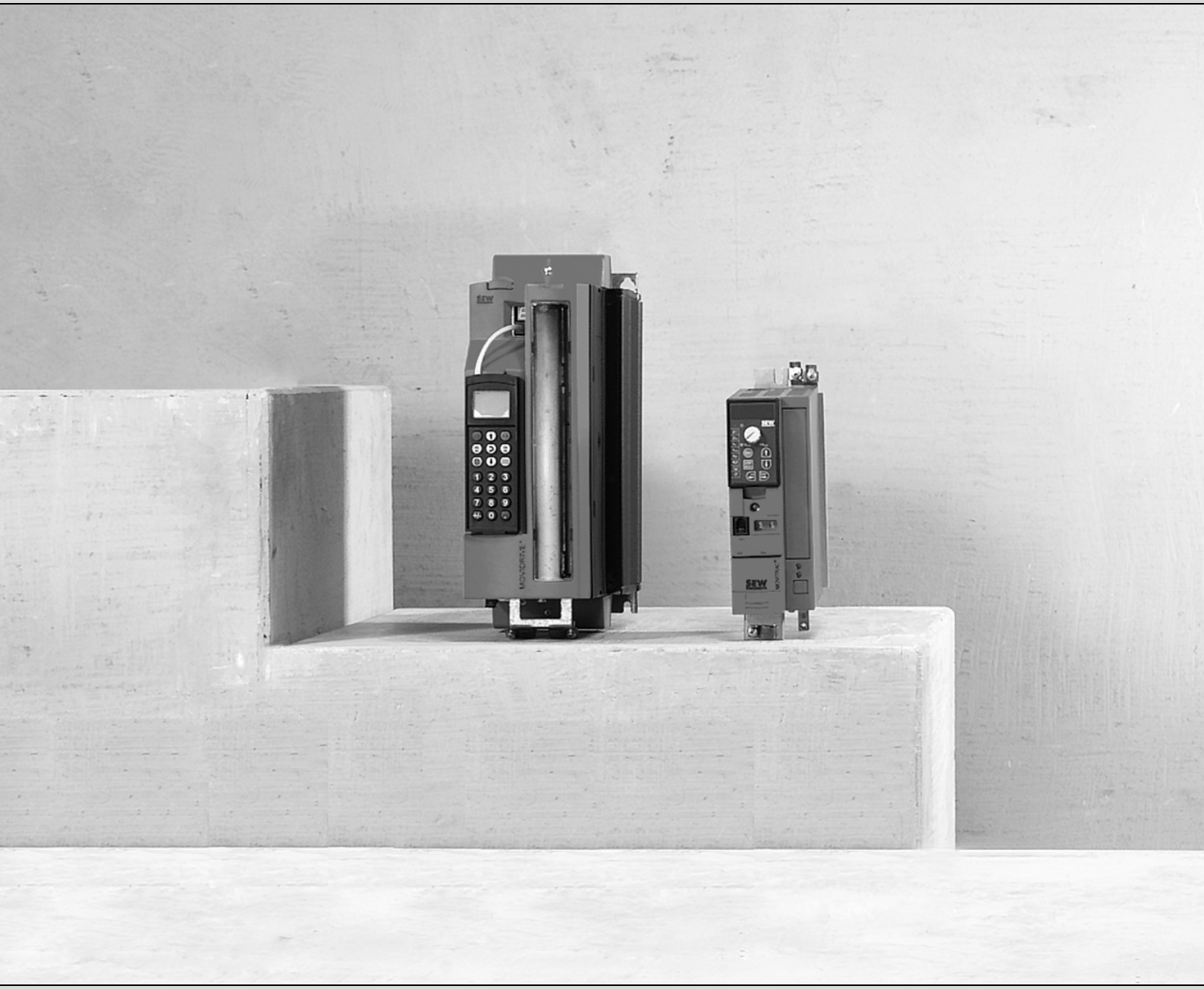
SEW EURODRIVE



Fieldbus Interface
DFE33B EtherNet/IP

Edition 04/2008
11637412 / EN

Manual

SEW
EURODRIVE

1 General Information

1.1 Structure of the safety notes

The safety notes in this manual are designed as follows:

Symbol	SIGNAL WORD
	Nature and source of hazard. Possible consequence(s) if disregarded. • Measure(s) to avoid the hazard.

Symbol	Signal word	Meaning	Consequences if disregarded
Example:  General hazard  Specific hazard, e.g. electric shock	**HAZARD!**	Imminent hazard	Severe or fatal injuries
	WARNING	Possible hazardous situation	Severe or fatal injuries
	CAUTION	Possible hazardous situation	Minor injuries
	**STOP!**	Possible damage to property	Damage to the drive system or its environment
	**NOTE**	Useful information or tip Simplifies drive system handling	

1.2 Rights 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 documentation. Therefore, read the manual before you start operating the device!

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

1.3 Exclusion of liability

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

2 Safety Notes

2.1 Other applicable documentation

- Installation and startup only by trained personnel observing the relevant accident prevention regulations and the following documents:
  - "MOVIDRIVE® MDX60B/61B" operating instructions
  - "MOVITRAC® B" operating instructions
- Read through these documents carefully before you commence installation and startup of the DFE33B option.
- 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® drive 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® MDX60B/61B and MOVITRAC® B inverters may not perform safety functions without higher-level safety systems. Use higher-level safety systems to ensure protection of equipment and personnel.

For safety applications, ensure that the information in the following publications is observed: "Safe Disconnection for MOVIDRIVE® / MOVITRAC® B".

2.4 Hoist applications

MOVIDRIVE® MDX60B/61B and MOVITRAC® B are not designed for use 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 named in these operating instructions 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, such as:

- Electronics scrap
- Plastics
- Sheet metal
- Copper

3 Introduction

3.1 Content of this manual

This user manual describes how to

- Install the DFE33B EtherNet/IP option card in the MOVIDRIVE® MDX61B inverter.
- Use the DFE33B EtherNet/IP option card in the MOVITRAC® B frequency inverter and in the UOH11B gateway housing
- Start up MOVIDRIVE® B in the EtherNet/IP fieldbus system
- Start up MOVITRAC® B on the EtherNet/IP gateway
- Operate MOVITOOLS® MotionStudio via Ethernet
- Perform diagnostics via integrated web server

3.2 Additional documentation

For information on how to connect MOVIDRIVE® / MOVITRAC® B easily and effectively to the EtherNet/IP fieldbus system, you should request the following additional publications about fieldbus technology:

- MOVIDRIVE® Fieldbus Unit Profile manual
- MOVITRAC® B / MOVIDRIVE® MDX60B/61B system manual

The "MOVIDRIVE® Fieldbus Unit Profile" manual and the MOVITRAC® B" system manual provide a description of the fieldbus parameters and their coding, as well as an explanation of the various control concepts and application options in the form of brief examples.

The MOVIDRIVE® fieldbus unit profile manual contains a listing of all parameters of the drive inverter which can be read or written via the various communication interfaces, such as system bus, RS-485 and also via the fieldbus interface.

3.3 Features

With the DFE33B EtherNet/IP option and the powerful universal fieldbus interface, the MOVIDRIVE® MDX61B drive inverter and the MOVITRAC®B frequency inverter allow for a connection to higher-level automation systems.

3.3.1 MOVIDRIVE®, MOVITRAC® B and EtherNet/IP

The unit behavior of the inverter that forms the basis of EtherNet/IP 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 fieldbus-independent drive applications. This makes it much easier to change to other bus systems, such as DeviceNet (option DFD).

3.3.2 Access to all information

SEW drives offer digital access to all drive parameters and functions via the EtherNet/IP interface. The drive inverter is controlled via fast, cyclic process data. Via this process data channel, you can enter setpoints such as the setpoint speed, ramp generator time for acceleration/deceleration, etc. as well as trigger various drive functions such as enable, control inhibit, normal stop, rapid stop, etc. However, at the same time you can also use this channel to read back actual values from the drive inverter, such as the actual speed, current, unit status, fault number and 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® / MOVITRAC® specifically to your application. You can determine, for instance, which of the drive inverter's error responses should be triggered in the event of a bus error. A rapid stop is a good idea for many applications, although this can also be achieved by 'freezing' the last setpoints so the drive continues operating with the most recently valid setpoints (for example, conveyor belt). As the control terminals also function in fieldbus operation, you can still implement fieldbus-independent emergency stop concepts via the terminals of the drive inverter.

3.3.4 Diagnostics

The MOVIDRIVE® drive inverter and the MOVITRAC® B frequency inverter offer you numerous diagnostics options for startup and service. You can, for instance, use the fieldbus monitor integrated in MOVITOOLS® MotionStudio to control setpoint values sent from the higher-level controller as well as the actual values. The integrated Web server allows you to access the diagnostic values using a standard browser (such as Internet Explorer).

3.3.5 Fieldbus monitor

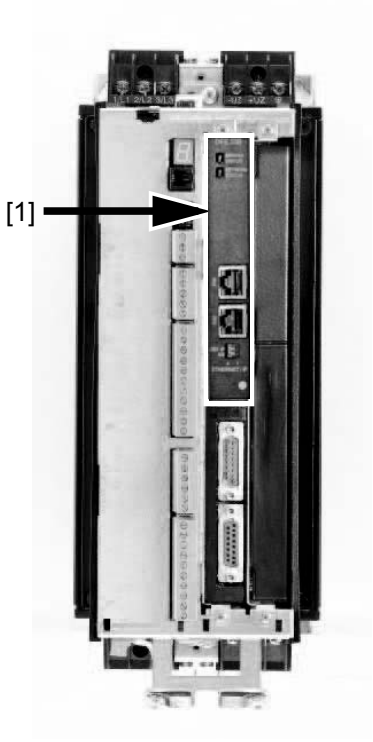
Furthermore, you are supplied with a variety of additional information about the status of the fieldbus interface. The fieldbus monitor function in conjunction with the MOVITOOLS® MotionStudio PC software offers you an easy-to-use diagnostic tool for setting all drive parameters (including the fieldbus parameters) and for displaying the fieldbus and device status information in detail.

4 Assembly and Installation Instructions

This section contains information about assembly and installation of the DFE33B EtherNet/IP option card in MOVIDRIVE® MDX61B, MOVITRAC® B and the UOH11B gateway housing.

4.1 Installing the DFE33B option card in MOVIDRIVE® MDX61B

	NOTES
	• **Only SEW-EURODRIVE personnel may install or remove option cards for MOVIDRIVE® MDX61 B size 0**. • **Users may only install or remove option cards for MOVIDRIVE® MDX61B sizes 1 to 6.** • Plug the DFE33B EtherNet/IP option card into the fieldbus slot [1]. • Only use connectors and cables approved for EtherNet/IP when cabling. • The DFE33B option is powered via MOVIDRIVE® B. A separate voltage supply is not required.



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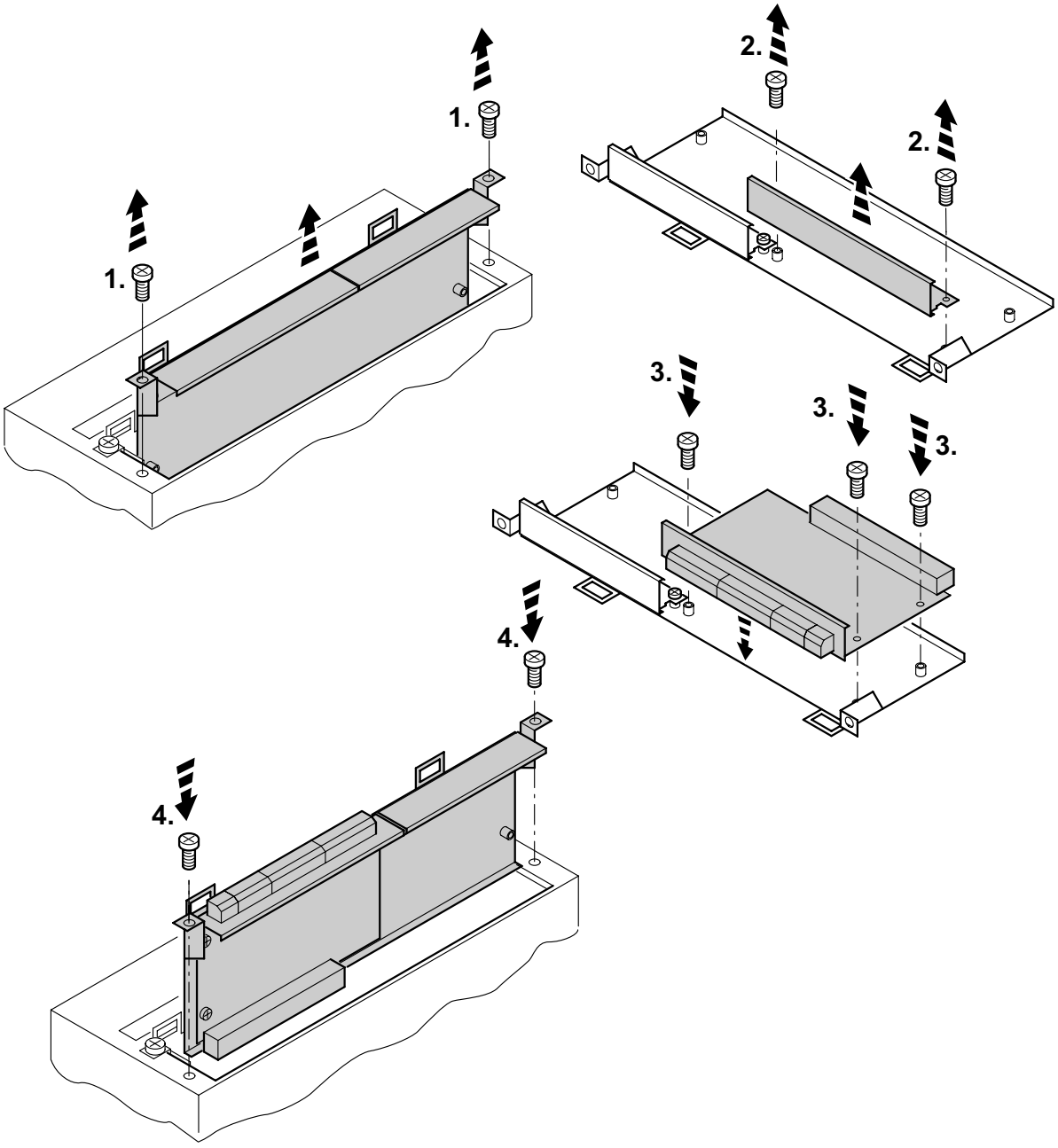
4.1.1 Before you start

Observe 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 to protect the option card from electrostatic charge (use discharge strap, conductive shoes, and so on) before touching it.
- **Before installing** the option card, remove the keypad and the front cover (→ MOVIDRIVE® MDX60B/61B operating instructions, section "Installation").
- **After having installed** the option card, replace the keypad and the front cover (→ MOVIDRIVE® MDX60B/61B operating instructions, section "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 components.

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



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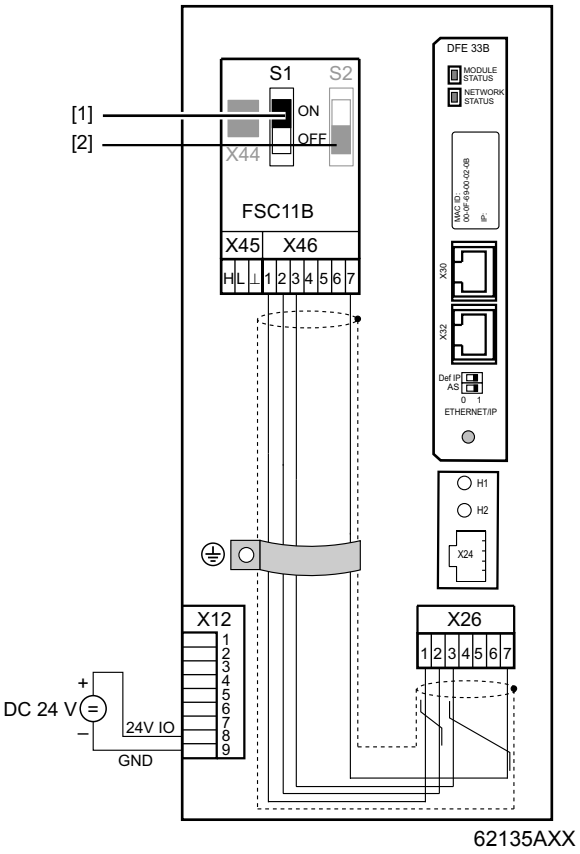
1. Remove the two retaining screws holding the card retaining bracket. Pull the card retaining bracket out evenly from the slot (do not twist!).
2. Remove the two retaining screws of the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the retaining bracket so that the three retaining screws fit into the corresponding bores 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.

4.2 Installing the DFE33B option card in MOVITRAC® B

	NOTE
	Only SEW-EURODRIVE engineers are allowed to install or remove option cards for MOVITRAC® B.

4.2.1 Connecting the system bus between a MOVITRAC® B unit and the DFE33B option



[1] Terminating resistor activated, S1 = ON

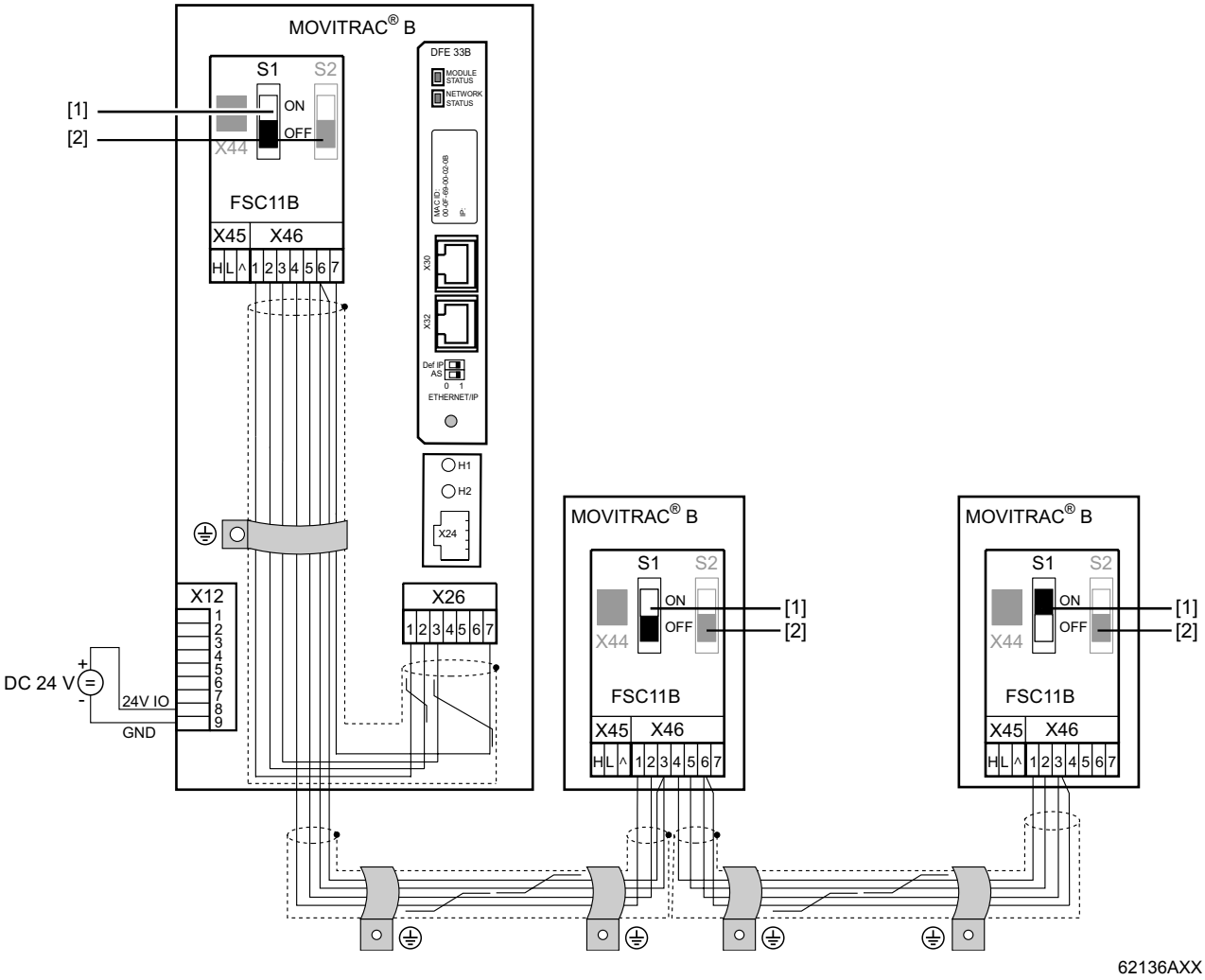
[2] DIP switch S2 (reserved), S2 = OFF

X46	X26	Terminal assignment
X46:1	X26:1	SC11 SBus +, CAN high
X46:2	X26:2	SC12 SBus –, CAN low
X46:3	X26:3	GND, CAN GND
	X26:4	Reserved
	X26:5	Reserved
X46:6	X26:6	GND, CAN GND
X46:7	X26:7	DC 24 V

X12	Terminal assignment
X12:8	DC+24 V input
X12:9	GND reference potential for the binary inputs

To simplify cabling, the DFE33B option can be supplied with DC 24 V from X46.7 of the MOVITRAC® unit to X26.7. MOVITRAC® B must be supplied with DC 24 V at terminals X12.8 and X12.9 when it supplies the DFE33B option. Activate the system bus terminating resistor at the FSC11B option (S1 = ON).

4.2.2 Connecting the system bus between several MOVITRAC® B units



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[1] **Only** terminating resistor at the last unit is activated, S1 = ON

[2] DIP switch S2 (reserved), S2 = OFF

MOVITRAC® B		**DFE33B in the UOH11B gateway housing**	
X46	**Terminal assignment**	**X26**	**Terminal assignment**
X46:1	SC11 (System bus high, incoming)	X26:1	SC11 SBus +, CAN high
X46:2	SC12 (System bus low, incoming)	X26:2	SC12 SBus –, CAN low
X46:3	GND (System bus reference)	X26:3	GND, CAN GND
X46:4	SC21 (System bus high, outgoing)	X26:4	Reserved
X46:5	SC22 (System bus low, outgoing)	X26:5	Reserved
X46:6	GND (System bus reference)	X26:6	GND, CAN GND
X46:7	DC 24 V	X26:7	DC 24 V

X12	**Terminal assignment**
X12:8	DC+24 V input
X12:9	GND reference potential for the binary inputs

Please note:

- Use a 2x2 core twisted and shielded copper cable (data transmission cable with braided copper shield). Connect the shield flatly on both sides of the electronics shield clamp of MOVITRAC®. Also connect the ends of the shield to GND. The cable must meet the following specifications:
  - Cable cross section 0.25 mm^2 (AWG18) ... 0.75 mm^2 (AWG23)
  - Cable resistance 120 Ω at 1 MHz
  - Capacitance per unit length = 40 pF/m at 1 kHz
    Suitable cables are CAN bus or DeviceNet cables.
- The permitted total cable length is 80 m (260 ft). The SBus baud rate has a fixed setting of 500 kBaud.
- Connect the system bus terminating resistor (S1 = ON) at the end of the system bus connection. Switch off the terminating resistor on the other units (S1 = OFF). The DFE33B gateway must always be connected either at the beginning or the end of the system bus connection. The terminating resistor is permanently installed.

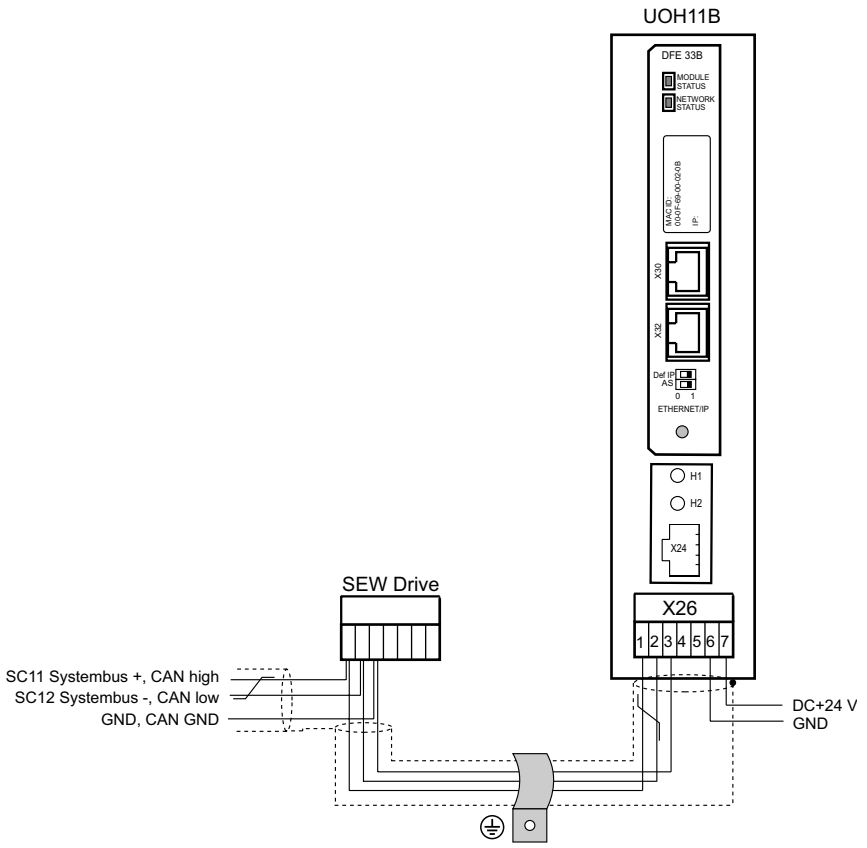
NOTES

- There must not be any potential displacement between the units connected with the SBus. Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.
- Point-to-point SBus wiring is not permitted.

