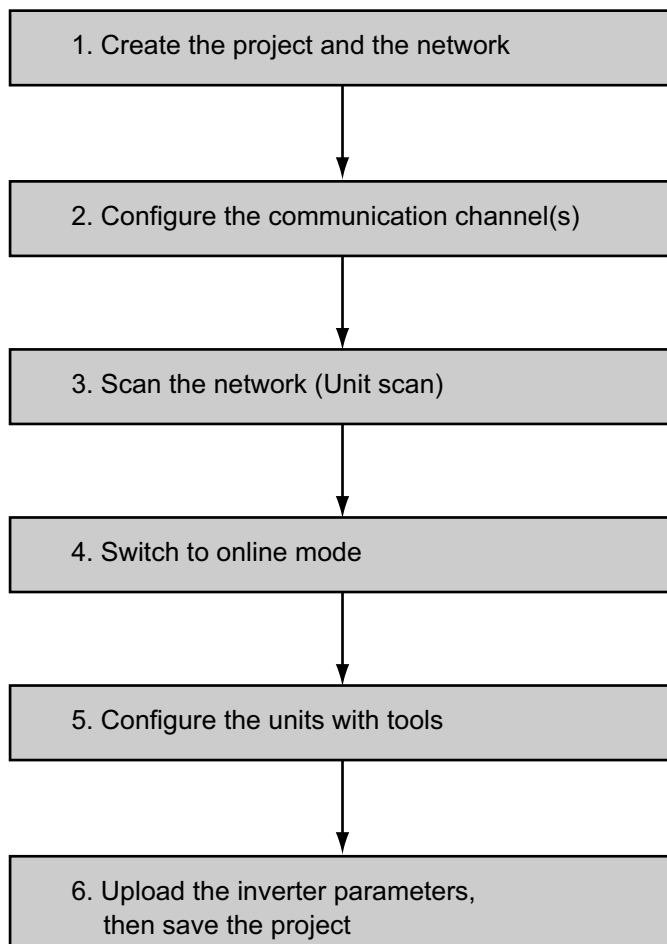
The table below describes the framework areas and their functions.

[1] Menu bar	The main menu and toolbar contain all the key commands for handling the framework.
[2] Toolbar	
[3] Area for project views	Information on the devices in a project is visualized by the following project views <ul style="list-style-type: none"> • Network view • Project view
[4] Area for plug-ins	This is the area in which the "tools" are displayed in the form of plug-ins. You can display the plug-ins via tab pages or as separate windows. The view selected depends on the tool in use. In the example, the "parameter tree" tool was selected for a MOVIDRIVE® unit.
[5] Device status	You can display status information on online devices in the "Status bar". You can also hide the "Device status" area.
[6] Status bar	The current communication status of the MOVITOOLS MotionStudio is shown in the status bar. Progress information is displayed here during a device scan.

11.2 Workflow for device configuration

Overview

The following figure shows the main steps for using the MOVITOOLS® MotionStudio tools to configure devices.

