SEW EURODRIVE

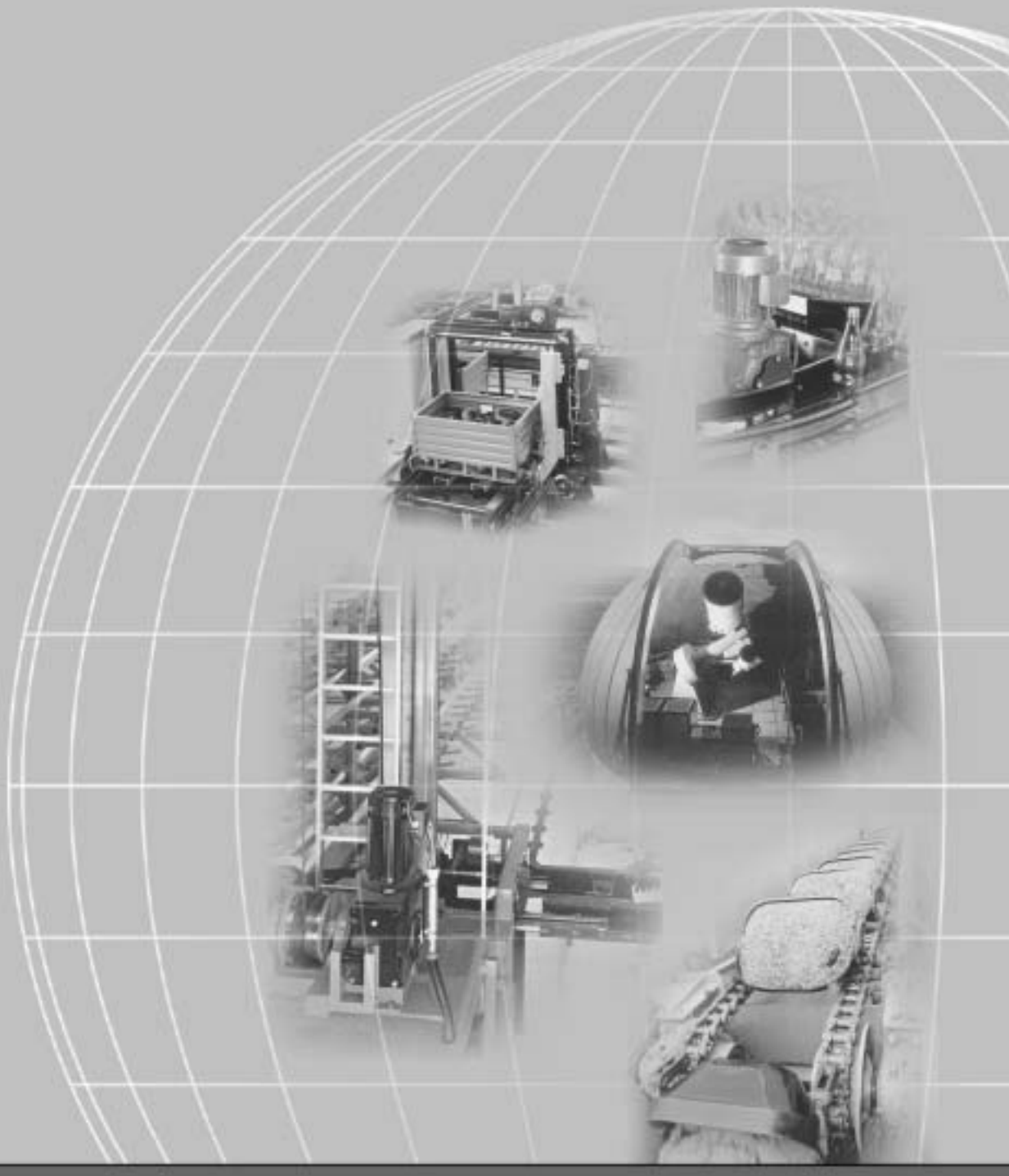
MOVIDRIVE® MDX61B
INTERBUS DFI11B Fieldbus Interface

Edition
03/2004

Manual

1126 3717 / EN

SEW
EURODRIVE



SEW-EURODRIVE

1 Important Notes

- **This manual does not replace the detailed operating instructions!**
- **Only electrical specialists are allowed to perform installation and startup observing 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 INTERBUS DFI11B 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.
- A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you observe the information in the documentation.