4.3 Installing the DFE33B gateway / UOH11B

The following figure shows the connection of the DFE33B option via the UOH11B gateway housing.

	NOTE
	Only SEW-EURODRIVE engineers are allowed to install or remove option cards in/from the UOH11B gateway housing.



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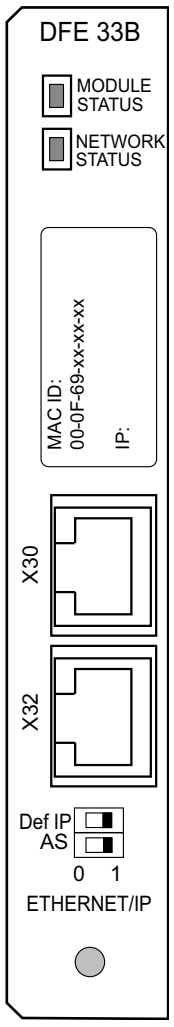
UOH11B gateway housing	
X26	**Terminal assignment**
X26:1	SC11 system bus +, CAN high
X26:2	SC12 system bus -, CAN low
X26:3	GND, CAN GND
X26:4	Reserved
X26:5	Reserved
X26:6	GND, CAN GND
X26:7	DC 24 V

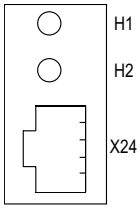
The gateway housing requires a power supply of DC 24 V that is connected to X26.

Connect the system bus terminating resistor at the end of the system bus connection.

4.4 Connection and terminal description of the DFE33B option

Part number EtherNet/IP interface option type DFE33B: 1821 346 4

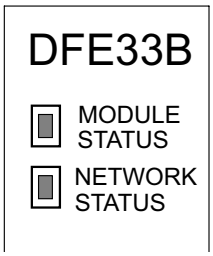
Front view of DFE33B	Description	DIP switch	Function
 62138AXX	**LED MODULE STATUS (red/green)** **LED NETWORK STATUS (red/green)**		Shows the current status of the DFE33B option. Shows the status of the EtherNet/IP connection.
	MAC address **IP input field** **X30: Ethernet connection** **LED Link (green)** **LED Activity (yellow)** **X32: Ethernet connection** **LED Link (green)** **LED Activity (yellow)**		MAC address, e.g. to configure the DHCP server. You can enter the allocated IP address in this field.
	DIP switch	**DEF IP** **AS**	Resets the address parameters to their default values and deactivates DHCP • IP address: 192.168.10.4 • Subnetwork mask: 255.255.255.0 • Gateway: 1.0.0.0 Auto setup for gateway operation

Front view of MOVITRAC ®B and UOH11B	Description	Function
 58129AXX	**LED H1 (red)**	System bus error (only for gateway functions)
	LED H2 (green)	Reserved
	X24 X terminal	RS485 interface for diagnostics via PC and MOVITOOLS® MotionStudio (only for MOVITRAC® B)

4.5 Status LED of the DFE33B option

4.5.1 EtherNet/IP LEDs

The LEDs of the DFE33B indicate the current condition of the DFE33B option and the EtherNet/IP system.



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LED MODULE STATUS

The **MODULE STATUS** LED indicates that the bus electronics are operating correctly

States of the MODULE STATUS LED	Meaning
Off	The DFE33B option card is not supplied with voltage or is defective
Flashing green	• If the NETWORK STATUS LED is off at the same time, the TCP/IP stack of the DFE33B option card will be started. If this status continues and DHCP is activated, the DFE33B option card waits for data from the DHCP server. • If the NETWORK STATUS LED is flashing green at the same time, the application of the DFE33B option card is started.
Flashing green/red	The DFE33B option card performs an LED test.
Green	Indicates the standard operating state of the DFE33B option card
Red	The DFE33B option card is in fault state.
Flashing red	A conflict while assigning the IP address was detected. Another station in the network uses the same IP address.

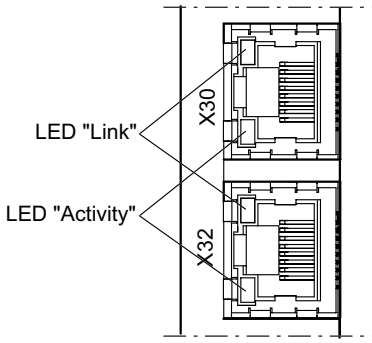
NETWORK STATUS LED

The **NETWORK STATUS** LED indicates the status of the EtherNet/IP system.

States of the NETWORK STATUS LED	Meaning
Off	The DFE33B option does not yet have any IP parameters.
Flashing green/red	The DFE33B option card performs an LED test.
Flashing green	There is no controlling IO connection.
Green	There is a controlling EtherNet/IP IO connection.
Red	A conflict while assigning the IP address was detected. Another station in the network uses the same IP address.
Flashing red	The previously established controlling IO connection is in timeout status. The status is reset by restarting communication.

Link / Activity LEDs

The two LEDs **Link (green)** and **Activity (yellow)** are integrated in the RJ45 plug connectors (X30, X32) and display the status of the Ethernet connection.



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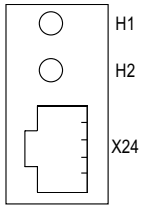
LED / status	Meaning
Link / green	There is an Ethernet connection.
Activity / yellow	Data is currently being exchanged via Ethernet.
Link / off	There is no Ethernet connection.

NOTE

As the firmware of the DFE33B option card requires approximately 15 seconds for initialization, the status "0" (inverter not ready) is displayed in the 7-segment display of MOVIDRIVE® during this time.

4.5.2 Gateway LED

LEDs H1 and H2 indicate the communication status in gateway operation.



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LED H1 Sys-Fault (red)	Only for gateway operation	
Status	**State**	**Description**
Red	System bus error	Gateway is not configured or one of the drives is inactive
Off	SBus ok	Gateway is configured correctly
Flashes	Bus scan	Bus is being checked by the gateway

- LED **H2** (green) is currently reserved.
- X-terminal X24 is the RS-485 interface for diagnostics via PC and MOVITOOLS® MotionStudio.

4.6 Connector assignment

Use prefabricated, shielded RJ45 plug connectors compliant with IEC 11801 edition 2.0, category 5.

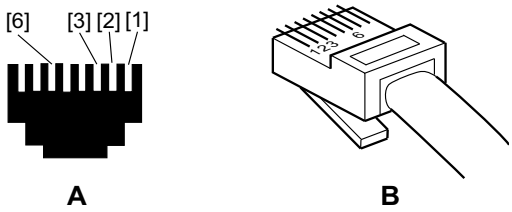

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Figure 1: Pin assignment of an RJ45 plug connector

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® / MOVITRAC® B / Ethernet connection

To connect DFE33B to the Ethernet, connect the Ethernet interface X30 or X32 (RJ45 plug connector) to the other network stations using a category 5, class D twisted-pair cable in accordance with IEC 11801 edition 2.0. The integrated switch provides support for realizing a line topology and has Autocrossing capability.

	NOTES
	• According to IEC 802.3, the maximum cable length for 10/100 MBaud Ethernet (10BaseT / 100BaseT), e.g. between two network stations, is 100 m. • We recommend that you do not directly connect end devices to the DFE33B option in order to minimize the load on the end devices caused by undesired multicast data traffic. Connect non-SEW devices via a network component that supports the IGMP snooping functionality (e.g. managed switch).

4.7 Shielding and routing bus cables

Only use shielded cables and connection elements that also meet the requirements of category 5, class 2 in compliance with 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 line 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.

STOP	**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). Make sure you supply adequate equipotential bonding in accordance with relevant VDE regulations in such a case.

4.8 Setting the DIP switches

i	**NOTE** The setting of the "Def IP" DIP switch is only adopted with a power-on reset (switching on and off mains and DC 24 V backup voltage).

Def IP

When the "Def IP" switch is set to "1" (= ON), the following default IP address parameters are set when activating the DC 24 V backup voltage:

- IP address: 192.168.10.4
- Subnetwork mask: 255.255.255.0
- Default gateway: 1.0.0.0
- P785 DHCP / Startup configuration: Saved IP parameters (DHCP is deactivated)

AS

The "AS" DIP switch is used to configure the SBus communication of the gateway (→ section "Auto setup for gateway operation").

The configuration becomes active when the "AS" DIP switch is set from "0" to "1". To continue operation, the "AS" DIP switch must remain in "1" position (= ON).

4.9 TCP / IP addressing and subnetworks

Introduction

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

- MAC address
- IP address
- Subnetwork mask
- Standard gateway

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

MAC address

Basis for all Ethernet addresses is the MAC address (Media Access Control). The MAC address is a worldwide unique 6-byte value (48 bits) assigned to the Ethernet device. SEW Ethernet devices have the MAC address 00-0F-69-xx-xx-xx. For extended networks the MAC address is not suitable. Free assignable IP addresses are therefore used.

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 decimal numbers separated by decimal points.

Example: 192.168.10.4

Each decimal number 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 subnetwork 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 a number of networks. They also use an explicit, adjustable subnet mask.

Subnetwork mask

A subnetwork mask is used to divide the network classes into even finer sections. The subnetwork mask is represented by four decimal numbers separated by decimal points, in the same way as the IP address.

Example: 255.255.255.128

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

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

If you compare the IP addresses with the subnetwork masks, you see that in the binary representation of the subnetwork mask all ones determine the network address and all the zeros determine the station address (→ following table).

		Byte 1		Byte 2		Byte 3		Byte 4
IP address	Decimal	192	.	168.	.	10	.	129
	Binary	11000000	.	10101000	.	00001010	.	10000001
Subnetwork 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 subnetwork mask. Two networks are created with the address 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 subnetwork 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 for passing on the data.

Standard gateway

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

DHCP (Dynamic Host Configuration Protocol)

Instead of setting the three parameters IP address, subnetwork mask and standard gateway manually, they can be assigned in an automated manner by a DHCP server in the Ethernet network.

This means the IP address is assigned from a table, which contains the allocation of MAC address to IP address.

Parameter P785 indicates whether the DFE33B option expects the IP parameters to be assigned manually or via DHCP.

4.10 Setting the IP address parameters

Initial startup

The "DHCP" protocol ("**D**ynamc **H**ost **C**onfiguration **P**rotocol) is activated as the default setting for the DFE33B option. This means that the DFE33B option card expects its IP address parameters from a DHCP server.

	NOTE
	Rockwell Automation provides a DHCP server free-of-charge on their homepage. The tool is known as "BOOTP Utility" and can be downloaded from the following website: http://www.ab.com/networks/bootp.html.

Once the DHCP server has been configured and the settings have been made for the subnetwork screen and the standard gateway, the DFE33B must be inserted in the assignment list of the DHCP server. In doing so, the MAC ID of the DFE33B option is allocated a valid IP address.

	NOTE
	The configured IP address parameters are stored permanently in the parameter set when DHCP is deactivated after having assigned the IP address.

Changing the IP address parameters after successful initial startup

If the DFE33B was started using a valid IP address, you can also access the IP address parameters via the Ethernet interface.

The following options are available for changing the IP address parameters via Ethernet:

- Via the homepage of DFE33B (→ section "Integrated Web Server")
- Using the MOVITOOLS® MotionStudio software via (→ section "MOVITOOLS® MotionStudio via Ethernet")
- Using the EtherNet/IP TCP/IP interface object (→ section "EtherNet/IP CIP object directory")

Additionally, you can change the IP address parameters via the serial interface of the gateway or MOVIDRIVE® MDX61B or using the DBG60B keypad (in MOVIDRIVE® B).

If the IP address parameters are assigned to the option DFE33B via a DHCP server, you can only change the parameters by adjusting the settings of the DHCP server.

The options listed above for changing the IP address parameters only come into effect once the supply voltages (mains **and** DC 24 V) have been switched off and back on again.

Deactivating / activating the DHCP

The type of IP address allocation is determined by the setting of the attribute *Configuration Control* of the EtherNet/IP TCP / IP interface object. The value is displayed or modified in the parameter *P785 DHCP / Startup Configuration*.

- Setting "Saved IP parameters"

  The saved IP address parameters are used.
- Setting "DHCP"

  The IP address parameters are requested by a DHCP server.

  If you use the DHCP server from Rockwell Automation, you can activate or deactivate the DHCP via a button. In this case, an EtherNet/IP telegram is sent to the TCP/IP interface object of the station that is being addressed.

Resetting the IP address parameters

If you do not know the IP address parameters and there is no serial interface or DGB60B keypad for reading the IP address, you can reset the IP address parameters to the default values using the DIP switch "Def IP".

This action resets the DFE33B option to the following default values:

- IP address: 192.168.10.4
- Subnetwork mask: 255.255.255.0
- Default gateway: 1.0.0.0
- P785 DHCP / Startup configuration: Saved IP parameters (DHCP is deactivated)

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

- Switch off the DC 24 V supply voltage and the mains voltage.
- Set the DIP switch "Def IP" on the DFE33B option to "1".
- Switch the DC 24 V supply voltage and the mains voltage back on.
- Wait until the DFE33B option boots up. The "MODULE STATUS" LED is green when the option is ready.
- Set the DIP switch "Def IP" on the DFE33B option to "0".
- The following options are available to assign the new IP address:
  - Via the homepage of DFE33B (→ Sec. "Integrated Web Server")
  - Using the MOVITOOLS® MotionStudio software via (→ section "MOVITOOLS® MotionStudio via Ethernet")
  - Via the EtherNet/IP TCP/IP interface object (→ Sec. "EtherNet/IP CIP object directory")

	NOTE
	• DHCP remains deactivated when you reset the DIP switch "Def IP" to "0". You can activate DHCP via DHCP server from Rockwell Automation, parameter P785, the integrated web server or via the EtherNet/IP TCP / IP interface object (→ section "EtherNet/IP CIP object directory"). • DHCP is not activated again when resetting the values to the default setting (*P802 Factory setting*).

4.11 Procedure for replacing the unit

If the DIP switch "Def IP" of the DFE33B option is set to "1" (= ON), then the DIP switch "Def IP" on the new DFE33B must also be set to "1" (= ON) (when replacing the option card or the MOVIDRIVE® B / MOVITRAC® B / gateway housing with option card mounted in). Other IP parameter settings are not required.

If the DIP switch "Def IP" of the DFE33B option is set to "0" (= OFF), it is important that you observe the following section when replacing the option card or a unit with option card:

- Section "Replacing MOVIDRIVE® B"
- Section "Replacing MOVITRAC® B / gateway"

4.11.1 Replacing MOVIDRIVE® B

When the DFE33B EtherNet/IP fieldbus interface is used as option card in MOVIDRIVE® B, the procedure for replacement depends on the following factors:

- Whether DHCP is activated or a saved IP address is used
- Whether the memory card of the replaced MOVIDRIVE® MDX61B is plugged into the new unit or not

If DHCP is active, the assignment list of the DHCP server must be updated when the DFE33B option or MOVIDRIVE® B with DFE33B option is replaced. The MAC address of the DFE33B option is printed on its front panel for this purpose.

If DHCP is not active, the IP parameters saved on the memory card of MOVIDRIVE® B will be used.

If the memory card of MOVIDRIVE® B is not plugged into the new unit when replacing it, you will have to perform complete startup of the new inverter (if DHCP is not active including the IP parameters). Instead, you can download a data backup created with the MOVITOOLS® MotionStudio software or saved in the DBG60B keypad.

Enter the IP address, which is set in the DFE33B or defined in the assignment list of the DHCP server, into the field on the front panel of the DFE33B option for future diagnostic or engineering purposes.

4.11.2 Replacing MOVITRAC® B / gateway

When the DFE33B EtherNet/IP fieldbus interface is operated as option card in MOVITRAC® B or in the UOH11B gateway housing, the procedure for replacement depends on the following factors:

- Whether DHCP is activated or a saved IP address is used
- Whether the DFE33B option is installed in MOVITRAC® B or in the gateway housing

If DHCP is active, the assignment list of the DHCP server must be updated when the DFE33B option or MOVITRAC® B with DFE33B option is replaced. The MAC address of the DFE33B option is printed on its front panel for this purpose.

If DHCP is not active, the IP parameters saved non-volatile on the DFE33B option will be used. Set the IP parameters just like for initial startup. Instead, you can download a data backup created with MOVITOOLS® MotionStuduio (from version 5.50).

If a MOVITRAC® B with DFE33B is replaced by a new unit, inverter startup will have to be performed in addition to setting the IP parameters. Refer to the MOVITRAC® B operating instructions for more information.

Enter the IP address, which is set in the DFE33B or defined in the assignment list of the DHCP server, into the field on the front panel of the DFE33B option for future diagnostic or engineering purposes.

5 Project Planning and Startup

This section provides you with information on project planning for the EtherNet/IP master and startup of the drive inverter for fieldbus operation.

	NOTE
	Current versions of the EDS files for the DFE33B option are available on the SEW homepage (http://www.sew-eurodrive.com) under the heading "Software".

5.1 Validity of the EDS file for DFE33B

	NOTE
	Entries in the EDS file must not be changed or expanded. SEW assumes no liability for inverter malfunctions caused by a modified EDS file!

SEW-EURODRIVE provides two different EDS files for configuring the scanner (EtherNet/IP master).

- If the DFE33B option is used as a fieldbus option in MOVIDRIVE® B, the file SEW_MOVIDRIVE_DFE33B.eds is required
- If the DFE33B option is used as a gateway in MOVITRAC® B or in the gateway housing (UOH11B), the file SEW_GATEWAY_DFE33B.eds is required

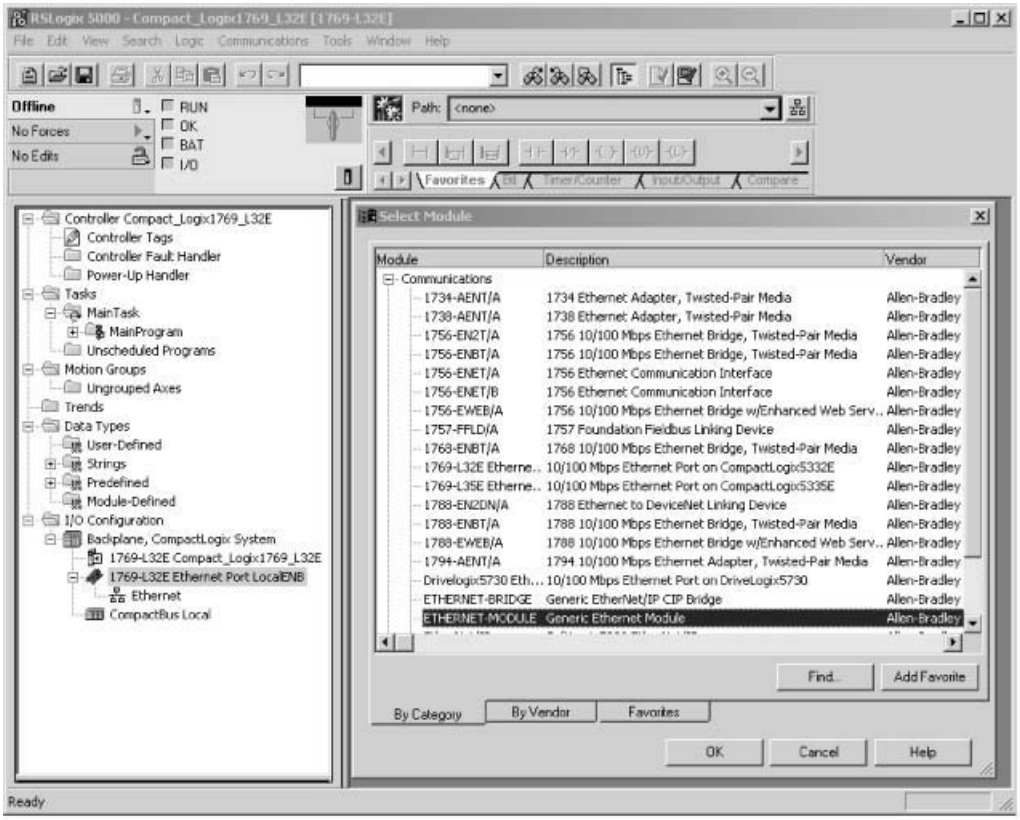
5.2 Configuring the master (EtherNet/IP scanner)

The following example refers to the configuration of the AllenBradley CompactLogix 1769-L32E controller with RSLogix 5000 programming software. The EtherNet/IP interface is already integrated in the CPU component.

	NOTE
	If a CPU without an EtherNet/IP interface is used, an Ethernet communication interface must first be added to the I/O configuration.

Process data exchange

In the following project planning example, the option DFE33B is added to a project. To do so, go to the view "Controller Organizer" in the RSLogix 5000 program as shown in the screenshot below (use the tree structure on the left side of the screen).



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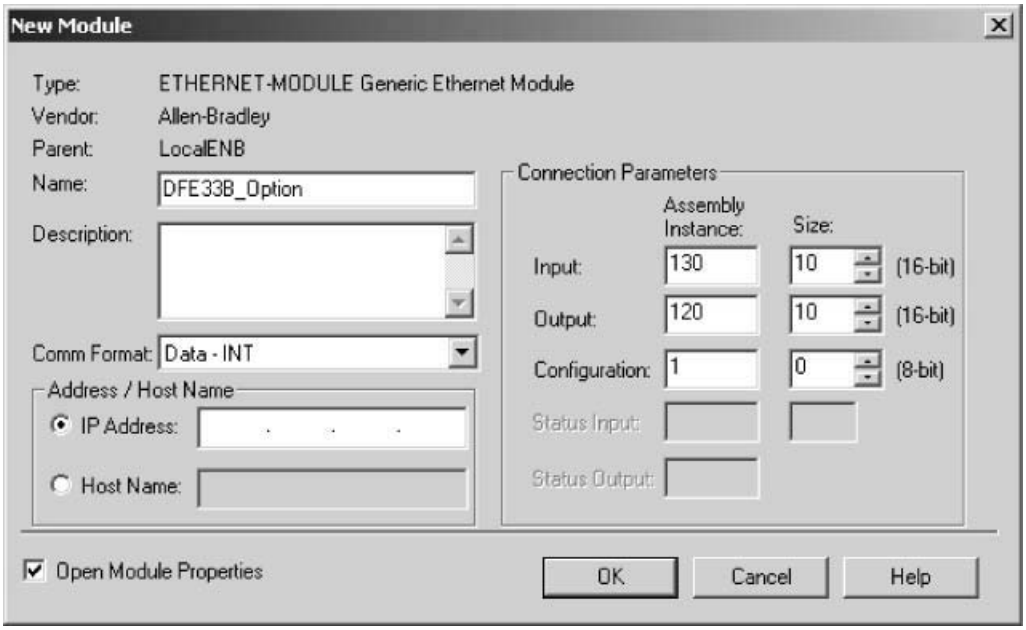
- In the "I/O Configuration" folder, select the entry "1769-L32E Ethernet Port LocalENB" as the Ethernet communication interface. Make a right mouse click to open the context menu and choose "New Module". The selection window "Select Module Type" appears.
- To add option DFE33B to the project, select the entry "ETHERNET MODULE" from the category "Communications". Confirm your selection by clicking <OK>.
- The "New Module" window opens.

5.2.1 Configuring the DFE33B as option in MOVIDRIVE® MDX61B

First specify the name under which the data is saved in the controller tags for the newly created module. Next, specify the IP address.



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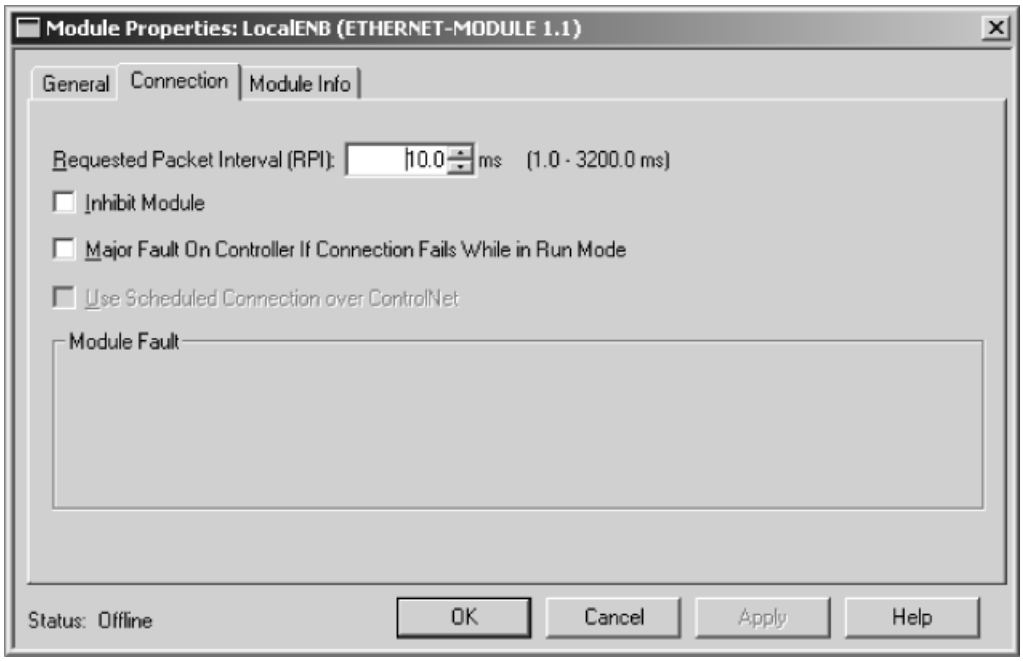
- **For the data format, open the dropdown menu "Comm-Format"and choose the entry "Data - INT". Process data for DFE33B always contains 16 bits (INT).**
- In the "Connection Parameters" group box, enter the value "130" in the "Input Assembly Instance" input field. The input data of the PLC must be linked to the output instance of DFE33B.
- To establish a controlling connection, in the "Connection Parameters" group box, enter the value "120" in the "Output Assembly Instance" input field. The input data of the PLC must be linked to the output instance of DFE33B.
- In the selection fields "Input Size" and "Output Size," set a maximum value of "10" (16 bit) as the data length.
- In the "Configuration Size" selection field, enter the value "0." The "Configuration Assembly Instance" is not used in this case.
- Confirm your setting by clicking <OK>.
- To offer compatibility to existing DeviceNet projects at "Comm Format" the datatype "SINT" is allowed too. The user must verify that an even number (2 ... 20) of bytes is configured and access to IO data provides consistent data.