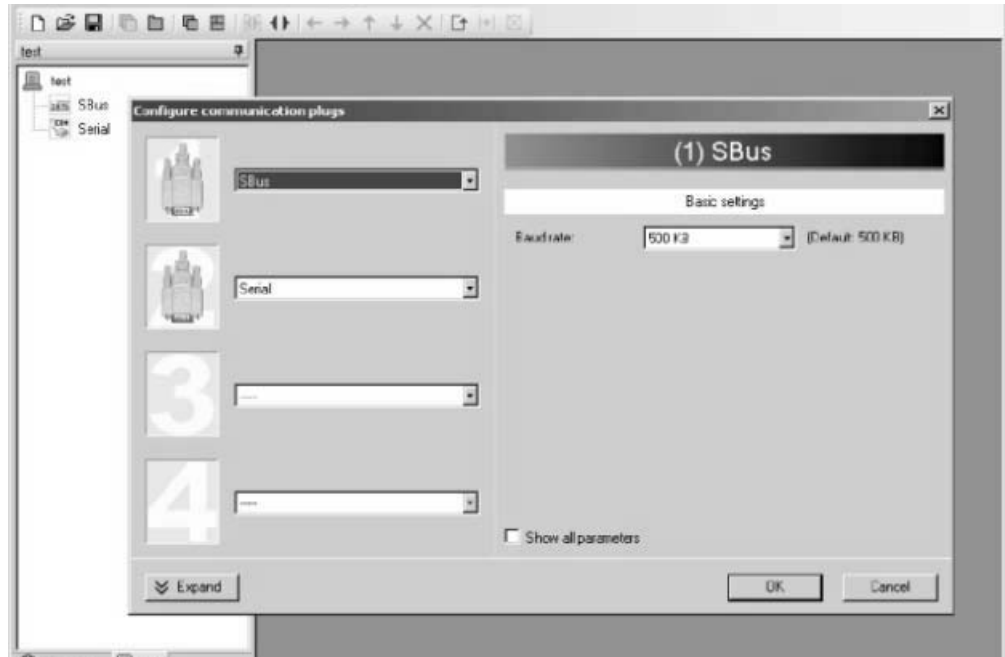


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Step 1: Create project and network

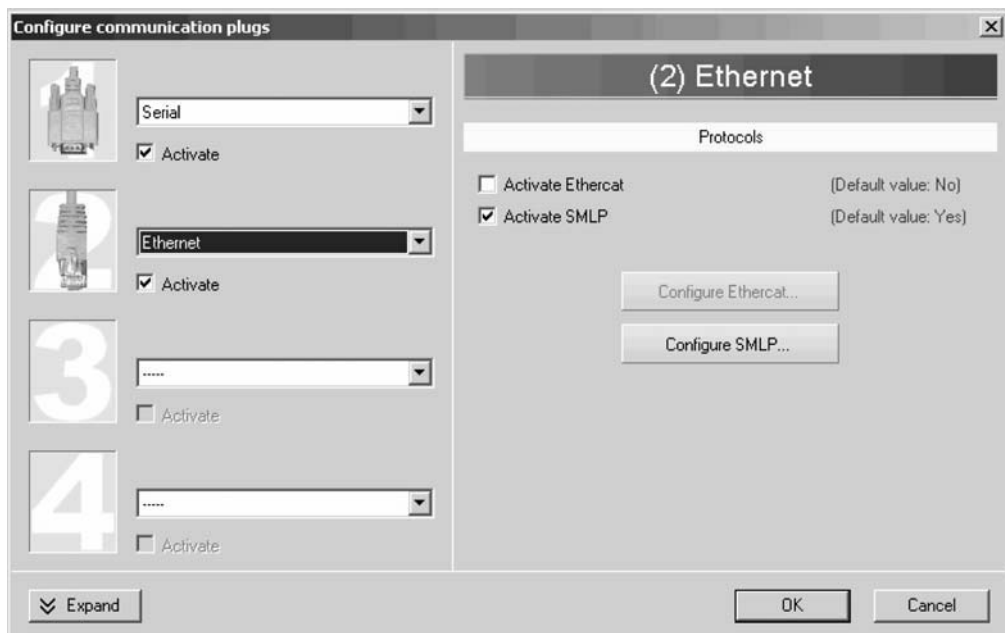
- Check that "New project" is selected and confirm the entry. The "New project" window is displayed.
- Specify a name and directory for the new project and confirm your entries. The "New network" window is displayed.
- Assign a name to the new network and confirm your entry. The main screen opens and the "Configure communication connection" window is called up.



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Step 2: Configure a communication channel


- Set the first or another communication channel to "Ethernet".




