



SEW
EURODRIVE



MOVIDRIVE® MDX61B
Fieldbus Interface DFE13B
EtherNet/IP

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Manual





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1 Important Notes



- This manual does not replace the detailed operating instructions!
- Only electrical specialists are allowed to perform installation and startup. Adhere to all relevant accident prevention regulations and the MOVIDRIVE® MDX60B/61B operating instructions!

Documentation

- Read through this manual carefully before you start installation and startup of MOVIDRIVE® drive inverters with the Ethernet DFE13B option card.
- This manual assumes that the user has access to and is familiar with the MOVIDRIVE® documentation, in particular the MOVIDRIVE® MDX60B/61B system manual.
- In this manual, cross references are marked with "→". For example, (→ Sec. X.X) means: Further information can be found in section X.X of this manual.
- As a prerequisite to fault-free operation and fulfillment of warranty claims, you must adhere to the information in the documentation.

Bus systems

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 inverter behavior. This may result in unexpected (not uncontrolled) system behavior.

Safety and warning notes

Always observe the safety and warning instructions contained in this publication!



Electrical hazard

Possible consequences: Severe or fatal injuries.



Hazard

Possible consequences: Severe or fatal injuries.



Hazardous situation

Possible consequences: Slight or minor injuries.



Harmful situation

Possible consequences: Damage to the unit and the environment.



Tips and useful information.



2 Introduction

<i>Content of the manual</i>	This user manual describes how to install the DFE13B option card in the MOVIDRIVE® MDX61B drive inverter and how to start up MOVIDRIVE® with the EtherNet/IP fieldbus system.
<i>Additional documentation</i>	In addition to this manual you should request the following publication on fieldbus technology for information on how to connect MOVIDRIVE® simply and effectively to the Ethernet fieldbus system: • "MOVIDRIVE® Fieldbus Unit Profile" manual The "MOVIDRIVE® Fieldbus Unit Profile" manual describes the fieldbus parameters and their coding and explains the whole range of control concepts and application options in the form of brief examples. The "MOVIDRIVE® Fieldbus Unit Profile" manual contains a list of all parameters of the drive inverter that can be read or written via the various communication interfaces, such as system bus, RS-485 or the fieldbus interface.
Characteristics	The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE13B option to connect to higher-level automation, project planning, and visualization systems via Ethernet because of its powerful, universal fieldbus interface.
<i>MOVIDRIVE® and Ethernet</i>	The unit behavior of the inverter that forms the basis of Ethernet 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 and makes it much easier to change to other bus systems, such as DeviceNet (option DFD).
<i>Access to all information</i>	MOVIDRIVE® MDX61B offers digital access to all drive parameters and functions via the Ethernet interface. The drive inverter is controlled via fast, cyclic process data. You can use this process data channel to enter setpoints, such as the setpoint speed, ramp generator time for acceleration/deceleration, etc., and to trigger various drive functions such as enable, controller inhibit, normal stop, rapid stop, etc. However, at the same time you can also use this process data channel to read back actual values from the drive inverter, such as the actual speed, current, unit status, fault numbers, or reference signals.
<i>Configuring the Ethernet option card</i>	By setting the IP address parameters over the DHCP server, you can quickly integrate a drive inverter into the Ethernet environment and activate it. The remaining parameter setting process can then be performed in a fully automated process by the higher-level master (parameter download). This forward-looking variant shortens the system startup time and simplifies the documentation of your application program because you can store all the important drive parameters in your control program.

*Monitoring functions*

Using a fieldbus system requires additional monitoring functions for the drive technology, such as time monitoring of the fieldbus (fieldbus timeout) or rapid stop concepts. You can adapt the monitoring functions of MOVIDRIVE® specifically to your application. You can determine which of the drive inverter's fault responses should be triggered in the event of a bus error. It is a good idea to use a rapid stop function for many applications. However you can also freeze the last setpoints so that the drive continues to operate with the most recently valid setpoints (for example, conveyor belt). As the range of functions for the control terminals is also guaranteed in fieldbus mode, you can continue to implement rapid stop concepts using the terminals of the drive inverter, irrespective of the fieldbus used.

Diagnostics

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

Fieldbus monitor

Furthermore, you are supplied with a variety of additional information about the status of the fieldbus option card. The fieldbus monitor function in conjunction with the MOVITOOLS® 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.



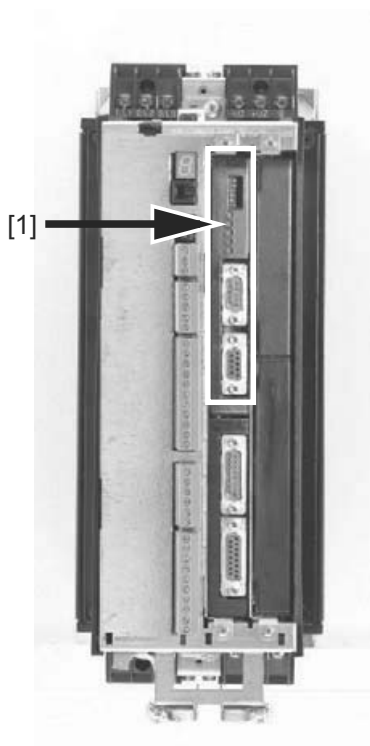
3 Assembly / Installation Instructions

3.1 Installing the DFE13B option card



- The MOVIDRIVE® MDX61B **must** have firmware status 824 854 0.17 or above. You can display the firmware status using parameter P076.
- **Only SEW-EURODRIVE engineers can install or remove option cards for MOVIDRIVE® MDX61B size 0.**
- End users may install or remove option cards for MOVIDRIVE® MDX61B sizes 1 to 6.

Plug the DFE13B option card into the fieldbus slot [1].



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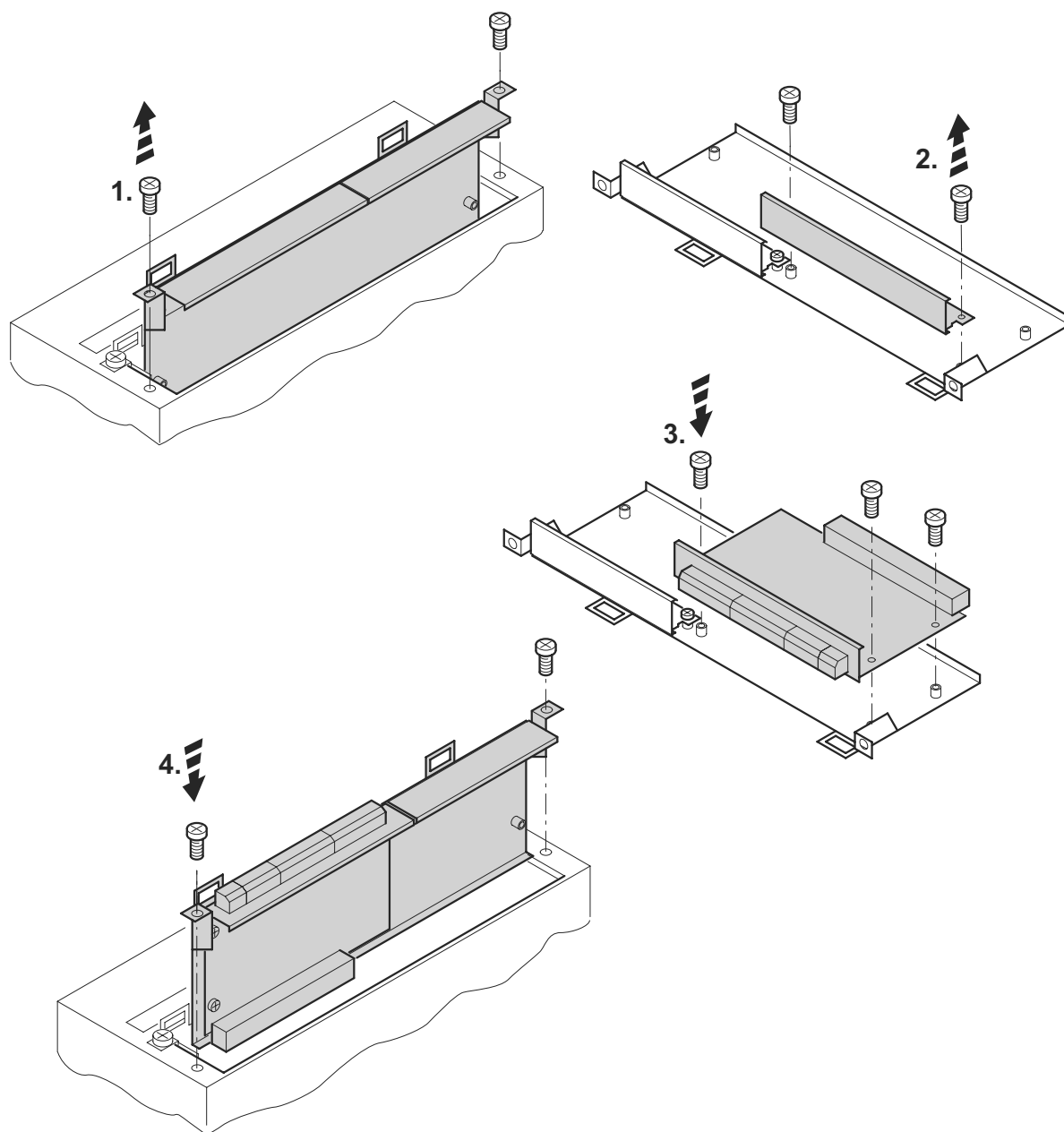
Before you begin

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

- Disconnect the inverter from the power. Switch off the 24 V DC and the supply voltage.
- Take appropriate measures to protect the option card from electrostatic charge (use discharge strap, conductive shoes, etc.) before touching it.
- **Before installing** the option card, remove the keypad and the front cover.
- **After installing** the option card, replace the front cover and the keypad.
- 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.