Other settings

The "Connection" tab page is used to set the data rate and, if required, the error response of the controller.



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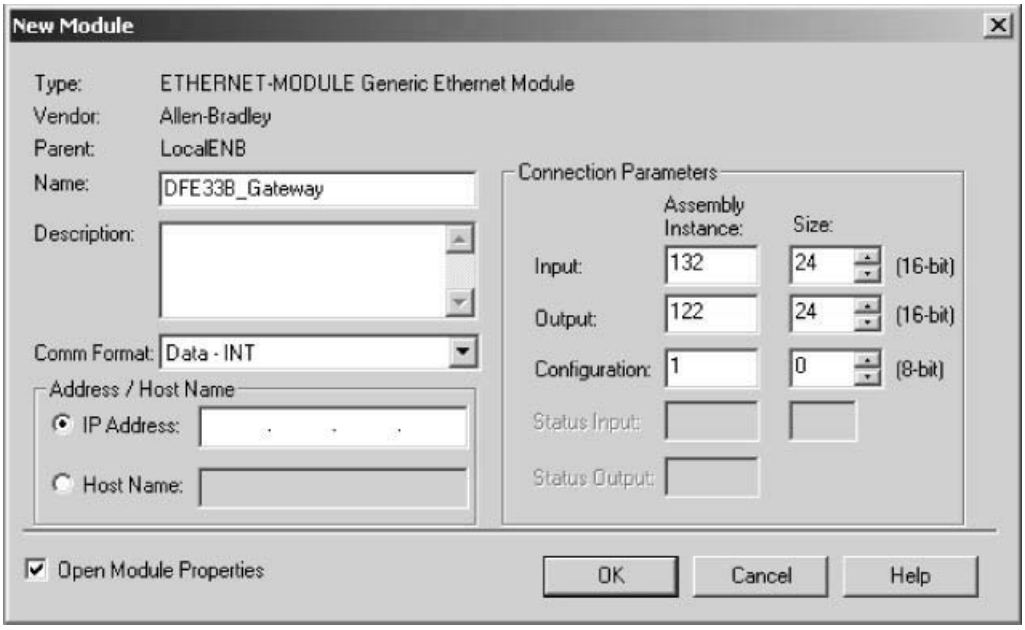
- The DFE33B option supports a minimum data rate (input field "Requested Packet Interval (RPI)") of 4 ms. Longer cycle times are also possible.
- Click the <OK> button. You have now configured process data exchange with a DFE33B.

5.2.2 Configuring the DFE33B as option in MOVITRAC® B or in the UOH11B gateway housing

First specify the name under which the data is saved in the controller tags for the newly created module. Next, specify the IP address.



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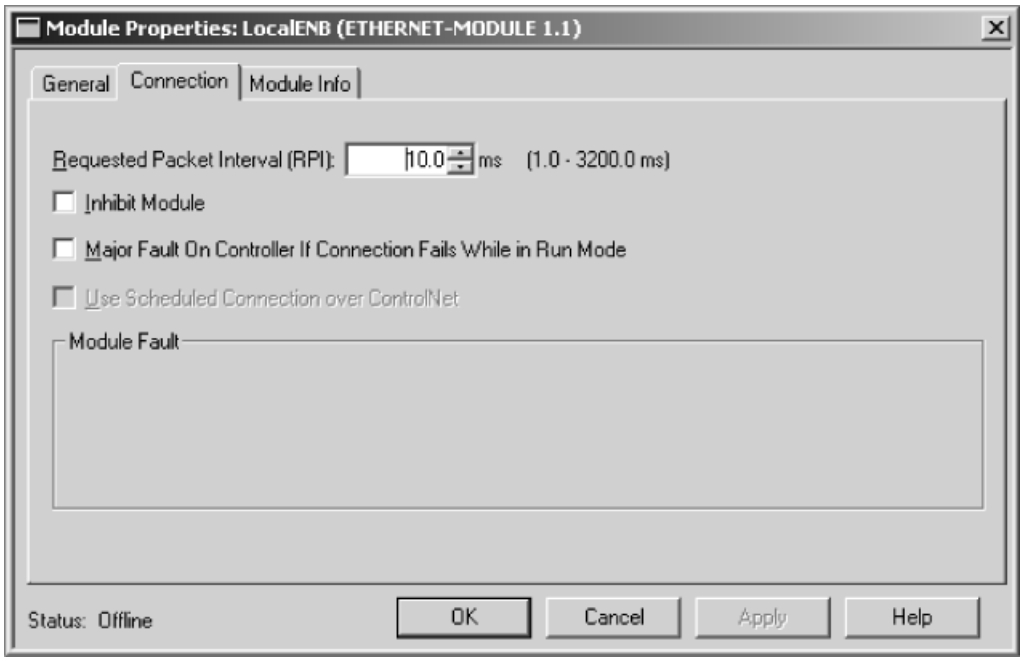
- **For the data format, open the dropdown menu "Comm-Format"and choose the entry "Data - INT". Process data for DFE33B always contains 16 bits (INT).**
- In the "Connection Parameters" group box, enter the value "132" in the "Input Assembly Instance" input field. The input data of the PLC must be linked to the output instance of DFE33B.
- To establish a controlling connection, in the "Connection Parameters" group box, enter the value "122" in the "Output Assembly Instance" input field. The input data of the PLC must be linked to the output instance of DFE33B.
- In the selection fields "Input Size" and "Output Size," set a maximum value of "24" (16 bit) as the data length. The value depends on the number of lower-level SBus stations (max. 8) Three process data words are exchanged with every lower-level station. Therefore, choose a multiple of 3 as data length.
- In the "Configuration Size" selection field, enter the value "0." The "Configuration Assembly Instance" input field is not used in this case.
- Click <OK> to confirm your settings.
- To offer compatibility to existing DeviceNet projects at "Comm Format" the datatype "SINT" is allowed too. The user must verify that an even number (6 ... 48) of bytes is configured and access to IO data provides consistent data.

Other settings

The "Connection" tab page is used to set the data rate and, if required, the error response of the controller.



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- The DFE33B option supports a minimum data rate (input field "Requested Packet Interval (RPI)") of 4 ms. Longer cycle times are also possible.
- Click the <OK> button. You have now configured process data exchange with a DFE33B.

5.2.3 Auto setup for gateway operation

The Auto setup function enables startup of the DFE33B as gateway to be performed without a PC. The function is activated via the Auto Setup DIP switch (see section 4.4 page 17).

	NOTE
	Setting the Auto-Setup DIP switch (AS) from OFF to ON position causes the function to be executed once. **The auto setup DIP switch must then remain in the ON position.** The function can be reactivated by turning the DIP switch off and back on again.

As a first step, the DFE33B searches for inverters on the SBus below its hierarchical level. This process is indicated by the **H1** LED (system error) flashing briefly. For this purpose, different SBus addresses must be set for the inverters (P881). We recommend assigning the addresses beginning with address 1 in ascending order based on the arrangement of inverters in the control cabinet. The process image on the fieldbus side is expanded by three words for each detected inverter.

The **H1** LED remains lit if no inverter was detected. A total of up to eight inverters is taken into account.

After the search is completed, the DFE33B periodically exchanges three process data words with each connected inverter. The process output data are fetched from the fieldbus, divided into blocks of three and transmitted. The inverters read the process input data, put them together and send them to the fieldbus master.

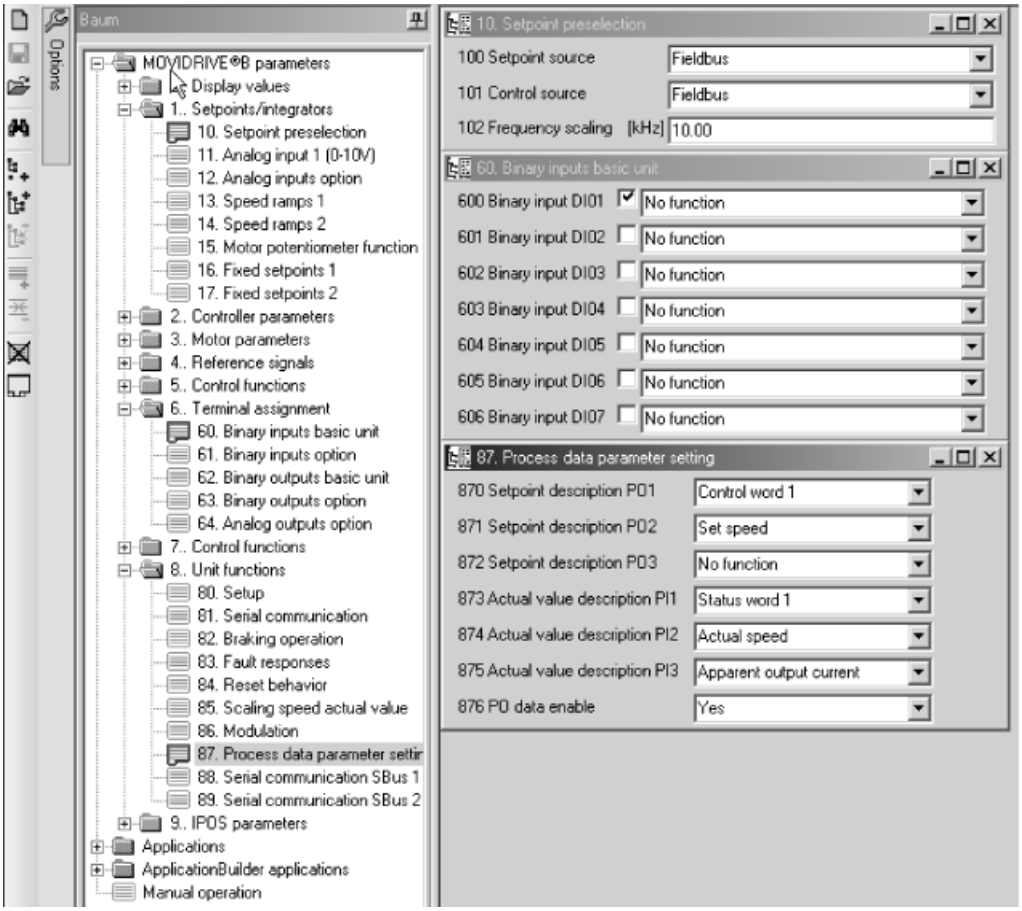
The cycle time of the SBus communication is 2 ms per station at a baud rate of 500 kBit/s without any additional engineering activities.

For an application with 8 inverters on the SBus, the cycle time of the process data update is then 8 x 2 ms = 16 ms.

	NOTE
	If you change the process data assignment of the inverters connected to the DFE33B, you have to activate Auto Setup again because the DFE33B saves these values only once during Auto Setup. At the same time, the process data assignments of the connected inverters may not be changed dynamically after Auto setup.

5.3 Setting the MOVIDRIVE® MDX61B inverter

The following settings are required for simple fieldbus operation.



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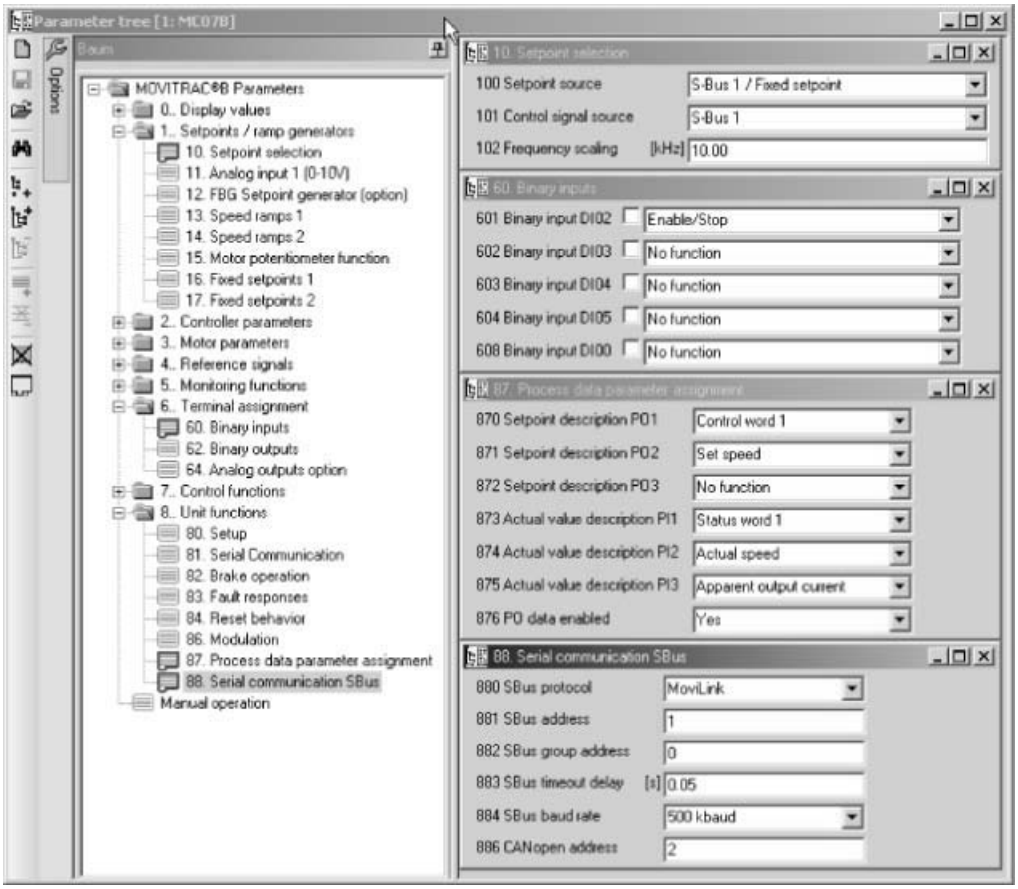
However, to control the MOVIDRIVE® B inverter via EtherNet/IP, you must first switch the inverter to control signal source (P101) and setpoint source (P100) to FIELDBUS. The FIELDBUS setting means the inverter parameters are set for control and setpoint entry via EtherNet/IP. The MOVIDRIVE® B inverter then responds to the process output data transmitted by the PLC.

The parameters of the MOVIDRIVE® B drive inverter can be set straight away via EtherNet/IP without any further settings once the EtherNet/IP 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 inverter at the terminals for control via the fieldbus system. Therefore, you must wire and program the terminals in such a way that the inverter is enabled via the input terminals. For example, the simplest way of enabling the inverter at the terminals is to connect the DIØØ (function / CONTROL INHIBIT) input terminal to a +24 V signal and to program input terminals DIØ1 ... DIØ7 to NO FUNCTION.

5.4 Setting the MOVITRAC® B frequency inverter



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To control the MOVITRAC® B frequency inverter via EtherNet/IP, you first have to set the drive inverter to **Control signal source (P101)** and **Setpoint source (P100)** to SBus. The SBus setting means the MOVITRAC® B parameters are set for control and setpoint entry via gateway. The MOVITRAC® B then responds to the process output data transmitted by the PLC.

It is necessary to set the SBus1 timeout interval (P883) to a value other than 0 ms for the MOVITRAC® B inverter to stop if faulty SBus communication occurs. We recommend a value in the range between 50 and 200 ms. Activation of the control signal source and setpoint source SBus is signaled to the higher-level controller using the "SBus mode active" bit in the status word.

For safety reasons, you must also enable the MOVITRAC® B at the terminals for control via the fieldbus system. Therefore, you must wire and program the terminals in such a way that the MOVITRAC® B is enabled via the input terminals. The simplest way of enabling MOVITRAC® B at the terminals is, for example, to connect the DIØ1 (function CW/STOP) input terminal to a +24 V signal and to program the remaining input terminals to NO FUNCTION.

NOTES

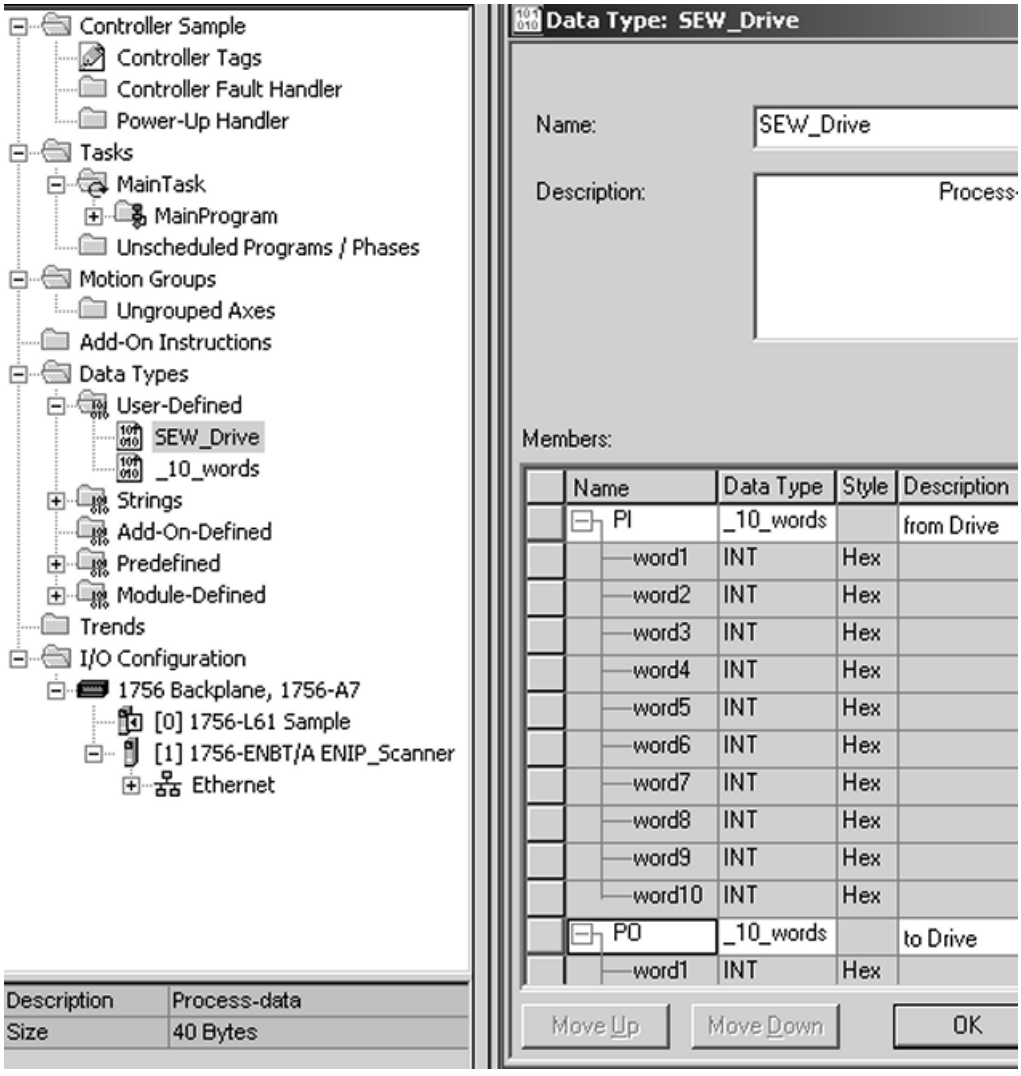
- Set the parameter *P881 SBus address* to values in ascending order between 1 and 8.
- The SBus address 0 is used by DFE33B gateway and therefore must not be used.
- Set *P883 SBus timeout* to values between 50 and 200 ms.

5.5 Project planning examples in RSLogix5000

5.5.1 MOVIDRIVE® B with 10 PD data exchange

1. Set the IP address of the DFE33B option (→ section "Setting the IP address parameters).
2. Then follow sections 5.2 and 5.2.1 to add MOVIDRIVE® B with DFE33B to the EtherNet/IP configuration.
3. Set the communication parameters of MOVIDRIVE® B as described in section 5.3.
4. Now the integration into the RSLogix project can be performed.

   Generate a controller tag with a user-defined data type to create a simple, data consistent interface to the inverter's process data (→ following figure).



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The description for PI and PO data can be assigned to the controller tag matching the definitions made in MOVIDRIVE® B (→ section 5.3).

Controller Tags - Sample(controller)

Scope: Sample | Show... | Show All

Name	Alias For	Data Type	Style	Description
-Movidrive		SEW_Drive		Process-data
-Movidrive.PI		_10_words		Process-data from Drive
-Movidrive.PI.word1		INT	Hex	Status Word 1
-Movidrive.PI.word2		INT	Hex	Actual Speed
-Movidrive.PI.word3		INT	Hex	Apparent Output Current
-Movidrive.PI.word4		INT	Hex	IPos-PI_word4
-Movidrive.PI.word5		INT	Hex	IPos-PI_word5
-Movidrive.PI.word6		INT	Hex	IPos-PI_word6
-Movidrive.PI.word7		INT	Hex	IPos-PI_word7
-Movidrive.PI.word8		INT	Hex	IPos-PI_word8
-Movidrive.PI.word9		INT	Hex	IPos-PI_word9
-Movidrive.PI.word10		INT	Hex	IPos-PI_word10
-Movidrive.PO		_10_words		Process-data to Drive
-Movidrive.PO.word1		INT	Hex	Control Word 1
-Movidrive.PO.word2		INT	Hex	Set Speed
-Movidrive.PO.word3		INT	Hex	No Function
-Movidrive.PO.word4		INT	Hex	IPos-PO_word4
-Movidrive.PO.word5		INT	Hex	IPos-PO_word5
-Movidrive.PO.word6		INT	Hex	IPos-PO_word6
-Movidrive.PO.word7		INT	Hex	IPos-PO_word7
-Movidrive.PO.word8		INT	Hex	IPos-PO_word8
-Movidrive.PO.word9		INT	Hex	IPos-PO_word9
-Movidrive.PO.word10		INT	Hex	IPos-PO_word10

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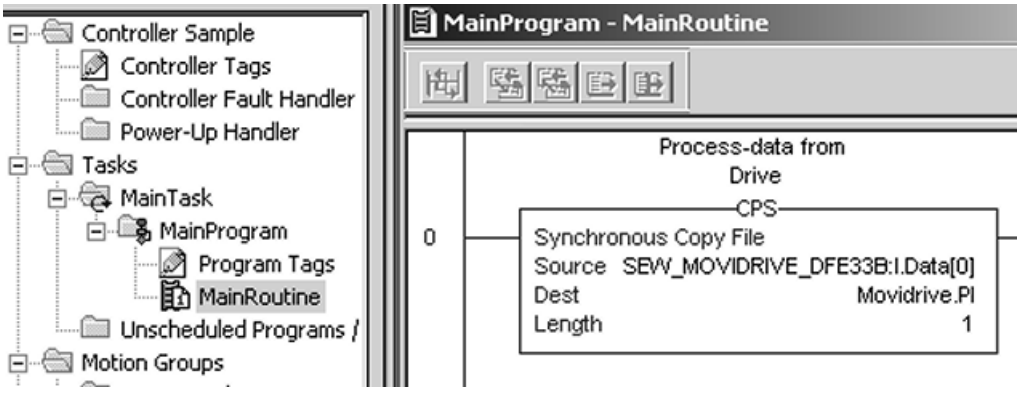
5. To copy the drive data to the new data structure, insert a CPS command at the beginning of the "MainRoutine" (→ following figure).



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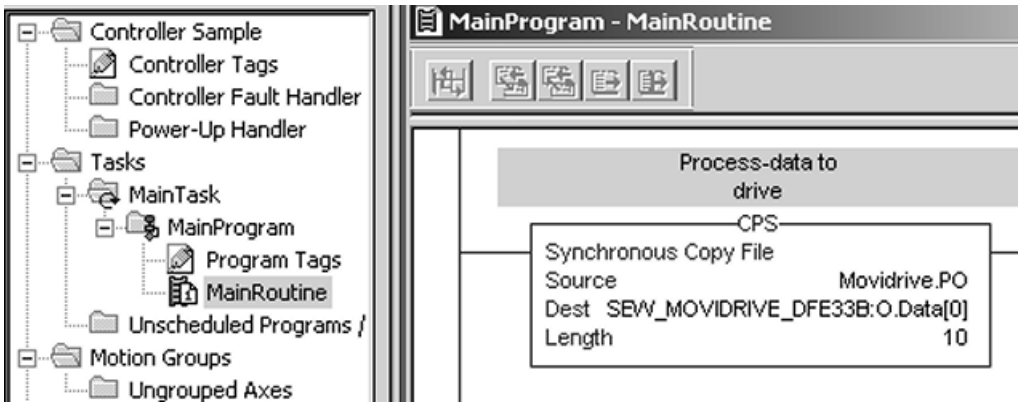
To copy the data from the new data structure to the drive, insert a CPS command at the end of the "MainRoutine" (→ following figure).