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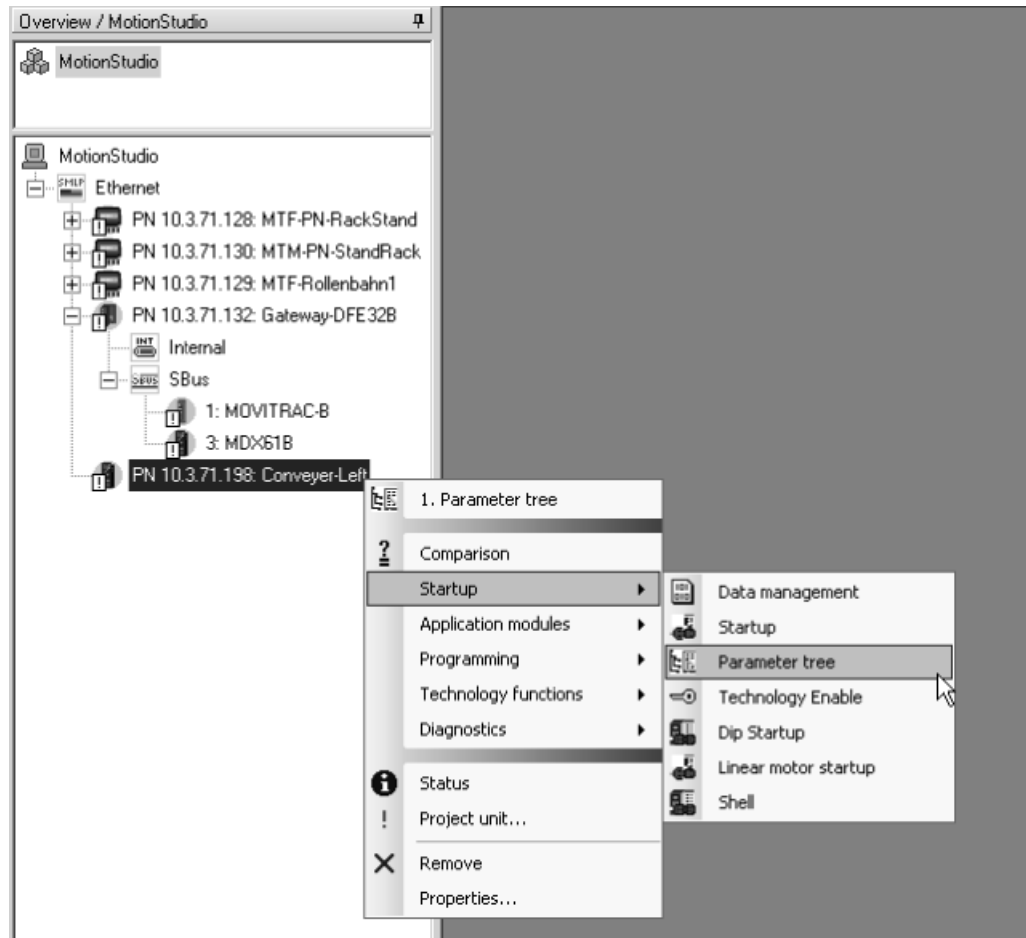


Step 3: Scan a network (device scan)

- Use  to scan the network (device scan).

Step 4: Configure device using tools

- Use  to activate the online mode.
- Select the device you want to configure.
- Use the right mouse button to open the context menu to display the tools for configuring the device.