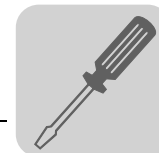
Basic procedure for installing/removing an option card



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Figure 1: Installing an option card in MOVIDRIVE® MDX61B sizes 1 to 6 (schematic diagram)

1. Remove the retaining screws holding the card retaining bracket. Pull the card retaining bracket out evenly from the slot (do not twist!).
2. Remove the 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 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 retaining screws.
5. To remove the option card, follow the instructions in reverse order.



3.2 Connection and terminal description of the DFE13B option

Part number

Ethernet interface type DFE13B option: 1 820 565 8



The "Ethernet interface type DFE13B" option is only possible in conjunction with MOVIDRIVE® MDX61B, not with MDX60B.

Plug the DFE13B option into the fieldbus slot.

The DFE13B option is powered by MOVIDRIVE® MDX61B. A separate voltage supply is not required.

Front view of DFE13B	Description	DIP switch Terminal	Function
	DIP switch	nc Def IP	Reserved Resets IP-parameters to default values and disables DHCP
	LED status (red/yellow/green)		Shows the current status of the DFE13B.
	LED 100MBit (green)		Shows the baud rate of the Ethernet connection.
	LED link/act. (green)		Shows the status of the Ethernet connection.
	X30: Ethernet connection		
	MAC address IP input field:		MAC address, e.g. to configure the DHCP server. You can enter the allocated IP address in this field.



3.3 Pin assignment

Use prefabricated, shielded RJ45 plug connectors to IEC11801 edition 2.0, category 5.

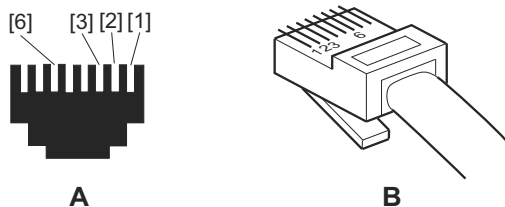


Figure 2: Pin assignment of an RJ45 plug connector

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A = Front view

B = View from back

[1] Pin 1 TX+ Transmit Plus

[2] Pin 2 TX– Transmit Minus

[3] Pin 3 RX+ Receive Plus

[6] Pin 6 RX– Receive Minus

MOVIDRIVE® / EtherNet connection

To connect DFE13B to the Ethernet, connect the Ethernet interface X30 (RJ45 connector) to the switch provided using a shielded category 5, class D patch cable twisted-pair in accordance with IEC11801 edition 2.0.

If you want to connect the DFE13B option card directly to your project planning computer, you need a crossover cable.



According to IEC 802.3 the maximum cable length for 10/100 Mbaud Ethernet (10BaseT / 100BaseT) between e.g. DFE13B and Switch is 100 m (330 ft).

The ODVA (Open DeviceNet Vendor Association) recommends in a CIP Technical Paper the use of network components that provide the feature IGMP Snooping (Managed Switch) to minimize end device and switch loading with unwanted traffic.



3.4 Shielding and routing bus cables

Only use shielded cables and connection elements that are shielded and meet the requirements of category 5, class D according to IEC11801 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 with the greatest possible surface area.
- Attach the shielding of the bus line on both sides.
- 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 in proximity using the shortest way possible.
- Avoid using plug connectors to extend bus cables.
- Route the bus cables along existing grounding surfaces.



In case of fluctuations in the earth 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 according to relevant VDE regulations in such a case.



3.5 TCP / IP addressing and subnetworks

Introduction

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

- 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.

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)	Description
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 subnetwork mask.

Subnetwork mask

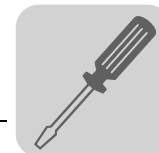
A subnetwork mask is used to divide the network classes into even finer sections. The subnetwork mask is represented by four decimal numbers separated by decimal points, in the same way as the IP address. Every decimal number stands for one byte.

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	.	128
	binary	11000000	.	10101000	.	1010	.	10000000
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 using the subnetwork mask 255.255.255.128. 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.

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 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.



3.6 Setting the IP address parameters

Initial startup

The "DHCP" protocol (**D**ynamc **H**ost **C**onfiguration **P**rotocol) is activated as the default setting. This means that the DFE13B option card expects its IP address parameters from a DHCP server.



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 DFE13B must be inserted in the assignment list of the DHCP server. In doing so, the MAC ID of the DFE13B option is allocated a valid IP address.



The configured IP address parameters are only adopted when DHCP is disabled after setting the IP-parameter.

Changing the IP address parameters after successful initial startup

If the DFE13B 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 DFE13B (→ Sec. "Integrated Web Server")
- Using the MOVITOOLS® software via Ethernet by means of the MOVILINK® switcher (→ Sec. "MOVITOOLS® via Ethernet")
- Using the EtherNet/IP TCP/IP interface object (→ Sec. "EtherNet/IP CIP object directory")

Additionally, you can also change the IP address parameters via the serial interface of MOVIDRIVE® MDX61B or using the DBG60B keypad.

If the IP address parameters are assigned to the option DFE13B 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 of the inverter (mains and 24 V DC) have been switched off and back on again.



Deactivating / activating the DHCP

The type of IP address allocation is determined by the attribute *Configuration Control* of the EtherNet/IP TCP/IP interface object. It can be changed by using the "BOOTP Utility" from Rockwell Automation. The value is displayed by the Parameter *P785 EtherNet/IP 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 cannot access the inverter using the serial interface or the DBG60B keypad, you can reset the IP address parameters to the default values using the DIP switch "Def IP".

This action resets the DFE13B option to the following default values:

- IP address: 192.168.10.4
- Subnetwork mask: 255.255.255.0
- Default gateway: 0.0.0.0
- P785 EtherNet/IP Startup Configuration: Saved IP parameters (DHCP is disabled)

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

- Switch off the 24 V DC supply voltage and the supply voltage.
- Set the DIP switch "Def IP" on the DFE13B option to "1."
- Switch the 24 V DC supply voltage and the supply voltage back on.
- Wait until the DFE13B option boots up. The "Status" LED flashes yellow/green when the option is ready.
- Set the DIP switch "Def IP" on the DFE13B option to "0."
- Now the following options are available to assign the new IP address:
 - Via the homepage of DFE13B (→ Sec. "Integrated Web Server")
 - Using the MOVITOOLS® software via Ethernet by means of the MOVILINK® switcher (→ Sec. "MOVITOOLS® via Ethernet")
 - Using the EtherNet/IP TCP/IP interface object (→ Sec. "EtherNet/IP CIP object directory")



When setting back the DIP switch "Def IP" to "0" DHCP stays disabled! DHCP can be reactivated using the EtherNet/IP TCP/IP interface object (→ Sec. "EtherNet/IP CIP object directory") or with the help of the DHCP-Server from Rockwell Automation.



3.7 Procedure for replacing the unit

The procedure for replacing a unit differs depending on the part of the unit that has to be replaced. The following table gives a list of possible cases; the part to be replaced is marked with a cross.

Memory card	MDX61B	DFE13B	Measures to restart communication
		X	- If the DHCP is activated, the new MAC ID of the previous IP address must be allocated in the assignment list of the DHCP server. - If the DHCP is deactivated and the unit uses the saved IP address parameters, no measures are necessary.
	X	X	
	X		No measures are necessary.
X			If the memory card is replaced, MOVIDRIVE® MDX61B is assigned the parameters that are stored on the new memory card. Because the values are not identical, we recommend that you restore the inverter to its delivery condition using the factory settings and perform the entire startup process again. Setting back the drive to factory settings does not change the IP address parameters. If the saved IP address parameters on the memory card are not known we recommend using the DIP switch "DefIP". If both the memory card and option DFE13B are replaced with DHCP activated, the new MAC ID of the previous IP address must be allocated in the assignment list of the DHCP server
X	X		
X		X	
X	X	X	

3.8 Operating mode displays of the DFE13B option

Ethernet LEDs

There are three LEDs on the DFE13B option card that display the current status of the DFE13B option and the Ethernet system.

LED status
(red/yellow/green)

- The **Status** LED shows the current status of the DFE13B option card.