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6. Finally save and download the project to the PLC. The PLC is set to RUN mode.
   You can now read the actual values from the device and write setpoint values.

Controller Tags - Sample(controller)

Scope: Sample | Show... | Show All

Name	Value	Style	Data Type	Description
Movidrive	{...}		SEW_Drive	Process-data
Movidrive.PI	{...}		_10_words	Process-data from Drive
Movidrive.PI.word1	16#0004	Hex	INT	Status Word 1
Movidrive.PI.word2	16#0000	Hex	INT	Actual Speed
Movidrive.PI.word3	16#0000	Hex	INT	Apparent Output Current
Movidrive.PI.word4	16#0000	Hex	INT	IPos-PI_word4
Movidrive.PI.word5	16#0000	Hex	INT	IPos-PI_word5
Movidrive.PI.word6	16#0000	Hex	INT	IPos-PI_word6
Movidrive.PI.word7	16#0000	Hex	INT	IPos-PI_word7
Movidrive.PI.word8	16#0000	Hex	INT	IPos-PI_word8
Movidrive.PI.word9	16#0000	Hex	INT	IPos-PI_word9
Movidrive.PI.word10	16#0000	Hex	INT	IPos-PI_word10
Movidrive.PO	{...}		_10_words	Process-data to Drive
Movidrive.PO.word1	16#0006	Hex	INT	Control Word 1
Movidrive.PO.word2	16#1000	Hex	INT	Set Speed
Movidrive.PO.word3	16#0000	Hex	INT	No Function
Movidrive.PO.word4	16#0000	Hex	INT	IPos-PO_word4
Movidrive.PO.word5	16#0000	Hex	INT	IPos-PO_word5
Movidrive.PO.word6	16#0000	Hex	INT	IPos-PO_word6
Movidrive.PO.word7	16#0000	Hex	INT	IPos-PO_word7
Movidrive.PO.word8	16#0000	Hex	INT	IPos-PO_word8
Movidrive.PO.word9	16#0000	Hex	INT	IPos-PO_word9
Movidrive.PO.word10	16#0000	Hex	INT	IPos-PO_word10

Monitor Tags | Edit Tags

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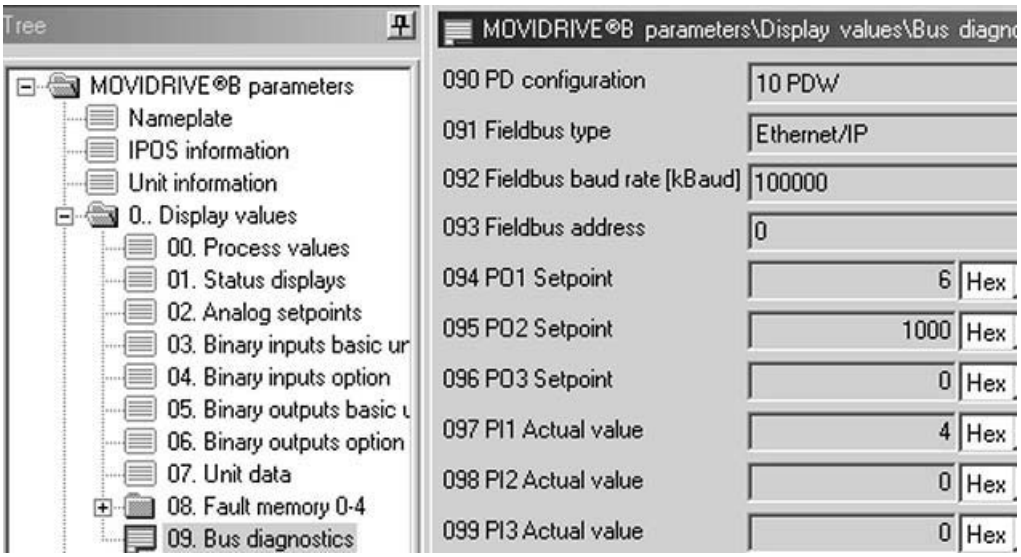
The process data should correspond with the values displayed in the parameter tree of MOVITOOLS® MotionStudio (→ following figure).



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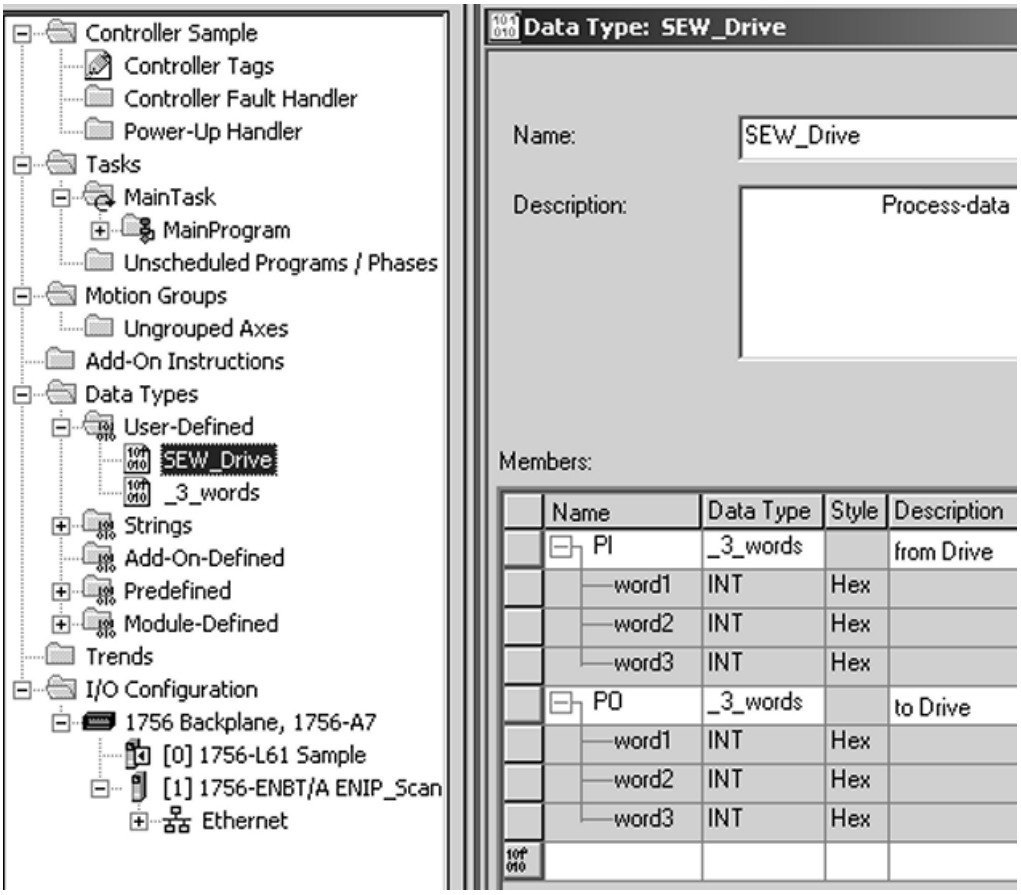
5.5.2 MOVITRAC® B via gateway DFE33B / UOH11B

1. Set the IP address of the DFE33B option (→ section "Setting the IP address parameters").
2. Add the DFE33B gateway to the EtherNet/IP configuration as described in sections 5.2 and 5.2.2.
3. Execute the Auto Setup function of the DFE33B gateway according to section 5.3 to configure the data mapping to the drives.
4. Set the communication parameters of MOVITRAC® B as described in section 5.4.
5. Now the integration into the RSLogix project can be performed.

   Generate a controller tag with a user-defined data type to create a simple, data consistent interface to the inverter's process data (→ following figure).



11789AXX

The description for PI and PO data can be assigned to the controller tag matching the definitions made in MOVITRAC® B (→ section 5.4).

Controller Tags - Sample(controller)

Scope: Sample | Show... | Show All

Name	Data Type	Style	Description
MOVITRAC_S1	SEW_Drive		Process-data SBus-Addr1
MOVITRAC_S1.PI	_3_words		Process-data SBus-Addr1 from Drive
MOVITRAC_S1.PI.word1	INT	Hex	Status Word 1
MOVITRAC_S1.PI.word2	INT	Hex	Actual Speed
MOVITRAC_S1.PI.word3	INT	Hex	Apparent Output Current
MOVITRAC_S1.PO	_3_words		Process-data SBus-Addr1 to Drive
MOVITRAC_S1.PO.word1	INT	Hex	Control Word 1
MOVITRAC_S1.PO.word2	INT	Hex	Set Speed
MOVITRAC_S1.PO.word3	INT	Hex	No Function
MOVITRAC_S2	SEW_Drive		Process-data SBus-Addr2
MOVITRAC_S2.PI	_3_words		Process-data SBus-Addr2 from Drive
MOVITRAC_S2.PO	_3_words		Process-data SBus-Addr2 to Drive

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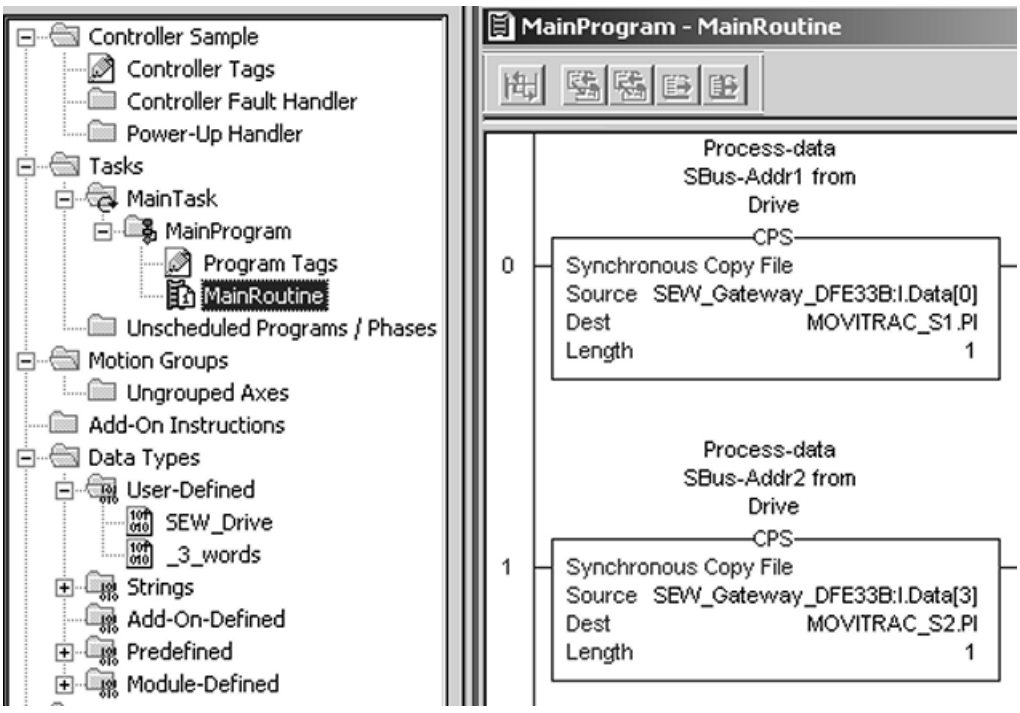
6. To copy the drive data to the new data structure, insert a CPS command at the beginning of the "MainRoutine" (→ following figure).



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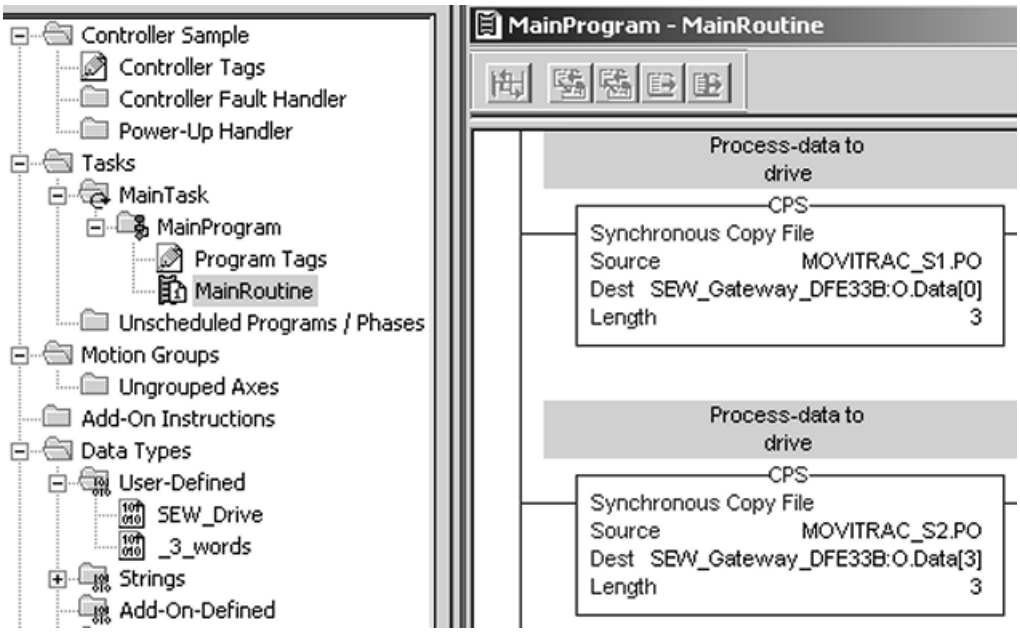
Note that the structure *SEW_Gateway_DFE33B:I.Data* contains the process data of all drives at the gateway. This means the three data words of each drive have to be copied from the structure beginning with a certain offset ([0], [3] ... [21]).

To copy the data from the new data structure to the drive, insert a CPS command at the end of the "MainRoutine" (→ following figure).

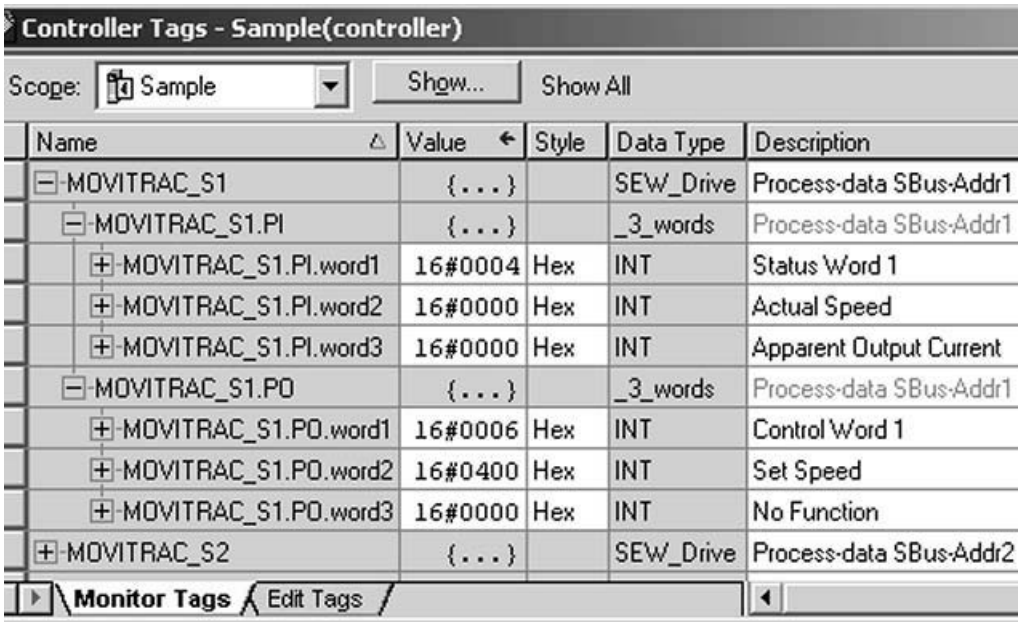


11792AXX

Note that the structure *SEW_Gateway_DFE33B:O.Data* contains the process data to all drives at the gateway. This means the three data words of each drive have to be copied into the structure beginning with a certain offset ([0], [3] ... [21]).

7. Finally save and download the project to the PLC. The PLC is set to RUN mode.

   Now actual values from the drives can be read and setpoint values can be written.



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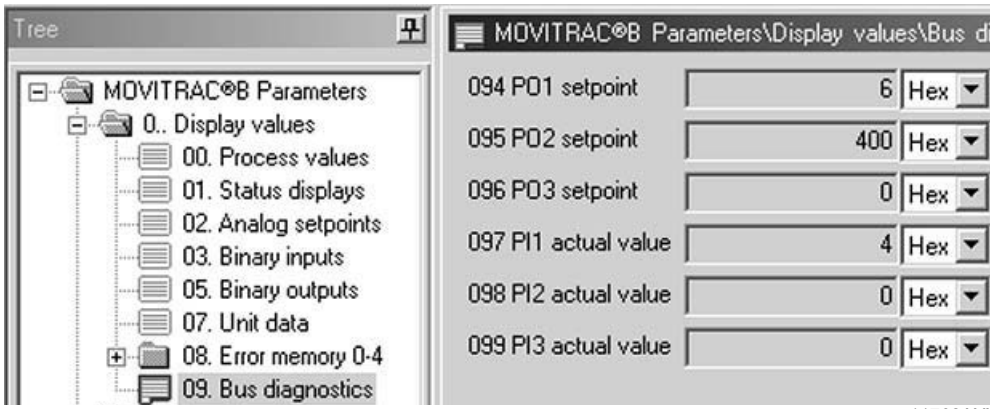
The process data should correspond with the values displayed in the monitor for the DFx fieldbus gateway or in the parameter tree in MOVITOOLS® MotionStudio (→ following figure).



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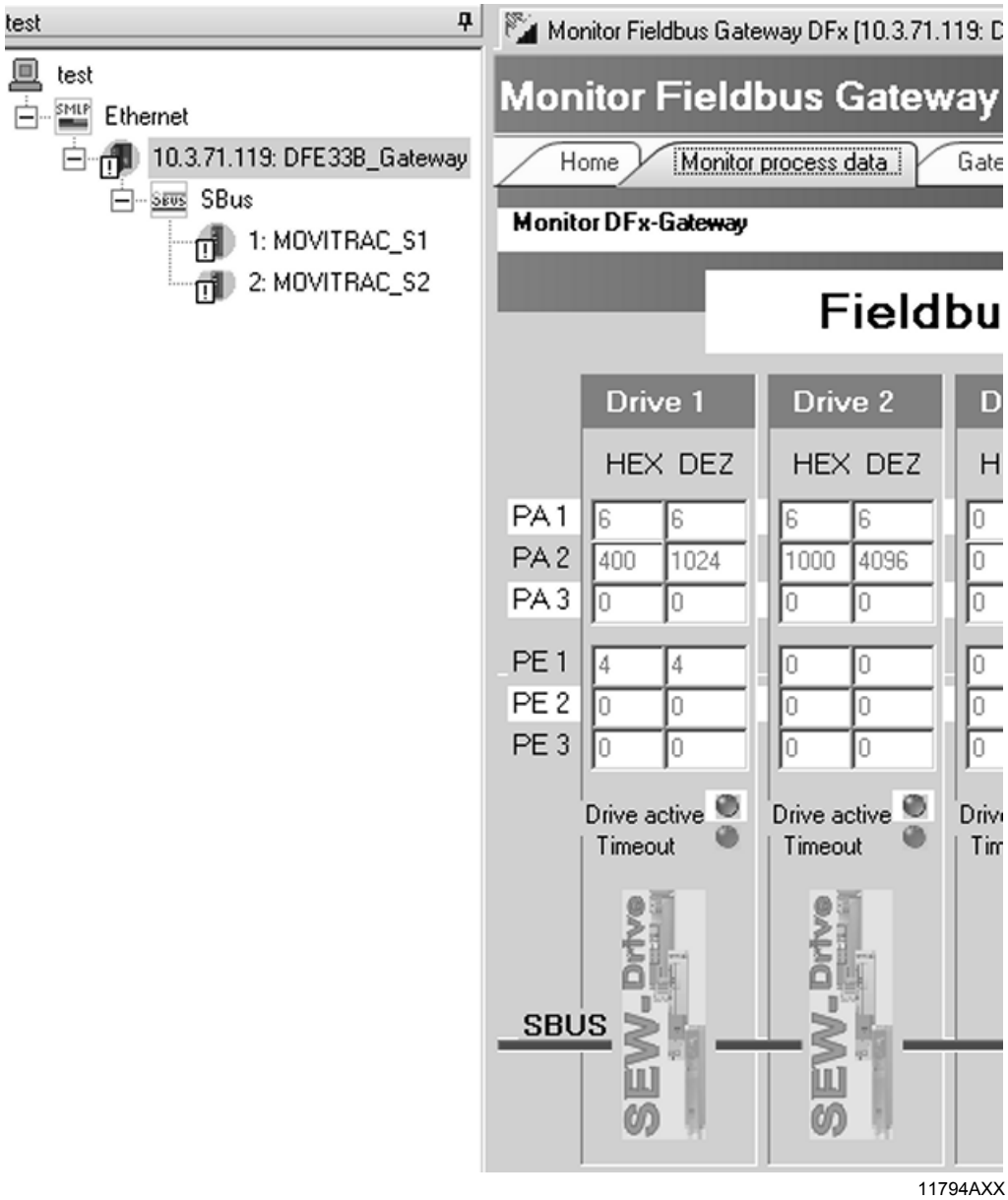


11794AXX

5.5.3 Access to the unit parameters of MOVIDRIVE® B

Parameter data exchange

You can access the MOVIDRIVE® unit parameters using a register object. The service telegrams "Get Attribute Single" and "Set Attribute Single" are attached using the SEW parameter channel.

The SEW parameter channel has the following structure:

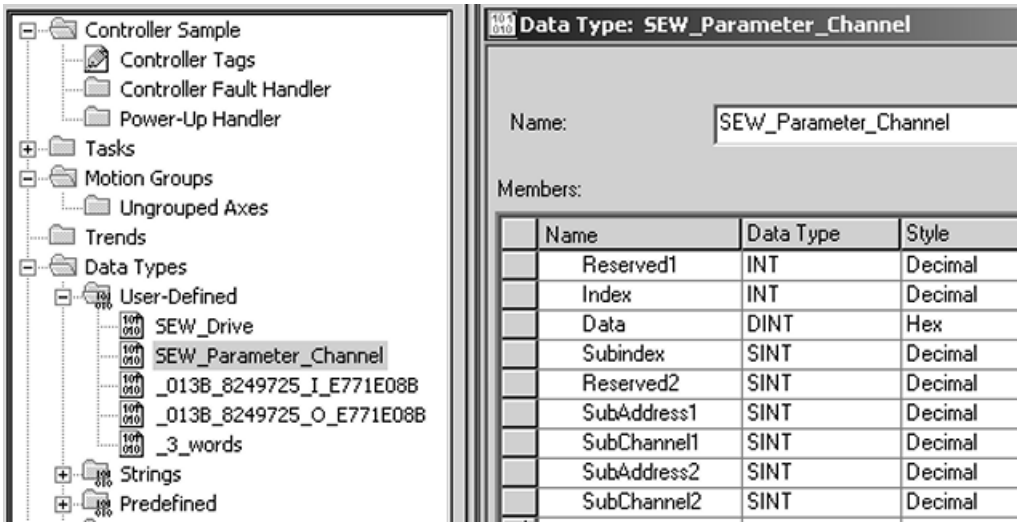
Index	Data	Subindex	Reserved	Sub-address 1	Sub-channel 1	Sub-address 2	Sub-channel 2

In MOVIDRIVE®, a unit parameter can only be addressed using the index and subindex. The subaddress and subchannel are not used. Set these telegram sections and the reserved telegram sections to "0".

It is easier to access the data elements in the parameter channel when you create a data type that maps the elements of the parameter channel in a structure (e.g. "SEW_PARAMETER_CHANNEL" → following figure). With the RSLogix 5000 program you can create your own data types in the directory structure (→ following figure). To do so, go to the "Controller Organizer" view and choose [Data Types] / User-Defined].

The following figure shows that the index is prefixed with a reserved range of 16 bits. This value is not used. However, this range is mandatory because the "Data" element has to be allocated to a 32-bit address.

1. Create a user-defined data structure "SEW_Parameter_Channel" (→ following figure)



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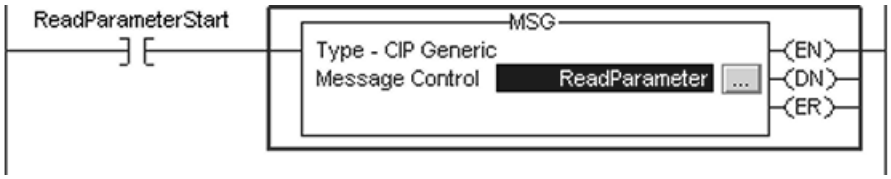
2. Define the following controller tags (→ following figure).