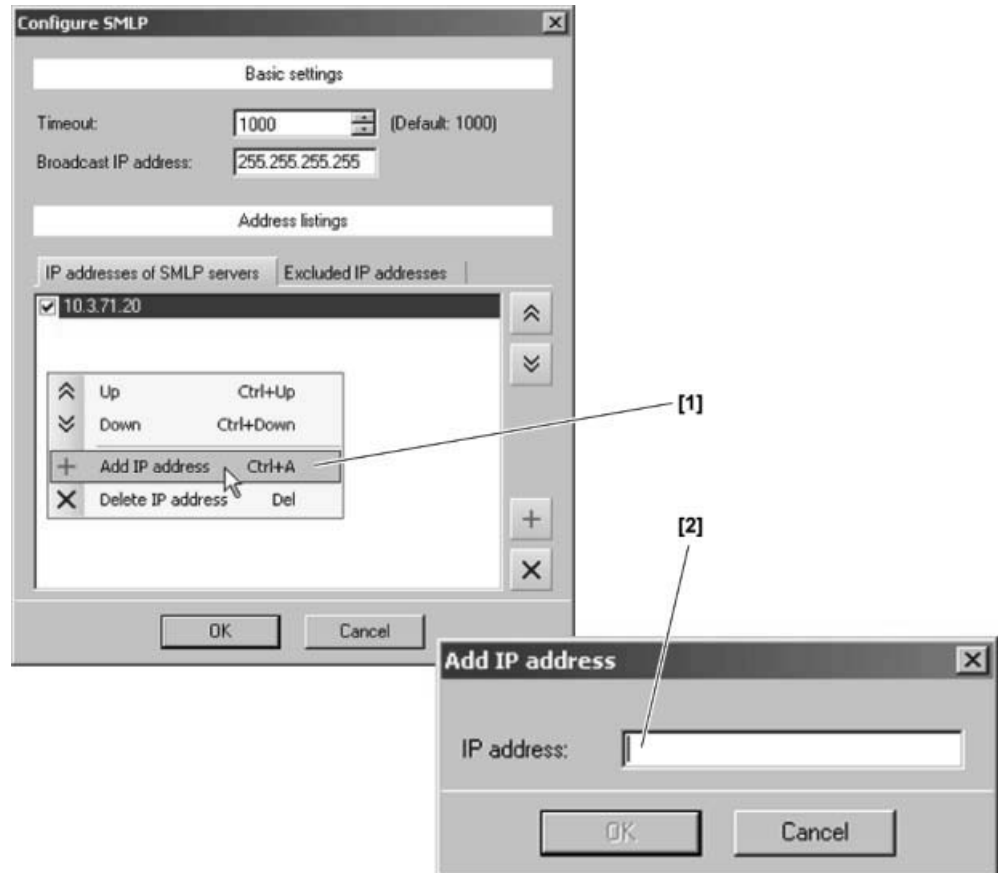


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11.3 Communication with external devices

If you would like to establish Ethernet communication with devices **outside** the local network segment, click the "Set up SMLP" button.



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- To add or delete an IP address, open the context menu [1] by clicking on the button or using the key combination [Ctrl-A].
- Enter the IP address of the DFS22B devices in the "IP address" input field.



Parameter for SMLP

The parameters for SMLP (Simple MOVILINK Protocol) are described in the following table.

Parameter	Description	Note
Timeout	Wait time in milliseconds that the client waits for a response from the server after a request.	Default setting: 1000 ms Increase the value, if necessary, when a delay in communication causes faults.
Broadcast IP address	IP address of the local network segment within which the device scan takes place.	The default setting for the device scan only includes devices that are located in the local network segment.
IP address SMLP server	IP address of the SMLP server or other devices that should be included in the device scan, but which are located outside the local network segment.	Enter the following IP address here: <ul style="list-style-type: none"> • IP address of the SIMATIC S7 controller when you operate direct Ethernet communication on PROFIBUS via SIMATIC S7. • IP address of devices that should be included in the device scan, but which are located outside the local network segment.