Status	Description
Off	The DFE13B option card is either not supplied with voltage or it is faulty.
Red	There is an error in the DFE13B option card.
Yellow	The operating system of the DFE13B option card has been started.
Flashing yellow	The TCP / IP stack of the DFE131B option card has been started. If this status continues and you have activated the DHCP server, the DFE13B option card waits for data from the DHCP server.
Flashing yellow/green	There is no controlling EtherNet/IP IO connection.
Green	There is a controlling EtherNet/IP IO connection.

LED 100 MBit
(green)

- The LED **100MBit** (green) shows the baud rate of the Ethernet connection.

Status	Description
On	There is an Ethernet connection with a baud rate of 100 MBit.
Off	There is an Ethernet connection with a baud rate of 10 MBit. If the LED Link/Activity is also off there is no Ethernet connection.



LED Link/Activity
(green)

- The LED **1Link/Activity** (green) shows the status of the Ethernet connection.

Status	Description
On	There is an Ethernet connection.
Flickering	Data is currently being exchanged via Ethernet.
Off	There is no Ethernet connection.



- As the firmware of the DFE13B option card requires approximately 20 seconds for initialization, the status "0" (inverter not ready) is displayed in the 7-segment display of MOVIDRIVE® during this time.
- The LEDs on the DFE13B display the following:
 - LED status → Yellow
 - LED 100 MBit → OFF
 - LED Link/Activity → Green



4 Project Planning and Startup

This section describes how to configure and start up the MOVIDRIVE® MDX61B drive inverter with the DFE13B option.

4.1 Startup of the drive inverter

After installing the fieldbus option card, you can immediately set the parameters for the MOVIDRIVE® drive inverter via the fieldbus system without making any additional settings. For example, you can set all parameters by the master programmable controller after power-on.

However, to control the drive inverter via the Ethernet system, you must first switch the drive inverter to control signal source and setpoint source = FIELDBUS. The FIELDBUS setting means the inverter parameters are set for control and setpoint transfer from the Ethernet. The drive inverter then responds to the process output data sent by the master programmable controller.

Activation of the control signal source/setpoint source FIELDBUS is signaled to the higher-level controller using the "Fieldbus mode active" bit in the status word. For safety reasons, you must also enable the drive inverter at the terminals for control via the fieldbus system. Consequently, you must wire or program the terminals in such a way that the inverter is enabled via the input terminals.

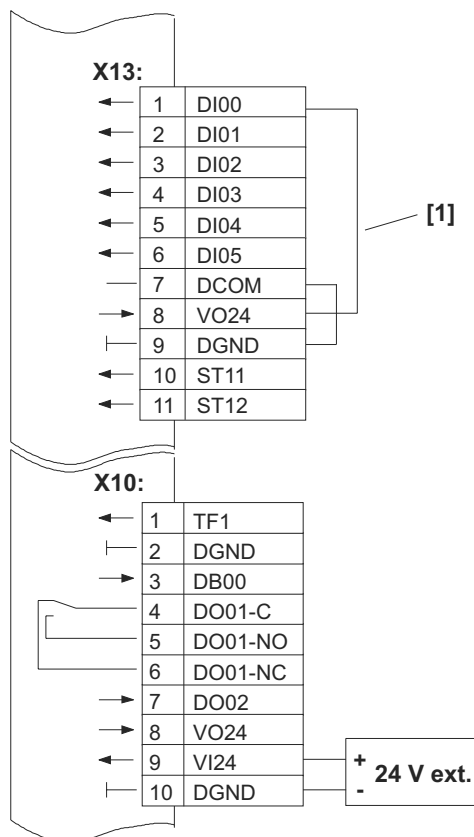
The simplest way of enabling the drive inverter at the terminals is to connect the DI00 (function /CONTROLLER INHIBIT) input terminal to a +24 V signal and to program input terminals DI01 ... DI05 to NO FUNCTION. The following section shows by way of example how to start the MOVIDRIVE® drive inverter with fieldbus interface.



**Procedure for
startup of the
MOVIDRIVE®
MDX61B**

1. Enable the power output stage at the terminals.

Connect the input terminal DI00 / X13.1 (function /CONTROLLER INHIBIT) to a +24 V signal (for example, using a device jumper).



DI00 = Controller inhibit
DI01 = no function
DI02 = no function
DI03 = no function
DI04 = no function
DI05 = no function
DCOM = Reference X13:DI00 ... DI05
VO24 = DC+ 24 V
DGND = Reference pot. for binary signals
ST11 = RS-485 +
ST12 = RS-485 -
TF1 = TF input
DGND = Reference pot. for binary signals
DB00 = Brake
DO01-C = Relay contact
DO01-NO = Normally open contact relay
DO01-NC = Normally closed contact relay
DO02 = /Malfunction
VO24 = DC+ 24 V
VI24 = DC+ 24 V (external supply)
DGND = Reference pot. for binary signals

Enabling the power output stage via unit jumper [1]
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2. Switch on the external 24 V voltage supply (not line voltage supply!).
You can now configure the drive inverter.
3. Setpoint source = FIELDBUS / control signal source = FIELDBUS.
Set the setpoint source and control signal source parameters to FIELDBUS to control the drive inverter via a fieldbus.

P100 Setpoint source = FIELDBUS

P101 Control signal source = FIELDBUS

4. Input terminals DI01 ... DI05 = NO FUNCTION.

Set the function of the input terminals to NO FUNCTION.

P600 Programming terminal DI01 = NO FUNCTION

P601 Programming terminal DI02 = NO FUNCTION

P602 Programming terminal DI03 = NO FUNCTION

P603 Programming terminal DI04 = NO FUNCTION

P604 Programming terminal DI05 = NO FUNCTION

For more information on startup and control of the MOVIDRIVE® drive inverter, refer to the "MOVIDRIVE® Fieldbus Unit Profile" manual.



Project Planning and Startup

Configuring the master (EtherNet/IP scanner)

4.2 Configuring the master (EtherNet/IP scanner)

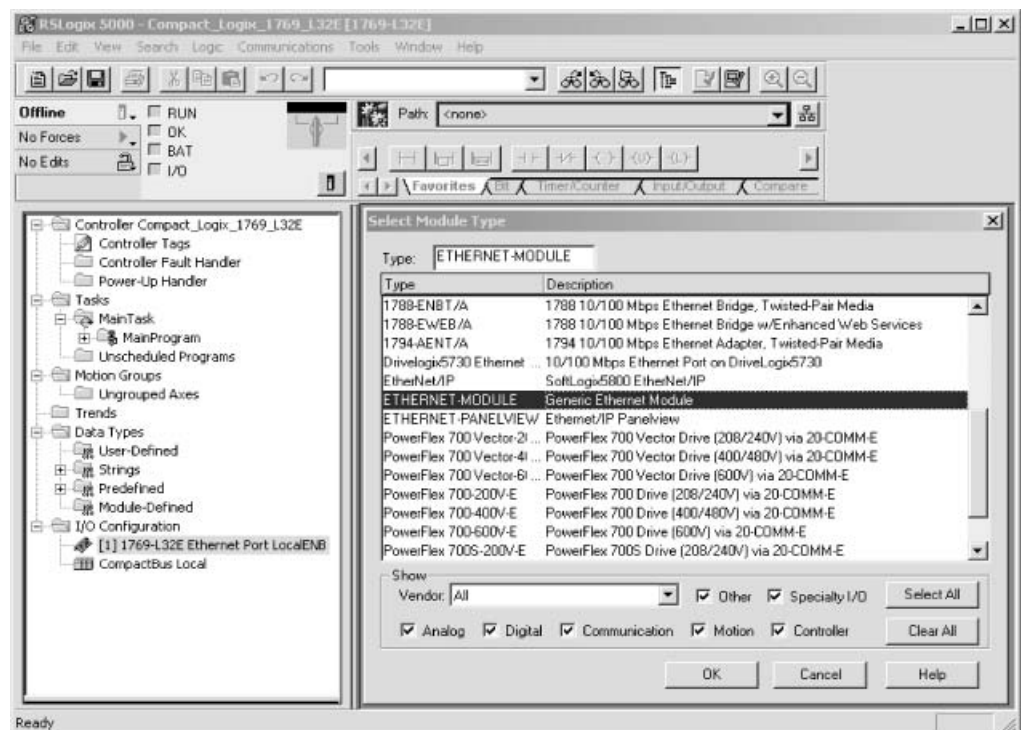
The following example refers to project planning for the Allen-Bradley CompactLogix 1769-L32E controller with RSLogix 5000 programming software. The EtherNet/IP interface is integrated in the CPU component of this controller.



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

Process data exchange

In the following project planning example, the option DFE13B 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. Click the right mouse button. The selection window "Select Module Type" appears.
- To add option DFE13B to the project, select the entry "Generic Ethernet Module." Confirm your selection by clicking <OK>.
- The window "Module Properties - LocalENB" is called up.



Configuring DFE13B

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- For the data format, open the dropdown menu "Comm-Format" and choose the entry "Data - INT." Process data for DFE13B 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 connected to the output instance of DFE13B.
- To establish a controlling connection, enter the value "120" in the "Output Assembly Instance" input field. The input data of the PLC must be connected to the output instance of DFE13B.
- 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.
- In the "Address / Host Name" group box, select the option "IP Address" and enter the IP address of the DFE13B option.
- Click <Next> to continue.