Bus systems

General safety notes on bus systems:

This communication system allows you to adjust the MOVIDRIVE® drive inverter to your specific application very accurately. 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's behavior. This may result in unexpected (not uncontrolled) system behavior.

Safety and warning notes

Always observe the safety and warning instructions 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

Contents of this manual

This user manual describes how to install the INTERBUS DFI11B option card in the MOVIDRIVE® MDX61B drive inverter and how to start up MOVIDRIVE® with the INTERBUS fieldbus system.

It also contains an explanation of all settings on the fieldbus option card and connection variants with INTERBUS in the form of small startup examples.

Additional documentation

For a simple and effective connection of MOVIDRIVE® to the INTERBUS fieldbus system, you should request the following publications from SEW-EURODRIVE about the fieldbus technology in addition to this manual:

- MOVIDRIVE® Fieldbus Unit Profile manual
- MOVIDRIVE® MDX60/61B system manual

The manual for the MOVIDRIVE® fieldbus unit profile describes the fieldbus parameters and their coding. It also explains the whole range of control concepts and application options in the form of small examples.

The parameter list is a list of all drive inverter parameters that can be read and written via various communication interfaces such as RS-485, SBus and even the fieldbus interface.

MOVIDRIVE® and INTERBUS

The MOVIDRIVE® drive inverter together with the DFI11B option and its high-performance universal fieldbus interface enable the connection to master programmable controllers via the open and standardized INTERBUS fieldbus system.

Unit profile

The performance of the inverter (also referred to as the unit profile) that forms the basis for INTERBUS operation, is fieldbus-independent and, therefore, uniform. This allows the user to develop fieldbus-independent drive applications. This makes it much easier to change to other bus systems, such as PROFIBUS (DFP 21B option) or DeviceNet (DFD 21B option).

Drive parameters

MOVIDRIVE® offers digital access to all drive parameters and functions via the INTERBUS interface. The drive inverter is controlled via the fast, cyclical process data. This process data channel offers the opportunity to initiate various drive functions such as enable, controller inhibit, normal stop, rapid stop, and to specify setpoint values such as setpoint speed, integrator time for acceleration/ramp down.

At the same time you can also use this channel to read back actual values from the drive inverter, such as actual speed, current, unit status, fault number or reference signals.

READ/WRITE

While the process data exchange generally occurs cyclically, the drive parameters can be read or written only acyclically via the READ and WRITE services. This parameter data exchange enables you to implement applications in which all the important drive parameters are stored in the master programmable controller, so that there is no need to make manual parameter settings on the drive inverter itself.

Startup

Generally, the INTERBUS DFI11B option card has been designed so that all INTERBUS-specific settings, such as process data length and baud rate can be made using the hardware switch on the option card. This manual setting means the drive inverter can be integrated into the INTERBUS system and switched on quickly.

The parameter setting process can be performed automatically by the higher-level INTERBUS master (parameter download). This forward-looking variant shortens the system startup time and simplifies the documentation of your application program because all the important drive parameters can now be stored directly in your control program.

Monitoring functions

The use of a fieldbus system requires additional drive system monitoring such as time monitoring of the fieldbus (fieldbus timeout) or even special emergency stop concepts. The MOVIDRIVE® monitoring functions can be customized to your application. You can determine, for instance, which of the drive inverter's fault responses should be triggered in the event of a bus error. A rapid stop is useful for many applications, although this can also be achieved by 'freezing' the last setpoint values so the drive continues operating with the most recently valid setpoint values (for example, conveyor belt). As the functions of the control terminals are still active in fieldbus operation, you can still implement fieldbus-independent emergency stop concepts via the terminals of the drive inverter.