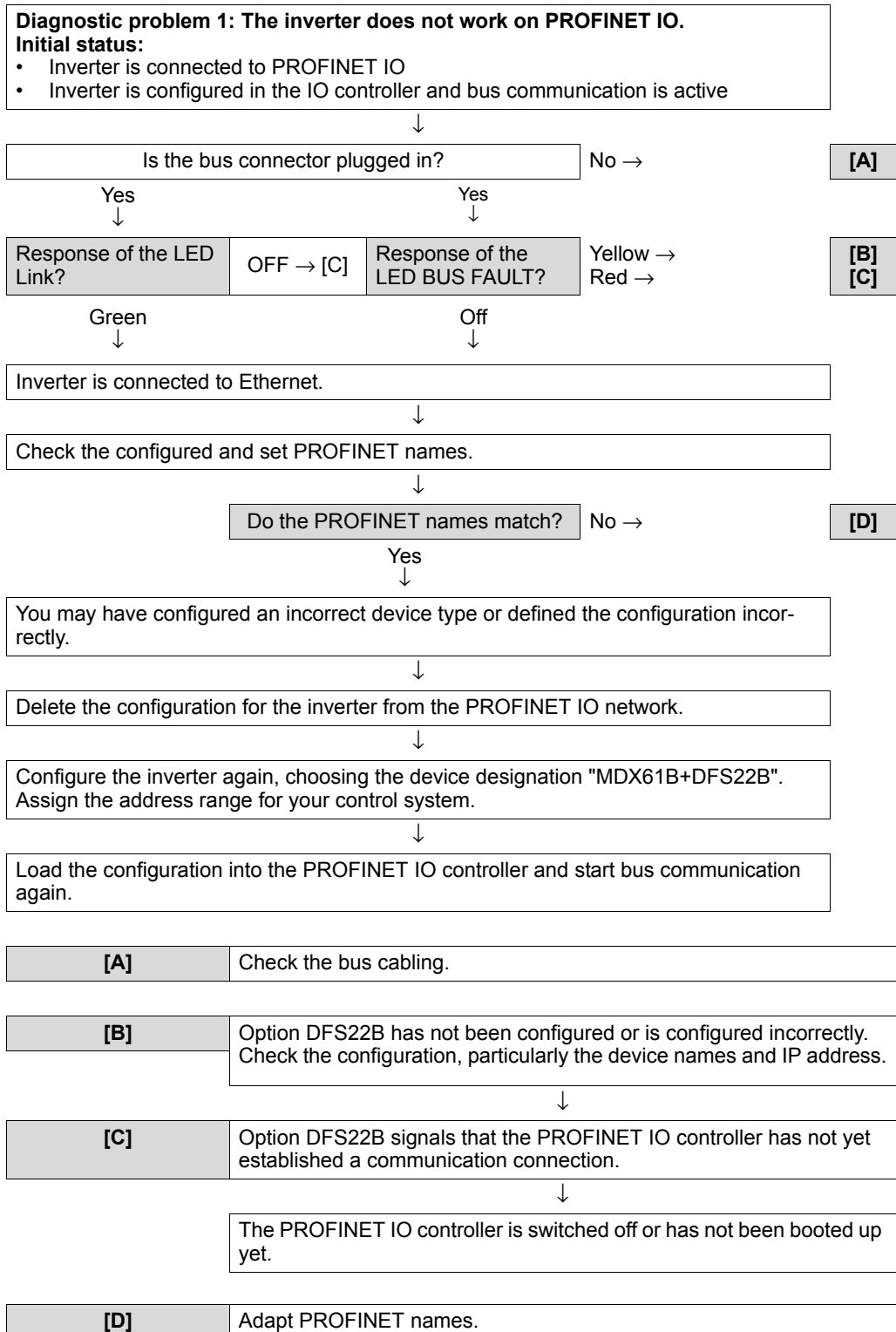
12 Error Diagnostics

12.1 *Diagnostic procedures*

The diagnostic procedures described in the following section demonstrate the error analysis methods for the following problems:

- Inverter does not work on PROFINET IO
- The inverter cannot be controlled using the IO controller.

For more information dealing specifically with the inverter parameter settings for various fieldbus applications, refer to the *Fieldbus Unit Profile manual and the MOVIDRIVE® parameter list*.





Diagnostic problem 2:

The inverter cannot be controlled using the IO controller.

Initial status:

- Bus communication with inverter OK (LED BUS FAULT off)
- Inverter running with 24 V (no supply voltage)



The problem is either caused by incorrect parameter settings in the inverter or a faulty control program in the PROFINET IO controller.



Use P094 ... P097 (setpoint description PO1 ... PO3) to check whether the setpoints sent by the controller are received correctly. To do so, send a setpoint other than 0 as a test in each output word.



Setpoints received?

Yes →

[A]

No



Check that the correct settings have been made for the following drive parameters:

- P100 SETPOINT SOURCE FIELD BUS
- P101 CONTROL SIGNAL SOURCE FIELD BUS
- P876 ENABLE PO DATA YES



Settings OK?

No →

[B]

Yes



The problem may be caused by your control program in the IO controller.



Check that the address used in the program is the same as the configured address.

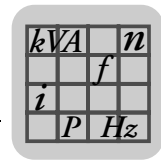
Note that the inverter requires consistent data and access must take place within the control program, if necessary, via special system functions (e.g. SIMATIC S7, SFC 14/15).

[A]

Setpoints are transferred correctly.
Check whether the drive inverter has been enabled at the terminals.

[B]

Correct settings.



13 Technical Data

13.1 DFS22B for MOVIDRIVE® B

Option DFS22B	
Part number	1821 184 4
Power consumption	P = 3 W
Application protocol	<ul style="list-style-type: none"> • PROFINET IO (Ethernet frames with frame ID 8892_{hex}) for controlling and setting the parameters for a drive inverter. • HTTP (Hypertext Transfer Protocol) for diagnostics using a Web browser. • SMLP (Simple Movilink Protocol), protocol used by MOVITOOLS®.
Port numbers used	<ul style="list-style-type: none"> • 300 (SMLP) • 80 (HTTP)
EtherNet services	<ul style="list-style-type: none"> • ARP • ICMP (Ping)
ISO / OSI layer 1/2	EtherNet II
Baud rate	100 MBaud in full-duplex mode
Connection technology	RJ45 with integrated switch and auto-crossing
Addressing	4 Byte IP address or MAC ID (00:0F:69:xx:xx:xx)
Manufacturer ID (Vendor ID)	010A _{hex}
Tools for startup	<ul style="list-style-type: none"> • MOVITOOLS® MotionStudio software package from version 5.40 • DBG60B keypad
Firmware status of MOVIDRIVE® MDX61B	Firmware status 824 854 0.17 or above (→ Display with P076)
Ambient temperature	0 ... 55 °C