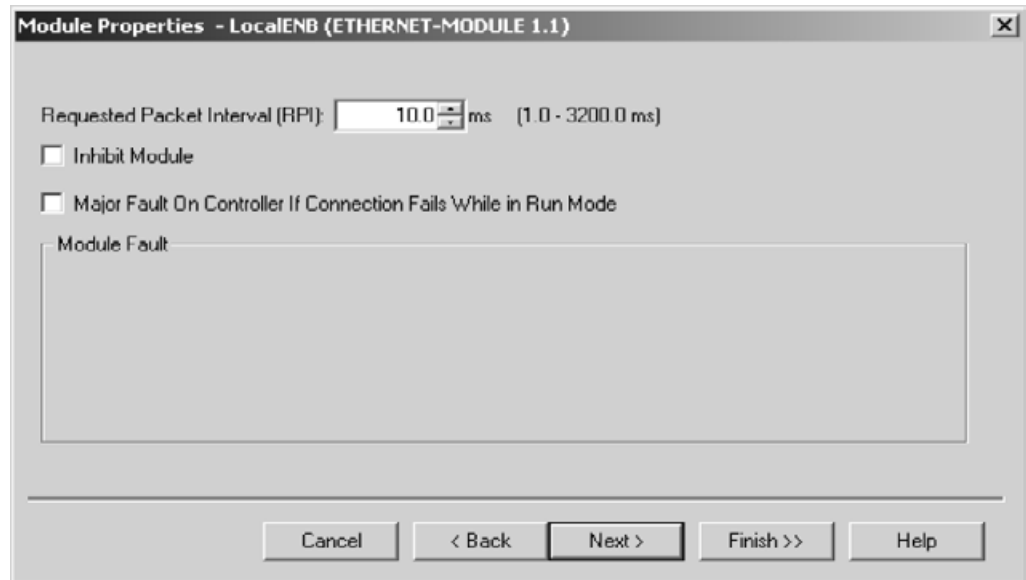


Project Planning and Startup

Configuring the master (EtherNet/IP scanner)

Setting the data rate

You set the data rate in this window.



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- The DFE13B option supports a minimum data rate (input field "Requested Packet Interval (RPI)") of 5 ms. Higher cycle rates can be used without any problems.
- Click <Finish>. You have now configured process data exchange with a DFE13B.



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 added using the SEW parameter channel.

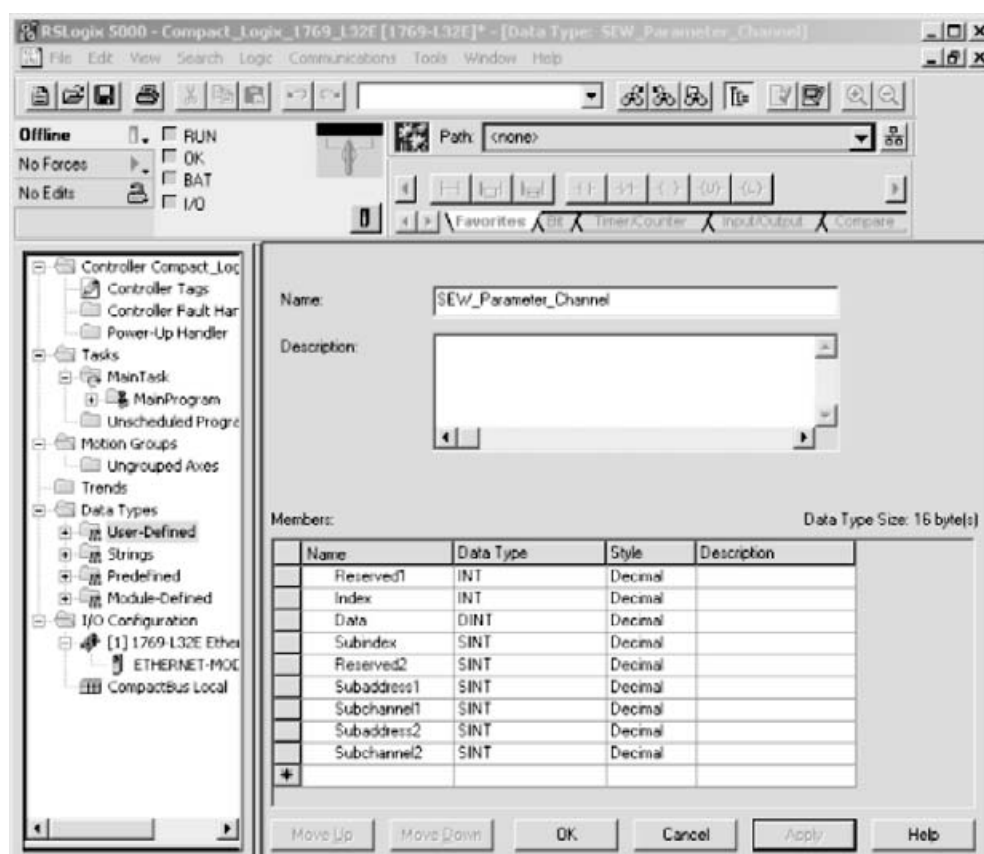
The SEW parameter channel has the following structure:

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

In MOVIDRIVE®, a unit parameter can only be addressed using the index. The subindex, 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 screenshot). With the RSLogix 5000 program you can create your own data types in the directory structure (→ Following screenshot). 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 located on a 32-bit address.



11194AXX

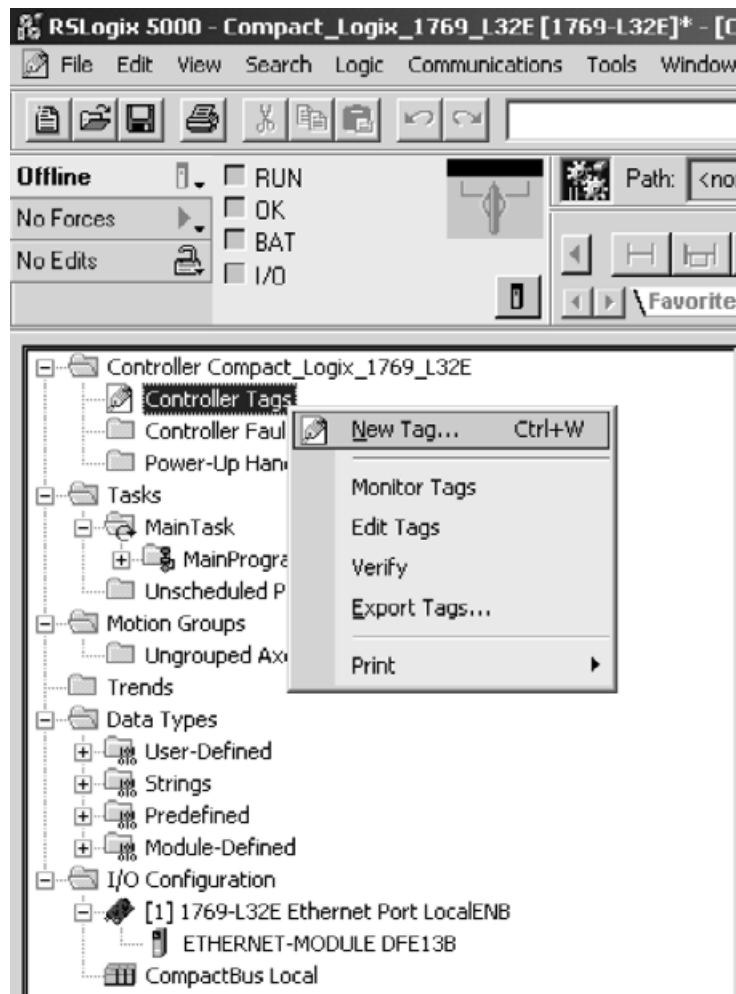
Two instances of the created "SEW_PARAMETER_CHANNEL" structure are required to send a parameter data telegram. One structure is used for the request data, the other structure is used to store the response data.