Diagnostics

The MOVIDRIVE® drive inverter offers numerous diagnostic options for startup and service.

For example, you can use the integrated fieldbus monitor to control both setpoint values sent from the higher-level controller as well as the actual values. The MOVITOOLS® software package offers a convenient diagnostic option that allows for a detailed display of fieldbus and device state information in addition to the settings of all drive parameters (including fieldbus parameters).

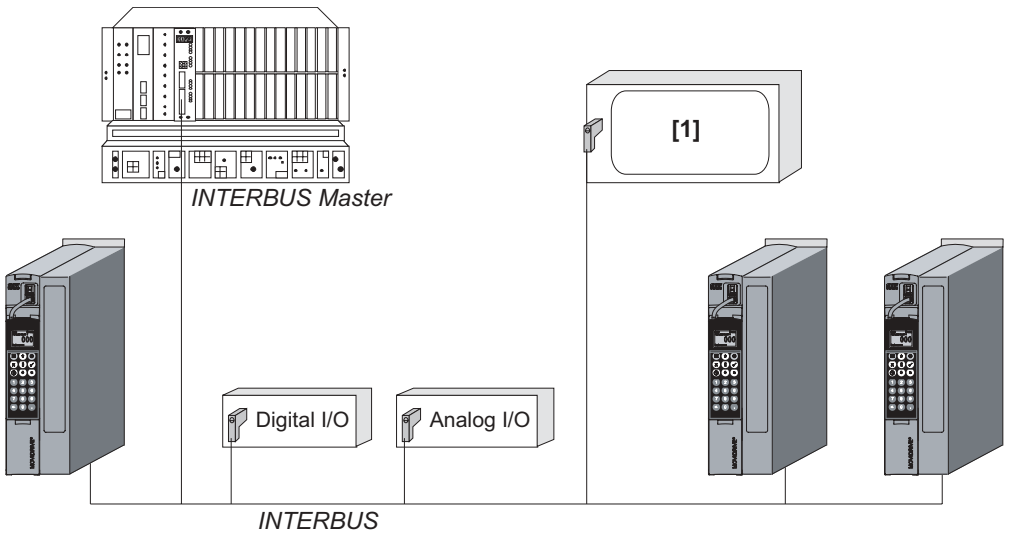


Figure 1: INTERBUS with MOVIDRIVE® MDX61B

3 Assembly / Installation Instructions

3.1 Installing the DFI11B option card

- **Option cards can only be installed and removed for MOVIDRIVE® MDX61B sizes 1 to 6.**
- **Only SEW-EURODRIVE engineers can install or remove option cards for MOVIDRIVE® MDX61B size 0.**