14 Index

A

Access protection	73
Assembly and installation instructions	15
Option card DFS22B in	
MOVIDRIVE® MDX61B	15
Option card DFS22B/DCS21B in	
MOVIDRIVE® MDX61B	16
Assembly and installation notes	
Installing and removing an option card	18

C

Configuration	
Reading or writing via database 47	66
Error codes of PROFINET services	67
PROFINET technical data for	
MOVIDRIVE® DFS22B	66
Sample program for SIMATIC S7	66
Configuration and startup	
Configuring the PROFINET IO controller	27
Configuration via PROFIdrive database 47	
Configuration sequence via database 47	53
Configuring PROFIsafe with STEP 7	37
Configuring PROFIsafe properties	37
Description of the F parameters	38
Configuring the PROFINET IO controller	27
Assigning the PROFINET device name	28
Configuring MOVIDRIVE® B	35
Configuring the PROFINET IO connection	
DFS22B	30
Creating a new project	30
Initializing the GSDML file	27
Starting the controller	34
Connection	
Option DFS22B	19
Control	
MOVIDRIVE® MDX61B	45
Control example	46

D

Description of the F parameters	
Parameter "F_CRC_Length"	38
Parameter "F_Dest_Add"	39
Parameter "F_PAR_Vision"	38
Parameter "F_SIL"	38
Parameter "F_Source_Add"	38
Parameter "F_WD_Time"	39
DFS22B	
Connection	19
Operating displays	25
Terminal description	19
DFS22B operating displays	25
Diagnostic procedures	80
Diagnosics with the PROFIsafe option DFS	
Error statuses of the PROFIsafe option DFS	
Safety diagnostics via PROFINET	40

E

Error diagnostics	80
Diagnostic procedures	80
Exclusion of liability	5

G

General information	
Exclusion of liability	5
Right to claim under limited warranty	5
General notes	5
Structure of the safety notes	5

I

Initializing the GSDML file	27
Installing and removing an option card	18
IP address	22

L

LED BUS FAULT	26
LED Link/Activity	26
LED RUN	25

M

MOVIDRIVE® MDX61B	
Control	45
Setting the drive inverter	36
MOVITOOLS® MotionStudio via PROFINET	74