Project Planning and Startup

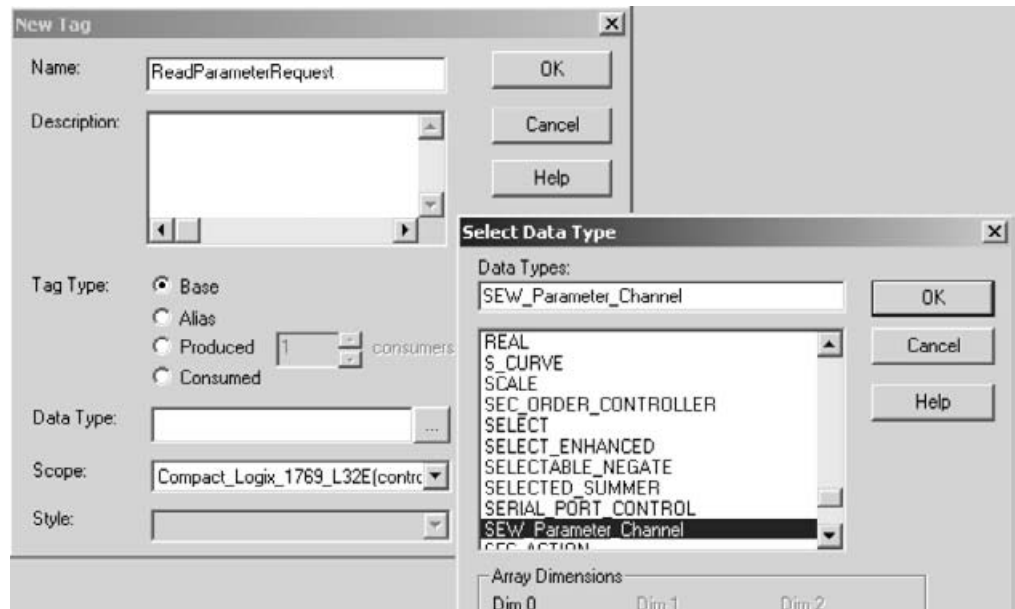
Configuring the master (EtherNet/IP scanner)

The new variables are created in the directory structure under [Controller Compact-Logix] / [Controller Tag].



11195AXX

- Mark the "Controller Tags" folder and click the right mouse button.
- Select the option "New Tag." The "New Tag" window appears (→ Following screen-shot).



11196AXX

- In the "Select Data Type" window, choose the structure "SEW_Parameter_Channel" that you have just created and confirm your selection by clicking <OK>.



Alternatively, instead of using the structure, you can also use an array comprising 12 SINT elements (8 bits). However, this array creates more work when breaking down and creating the elements "Index" and "Data". Also note that you have to store the elements in "Little Endian" format (Intel format or low byte first).



Project Planning and Startup

Configuring the master (EtherNet/IP scanner)

*Sending a
parameter
telegram*

You use the "Message Instruction" (MSG) to send a parameter telegram. This telegram must be configured as shown below.

11197AXX

- Choose "CIP Generic" from the "Message Type" dropdown menu.
- Choose "Custom" from the "Service Type" dropdown menu. This setting attaches the SEW parameter channel to the telegram.



11198AXX

- Enter the following values in the "Service Code" input field:
 - Enter the value "E_{hex}" for read access. This service code corresponds to the service type "Get Attribute Single."
 - Enter the value "10_{hex}" for write access. This service code corresponds to the service type "Set Attribute Single."

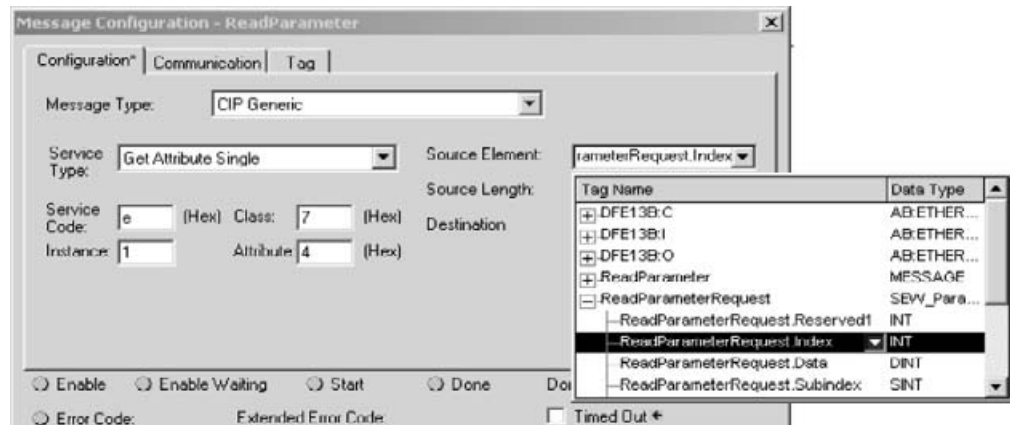
Once you have entered the service code, the corresponding service type appears in the "Service Type" field.

- You can also select the services "Get Attribute Single" and "Set Attribute Single" directly. In this case, write protection is activated in the dropdown menus "Source Element" and "Source Length" (for "Get Attribute Single") and "Destination" (for "Set Attribute Single"), and you cannot enter any more data in the telegram. Therefore, first choose "Custom" from the "Service Type" dropdown menu. Then enter the service code in the "Service Code" input field.
- In the "Class" input field, enter the value "7_{hex}." This value is the ID of the register object. Instance 1 is used for read access. Instance 2 is used for write access. The data field is in attribute 4 (→ Following screenshot).



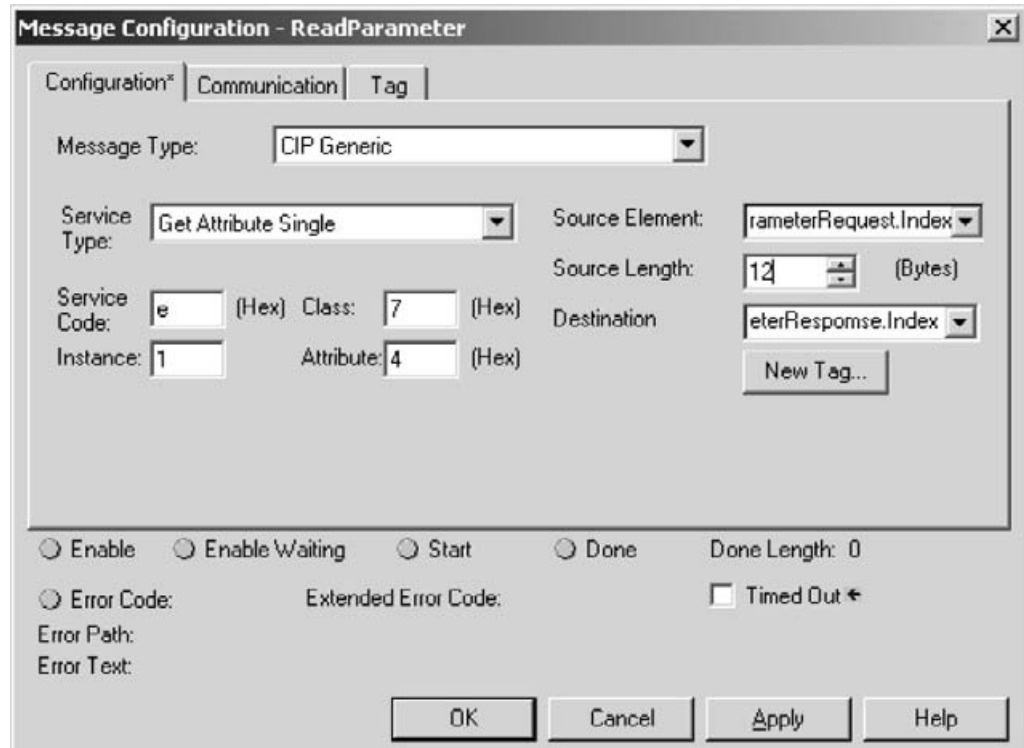
Project Planning and Startup

Configuring the master (EtherNet/IP scanner)



11199AXX

- In the "Source Element" dropdown menu, choose the request structure you created at the start. You must select the "Index" structure element as the initial element. Leave the reserved 16-bit word "Reserved 1" blank.

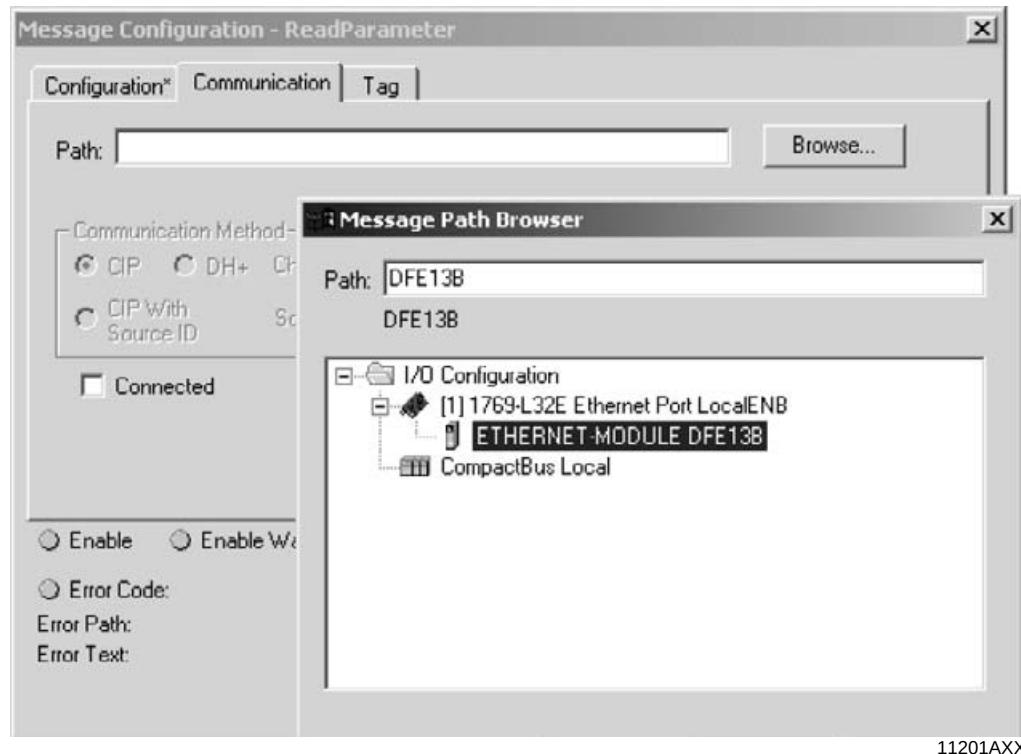


11200AXX

- In the "Source Length" selection field, enter the value "12." In the "Destination" dropdown menu, choose the same "Index" element of the response structure that you selected for the source element.