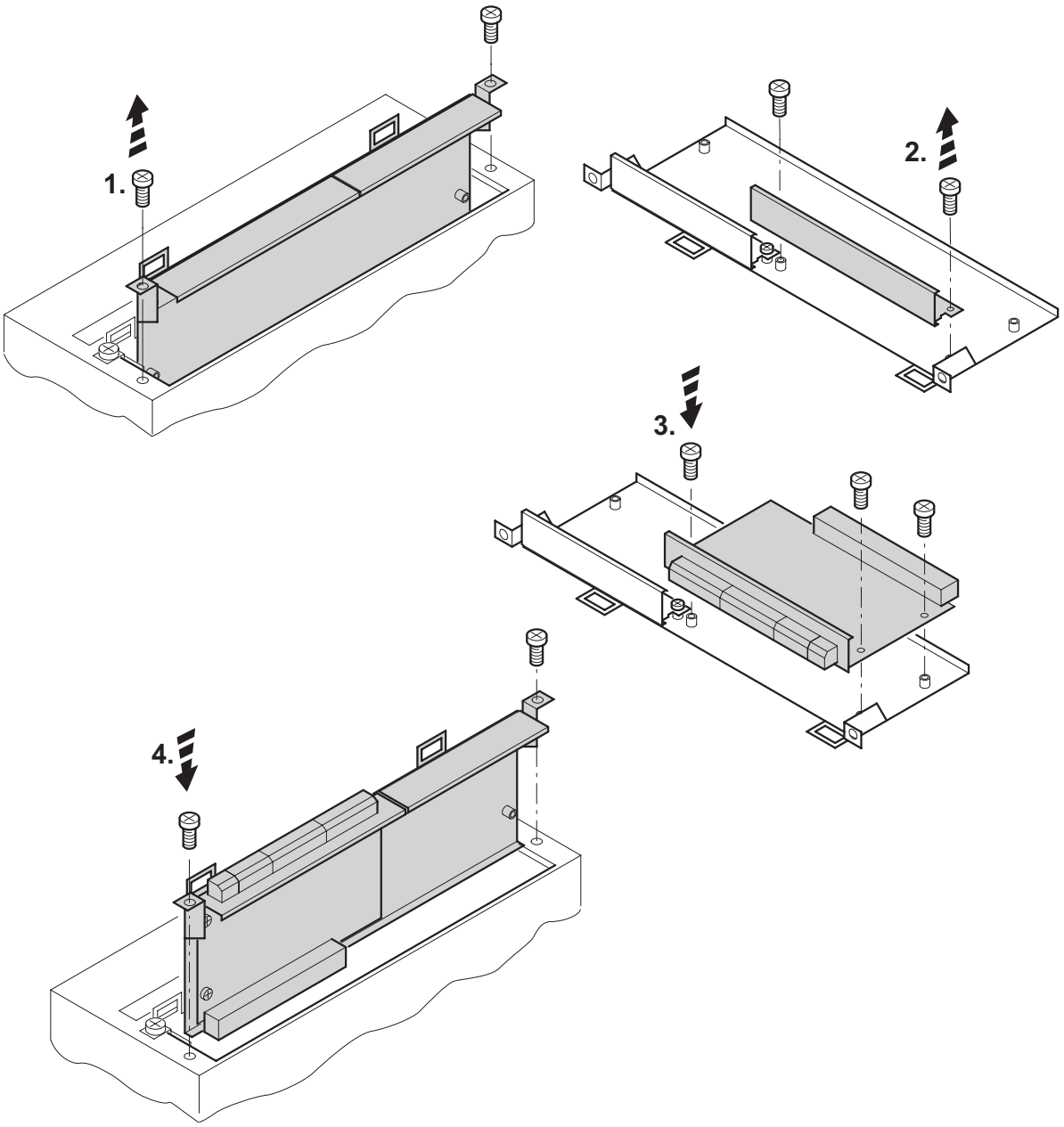
Before you begin

The DFI11B option card must be plugged into the fieldbus slot.

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

- De-energize the inverter. 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, 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. Do not remove the option card from the packaging until immediately before you are ready to install it.
- Hold the option card by its edges only. Do not touch any components.

Installing and removing the option card



53001AXX

Figure 2: Installing an option card in MOVIDRIVE® MDX61B sizes 1 to 6

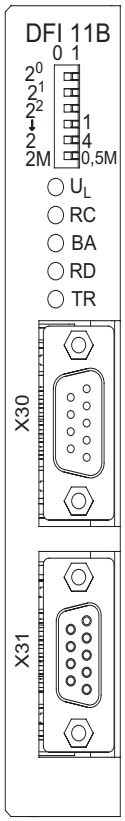
1. Remove the two retaining screws holding the card retaining bracket. Evenly pull the card retaining bracket out from the slot (do not twist!).
2. Remove the two retaining screws of the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the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