Name	Data Type
ReadParameter	MESSAGE
ReadParameterRequest	SEW_Parameter_Channel
ReadParameterResponse	SEW_Parameter_Channel
ReadParameterStart	BOOL

11765AXX

3. Create a rung for executing the "ReadParameter execution" command (→ following figure).



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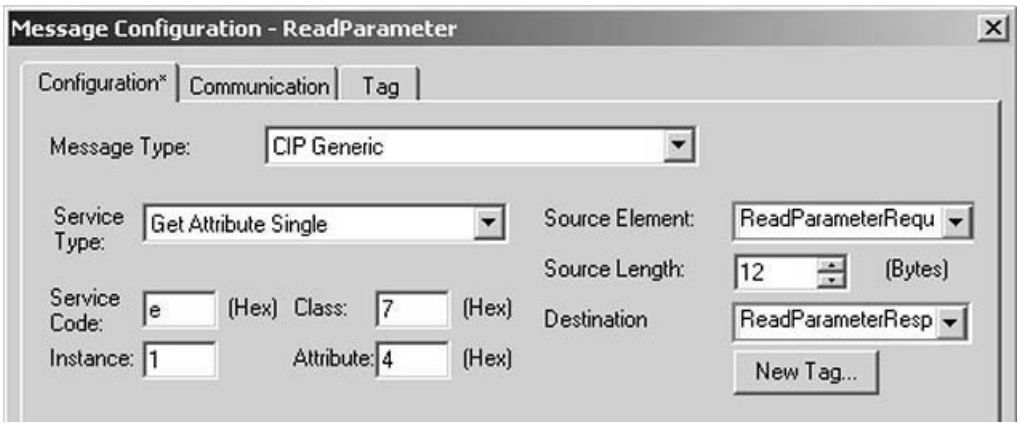
- For contact, select the tag "ReadParameterStart"
- For the Message Control, select the tag "ReadParameter"

4. Click on [...] in the MSG command to open the "Message Configuration" window (→ following figure).



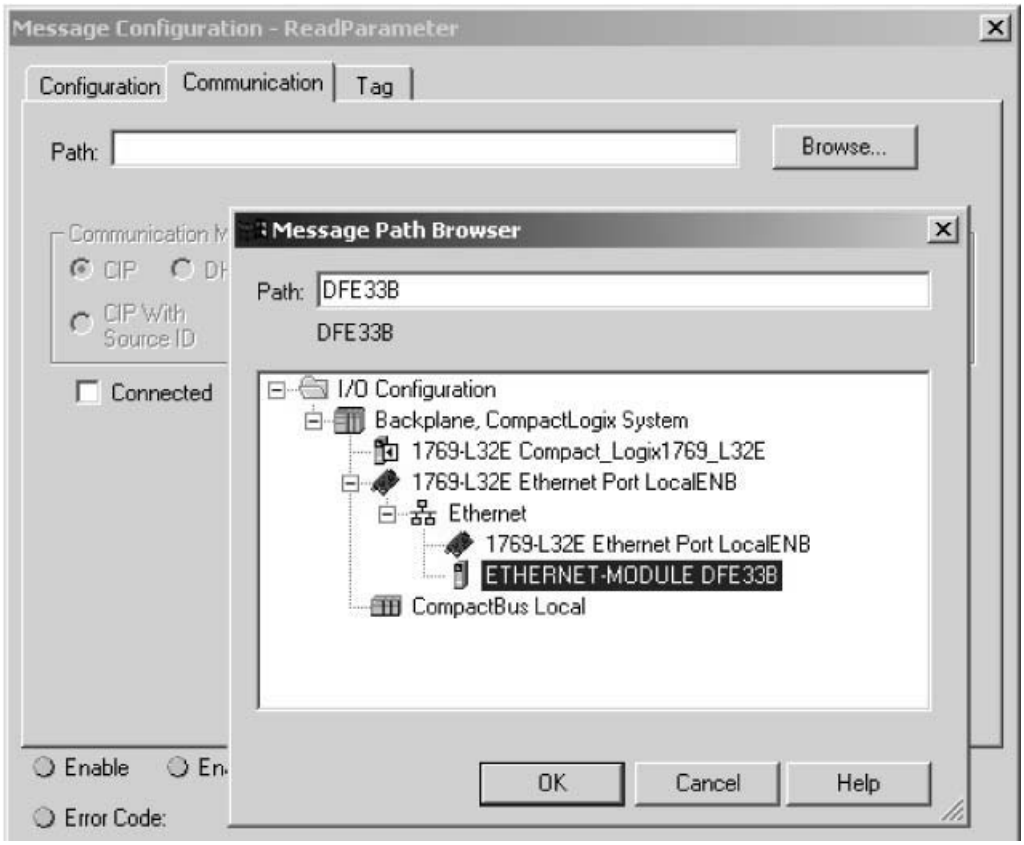
11767AXX

Select "CIP Generic" as "message type". Fill in the further data in the following order:

A Source Element = ReadParameterRequest.Index
B SourceLength = 12
C Destination = ReadParameterResponse.Index
D Class = 7_{hex}
E Instance = 1
F Attribute = 4_{hex}
G Service Code = e_{hex}

The service type is set automatically.

5. Specify the target device on the "Communication" tab. Click <Browse>. The "Message Path Browser" window opens. In the following example, option DFE33B is set up as the recipient.



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Do **not** select the "Connected" checkbox because both the controller and the DFE33B option permit only a limited number of connections.

6. After downloading the changes to the PLC, the index of the parameter to be read can be entered at *ReadParameterRequest.Index*. By altering the control bit *ReadParameterStart* to "1", the read request is executed once (→ following figure).

Controller Tags - Sample(controller)

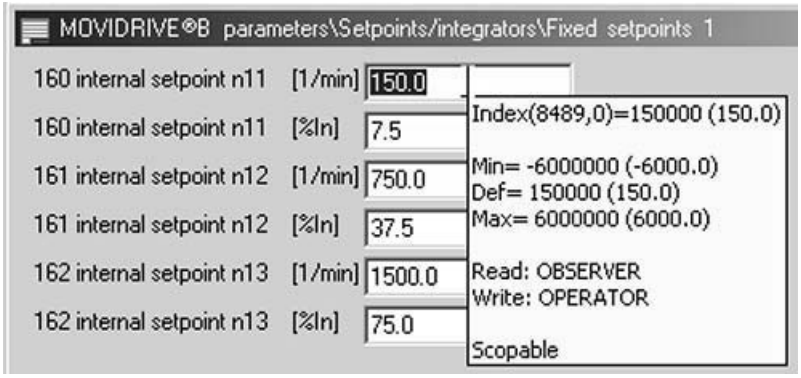
Scope: Sample | Show... | Show All

Name	Value	Style	Data Type
ReadParameter	{...}		MESSAGE
ReadParameterRequest	{...}		SEW_Parameter_Channel
ReadParameterRequest.Reserved1	0	Decimal	INT
ReadParameterRequest.Index	8489	Decimal	INT
ReadParameterRequest.Data	16#0000_0000	Hex	DINT
ReadParameterRequest.Subindex	0	Decimal	SINT
ReadParameterRequest.Reserved2	0	Decimal	SINT
ReadParameterRequest.SubAddress1	0	Decimal	SINT
ReadParameterRequest.SubChannel1	0	Decimal	SINT
ReadParameterRequest.SubAddress2	0	Decimal	SINT
ReadParameterRequest.SubChannel2	0	Decimal	SINT
ReadParameterResponse	{...}		SEW_Parameter_Channel
ReadParameterResponse.Reserved1	0	Decimal	INT
ReadParameterResponse.Index	8489	Decimal	INT
ReadParameterResponse.Data	150000	Decimal	DINT
ReadParameterResponse.Subindex	0	Decimal	SINT
ReadParameterResponse.Reserved2	0	Decimal	SINT
ReadParameterResponse.SubAddre...	0	Decimal	SINT
ReadParameterResponse.SubChann...	0	Decimal	SINT
ReadParameterResponse.SubAddre...	0	Decimal	SINT
ReadParameterResponse.SubChann...	0	Decimal	SINT
ReadParameterStart	1	Decimal	BOOL

11769AXX

On response to the read request, *ReadParameterResponse.Index* should indicate the read index and *ReadParameterResponse.Data* should contain the read data. In this example *P160 internal setpoint n11* (index 8489) has the value 150 rpm.

You can check the value in the MOVITOOLS® MotionStudio parameter tree (→ following figure). The tooltip of a parameter displays e. g. index, subindex, scaling, etc. of a parameter.



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For a complete list of index numbers and scaling factors, refer to the "MOVIDRIVE® Fieldbus Unit Profile" manual.

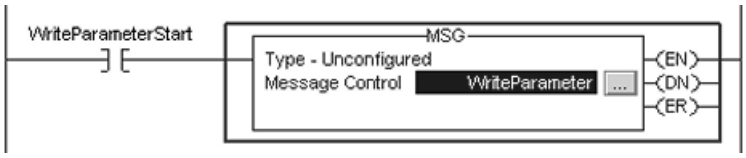
Only a few changes are required for parameter write access:

- Create the controller tags (→ following figure).

Name	Data Type
⊞ WriteParameter	MESSAGE
⊞ WriteParameterRequest	SEW_Parameter_Channel
⊞ WriteParameterResponse	SEW_Parameter_Channel
WriteParameterStart	BOOL

11771AXX

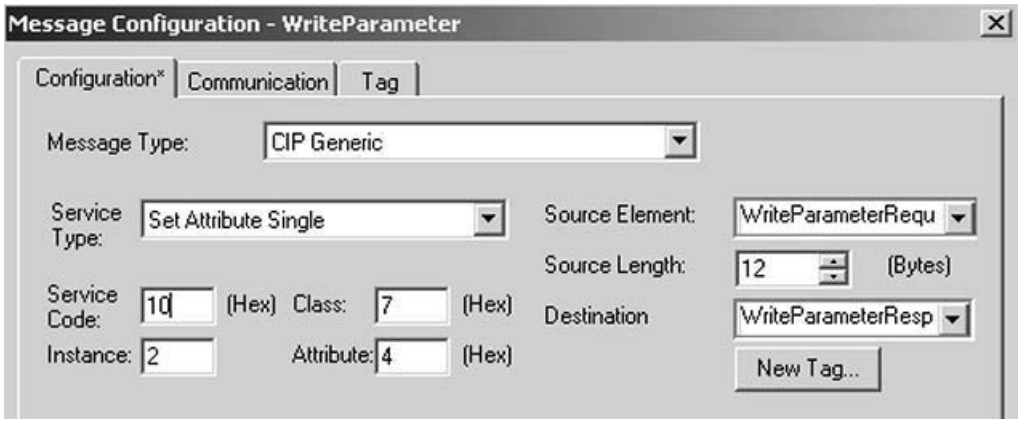
- Create a rung for executing the "WriteParameter" command (→ following figure).



11772AXX

For contact, select the tag "WriteParameterStart"
For message control, select the tag "WriteParameter"

- Click on ... in the MSG command to open the "Message Configuration" window (→ following figure).



11773AXX

Select "CIP Generic" as "message type". Fill in the data in the following order:
- Source Element = WriteParameterRequest.Index
- SourceLength = 12
- Destination = WriteParameterResponse.Index
- Class = 7_{hex}
- Instance = 2
- Attribute = 4_{hex}
- Service Code = 10_{hex}

7. After downloading the changes to the PLC, index and value to be written into the parameter can be entered at *WriteParameterRequest.Index* and *WriteParameter-Request.Data.* By altering *WriteParameterStart* to "1" the write request is executed once (→ following figure).

Controller Tags - Sample(controller)

Scope: Sample | Show... | Show All

Name	Value	Style	Data Type
+WriteParameter	{...}		MESSAGE
−WriteParameterRequest	{...}		SEW_Parameter_Channel
+WriteParameterRequest.Reserved1	0	Decimal	INT
+WriteParameterRequest.Index	8489	Decimal	INT
+WriteParameterRequest.Data	200000	Decimal	DINT
+WriteParameterRequest.Subindex	0	Decimal	SINT
+WriteParameterRequest.Reserved2	0	Decimal	SINT
+WriteParameterRequest.SubAddress1	0	Decimal	SINT
+WriteParameterRequest.SubChannel1	0	Decimal	SINT
+WriteParameterRequest.SubAddress2	0	Decimal	SINT
+WriteParameterRequest.SubChannel2	0	Decimal	SINT
−WriteParameterResponse	{...}		SEW_Parameter_Channel
+WriteParameterResponse.Reserved1	0	Decimal	INT
+WriteParameterResponse.Index	8489	Decimal	INT
+WriteParameterResponse.Data	200000	Decimal	DINT
+WriteParameterResponse.Subindex	0	Decimal	SINT
+WriteParameterResponse.Reserved2	0	Decimal	SINT
+WriteParameterResponse.SubAddre...	0	Decimal	SINT
+WriteParameterResponse.SubChann...	0	Decimal	SINT
+WriteParameterResponse.SubAddre...	0	Decimal	SINT
+WriteParameterResponse.SubChann...	0	Decimal	SINT
WriteParameterStart	1	Decimal	BOOL

11774AXX

On response to the write request, *WriteParameterResponse.Index* should give the written index and *WriteParameterResponse.Data* should contain the written data. In this example *P160 internal setpoint n11* (Index 8489) has the value of 200 rpm.

You can check the value in the MOVITOOLS® MotionStudio parameter tree. The tooltip of a parameter displays e. g. index, subindex, scaling of a parameter.

5.5.4 MOVITRAC® B parameter access via DFE33B / UOH11B

The access to MOVITRAC® B parameter data via EtherNet/IP-SBus gateway DFE33B/UOH11B is identical to the access to MOVIDRIVE® B parameter data (→ section 5.5.3).

The only difference is that **Read/WriteParameterRequest.SubChannel1** is to be set to **2** and **Read/WriteParameterRequest.SubAddress1** must be set to the **SBus address** of the MOVITRAC® B connected to the DFE33B/UOH11B (→ following figure).

Controller Tags - Sample(controller)

Scope: Sample | Show... | Show All

Name	Value	Style	Data Type
ReadParameter	{...}		MESSAGE
ReadParameterRequest	{...}		SEW_Parameter_Channel
ReadParameterRequest.Reserved1	0	Decimal	INT
ReadParameterRequest.Index	8489	Decimal	INT
ReadParameterRequest.Data	16#0000_0000	Hex	DINT
ReadParameterRequest.Subindex	0	Decimal	SINT
ReadParameterRequest.Reserved2	0	Decimal	SINT
ReadParameterRequest.SubAddress1	7	Decimal	SINT
ReadParameterRequest.SubChannel1	2	Decimal	SINT
ReadParameterRequest.SubAddress2	0	Decimal	SINT
ReadParameterRequest.SubChannel2	0	Decimal	SINT
ReadParameterResponse	{...}		SEW_Parameter_Channel
ReadParameterResponse.Reserved1	0	Decimal	INT
ReadParameterResponse.Index	8489	Decimal	INT
ReadParameterResponse.Data	150000	Decimal	DINT
ReadParameterResponse.Subindex	0	Decimal	SINT
ReadParameterResponse.Reserved2	0	Decimal	SINT
ReadParameterResponse.SubAddress1	7	Decimal	SINT
ReadParameterResponse.SubChannel1	2	Decimal	SINT
ReadParameterResponse.SubAddress2	0	Decimal	SINT
ReadParameterResponse.SubChannel2	0	Decimal	SINT
ReadParameterStart	1	Decimal	BOOL

11775AXX

In this example, MOVITRAC® B connected to the DFE33B gateway with SBus address 7 reads the value 150 rpm from *P160 Internal Setpoint n11* (index 8489).

6 Ethernet Industrial Protocol (EtherNet/IP)

6.1 Introduction

The EtherNet Industrial Protocol (EtherNetIP) is an open communication standard based on the classic EtherNet protocols TCP/IP and UDP/IP.

EtherNet/IP has been defined by the **O**pen **D**eviceNet **V**endor **A**ssociation (ODVA) and **C**ontrolNet **I**nternational (CI).

EtherNet/IP extends EtherNet technology to include the CIP application protocol (**C**ommon **I**ndustrial **P**rotocol). CIP is known in the field of automation engineering because it is used alongside DeviceNet and ControlNet as an application protocol.

In the Common Industrial Protocol, all unit data can be accessed via objects. The objects listed in the following table are integrated in the DFE33B option.

Class [hex]	Name
01	Identity object
02	Message Router Object
04	Assembly Object
06	Connection Manager Object
07	Register Object
0F	Parameter Object
64	Vardata Object
F5	TCP/IP Interface Object
F6	Ethernet Link Object

The meaning of the objects and a description of how to access them is given in the section "CIP object directory."

6.2 CIP object directory

Identity object

- The identity object contains general information on the EtherNet/IP device.
- Class code: 01_{hex}

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0001	Revision 1
2	Get	Max Instance	UINT	0001	Maximum instance

Instance 1

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Vendor ID	UINT	013B	SEW-EURODRIVE GmbH & Co KG
2	Get	Device Type	UINT	0065	Manufacturer-specific type
3	Get	Product Code[1)]	UINT	0003 0004	Product no. 3: DFE33B for MOVIDRIVE® B Product no. 4: DFE33B as gateway
4	Get	Revision	STRUCT of		Revision of the identity object, depends on firmware version
		Major Revision	USINT		
		Minor Revision	USINT		
5	Get	Status	WORD		→ table "Coding of attribute 5 status"
6	Get	Serial Number	UDINT		Unique serial number
7	Get	Product Name[1)]	SHORT_STRING	SEW-MOVIDRIVE-DFE33B SEW-GATEWAY-DFE33B	Product name

1) The values in the identity object depend on whether the DFE33B option is used in MOVIDRIVE® B or as gateway.

- Coding of attribute 5 "Status":

Bit	Name	Description
0	Owned	Controlling connection is active
1	-	Reserved
2	Configured	Configuration complete
3	-	Reserved
4 ... 7	Extended Device Status	→ table "Coding of the extended device status"
8	Minor Recoverable Fault	Minor fault that can be remedied
9	Minor Unrecoverable Fault	Minor fault that cannot be remedied
10	Major Recoverable Fault	Major fault that cannot be remedied
11	Major Unrecoverable Fault	Major fault that cannot be remedied
12 ... 15	-	Reserved

- Coding of the "extended device status " (Bit 4 ... 7):

Value [binary]	Description
0000	Unknown
0010	At least one faulty I/O connection
0011	No I/O connection established
0110	At least one I/O connection active

Supported services

Service code [hex]	Service name	Class	Instance
01	Get_Attributes_All	X	X
05	Reset	-	X
0E	Get_Attribute_Single	X	X

Message router object

- The message router object provides information on the implemented objects.
- Class code: 02_{hex}

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0001	Revision 1

Instance 1

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Object_List	STRUCT of		Object list comprising: • Number of objects • List of objects
		Number	UINT	0009	
		Classes	ARRAY of UINT	01 00 02 00 04 00 06 00 07 00 0F 00 64 00 F5 00 F6 00	
2	Get	Number Available	UINT	0009	Maximum number of connections

Supported services

Service code [hex]	Service name	Class	Instance
01	Get_Attributes_All	X	-
0E	Get_Attribute_Single	X	X

Assembly object

- The assembly object is used to access the DFE33B process data. IO connections can be created for the instances of the assembly object to exchange cyclic process data.
- Class code: 04_{hex}

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0002	Revision 2
2	Get	Max Instance	UINT	0082	Maximum instance

Instances for operation as option in MOVIDRIVE® B

Instance 120 - SEW PO data range

This instance is used to access the DFE33B process output data. MOVIDRIVE® can be controlled by only one scanner. Therefore, only one connection can be established with this instance.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	OUTPUT assembly

Instance 121 - "Heartbeat"

This instance is accessed when the scanner wants to establish an input only connection. No process output data is sent with this type of connection. It is used only to read process input data.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	OUTPUT assembly Data size = 0

Instance 130 - SEW PI data range

This instance is used to access the DFE33B process input data. Several multicast connections or a point-to-point connection can be established with this instance.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	INPUT assembly

Instances for operation as gateway

Instance 122 - SEW PO data range

This instance is used to access the DFE33B process output data. It can be controlled by only one scanner. Therefore, only one connection can be established with this instance.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	OUTPUT assembly

Instance 121 - "Heartbeat"

This instance is accessed when the scanner wants to establish an input only connection. No process output data is sent with this type of connection. It is used only to read process input data.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	OUTPUT assembly Data size = 0

Instance 132 - SEW PI data range

This instance is used to access the DFE33B process input data. Several multicast connections or a point-to-point connection can be established with this instance.

Attribute	Access	Name	Data type	Default value [hex]	Description
3	Get	Data	Array of BYTE	-	INPUT assembly

NOTE

The names "INPUT assembly" and "OUTPUT assembly" refer to the processes as seen from the network's point of view. "INPUT assembly" produces data on the network, an "OUTPUT assembly" consumes data from the network.

Supported services

Service code [hex]	Service name	Class	Instance 120 Instance 122	Instance 121	Instance 130 Instance 132
0E	Get_Attribute_Single	X	X	-	X

Register object

- The register object is used to access an SEW parameter index.
- Class code: 07_{hex}

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
2	Get	Max Instance	UINT	0009	Maximum instance

The MOVILINK® parameter services are mapped in the nine instances of the register object. The "Get_Attribute_Single" and "Set_Attribute_Single" services are used for access.

As the register object is designed so that INPUT objects can only be read and OUTPUT objects can be read and written, the options listed in the following table are available for addressing the parameter channel.

Instance	INPUT / OUTPUT	Resulting MOVILINK® service with	
		Get_Attribute_Single	Set_Attribute_Single
1	INPUT	READ parameter	Invalid
2	OUTPUT	READ	WRITE parameters
3	OUTPUT	READ	WRITE VOLATILE parameters
4	INPUT	READ MINIMUM	Invalid
5	INPUT	READ MAXIMUM	Invalid
6	INPUT	READ DEFAULT	Invalid
7	INPUT	READ SCALING	Invalid
8	INPUT	READ ATTRIBUTE	Invalid
9	INPUT	READ EEPROM	Invalid

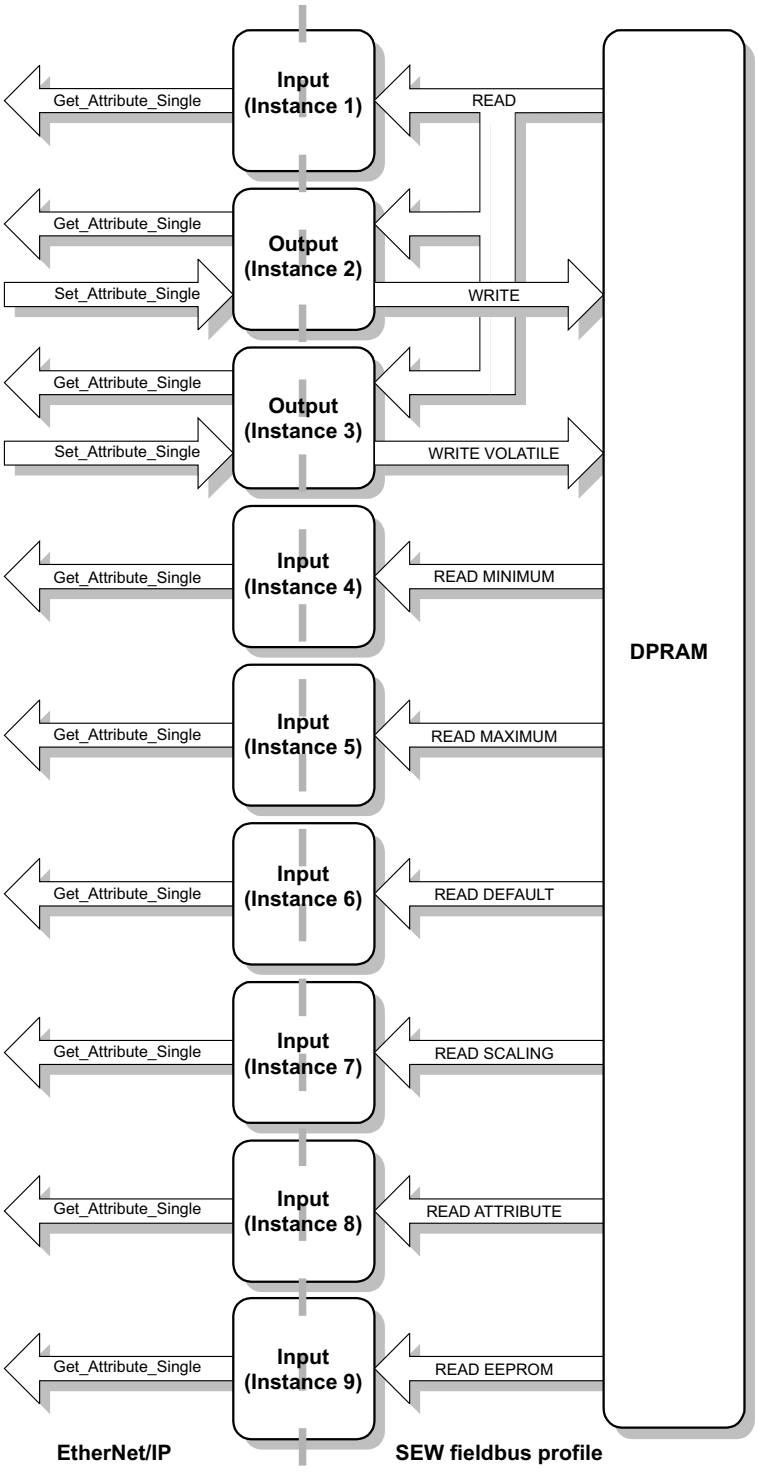


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Figure 2: Description of the parameter channel

Instance 1 ... 9

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Bad Flag	BOOL	00	0 = good / 1 = bad
2	Get	Direction	BOOL	00 01	Input register Output register
3	Get	Size	UINT	0060	Data length in bits (96 bits = 12 bytes)
4	Get/Set	Data	ARRAY of BITS		Data in format of the SEW parameter channel

NOTES

Explanation of the attributes:

- Attribute 1 indicates whether an error occurred during the previous access to the data field.
- Attribute 2 displays the direction of the instance.
- Attribute 3 indicates the data length in bits.
- Attribute 4 represents the parameter data. When accessing attribute 4, the SEW parameter channel must be attached to the service telegram. The SEW parameter channel consists of the elements listed in the following table.