- Choose the "Communication" tab page to define the telegram recipient.
- Click <Browse>. The "Message Path Browser" window is opened. In the following example, option DFE13B is set up as the recipient.



11201AXX

- Do not select the "Connected" checkbox because both the controller and the DFE13B option permit only a limit number of connections.

4.3 Process data timeout

The MOVIDRIVE® MDX61B drive inverter expects setpoints to be written regularly from the scanner. If the data transfer via EtherNet/IP is interrupted, the fieldbus timeout time in the MOVIDRIVE® MDX61B runs down. MOVIDRIVE® MDX61B displays fault 28 *Fieldbus Timeout*. At the same time, the drive inverter performs the fault response selected with *P831 Fieldbus timeout response*. Parameter *P819 Fieldbus Timeout* displays the adjustable monitoring time.

4.4 Response fieldbus timeout

Parameter *P831 Response Fieldbus Timeout* is used to set the fault response that is triggered via the fieldbus timeout monitoring function.



5 The EtherNet Industrial Protocol (EtherNet/IP)

5.1 Introduction

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

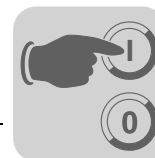
EtherNet/IP has been defined by the **O**pen **D**evice**N**et **V**endor **A**ssociation (ODVA) and **C**ontrol**N**et International (CI).

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 DFE13B 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."



5.2 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	UINT	0001	EtherNet/IP product no. 1
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	SHORT_STRING	SEW-EURO-DRIVE-DFE13B	Product name

- 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 can 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 IO connection
0101	No IO connection established
0110	At least one IO 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 DFE13B 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

Instance 120 - SEW PO data range

This instance is used to access the DFE13B 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 DFE13B 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



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" takes data from the network.

Supported services

Service Code [hex]	Service Name	Class	Instance 100	Instance 101	Instance 150
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 services "Get_Attribute_Single" and "Set_Attribute_Single" 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	Invalid
2	OUTPUT	READ	WRITE
3	OUTPUT	READ	WRITE VOLATILE
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

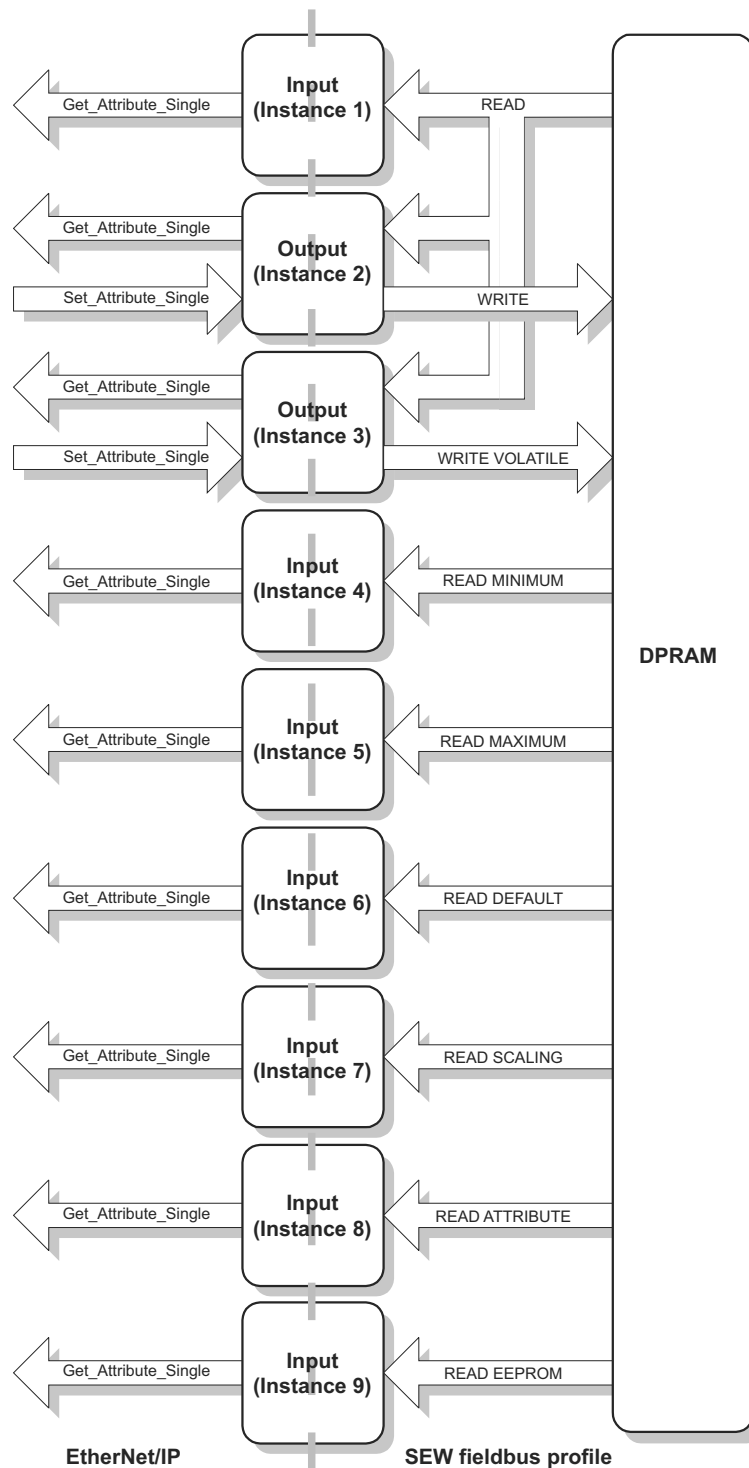
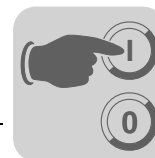


Figure 3: Description of the parameter channel

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Instance 1 - Read parameter

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

Instance 2 - Write parameter

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

Instance 3 - Write parameter volatile

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

Instance 4 - Read minimum

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

Instance 5 - Read maximum

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



Instance 6 - Read default

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

Instance 7 - Read scale

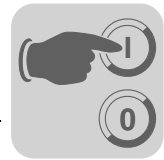
Attribute	Access	Name	Data Type	Default Value [hex]	Description
1	Get	Bad Flag	BOOL	00	0 = good / 1 = bad
2	Get	Direction	BOOL	00	Input register
3	Get	Size	UINT	0060	Data length in bits (96 bits = 12 bytes)
4	Get	Data	ARRAY of BITS		Data in format of the SEW parameter channel

Instance 8 - Read attribute

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

Instance 9 - Read EEPROM

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



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 displays the length of the data in bits.
- Attribute 4 displays the parameter data. When accessing attribute 4, the SEW parameter channel must be added to the service telegram. The SEW parameter channel consists of the elements listed in the following table.

Name	Data Type
Index	UINT
Data	UDINT
Subindex	BYTE
Reserved	BYTE
Subaddress 1	BYTE
Subchannel 1	BYTE
Subaddress 1	BYTE
Subchannel 1	BYTE

*Supported
services*

Service Code [hex]	Service Name	Class	Instance
0x0E	Get_Attribute_Single	X	X
0x10	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 add user-defined data to the services "Get_Attribute_Single" and "Set_Attribute_Single."

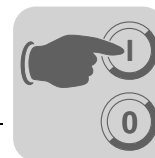
When you use the parameter object, it takes a number of steps to address a parameter index.

- 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	206C	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

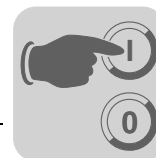


Instance 5 - SEW
read/write

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
0x0E	Get_Attribute_Single	X	X
0x32	Vardata	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 format (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 1	BYTE
Subchannel 1	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	DFE13B has a TCP/IP interface

Instance 1

Attribute	Access	Name	Data Type	Default Value [hex]	Description
1	Get	Status	SWORD	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	0001	Revision 1
2	Get	Max Instance	UINT	0001	Maximum instance
3	Get	Number of Instances	UINT	0001	DfE13B has a TCP/IP interface.