N

Network classes	22
-----------------------	----

O

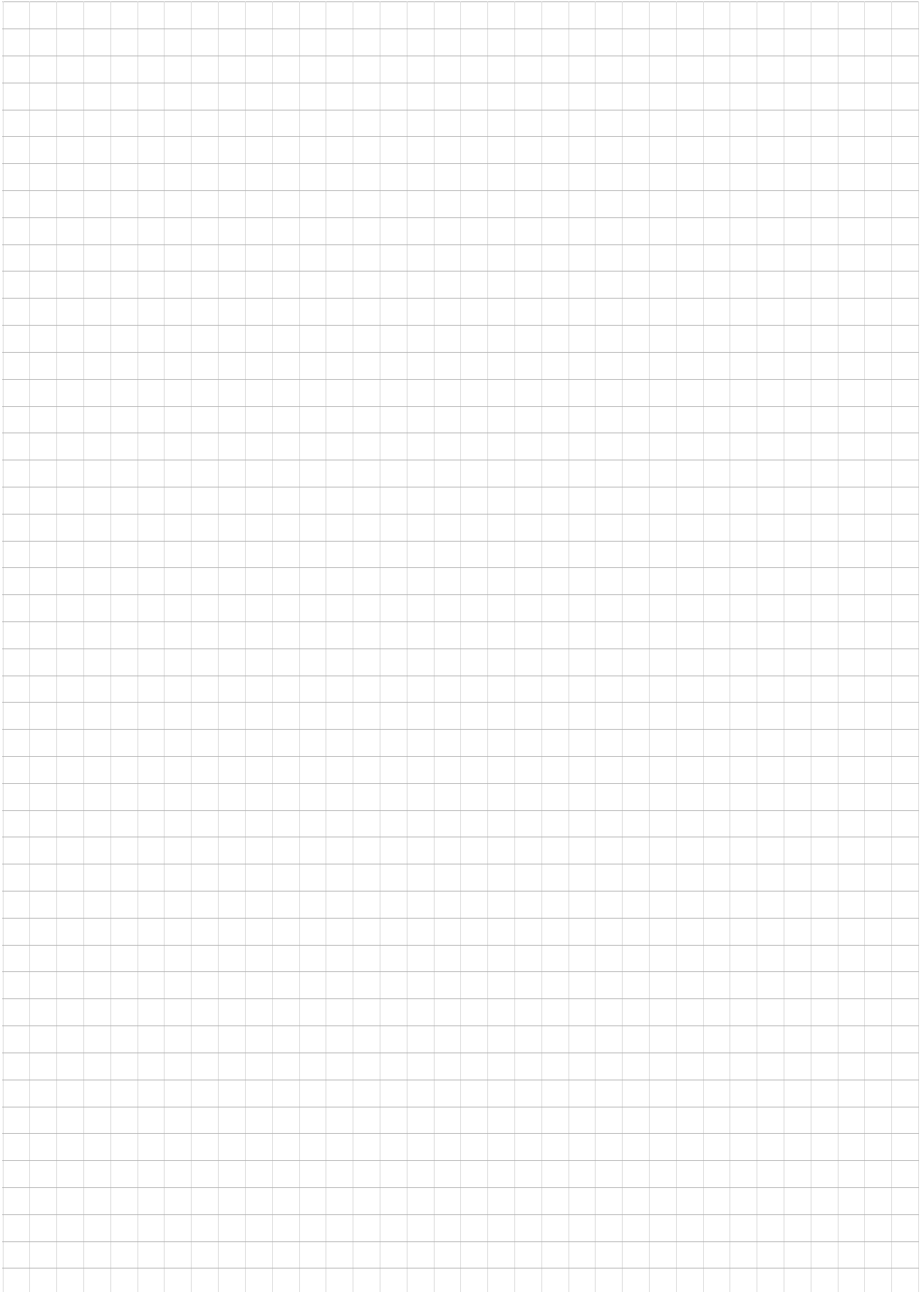
Operating characteristics on PROFINET	41
Communication model	42
Device model	42
Process data configuration	44
Three communication classes	41
Three device types	41
Operating displays	
LED BUS FAULT	26
LED Link/Activity	26