3.2 Connection and terminal description of the DFI11B option

Part number INTERBUS interface type DFI11B option: 824 309 3

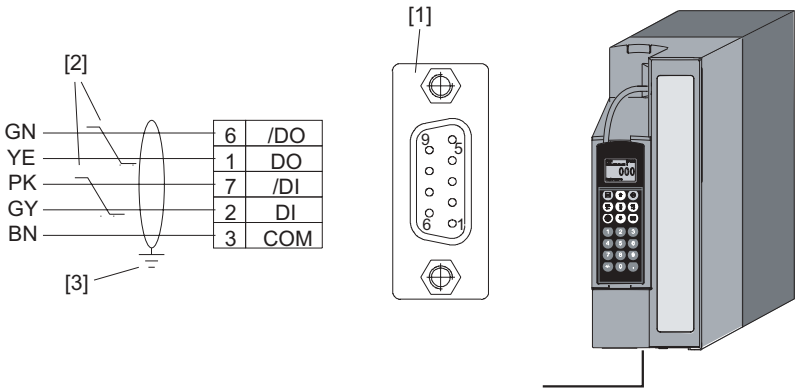
The "INTERBUS interface type DFI11B" option is only possible in conjunction with MOVIDRIVE® MDX61B, not with MDX60B.

The DFI11B option must be plugged into the fieldbus slot.

Front view of DFI11B	Description	DIP switch Terminal	Function
 52287AXX	**Six (6) DIP switches for setting the process data length, PCP length and baud rate**	**2^0, 2^1, 2^2** **1, 2, 4** **2M / 0,5M**	Number of process data (1 to 6 words) Number of PCP words (1, 2 or 4 words) Baud rate: 0 = 2 MBaud 1 = 0.5 MBaud
	U_L = Logic voltage (green = OK) **RC = Remote cable check (green = OK)** **BA = Bus active (green = OK)** **RD = Remote bus disabled (orange = OK)** **TR = Transmit (green = PCP active)**		The INTERBUS LEDs display the current status of the fieldbus interface and the INTERBUS system:
	X30: INTERBUS interface incoming	**X30:1** **X30:2** **X30:3** **X30:4** **X30:5** **X30:6** **X30:7** **X30:8** **X30:9**	DO DI COM N.C. N.C. /DO /DI N.C. N.C.
	X31: INTERBUS interface outgoing	**X31:1** **X31:2** **X31:3** **X31:4** **X31:5** **X31:6** **X31:7** **X31:8** **X31:9**	DO DI COM N.C. Jumper to X31:9 /DO /DI N.C. Jumper to X31:5

3.3 Pin assignment

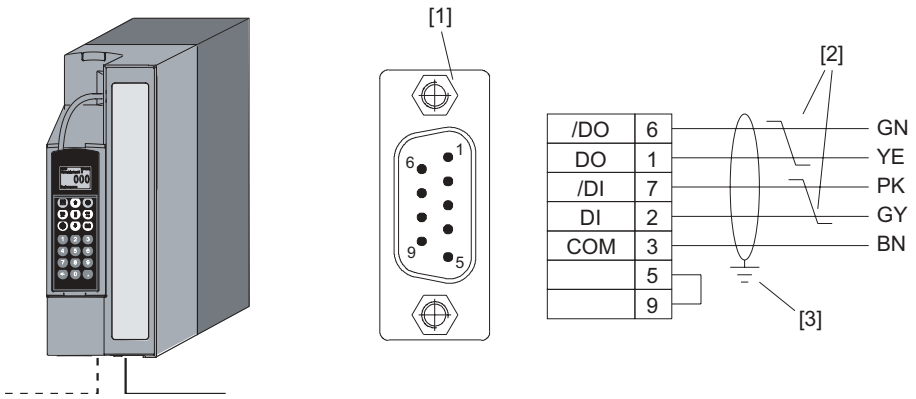
Connection to the INTERBUS network is realized using a 9-pin sub D coupling for the incoming remote bus and a 9-pin sub D plug for the outgoing remote bus according to IEC 61158. The following figures show the connection assignment of the 9-pole Sub D coupling/plug for the incoming and outgoing remote bus as well as the signal wire colors of the bus cable used for the INTERBUS.