Instance 1

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 indicates the 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 Integrated Web Server

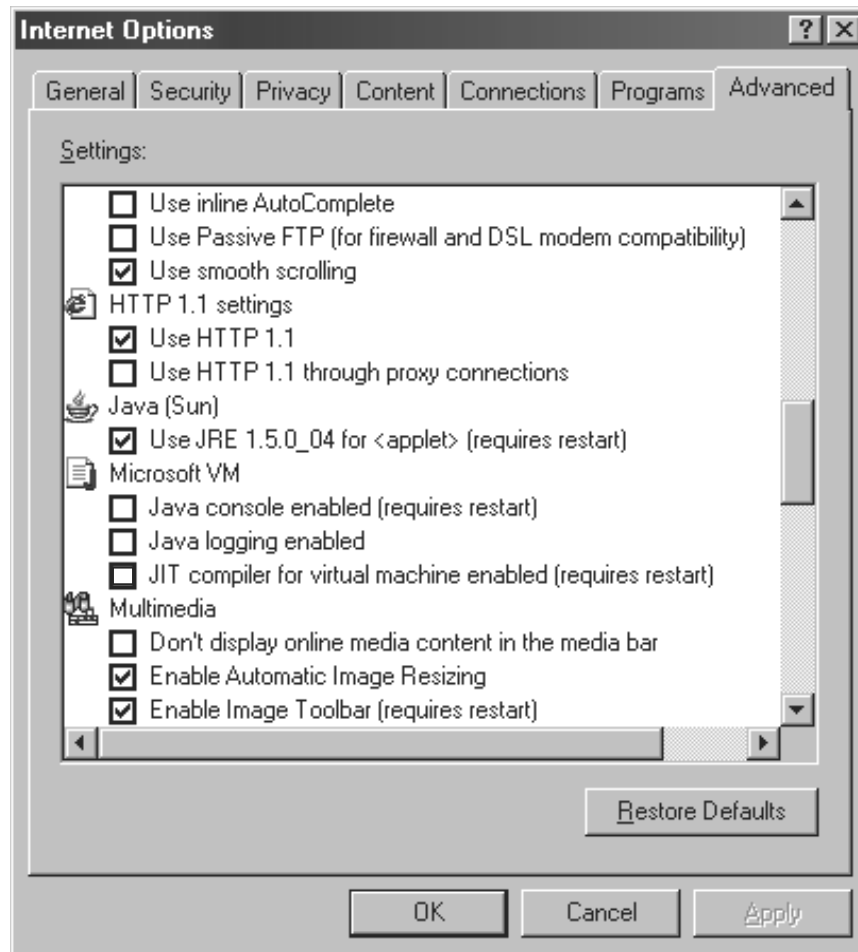
The DFE13B option card has a homepage prepared by SEW-EURODRIVE. To access the homepage, start your browser and enter the following IP address of the DFE13B:

http://192.168.10.4

The web pages allow you access to service and diagnostics information and the fault list of MOVIDRIVE® MDX60B/61B.

6.1 Software requirements

The DFE13B homepage has been tested with Microsoft® Internet Explorer 5.0 and Netscape® Navigator 7.1. To display dynamic elements you will need the Java 2 Runtime Environment SE, V1.4.2 or above. To download Java for your operating system from the Internet, choose "Free Downloads" from the web sites www.java.com or www.java.sun.com/j2se/. In Microsoft® Internet Explorer you have to deactivate all the options listed under the heading Microsoft® VM. To do so, choose [Extras] / [Internet Options]



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6.2 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 access protection by assigning a password. You can deactivate it again by deleting the password (→ button "Change Password" on the homepage for MOVIDRIVE® MDX61B with the DFE13B option).

If password protection is activated, you will be asked to enter your password. You can use the observer login to have read access to all the inverter parameters. You can use the maintenance login to have read and write access to all the inverter parameters. You can enter different passwords for both types of login. If you enter a password for the observer login only, it will also be used for the maintenance login. The passwords are identical with those used for the MOVILINK®-Switcher and vice versa.

6.3 Layout of the MOVIDRIVE® MDX61B homepage with the DFE13B option



11202AXX

- [1] Main window
- [2] Navigation buttons
- [3] Status of MOVIDRIVE® MDX61B
- [4] Menu tree with submenus



6.4 Navigation options

The following navigation options are available on the homepage:

- Main window
- Navigation buttons
- Menu tree with submenus

In the **main window** you can navigate through the site by clicking on the underlined link.

In the **menu tree** you can open the submenus by clicking on the plus symbol. Click on a menu entry to display additional submenus or parameter values in the main window.

Click on the **navigation buttons** (→ following figure) to go directly to each main menu.



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- [1] Information
- [2] Back
- [3] Information
- [4] Diagnostics
- [5] Control
- [6] Configuration
- [7] Tools
- [8] Help

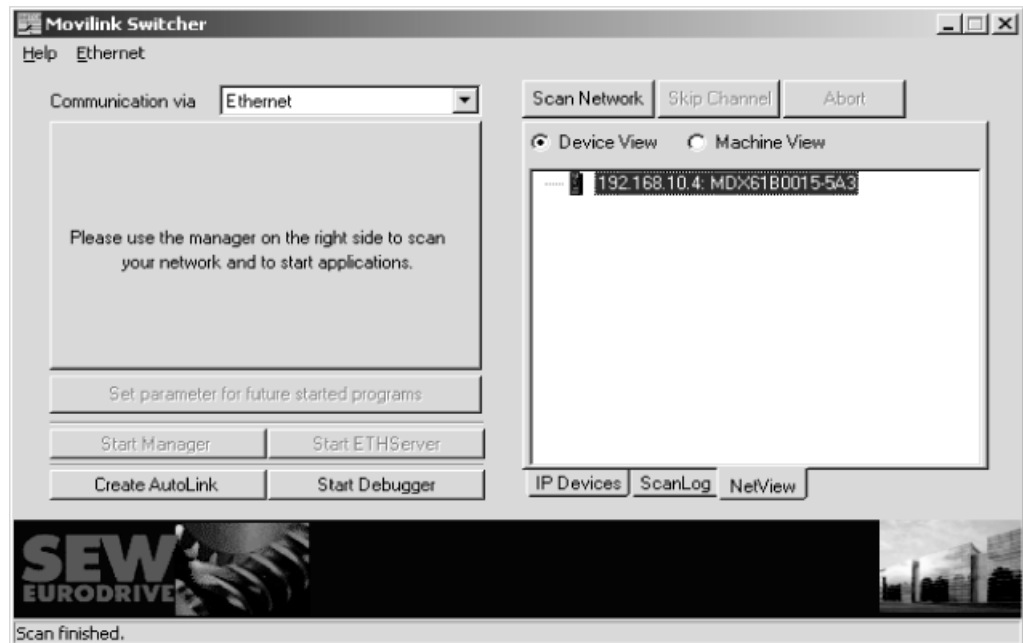
- **information**
Displays the connected inverter type and contact information for SEW-EURODRIVE.
- **Diagnostics**
This menu item guides you to the inverter display values.
- **Control**
Reserved for future applications.
- **Configuration**
Allows you to set selected inverter parameters.
- **Tools**
Directs you to SEW-EURODRIVE's website where you can download the latest version of the MOVITOOLS[®] software (→ MOVITOOLS[®] via EtherNet).
- **Help**
Includes a fault list of MOVIDRIVE[®] MDX60B/61B in PDF-Format. To be able to read the documentation you must have the Adobe Reader[®] installed on your PC.



7 MOVITOOLS® via Ethernet

The MOVITOOLS® operating software (version 4.25 or above) enables simple parameter setting, visualization and diagnostics for your drive application. You can use MOVITOOLS® to communicate with the MOVIDRIVE® MDX61B drive inverter via the DFE13B option card.

- In the MOVITOOLS® program group start the subprogram ML - Switcher.
- Choose "Ethernet" from the [Communication via] dropdown menu.
- In the input field "Broadcast Address", enter the network section of your IP address, for example 192.168.10. Enter 255 as the node address. The complete broadcast address is 192.168.10.255.
- Click the <Scan Network> button. A list of all the SEW drive inverters available in the network and their IP addresses is displayed.
- Choose the <NetView> tab page. The drive inverters connected in the network are displayed (→ Following figure).
 - If you select the option *Device View*, all the drive inverters are displayed with their type designations.
 - If you choose the option *Machine View*, the logical identification of the drive inverters is displayed. You can assign the logical identification to drive inverters in the program Shell under [Display] / [Signature].



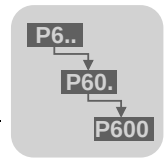
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- Select a drive. Click the right mouse button and start the MOVITOOLS® application you require from the context menu that appears.

**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. Delete the password to deactivate the function again. You can change the password in the MOVILINK® Switcher by choosing [Ethernet] / [Settings]. Enter the IP address of the drive inverter and a password of your choice.

If password protection is activated you will be asked to enter your password. There are two levels of protection. You can use the observer login to have read access to all the inverter parameters. You can use the maintenance login to have read and write access to all the inverter parameters, to replace data sets and to use the scope. You can enter different passwords for both types of login. If you enter a password for the observer login only, it is also used for the maintenance login. The passwords are identical with those for the Web interface (see section "Integrated Web Server") and vice versa.



8 EtherNet Configuration Parameters

8.1 Parameter description



The parameter group P78x includes display and setting values that are specific to the DFE13B option.

As the DHCP is activated by default in the DFE13B 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.