Name	Data type	Description		
Index	UINT	SEW parameter index		
Data	UDINT	Data (32 bit)		
Subindex	BYTE	SEW unit subindex		
Reserved	BYTE	Reserved (must be '0')		
Subaddress 1	BYTE	0 Parameter of MOVIDRIVE® B or gateway itself	1 ...63	SBus-address of drives connected to the SBus of the gateway
Subchannel 1	BYTE	0	2	SBus → Subchannel of the gateway
Subaddress 2	BYTE	Reserved (must be '0')		
Subchannel 2	BYTE	Reserved (must be '0')		

Supported services

Service code [hex]	Service name	Class	Instance
0E	Get_Attribute_Single	X	X
10	Set_Attribute_Single	-	X

Parameter object

- In exceptional cases, you can also use the parameter object to access an SEW parameter channel.
- Class code: $0F_{hex}$

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0001	Revision 1
2	Get	Max Instance	UINT	0005	Maximum instance
8	Get	Parameter Class Descriptor	UINT	0009	Bit 0: Supports parameter instances Bit 3: Parameters are saved permanently
9	Get	Configuration Assembly Interface	UINT	0000	Configuration assembly is not supported.

The instances of the parameter object should only be used to access SEW parameters when the EtherNet/IP scanner does not support the option to attach user-defined data to the services "Get_Attribute_Single" and "Set_Attribute_Single."

When you use the parameter object, it takes a number of steps to address a parameter index.

- First, the address of the required parameter is set in instances 1 to 4.
- Next, instance 5 is used to access the parameter that is addressed in instances 1 to 4.

Access to an SEW parameter index via the parameter object is complicated and prone to errors. Consequently, this process should only be used when the EtherNet/IP scanner does not support configuration using the mechanisms of the register object.

Instance 1 - SEW parameter index

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Set	Parameter Value	UINT	207A	Index of the parameter
2	Get	Link Path Size	USINT	00	No link is specified
3	Get	Link Path	Packed EPATH	00	Not used here
4	Get	Descriptor	WORD	0000	Read/write parameter
5	Get	Data Type	EPATH	00C7	UINT
6	Get	Data Size	USINT	02	Data length in bytes

Instance 2 - SEW subindex

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Set	Parameter Value	UINT	0000	Low byte contains the subindex
2	Get	Link Path Size	USINT	00	No link is specified
3	Get	Link Path	Packed EPATH	00	Not used here
4	Get	Descriptor	WORD	0000	Read/write parameter
5	Get	Data Type	EPATH	00C7	UINT
6	Get	Data Size	USINT	02	Data length in bytes

Instance 3 - SEW subparameter 1

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Set	Parameter Value	UINT	0000	Low byte contains subaddress 1 High byte contains subchannel 1
2	Get	Link Path Size	USINT	00	No link is specified
3	Get	Link Path	Packed EPATH	00	Not used here
4	Get	Descriptor	WORD	0000	Read/write parameter
5	Get	Data Type	EPATH	00C7	UINT
6	Get	Data Size	USINT	02	Data length in bytes

Instance 4 - SEW subparameter 2

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Set	Parameter Value	UINT	0000	Low byte contains subaddress 2 High byte contains subchannel 2
2	Get	Link Path Size	USINT	00	No link is specified
3	Get	Link Path	Packed EPATH	00	Not used here
4	Get	Descriptor	WORD	0000	Read/write parameter
5	Get	Data Type	EPATH	00C7	UINT
6	Get	Data Size	USINT	02	Data length in bytes

Instance 5 - SEW read/write

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Set	Parameter Value	UDINT		The set service executes write access to the parameters addressed in instances 1 to 4. The get service executes read access to the parameters addressed in instances 1 to 4.
2	Get	Link Path Size	USINT	00	No link is specified
3	Get	Link Path	Packed EPATH	00	Not used here
4	Get	Descriptor	WORD	0000	Read/write parameter
5	Get	Data Type	EPATH	00C8	UDINT
6	Get	Data Size	USINT	04	Data length in bytes

Supported services

Service code [hex]	Service name	Class	Instance
0E	Get_Attribute_Single	X	X
10	Set_Attribute_Single	-	X

Vardata object

- This manufacturer-specific object is required to use the engineering option of some of the software tools provided by SEW-EURODRIVE.
- Class code: 64_{hex}

Class

None of the class attributes are supported.

Instance 1

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Data	ARRAY OF SINT	-	-
2	Get	Size	UINT	00F2	Maximum data length in bytes

Supported services

Service code [hex]	Service name	Instance attribute 1	Instance attribute 2
0E	Get_Attribute_Single	X	X
32	Vardata (custom)	X	-

The standardized service "Get_Attribute_Single" (Service Code 0x0E) returns a data stream with the maximum data length (attribute 2) when instance attribute 1 is accessed. The data content is filled with zeros. If the request telegram is added to a data stream (service type custom), this data is returned in a mirrored form (Vardata test mode).

The Vardata service (service code 0x32) is a manufacturer-specific service. In this service, the telegram structure for the request and response are the same. The telegram contains routing information, the data length of the Vardata user data telegram and the actual Vardata layer-7 telegram. The data length of the Vardata layer-7 telegram is variable.

The following table shows the complete telegram structure.

Name	Data type
Subaddress 1	BYTE
Subchannel 1	BYTE
Subaddress 2	BYTE
Subchannel 2	BYTE
Data Len Low	BYTE
Data Len High	BYTE
Reserved	BYTE
Reserved	BYTE
FC	BYTE
Vardata	Array of BYTE

TCP/IP interface object

- The TCP/IP interface object enables the IP parameters to be configured via EtherNet/IP.
- Class code: $F5_{hex}$

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0001	Revision 1
2	Get	Max Instance	UINT	0001	Maximum instance
3	Get	Number of Instances	UINT	0001	DFE33B has one TCP/IP interface

Instance 1

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Status	DWORD	00000001	Valid configuration
2	Get	Configuration Capability	DWORD	00000014	The interface configuration attribute (5) is writeable. The DHCP can be used for configuration.
3	Set	Configuration Control	DWORD	00000002	0 = The unit uses the stored IP parameters at startup. 2 = The unit waits for its IP configuration via DHCP at startup.
4	Get	Physical Link Object	STRUCT of		Reference to the EtherNet link object (class code 0xF6) as sublayer.
		Path Size	UINT	0002	
		Path	Padded EPATH	20 F6 24 01	
5	Set	Interface Configuration	STRUCT of		
		IP Address	UDINT		Current IP address
		Network Mask	UDINT		Current subnetwork mask
		Gateway Address	UDINT		Current standard gateway
		Name Server	UDINT	00000000	DNS is not supported
		Name Server 2	UDINT	00000000	DNS is not supported
		Domain Name	STRING	sew.de	
6	Get	Host Name	STRING		Not used here

Supported services

Service code [hex]	Service name	Class	Instance
01	Get_Attributes_All	X	_
0E	Get_Attribute_Single	X	X
10	Set_Attribute_Single	-	X

Ethernet link object

- Information on the Ethernet communication interface is stored in the Ethernet link object.
- Class code: $F6_{hex}$

Class

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Revision	UINT	0002	Revision 2
2	Get	Max Instance	UINT	0001	Maximum instance
3	Get	Number of Instances	UINT	0001	DFE33B has one TCP/IP interface

Instance 1 – Ethernet connection X30

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Interface Speed	UDINT	00000064	Default value = 100 → transfer rate in MBit/s
2	Get	Interface Flags	DWORD		• Bit 0 displays the active link • BIt 1 displays full duplex mode • Bit 2 ... bit 4 signal negotiation status • Bit 5 shows whether the manual setting has to be reset • Bit 6 indicates a local hardware fault
3	Get	Physical address	ARRAY of 6 USINTs	00 0F 69 xx xx xx	MAC ID SEW MAC OUI: 00 0F 69

Instance 2 – Ethernet connection X32

Attribute	Access	Name	Data type	Default value [hex]	Description
1	Get	Interface Speed	UDINT	00000064	Default value = 100 → transfer rate in MBit/s
2	Get	Interface Flags	DWORD		• Bit 0 displays the active link • BIt 1 displays full duplex mode • Bit 2 ... bit 4 signal negotiation status • Bit 5 shows whether the manual setting has to be reset • Bit 6 indicates a local hardware fault
3	Get	Physical address	ARRAY of 6 USINTs	00 0F 69 xx xx xx xx	MAC ID SEW MAC OUI: 00 0F 69

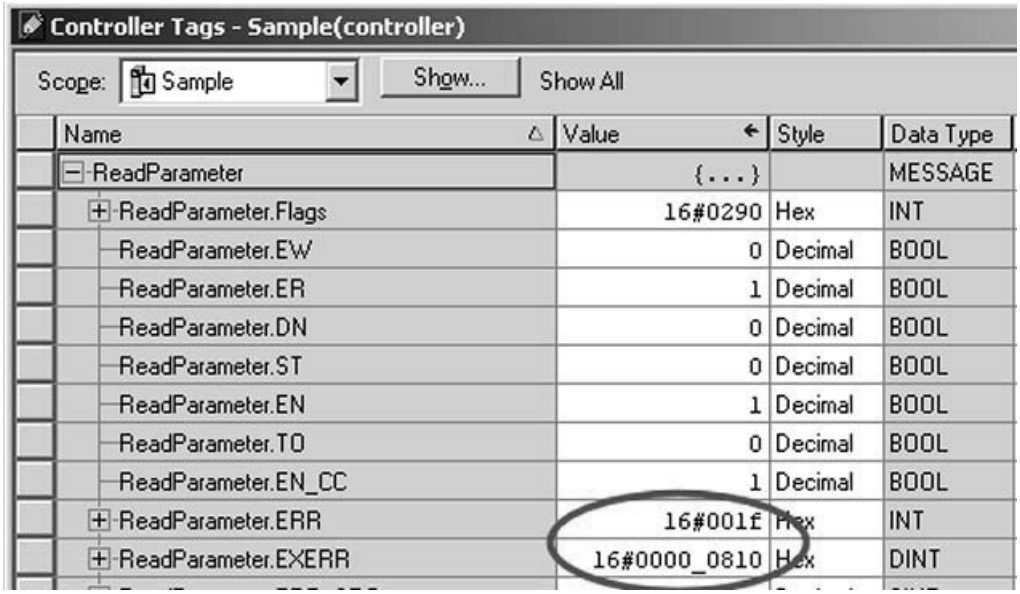
Supported services

Service code [hex]	Service name	Class	Instance
01	Get_Attributes_All	X	_
0E	Get_Attribute_Single	X	X

6.3 Return codes for parameter setting via explicit messages

If a parameter request via explicit messages fails, the cause can be determined by means of an error code. An error can be generated either by the DFE33B option, by the Ethernet/IP system, or by a timeout.

The general error code (ERR) and the additional code (EXERR) can be read from the status registers of the message tags (see following figure).



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SEW-specific return codes

The return codes that are returned by the DFE33B option or the inverter in the event of incorrectly set parameters are described in the "MOVIDRIVE® Fieldbus Unit Profile" manual and are therefore not described here. In conjunction with EtherNet/IP, the return codes are returned in the following format. The table below shows the data format for an exemplary parameter response telegram.

	Byte Offset			
	0	**1**	**2**	**3**
Function	General error codes	Additional code length (words)	Additional code word 1 (low byte)	Additional code word 1 (high byte)
Example	$1F_{hex}$ Vendor specific	01_{hex} only low word (word 1)	10_{hex} Additional error code	08_{hex} MOVILINK® error class

In the above example, the high byte of the additional code includes MOVILINK® error class 08 (general error). MOVILINK® additional error code 10 (invalid index) is located in the additional code low byte. This means a non-existing unit index was accessed.

Return codes EtherNet/IP

If the data format is not complied with during the transmission or a service is executed that is not implemented, Ethernet/IP-specific return codes will be issued in the error telegram. The coding of these return codes is described in the EtherNet/IP specification (see section "General error codes").

Timeout of explicit messages

The timeout is triggered by the DFE33B option. The timeout interval must be set by the master once the connection has been established. In the EtherNet/IP specification, the timeout interval is referred to as expected packet rate. The expected packet rate is calculated from the timeout interval as follows:

$t_{Timeout\_ExplicitMessages} = 4 \times t_{Expected\_Packet\_Rate\_EXplicitMessages}$

They can be set via connection object class 5, instance 1, attribute 9. The value range is from 0 ms to 655535 ms, step 5 ms.

If a timeout occurs for the explicit messages, this connection type for explicit messages will be automatically disconnected unless the polled I/O or bit-strobe connections are not in ESTABLISHED condition. This is the default setting of EtherNet/IP. To being able to communicate again with explicit messages, the connection for these explicit messages must be re-established. The timeout is **not** passed on to the inverter.

General error codes

General error code (hex)	Error name	Description
00	Success	Successful
01	Conection failure	A connection-specific service has failed.
02	Ressource unavailable	The source required for executing the service is not available.
03		Reserved
04	Path segment error	The processing node cannot interpret the path segment identifier or the segment syntax.
05	Path destination unknown	The path refers to an object class, object instance, or a structure element that is not supported by the processing node.
06-07		Reserved
08	Service not supported	The service is not supported for the selected class/instance.
09	Invalid attribute value	Invalid attribute values were sent.
0A-0B		
0C	Object state conflict	The selected object cannot execute the service in its current status.
0D		Reserved
0E	Attribute not settable	The selected object can be accessed with write access.
10	Device state conflict	The current status of the device prohibits execution of the requested service.
11-12		Reserved
13	Not enough data	The length of transmitted data is too short to execute the service.
14	Attribute not supported	The selected attribute is not supported.
15	Too much data	The length of transmitted data is too long to execute the service.
16	Object does not exist	The selected object is not implemented in the device.
17-1E		Reserved
1F	Vendor specific error	Vendor-specific error (see "Fieldbus Unit Profile" manual).
20	Invalid parameter	Invalid parameter. This error message is used if a parameter does not meet the requirements of the specification and/or the requirements of the application.
21-FF		Reserved

6.4 The integrated Ethernet switch

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

	NOTE
	The number of industrial Ethernet switches connected in line affects the telegram runtime. If a telegram passes through the units, the telegram runtime is delayed by the store & forward function of the Ethernet switch: • for a telegram length of 64 bytes by approximately 10 µs (at 100 Mbit/s) • for a telegram length of 1500 bytes by approximately 130 µs (at 100 Mbit/s) This means that the more units a telegram has to pass through, the higher the telegram runtime is.

Autocrossing

The two ports leading out of the Ethernet switch have autocrossing functionality. This means you can use patch or cross-over cables to connect the next Ethernet node.

Autonegotiation

The baud rate and the duplex mode is negotiated by both Ethernet nodes when establishing the connection. The two Ethernet ports of the EtherNet/IP interface support autonegotiation functionality and operate at a baud rate of 100 Mbit or 10 Mbit in full duplex or half duplex mode.

Notes on multicast handling

- The integrated Ethernet switch does not provide a filter function for Ethernet multicast telegrams. Multicast telegrams that are usually sent from the adapters (DFE33B) to the scanners (PLC) are passed on to all switch ports.
- IGMP snooping (managed switch) is not supported.
- SEW-EURODRIVE therefore recommends to connect the DFE33B option only with network components that support IGMP snooping (e.g. managed switch) or that have safety mechanisms integrated against excessive multicast load (e.g. devices from SEW-EURODRIVE). Units that do not have this function integrated may have malfunctions caused by excessive system load.

7 Integrated Web Server

The DFE33B option card has a homepage for simple web diagnostics of MOVIDRIVE® and MOVITRAC®. To access the start page, start your browser and enter the following IP address of the DFE33B:

Example: http://192.168.10.4

You can use the web page to access information about service and diagnostics.

7.1 Software requirements

The website 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 above.

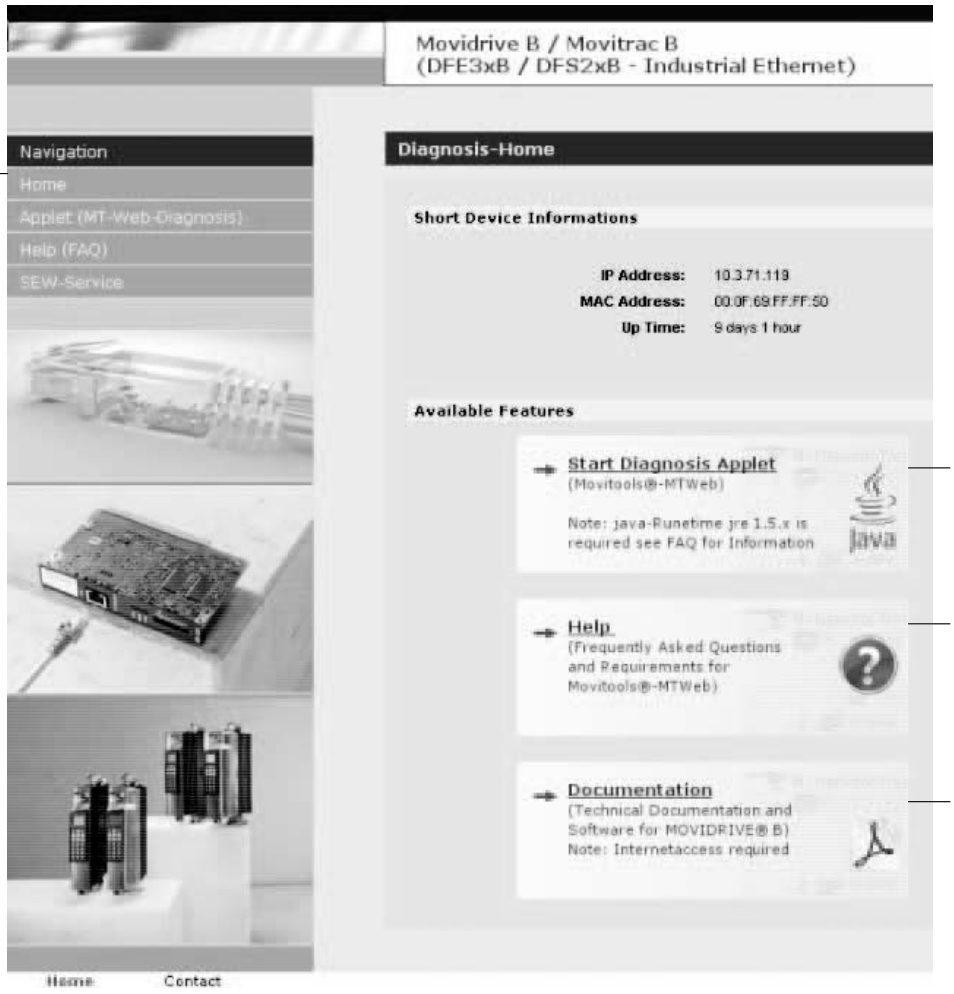
If the Java 2 Runtime environment is not installed on your system, the program will connect to Java and start an automatic download, if you allow it. Should you encounter any problems, you can also download Java 2 Runtime from www.sun.com and install it locally.

7.2 Security settings

If you are using a firewall or if you have a personal firewall installed on your system, they could prevent you from accessing the Ethernet units. In this situation, you should allow outgoing TCP/IP and UDP/IP traffic.

- The applet "sewAppletsMoviEWeb.JAppletWeb" will prompt you to accept a certificate. Click <Execute>. The certificate will be imported to the certificate list of the Java 2 Runtime environment
- Click the check box "Always trust content from this publisher" in order to avoid this dialog for future executions.

7.3 Design of the homepage of the integrated web server



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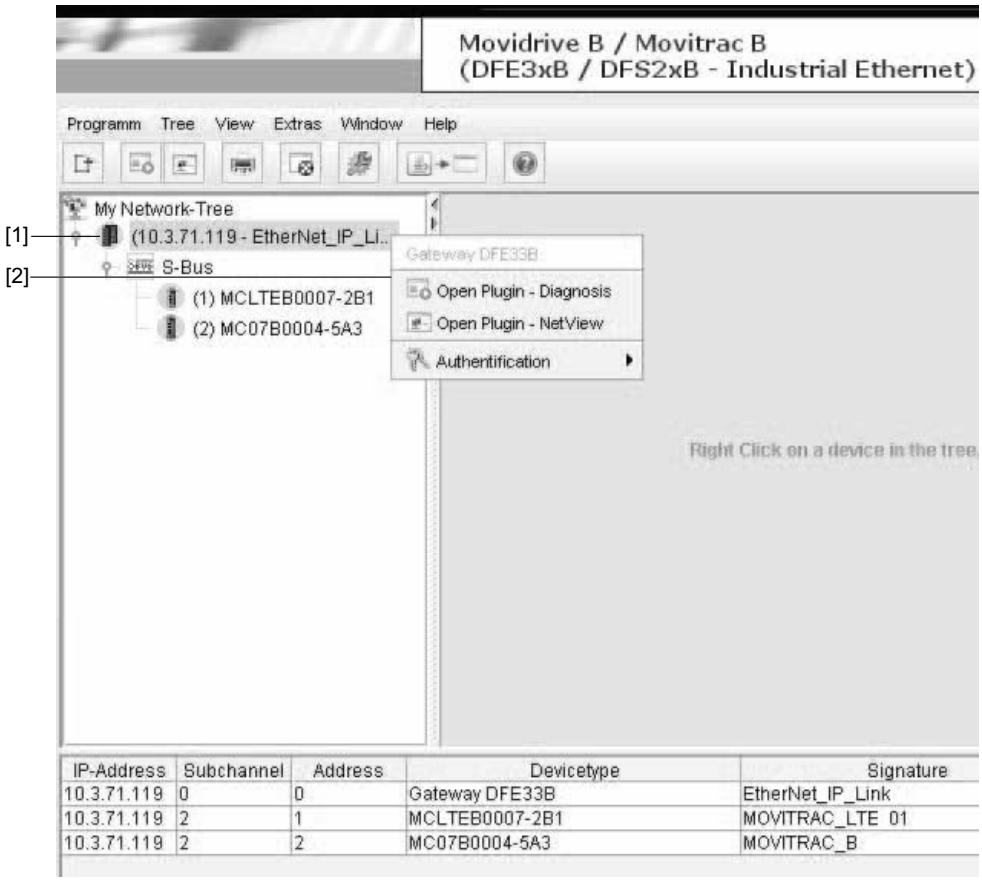
[1] Navigation bar	
[2] Main window (Home)	Button for starting the diagnostics applet
[3] Main window (Home)	Button for displaying website help
[4] Main window (Home)	Link to the MOVIDRIVE® B documentation page (Internet access required)

7.4 Structure of the diagnostics applet



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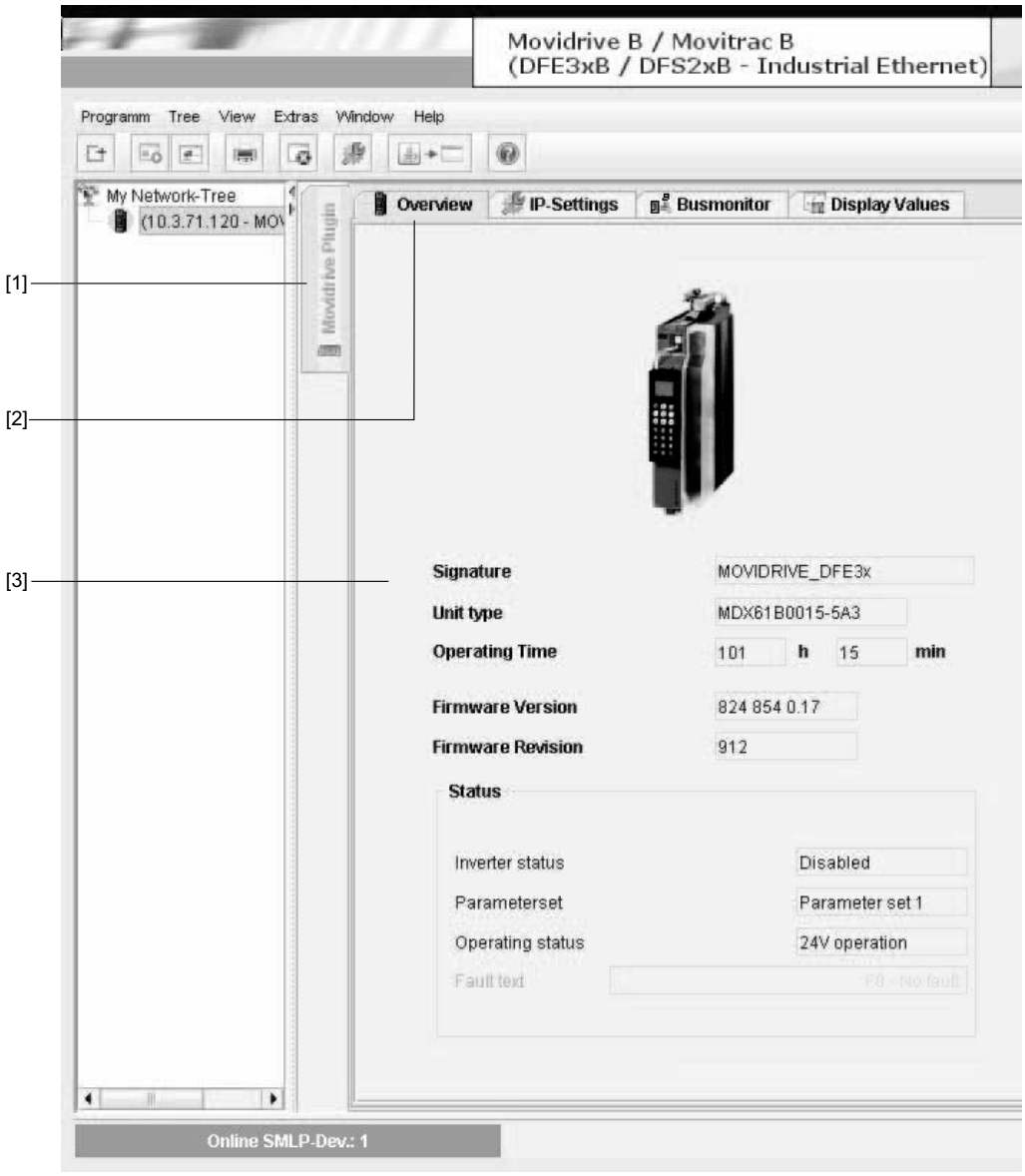
[1] Tree view / Overview	The tree displays the MOVIDRIVE® B Ethernet unit in the network node "My Network Tree". Individual subsystems of the corresponding unit versions are displayed below that; they may contain additional units.
[2] Popup menu when you right-click on a unit in the tree	You can navigate to the plugins of an individual unit by right-clicking a unit in the tree. A popup window appears, which leads you to that unit's plugins. Further, you can adjust the access settings for a MOVIDRIVE® B (see section "Access protection" To detect new units and have them displayed in the tree, right-click on the network node and select "Scan".
[3] Toolbar (Quick selection using buttons)	 [a] Rescan unit tree and display it in the tree [b] Open plugin for selected unit in unit tree [c] Overview plugin for selected unit in unit tree, see section "Plugin window (Overview)" [d] Close the selected plugin [e] Settings for Ethernet communication and scanner [f] Change to window mode or applet mode [g] Display information dialog box
[4] Plugin window	See section "Plugin window".
[5] Status table and unit status	The table is visible by default. It lists all units and subunits found during a scan. Since the status table sends cyclical parameter requests to the unit, you can also close the table using the status button (bottom right).