52296AXX

Figure 3: Assignment of 9-pin sub D coupling of the incoming remote bus cable

GN = Green	BN = Brown
YE = Yellow	[1] 9-pin sub D coupling
PK = Pink	[2] Signal cable, twisted
GY = Gray	[3] Conductive, wide area connection is necessary between the plug housing and the shield



52297AXX

Figure 4: Assignment of 9-pin sub D plug of the outgoing remote bus cable

GN = Green	BN = Brown
YE = Yellow	[1] 9-pole sub D connector
PK = Pink	[2] Signal line, twisted
GY = Gray	[3] Conductive, wide area connection is necessary between the plug housing and the shield

As a rule, the DFI11B option is connected to the INTERBUS system using the 2-wire remote bus with a 6-core shielded cable with twisted signal wire pairs.

The 2-wire remote bus chiefly comprises an RS-485 data out channel (signal wires "DO" and "/DO") and the RS-485 data in channel (signal wires "DI" and "/DI").

3.4 Shielding and routing bus cables

The INTERBUS interface DFI11B supports RS-485 transmission technology and requires the cable type A to IEC 61158 specified as the physical medium for INTERBUS. This cable must be a 6-core shielded and twisted pair cable.

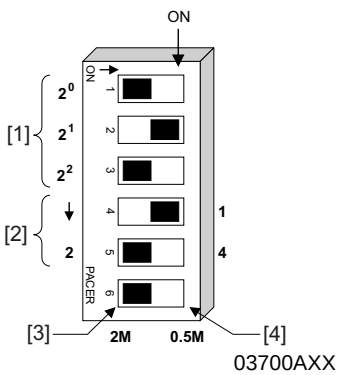
Correct shielding of the bus cable attenuates electrical interference that may occur in industrial environments. The following measures ensure the best possible shielding:

- Tighten the mounting screws on the connectors, modules and equipotential bonding conductors by hand.
- Only use 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.
- Do not route signal and bus cables parallel to power cables (motor leads). They must be routed in separate cable ducts.
- Use metallic, grounded cable racks in industrial environments.
- Route the signal cable and the corresponding equipotential bonding in close proximity using the shortest way possible.
- Avoid using plug connectors to extend bus cables.
- Route the bus cables closely 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 Setting the DIP switches

The six DIP switches S1 to S6 on the front side of the option are used for setting the process data length, the PCP length and for selecting the baud rate.



DIP switch assignment for DFI11B

[1] Number of process data (1 to 6 words)

[2] Number of PCP words (1, 2 or 4 words)

Baud rate: [3] OFF: 2 MBaud / [4] ON: 0.5 Mbaud

Setting shown in the figure:

Process data width: 2 PD

Number of PCP words: 1 PCP

Baud rate: 2 Mbaud

Note

De-energize the drive inverter (mains and 24 V backup supply) every time before you change the DIP switch settings. The settings of DIP switches S1-1 to S1-5 only become effective during initialization of the drive inverter.

The drive inverter signals the "Microprocessor not ready" ID code (38 hex) if the DIP switch settings are incorrect.

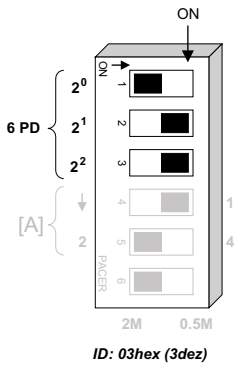
Setting the baud rate

The baud rate is selected using DIP switch S1-6. The selected baud rate takes effect immediately and might therefore interrupt an existing data communication of the Interbus.

Setting the process data and PCP length

Up to six INTERBUS data words can be exchanged between the INTERBUS interface and the DFI11B. These data words can be divided between the process data channel and the PCP channel using DIP switches S1-1 to S1-5. Because of the restriction to six data words, some settings cannot be reproduced on the Interbus.