P780 IP address

Setting range: 0.0.0.0 - 223.255.255.255

Factory setting: 0.0.0.0

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

P781 Subnet-work mask

Setting range: 0.0.0.0 - 255.255.255.255

Factory setting: 0.0.0.0

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 is activated (P785), the value specified by the DHCP server will be displayed here.

P782 Standard gateway

Setting range: 1.0.0.0 - 223.255.255.255

Factory setting: 0.0.0.0

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 the DHCP is activated (P785), the value specified by the DHCP server will be displayed.

P783 Baud rate

Display value that cannot be changed. The current baud rate of the EtherNet connection is displayed. During the initialization phase of the DFE13B, the value "0" is displayed for approximately 20 seconds.

P784 MAC ID

Display value that cannot be changed. Displays the MAC ID; that is, the unique EtherNet address of the interface module.

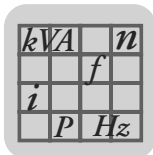
P785 EtherNet/IP startup configuration

Display value that cannot be changed.

Factory setting: DHCP

DHCP: The DFE13B option is assigned its IP parameters (P780 ... P782) by a DHCP server when the supply voltage is switched on.

Saved IP parameters: The DFE13B option is started with the saved IP parameters when the supply voltage is switched on.



9 Technical Data

9.1 Option DFE13B

Option DFE13B	
Part number	1820 565 8
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 2	Ethernet II
Automatic baud rate detection	10 MBaud / 100 MBaud
Connection technology	RJ45 modular jack 8-8
Addressing	4 byte IP address
Manufacturer ID (Vendor ID)	013B _{hex}
Tools for startup	• MOVITOOLS® software package from version 4.30 • DBG60B keypad
Firmware status of MOV-IDRIVE® MDX61B	Firmware status 824 854 0.17 or above (→ Display with P076)

10 Glossary

Term	Description
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 decimal 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 DFE13B option for cyclical data exchange.
Server	Application on a computer that offers services to other computers. Example: The DFE13B 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.
Patch cable	Network cable for connecting terminals (e.g. MOVIDRIVE® MDX61B with the DFE13B option) to network infrastructure components (e.g. switch). The cables for RX and TX between the terminal and network components (e.g. switch) are connected 1:1.
Cross over cable	Network cable for connecting terminals to one another (e.g. between MOVIDRIVE® MDX61B with the DFE13B option and a PC).
STP	S hielded T wisted P air .
UTP	U nshielded T wisted P air .



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Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Service Competence Center	Central Gear units / Motors	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte-gm@sew-eurodrive.de
	Central Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-mitte-e@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzter Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		
France			
Production Sales Service	Haguenau	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocomme.com sew@usocomme.com
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
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Argentina			
Assembly Sales Service	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar



Address List

Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
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	Additional addresses for service in Brazil provided on request!		
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Cameroon			
Sales	Douala	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03
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Sales	Tallin	ALAS-KUUL AS Mustamäe tee 24 EE-10620 Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee
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Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
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Address List

Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu
India			
Assembly Sales Service	Baroda	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	Bangalore	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com
Ireland			
Sales Service	Dublin	Alpertown Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458
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Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net
Italy			
Assembly Sales Service	Milano	SEW-EURODRIVE di R. Blicke & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36
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Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com
Lebanon			
Sales	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com



Lithuania			
Sales	Alytus	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt
Luxembourg			
Assembly Sales Service	Brüssel	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
Macedonia			
Sales	Skopje	SGS-Skopje / Macedonia "Teodosij Sinactski" 66 91000 Skopje / Macedonia	Tel. +389 2 385 466 Fax +389 2 384 390 sgs@mol.com.mk
Malaysia			
Assembly Sales Service	Johore	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Queretaro	SEW-EURODRIVE, Sales and Distribution, S. A. de C. V. Privada Tequisquiapan No. 102 Parque Ind. Queretaro C. P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Morocco			
Sales	Casablanca	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma
Netherlands			
Assembly Sales Service	Rotterdam	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Peru			
Assembly Sales Service	Lima	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe



Address List

Poland			
Assembly Sales Service	Lodz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucuresti	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoosn
Serbia and Montenegro			
Sales	Beograd	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybnicna 40 SK-83107 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 http://www.sew.sk sew@sew-eurodrive.sk
	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovska cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za

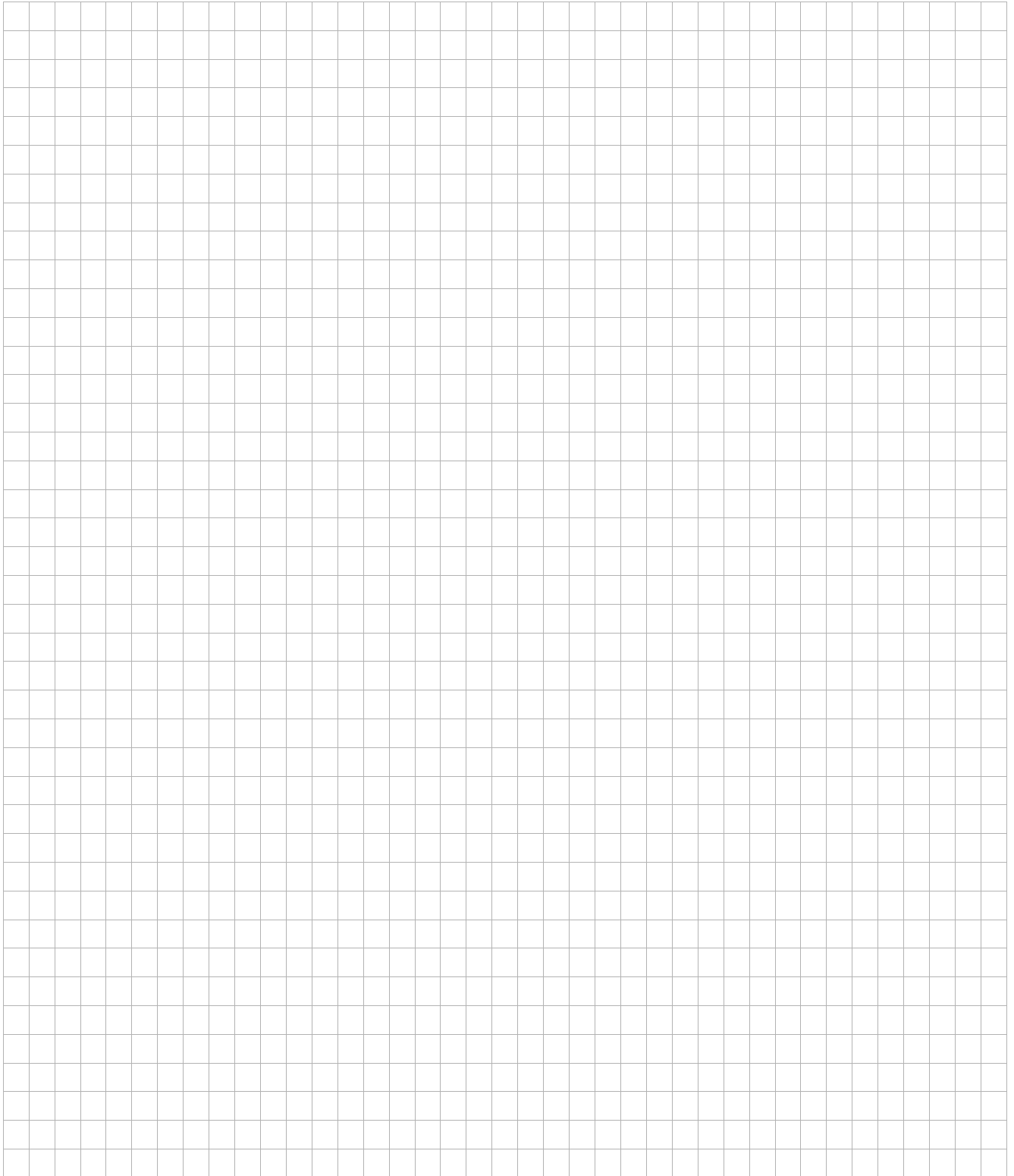


South Africa			
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly Sales Service	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.co.th
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76
Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 + 216 4419164 + 216 3838014 Fax +90 216 3055867 sew@sew-eurodrive.com.tr
Ukraine			
Sales Service	Dnepropetrovsk	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
USA			
Production Assembly Sales Service	Greenville	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com



Address List

USA			
Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net



How we're driving the world

With people who think fast and develop the future with you.



With a global presence that offers responsive and reliable solutions. Anywhere.



With a worldwide service network that is always close at hand.

With drives and controls that automatically improve your productivity.



With innovative technology that solves tomorrow's problems today.

With comprehensive knowledge in virtually every branch of industry today.



With online information and software updates, via the Internet, available around the clock.

With uncompromising quality that reduces the cost and complexity of daily operations.



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**SEW
EURODRIVE**

SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023 · D-76642 Bruchsal / Germany
Phone +49 7251 75-0 · Fax +49 7251 75-1970
sew@sew-eurodrive.com

→ www.sew-eurodrive.com