Plugin window



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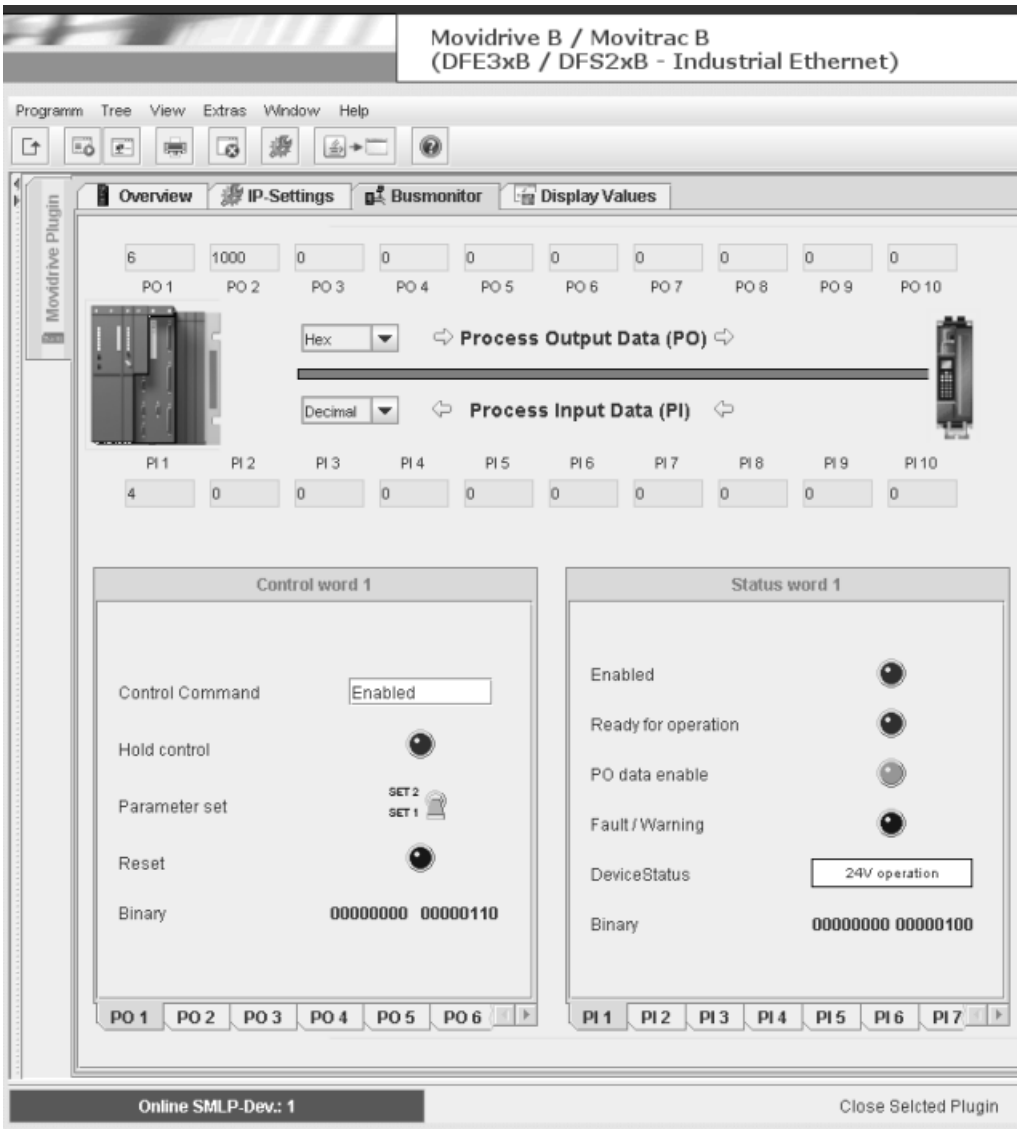
[1] Tab for opened plugins	If several plugins are open (e.g. plugins for various units), they will be listed on the tab.
[2] Tab within the plugin (shows parameter displays being implemented)	If the selected unit has several display columns, the tab will display those columns.
[3] Main window with display values and figures	The main window gives a visualization of the parameters.

Example: Bus monitor plugin for MOVIDRIVE®

This plugin is used to display the process data between the controller and the MOVIDRIVE® B as well as to diagnose the process data assignment.



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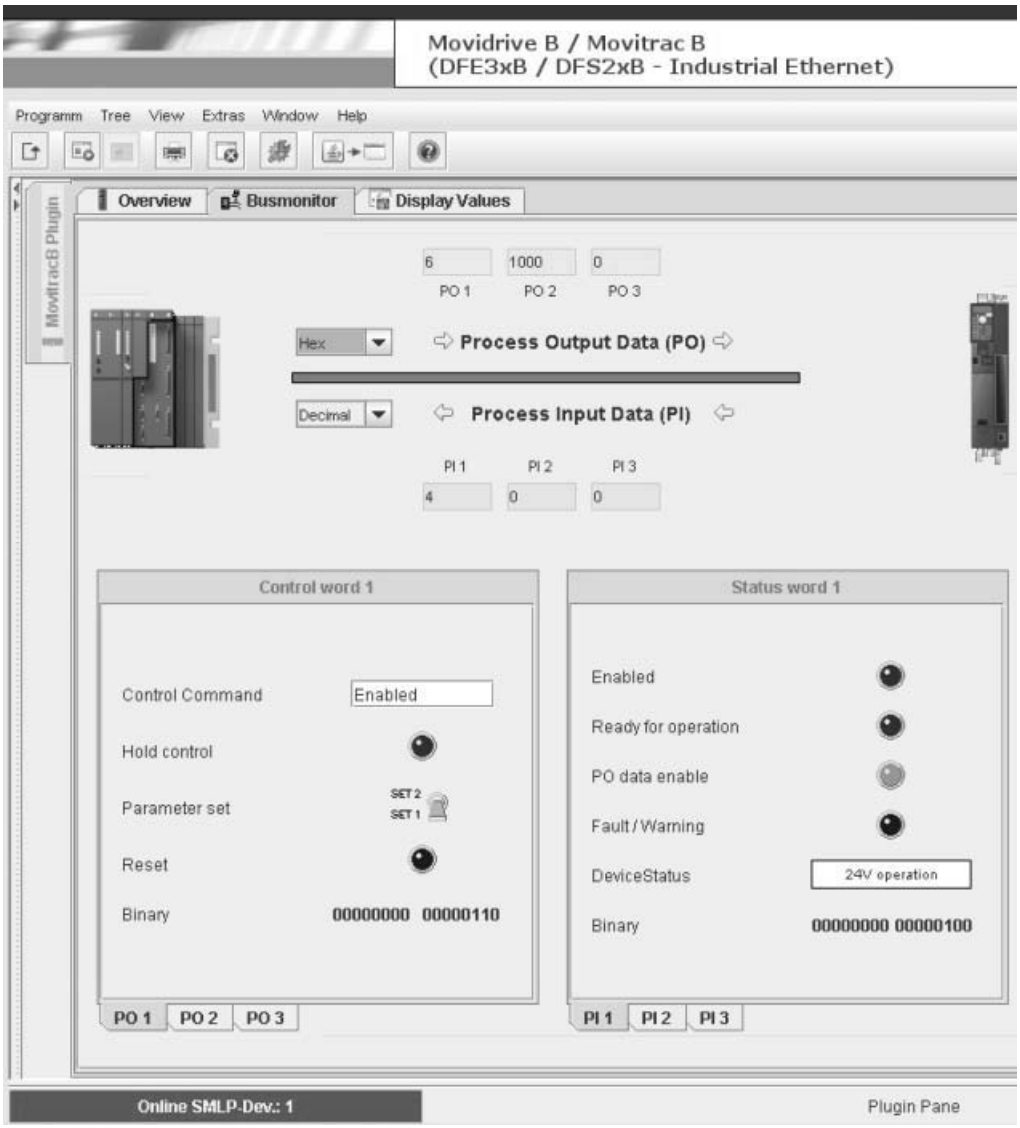
Example: Bus monitor plugin for MOVITRAC®

This plugin is used to display the process data between the control and the MOVITRAC® B and also for diagnosing the process data assignment.



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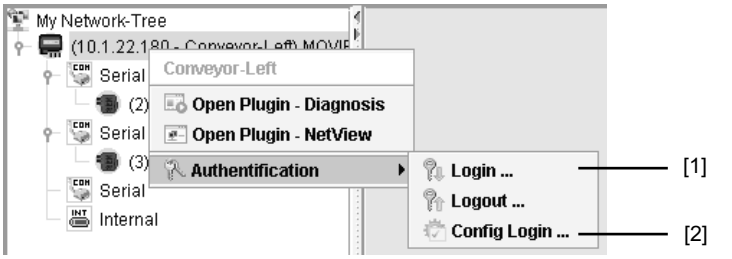
7.5 Access protection

Access to the drive parameters and diagnostics information can be protected by a password. The access protection is deactivated as standard. You can activate the access protection function by assigning a password [2]. To deactivate the function again, delete the password (blank password).

If access protection is activated, a login dialog [1] will appear to request the saved password.



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[1] Login

[2] Config Login

Under "User" in the login dialog, you can select "Observer" or "Maintenance".

- Observer
  - The drive unit parameters can be read with MOVITOOLS® MotionStudio but cannot be changed.
  - The current parameter settings can be uploaded from the unit to the PC (parameter set upload).
  - It is not possible to download a parameter set or an IPOS$^{plus®}$program.
  - Diagnostics via MOVITOOLS® MotionStudio is possible, the scope settings, however, cannot be changed.

- Maintenance
  - MOVITOOLS® MotionStudio can be operated without any limitations.

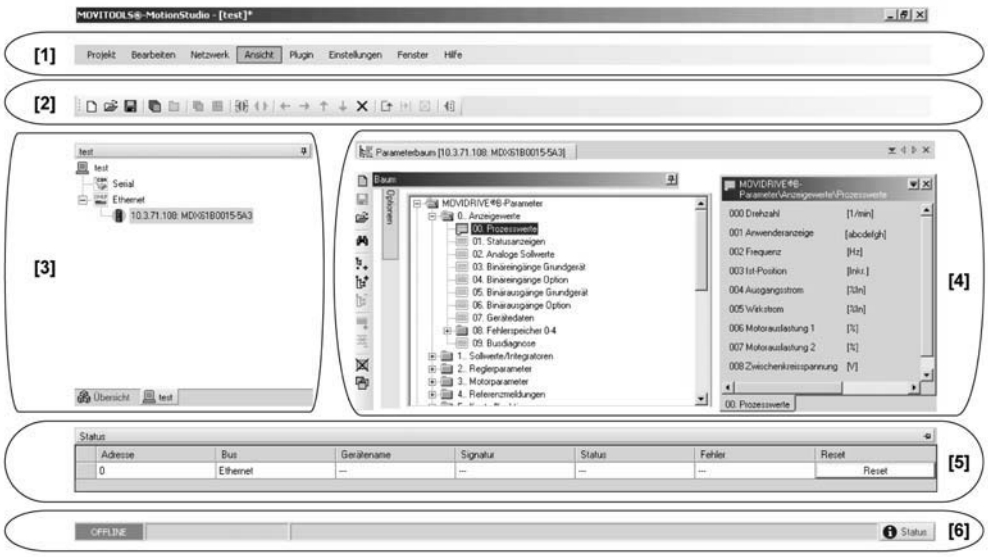
8 MOVITOOLS® MotionStudio via Ethernet

The MOVITOOLS® software (version 5.40 or higher) enables straightforward parameter setting, visualization and diagnostics for your drive application. With MOVITOOLS® MotionStudio, you can communicate with the MOVIDRIVE® MDX61B drive inverter, the DFE33B gateway and the SEW units connected to the gateway via Ethernet via the DFE33B option card.

STOP	**STOP!**
	Before starting MOVITOOLS® MotionStudio, you must add exceptions to your firewall for the installed software components. • In your firewall, enter all the executable programs that belong to the software components you have installed. • Check your firewall settings. It is possible that the firewall would prevent the execution of a program in the background. In other words, the user would not receive a message. • Check whether an Ethernet communication can be established between the PC and the DFE33B. To do so, you can use the "ping" command of the Windows command prompt (example: ping 192.168.10.4).

8.1 Overview

The MOVITOOLS® MotionStudio user interface comprises a central framework and the individual tools. These are started as separate applications from the framework, or they are integrated into the framework as plugins. The following figure shows the areas within the framework.



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Areas and their functions

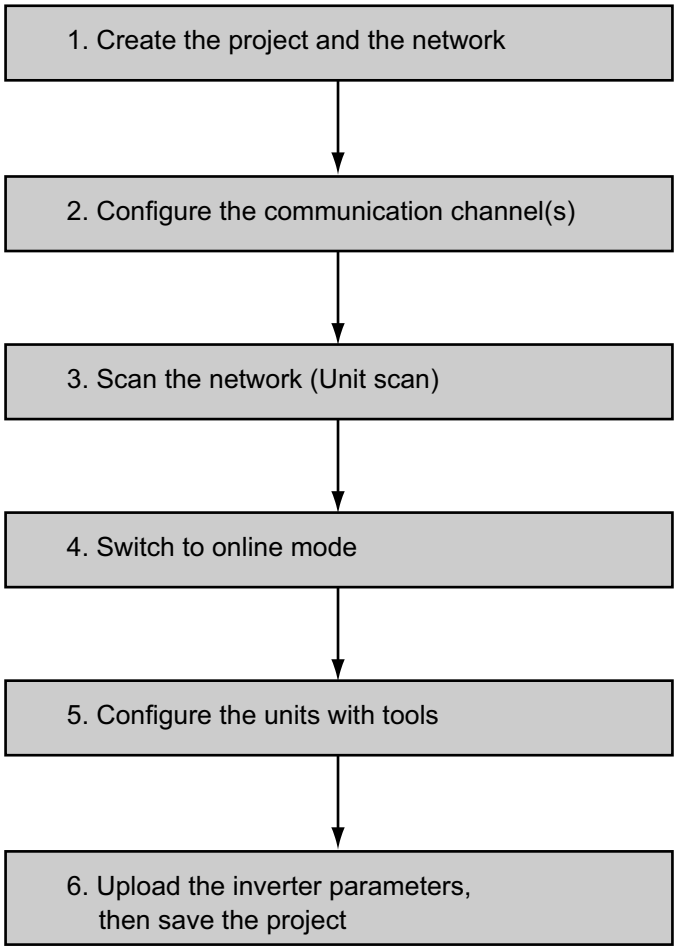
The following table describes the areas within the framework and their function.

[1] Menu bar	The main menu and toolbar contain all the important commands for navigating the framework.
[2] Toolbar	
[3] Area for project views	Information about the units in a project. The information is visualized using the following types of project views: • Network View • Project Planning View
[4] Area for plugins	The tools are displayed in the form of plugins in this area. The plugins are displayed either using tabs or as a separate window. The display depends on the selected tool. In this example, the "Parameter tree" tool has been selected for a MOVIDRIVE®.
[5] Unit status area	You can display the status information of units that are accessible online in the "Status bar". You can also hide the "unit status" area.
[6] Status bar	You can view the current communication status of the MOVITOOLS® MotionStudio in the status bar. This is where progress information is displayed during a unit scan.

8.2 Procedure for configuring units

Overview

The following figure shows the main steps to configure units with MOVITOOLS® MotionStudio.



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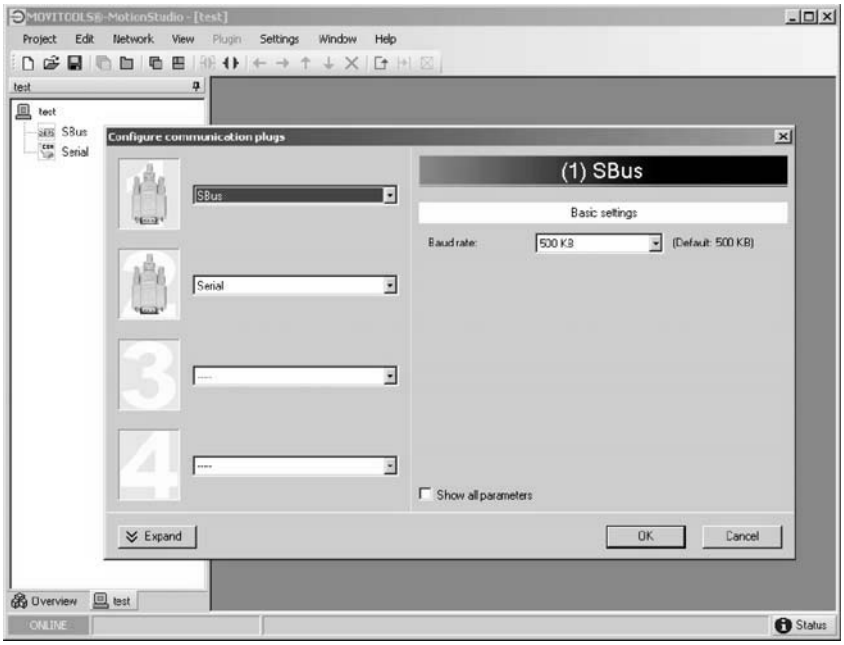
Step 1: Create a project and network

- Make sure that "New project" is selected and confirm. The "New project" window opens.
- Enter a name and directory for the new project and confirm your entries. The "New network" window opens.
- Enter a name for the new network and confirm your entries. The main screen opens and the "Configure communication plugs" window opens.



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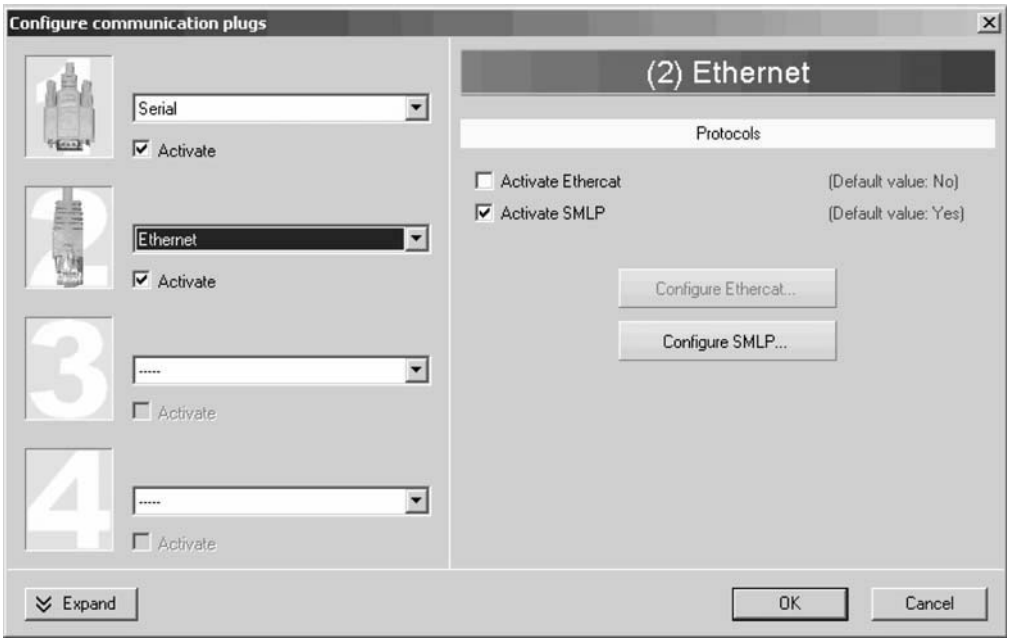
Step 2: Configuring the communication channel

- Set the first or an additional communication channel to "Ethernet".



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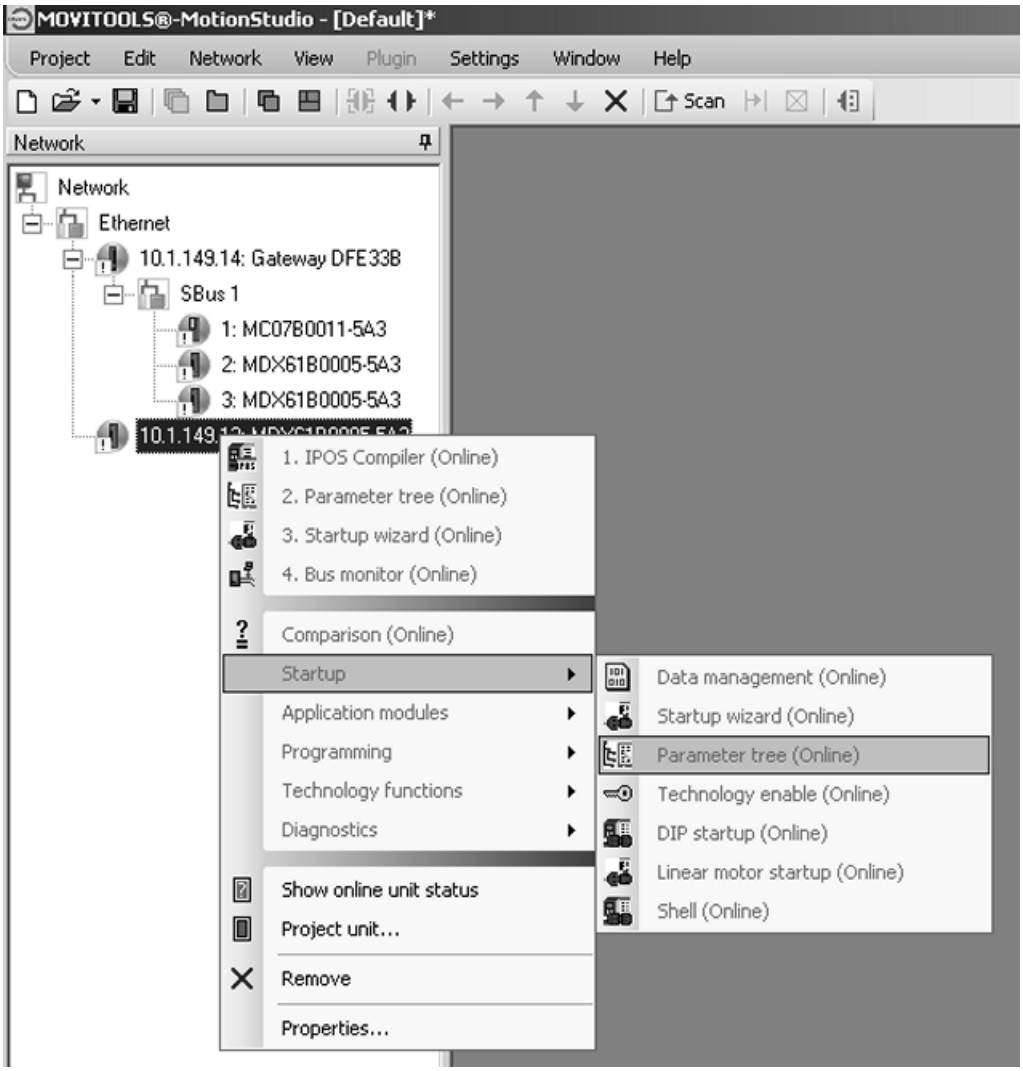
Step 3: Scan the network (unit scan)

- Scan the network with (unit scan).

Step 4: Configure units using Tools

- Activate the online mode with .
- Select the unit you want to configure.
- Right-click to open the context menu and display the tools for configuring the unit.