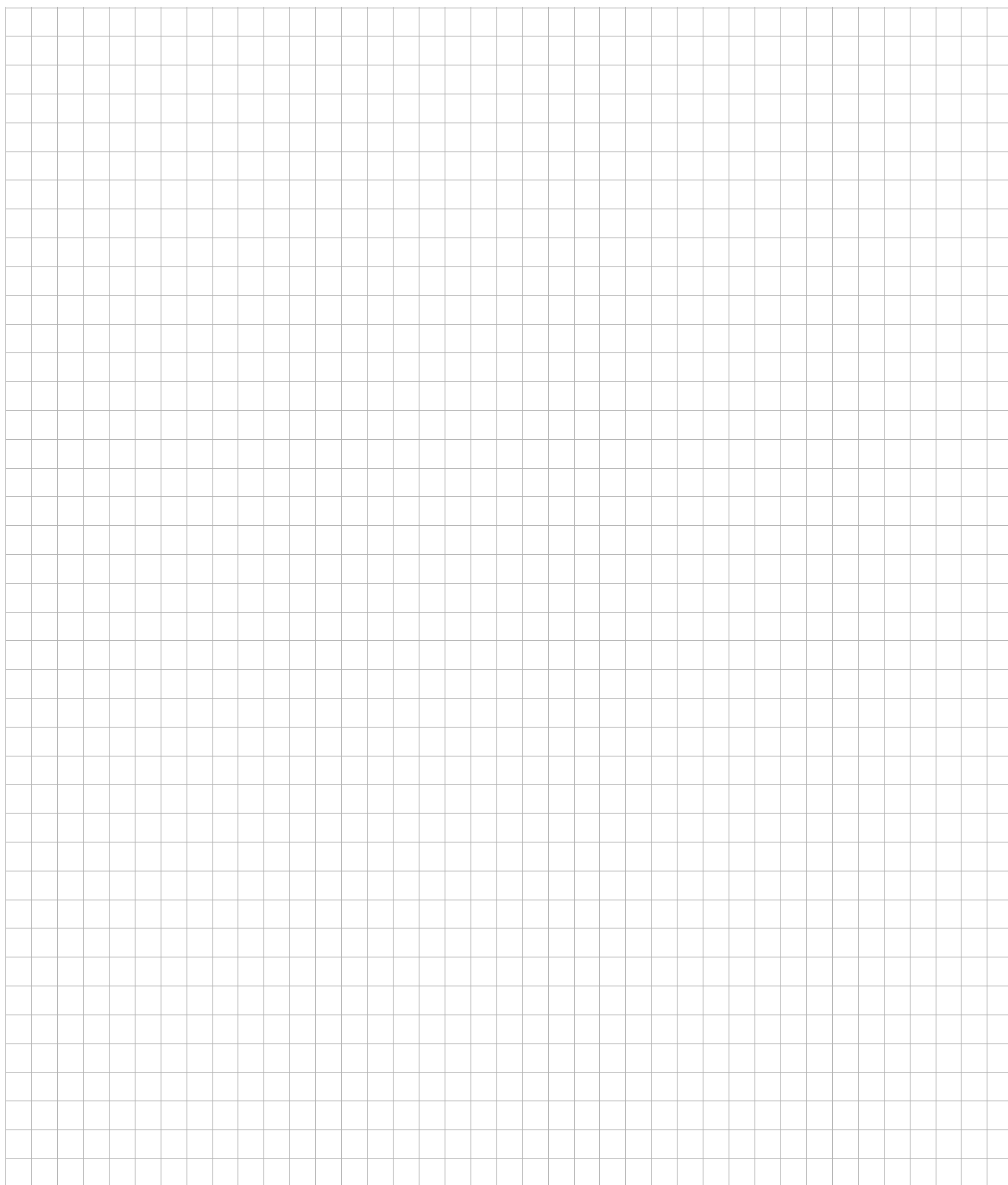
P

Parameter setting via PROFIdrive database 47 .	50
Addressing lower-level inverters	55
Introduction to PROFINET records	50
MOVILINK® parameter requests	56
Processing sequence for	
controller / supervisor	54
PROFIdrive parameter requests	61
Properties of PROFINET devices from	
SEW-EURODRIVE	51
Structure of the PROFINET	
parameter channel	52
Pin assignment	
MOVIDRIVE® - RPOFINET connection	20
RJ45 plug connector	20



Plug-in window	71	W	
<i>Example of the bus monitor plug-in for MOVIDRIVE®</i>	72	Web server	68
Procedure after replacing the unit	25	Access protection	73
Process data configuration	44	Plug-in window	71
Permitted configurations	44	Security settings	68
PROFINET		Software requirements	68
Timeout	46	Structure of the diagnostic applet	70
PROFINET LEDs	25	Structure of the homepage	69
LED RUN	25		
Program example			
SIMATIC S7	47		
R			
Resetting IP address parameters	24		
Right to claim under limited warranty	5		
S			
Safety concept			
Limitations	12		
Schematic representation	13		
Safety notes			
Diagnostics	10		
Fieldbus monitor	10		
General safety notes for bus systems	7		
Hoist applications	7		
Monitoring functions	10		
Other applicable documentation	7		
Sample program			
SIMATIC S7	66		
Setting			
MOVIDRIVE® MDX61B drive inverter	36		
Setting IP address parameters via DCP			
Resetting IP address parameters	24		
Setting IP address parameters via the DCP	24		
Initial startup	24		
Shielding and routing bus cables	21		
SIMATIC S7	46		
Program example	47		
Sample program	66		
Standard gateway	23		
Structure of the diagnostic applet	70		
Structure of the homepage	69		
Structure of the safety notes	5		
Subnet mask	22		
T			
TCP/IP addressing and subnets	22		
IP address	22		
Network classes	22		
Standard gateway	23		
Subnet mask	22		
Technical data for DFS22B	83		
Terminal description			
Option DFS22B	19		
Timeout			
PROFINET	46		





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