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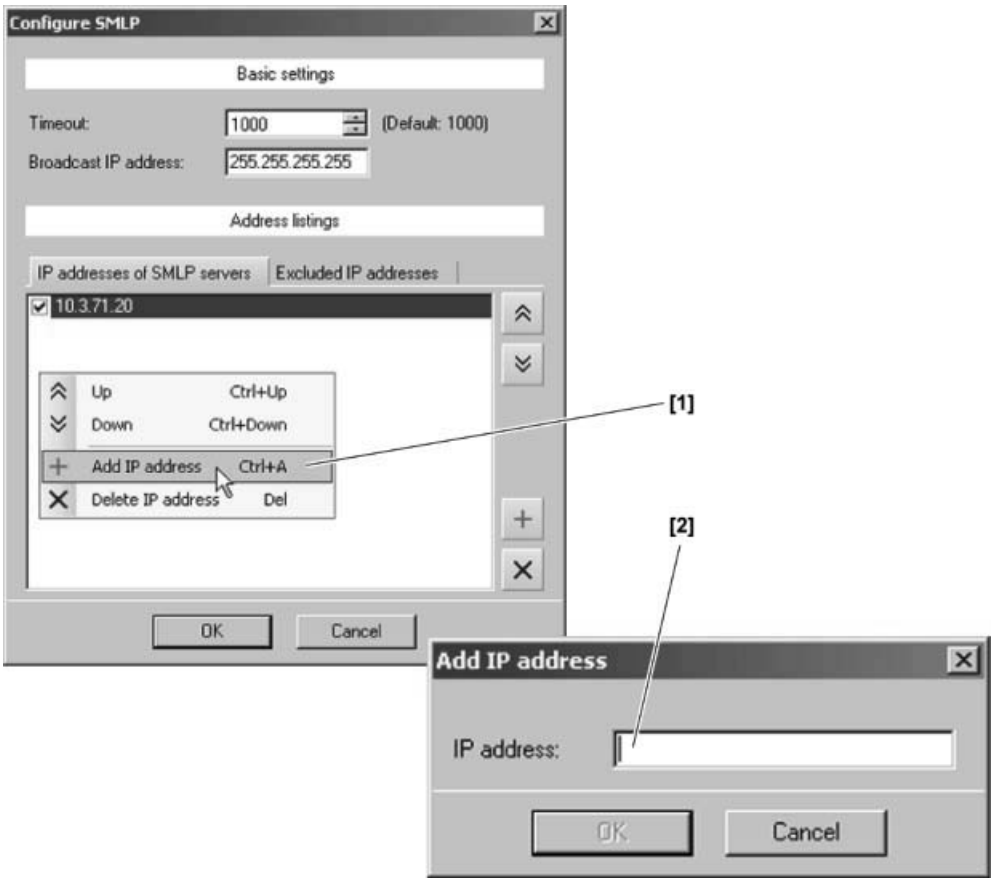
8.3 Communication with units outside the local subnetwork

If you want to establish an Ethernet communication with units **outside** the local network segment, click "Configure SMLP".



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- To add or delete an IP address, open the context menu [1] by clicking on the button or via the key combination [Ctrl-A].
- Enter the respective IP address of the DFE33B units in the "IP address" field.

Parameters for SMLP

The following table describes the parameters for SMLP (Simple MOVILINK® Protocol).

Parameter	Description	Note
Timeout	Waiting time in milliseconds that the client waits for a reply from the server after it has made a request.	Default setting: 1000 ms Increase the value as required if a delay in communication is causing malfunctions.
Broadcast IP address	IP addresses of the local network segment within which the unit scan is carried out	In the default setting, the unit scan only retrieves units in the local network segment.
IP address SMLP server	IP address of the SMLP server or of other units that are to be included in the unit scan but are outside the local network segment	Enter the IP address of units that are to be included in the unit scan but are located outside the local network segment.

9 EtherNet Configuration Parameters

9.1 Parameter description

The parameter group P78x includes display and setting values that are specific to the DFE33B option.

	NOTES
	As the DHCP is activated by default in the DFE33B option, the following parameters are given values assigned by the DHCP server: • P780 IP address • P781 Subnetwork mask • P782 Standard gateway Any changes made to the above parameters are only adopted when the DHCP (P785) is deactivated **before** the unit is switched off and then on again. If the DIP switch "Def IP" is set to "1" when switching on the DFE33B option, the specified default values of parameters P780 to P782 will be active.

P780 IP address

Setting range: 0.0.0.0 - 223.255.255.255

Factory setting: 0.0.0.0

Default value: 192.168.10.4

Use P780 to set the IP address for linking the DFE33B option via Ethernet. If DHCP (P785) is activated, the value specified by the DHCP server will be displayed.

P781 Subnetwork mask

Setting range: 0.0.0.0 - 255.255.255.255

Factory setting: 0.0.0.0

Default value: 255.255.255.0

The subnetwork mask divides the network into subnetworks. The set bits determine which part of the IP address represents the address of the subnetwork. If the DHCP (P785) is activated, the value specified by the DHCP server will be displayed here.

P782 Standard gateway

Setting range: 0.0.0.0 - 223.255.255.255

Factory setting: 0.0.0.0

Default value: 1.0.0.0

The standard gateway is addressed if the desired communication partner is not within the actual network. The standard gateway will have to be part of the actual network. If DHCP (P785) is activated, the value specified by the DHCP server will be displayed.

P783 Baud rate

Display value that cannot be changed. The value 100 MBaud is displayed after the initialization phase. This is the baud rate between internal switch and bus electronics, not the baud rate over X30 or X32.

P784 MAC ID

Display value that cannot be changed. Displays the MAC ID, that is, the unique Ethernet address of the interface module. The MAC ID of Ethernet components from SEW-EURODRIVE has the identification "00-0F-69" in the first three bytes.

P785
DHCP / Startup configuration

Setting range: 0 (saved IP parameter) / 2 (DHCP)

Factory setting: 2 (DHCP)

DHCP: The DFE33B option is assigned its IP parameters (P780 ... P782) P782) by a DHCP server when the supply voltage is switched on.

Saved IP parameters: The DFE33B option is started with the saved IP parameters when the supply voltage is switched on.

10 Troubleshooting

10.1 Introduction

The diagnostic procedures described in the following section demonstrate the integration of the DFE33B option into an EtherNet/IP network and the error analysis method for the following problems:

- Inverter is not integrated properly in the EtherNet/IP network
- Inverter cannot be controlled using the EtherNet/IP master (scanner)

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*.

For more diagnostic information, refer to the online status display in the EtherNet/IP master (scanner) and the associated online help.

10.2 Diagnostic procedure: MDX61B with DFE33B option

The following subsections are a step-by-step description of the startup procedure for MOVIDRIVE® B with DFE33B EtherNet/IP option.

10.2.1 Preliminary work

Step 1: Install the required software

1. FTDI driver for USB11A programming interface
   - Connect USB11A to the PC. Windows hardware detection installs the required FTDI driver.
   - The FTDI driver is available on the Software ROM 7 or on the SEW website.
2. MOVITOOLS® MotionStudio version 5.40 and higher.
3. EDS file SEW_MOVIDRIVE_DFE33B.eds if required

Step 2: Install the units

1. Install MOVIDRIVE® MDX60B/61B according to the operating instructions:
   - Supply system cable
   - Motor cable
   - Braking resistor
   - DC 24 V backup voltage
2. Establish EtherNet/IP network (managed switch) and connect DFE33B to it.

10.2.2 Switching on MOVIDRIVE® MDX61B with DC 24 V or AC 400 V (configuring MOVIDRIVE® B)

1. Start MOVITOOLS® MotionStudio and open a new project.

   Specify a project name and assign USB11A programming interface according to the serial COM interface.

   – When the USB11A programming interface is connected to the PC for the first time, Windows hardware detection installs the required FTDI driver
   – If USB11A is not recognized, check the assignment to the COM interface. The matching COM port is marked by "USB"
2. Connect the PC to MOVIDRIVE® B via USB11A programming interface.
3. Perform a unit scan. To do so, select the unit using the mouse button and make a right-mouse click to open the context menu. Then choose [Startup] / [Parameter tree] from the menu.
4. Set *P100 setpoint source* and *P101 control signal source* to "Fieldbus".
5. For simple control via fieldbus, the binary inputs can be set to "No Function" using parameters P601 ... P608.
6. Check the parameter setting for the process data (P87x). The parameters for control word and status word must be set. Set *P876 PO data enable* to "Yes".

10.2.3 Configuring EtherNet/IP and enabling MOVIDRIVE® B

1. Start the configuration program for the controller and the EtherNet/IP interface (e.g. Logix 5000).
2. Check whether PC and controller are located in the same subnetwork:
   – Are the IP addresses of PC and CPU identical up to the lowest byte?
   – Is the subnet mask identical?
3. Check whether a TCP/IP communication can be established with the controller.
4. Carry out the EtherNet/IP configuration as described in this manual.
   – Assign IP address to DFE3B
   – Activate the IP address in the configuration
   – Perform process data configuration
   – Load the configuration to the controller
5. After successful EtherNet/IP configuration, the MODULE STATUS and NETWORK STATUS LEDs light up green. Process data is now being exchanged.
6. Expand the control program in order to exchange the required data with the DFE33B option.
7. Start MOVITOOLS® MotionStudio and open a new project. Set up "Ethernet" as communication interface.
   – Alternatively, MOVITOOLS® MotionStudio can be operated via serial communication with USB11A. Connect PC with MOVIDRIVE® B.
8. Perform a unit scan.
9. Select MOVIDRIVE® B, make a right mouse click and choose [Diagnostic] / [Bus monitor] from the context menu. Check whether the project data exchange between control and MOVIDRIVE® is working.
10. Switch on the supply voltage and enable MOVIDRIVE® B at the terminals (DI00=1). Activate unit enable via control word 1 = 0x0006 .
    – If MOVIDRIVE® B remains in "No Enable" condition, check the terminal assignment (parameter group P60x) and supply further binary inputs with DC 24 V if required.

10.3 Diagnostic procedure for MOVITRAC® B with DFE33B as gateway

The following subsections are a step-by-step description of the startup procedure for MOVITRAC® B with DFE33B EtherNet/IP option.

10.3.1 Preliminary work

Step 1: Install the required software

1. FTDI driver for USB11A programming interface
   - Connect USB11A to the PC. Windows hardware detection installs the required FTDI driver.
   - The FTDI driver is available on the Software ROM 7 or on the SEW website.
2. MOVITOOLS® MotionStudio version 5.40 and higher.
3. EDS file SEW_GATEWAY_DFE33B.eds if required

Step 2: Install the units

1. Install MOVITRAC® B according to the operating instructions:
   - Supply system cable
   - Motor cable
   - Braking resistor
   - DC 24 V backup voltage
2. Establish EtherNet/IP network (managed switch) and connect DFE33B to it.
3. Install the system bus according to this manual.
4. Activate SBus terminating resistor at final node.

10.3.2 Switching on units with DC 24 V or AC 400 V (configuring MOVITRAC® B)

1. Start MOVITOOLS® MotionStudio and open a new project.

   Specify a project name and assign USB11A programming interface according to the serial COM interface.

   – When the USB11A programming interface is connected to the PC for the first time, Windows hardware detection installs the required FTDI driver
   – If USB11A is not recognized, check the assignment to the COM interface. The matching COM port is marked by "USB"
2. Connect the PC to MOVITRAC® B via USB11A programming interface.
3. Perform a unit scan. To do so, select the unit using the mouse button and make a right-mouse click to open the context menu. Then choose [Startup] / [Parameter tree] from the menu.
4. Set the parameters for *P881 SBus address* in ascending order (1 ... 8) unequal to 0 Set *P883 SBus timeout interval* to 50 ... 200 ms
5. Set *P100 setpoint source* to "SBus1 / fixed setpoint" and *P101 control signal source* to "SBus1".
6. For simple control via fieldbus, the binary inputs can be set to "No Function" using parameters P601 to P608.
7. Check the parameter setting for the process data (P87x). The parameters for control word and status word must be set. Set *P876 PO data enable* to "Yes".
8. Repeat steps 2 to 7 for the individual units connected to the SBus.
9. Activate "Auto setup" function via DIP switch "AS" of the DFx gateway. Set DIP switch "AS" to "1". H1 LED flashes during the scan and goes out after successful completion.
10. Connect the PC to DFx gateway via USB11A programming interface.
11. Perform a unit scan. The DFx gateway and all units installed at the SBus must now be accessible.
12. Select DFx gateway and open the context menu with a right mouse click. Choose [Diagnostics] / [Monitor Fieldbus Gateway DFx] from the menu. Go to the "Gateway Configuration" tab page and check whether the "Auto setup" function has recognized all units. If not, check

    – the SBus installation
    – whether the terminating resistor is connected to the final unit
    – the SBus addresses of the individual units

10.3.3 Configuring EtherNet/IP and enabling MOVITRAC® B

1. Start the configuration program for the controller and the EtherNet/IP interface (e.g. Logix 5000).
2. Check whether PC and controller are located in the same subnetwork:
   - Are the IP addresses of PC and CPU identical up to the lowest byte?
   - Is the subnet mask identical?
3. Check whether a TCP/IP communication can be established with the controller.
4. Carry out the EtherNet/IP configuration as described in this manual.
   - Assign IP address to DFE3B
   - Activate the IP address in the configuration
   - Perform process data configuration
   - Load the configuration to the controller
5. After successful EtherNet/IP configuration, the MODULE STATUS and NETWORK STATUS LEDs light up green. Process data is now being exchanged.
6. Expand the control program in order to exchange the required data with the DFE33B option.
7. Start MOVITOOLS® MotionStudio and open a new project. Set up "Ethernet" as communication interface.
   - Alternatively, MOVITOOLS® MotionStudio can be operated via serial communication with USB11A. Connect PC with MOVIDRIVE® B.
8. Start MOVITOOLS® MotionStudio and open a new project. Set up "Ethernet" as communication interface.
   - Alternatively, MOVITOOLS® MotionStudio can be operated via serial communication with USB11A. Connect PC with DFx gateway.
9. Perform a unit scan. DFx gateway and all units installed at the SBus must now be accessible if the MOVITRAC® B units have been configured beforehand.
10. Activate DFx gateway with the mouse button and start the "Monitor DFx Fieldbus Gateway" tool by clicking on it with the right mouse button. Go to the "Process data monitor" window and check whether the process data exchange between controller and gateway is working.
11. Switch on the supply voltage and enable MOVITRAC® B at the terminals (DI01=1). Activate unit enable via control word 1 = 0x0006
    - If MOVITRAC® B remains in "No Enable" condition, check terminal assignment (parameter group P60x) and supply further binary inputs with DC 24 V if required.

10.4 Error list in gateway operation

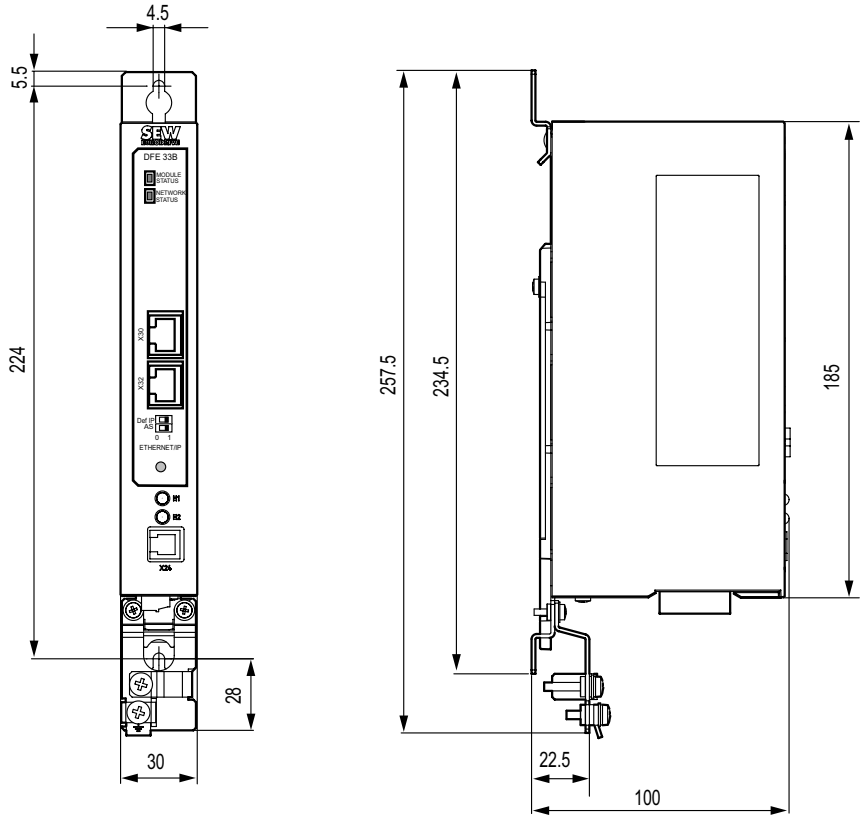
Error code	Designation	Response	Cause	Measure
25	EEPROM	SBus communication stopped	Error while accessing EEPROM	Activate factory settings, perform reset and set parameters for DFE again. Contact SEW service if the error occurs again
28	Fieldbus timeout	Default: PO data = 0 Error response adjustable via P831	No communication between master and slave within the projected response monitoring.	• Check communications routine of the master • Extend the fieldbus timeout interval (response monitoring) in the master configuration or deactivate monitoring
37	Watchdog error	SBus communication stopped	Error during execution of system software	Contact SEW Service.
38	Internal error	SBus communication stopped	Inverter electronics is faulty, possibly due to EMC influence	Check ground connections and shielding and correct, if necessary. Contact SEW service if this error occurs again.
45	Initialization error	SBus communication stopped	Error after self-test during reset	Perform a reset. Consult SEW service if the error occurs again.
111	System error device timeout	None	Check the red system error LED (**H1**) of the DFE. If this LED is on, one or several participants on the SBus could not be addressed within the timeout interval. If the red system error LED (**H1**) flashes, the DFE itself is in an error state. In this case, error F111 was reported to the control only via fieldbus.	Check voltage supply and SBus cabling, check SBus terminating resistors. Check the project planning if the DFE was configured with the PC. Switch DFE off and on again. If the error is still present, query the error via diagnostic interface and perform the action described in this table.

11 Technical Data

11.1 DFE33B option for MOVIDRIVE® B

DFE33B option	
Part number	1821 346 4
Power consumption	P = 3 W
Application protocol	• **EtherNet/IP** (Industrial Protocol) to control and set parameters for the drive inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS®. • **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically.
Port numbers used	• 44818 (EtherNet/IP TCP) • 2222 (EtherNet/IP UDP) • 300 (SMLP) • 80 (HTTP) • 67 / 68 (DHCP)
Ethernet services	• ARP • ICMP (ping)
ISO / OSI layer 1/2 **ISO / OSI layer 4/5**	EtherNet II TCP/IP and UDP/IP
Automatic baud rate detection	10 MBaud / 100 MBaud
Connection technology	2 x RJ45 with integrated switch and Autocrossing
Addressing	4 byte IP address or MAC-ID (00-0F-69-xx-xx-xx)
Manufacturer ID (Vendor ID)	$013B_{hex}$
Tools for startup	• MOVITOOLS® MotionStudio version 5.40 and higher. • DBG60B keypad
Firmware status of MOVIDRIVE® MDX61B	Firmware status 824 854 0.17 or higher (→ display with P076)

11.2 Dimension drawing of DFE33B for MOVITRAC® B and in the gateway housing



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DFE33B option (MOVITRAC® B gateway)	
External voltage supply	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
Application protocol	• **EtherNet/IP** (Industrial Protocol) to control and set parameters for the drive inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS®. • **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically.
Port numbers used	• 44818 (EtherNet/IP TCP) • 2222 (EtherNet/IP UDP) • 300 (SMLP) • 80 (HTTP) • 67 / 68 (DHCP)
Ethernet services	• ARP • ICMP (ping)
ISO / OSI layer 1/2 **ISO / OSI layer 4/5**	EtherNet II TCP/IP and UDP/IP
Automatic baud rate detection	10 MBaud / 100 MBaud
Connection technology	2 x RJ45 with integrated switch and Autocrossing
Addressing	4 byte IP address or MAC-ID (00-0F-69-xx-xx-xx)
Manufacturer ID (Vendor ID)	$013B_{hex}$
Tools for startup	MOVITOOLS® MotionStudio version 5.40 and higher.
Firmware version of MOVITRAC® B	No special firmware is required

12 Glossary

12.1 Terms

Term	Meaning
DHCP	**D**ynamic **H**ost **C**onfiguration **P**rotocol. Allows you to allocate an IP address and additional configuration parameters for automation components in a network via a server.
TCP	**T**ransmission **C**ontrol **P**rotocol. Acknowledged connection-oriented transport protocol.
UDP	**U**ser **D**atagram **P**rotocol. Non-acknowledged, connectionless transport protocol.
IP	**I**nternet **P**rotocol. Protocol for data transport in the Internet.
IP address	An IP address consists of 32 bits divided into four so called octets containing 8 bits each for the sake of clarity. These values are displayed as four decimal numbers separated by points, for example, "192.168.1.1". An IP address is subdivided into the network section (net ID) and the node address (host ID)
Subnetwork mask	The subnetwork mask establishes which part of the IP address is used to address the network and which part is used to address a station (host). All bits set to 1 in the subnetwork mask represent the network part (net ID); all bits set to 0 represent the node address (host ID). In a class B network, for example, the subnetwork mask is 255.255.0.0; that is, the first two bytes of the IP address identify the network.
Standard gateway	IP address of the station in the subnetwork that establishes a connection to other networks.
Client	Application that uses the services from another computer. Example: A controller uses a service from the DFE33B option for cyclical data exchange.
Server	Application on a computer that offers services to other computers. Example: The DFE33B option offers a controller the service for cyclical process data exchange.
Broadcast	A broadcast is a transmission to all stations within a distribution list or network.
STP	**S**hielded **T**wisted **P**air .
UTP	**U**nshielded **T**wisted **P**air .

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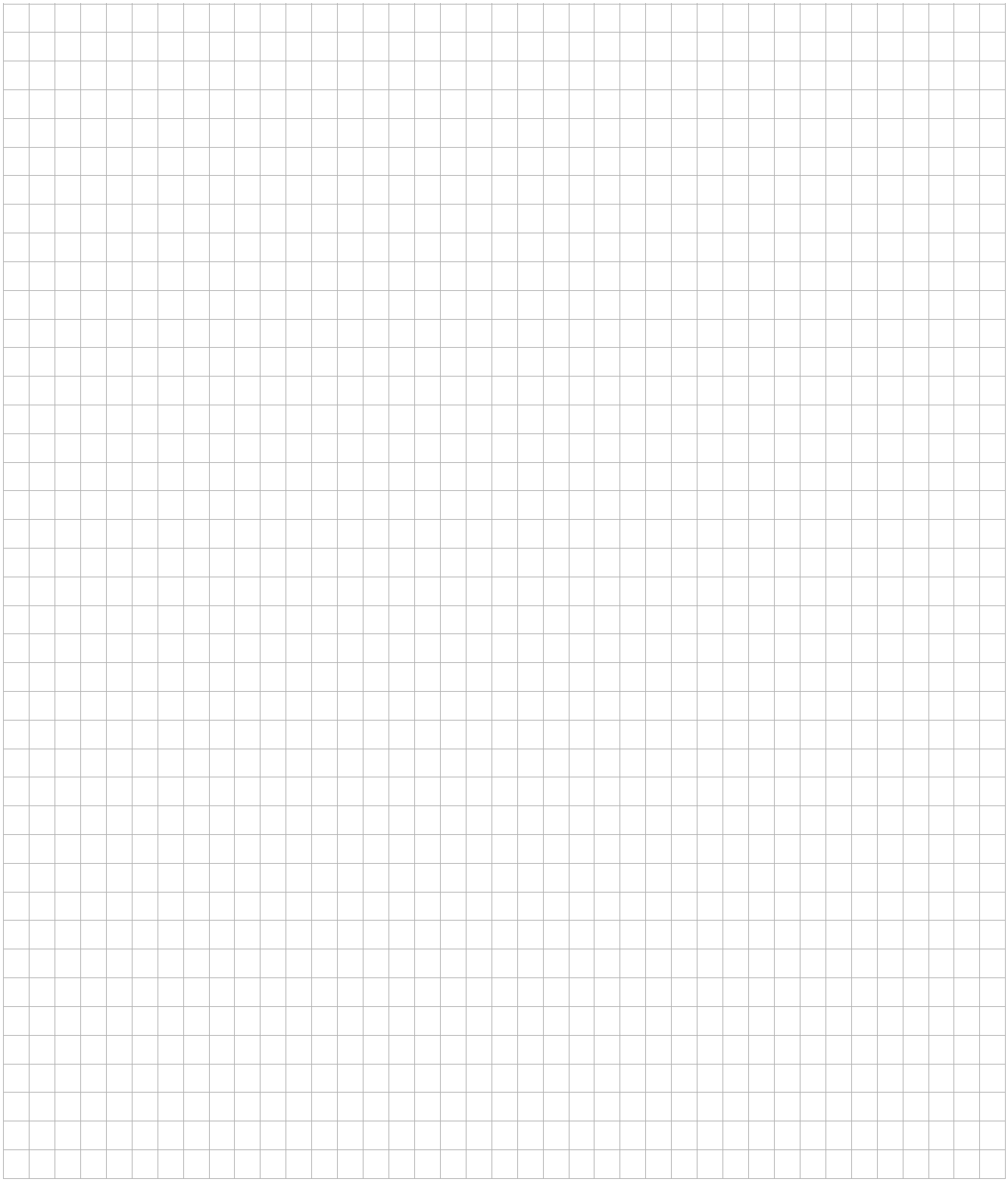

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