The DFI11 signals the "Microprocessor not ready" ID code (38hex) if the setting is incorrect. The incorrect setting is indicated by the red TR LED. The following figure shows the peripheral conditions for setting the process data and PCP lengths. The following restrictions apply:

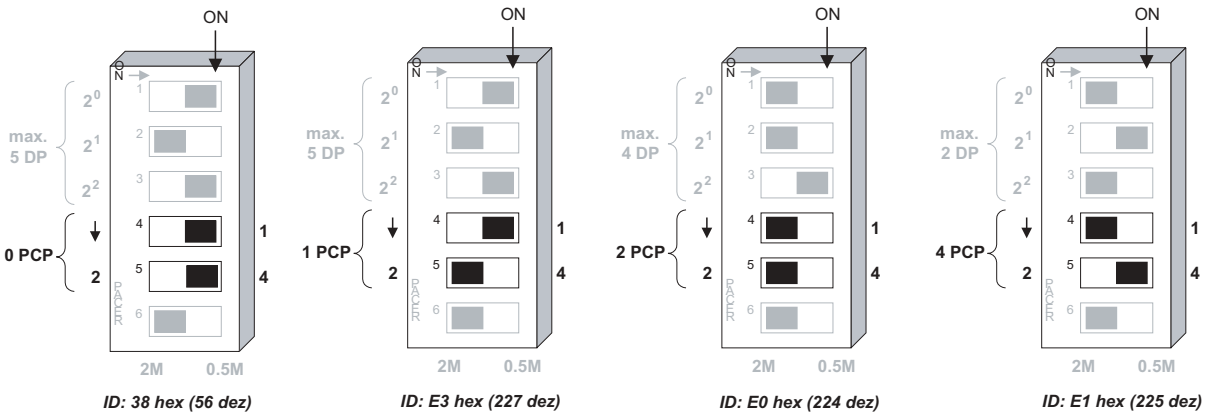


03701AXX

Figure 5: Settings for operating the DFI11B with 6 process data

[A] PCP setting ineffective!

Process data length in words	PCP length	ID code
6	PCP setting ineffective; no PCP channel can be used	03hex (3dec)



53597AXX

Figure 6: Examples for setting the PCP length and the maximum process data length

PCP length	Maximum process data length	ID code
1 word	5 words	E3 hex (227dec)
2 words	4 words	E0 hex (224dec)
4 words	2 words	E1 hex (225dec)
	If the max. length is exceeded or the setting is 0 or 7 PD	38 hex (56dec) = "Microprocessor not ready"

All settings that have not been mentioned result in the "Microprocessor not ready" ID code. The inverter then signals 0PD in parameter P090 "PD configuration" and indicates that the setting is incorrect by means of the red TR LED on the DFI11B option card.

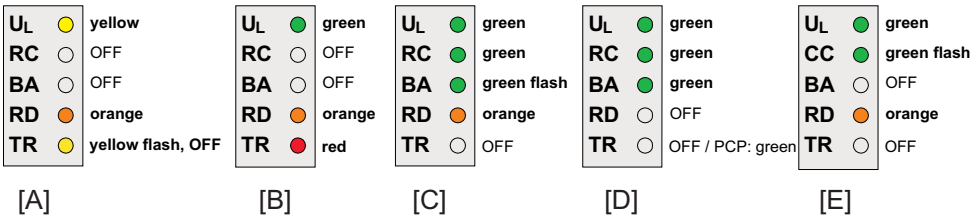
3.6 Display elements

INTERBUS LEDs

The INTERBUS interface DFI11B option card has five LEDs for diagnosing the INTERBUS system. These LEDs indicate the current status of the DFI1B and the INTERBUS system.

U_L	Logic Voltage (green = OK)
RC	Remote Cable Check (green = OK)
BA	Bus Active (green = OK)
RD	Remote Bus Disabled (red = OFF)
TR	Transmit (green = PCP active)

The following figure shows frequently occurring LED patterns of the diagnostic LEDs. The following tables provide a detailed description of the LEDs.



06515AEN

Figure 7: Frequently occurring LED patterns

[A] Inverter power-on (INTERBUS not yet active)

[B] Incorrect DIP switch setting (INTERBUS not yet active)

[C] Initialization phase of the INTERBUS system

[D] Correct INTERBUS operation

[E] Incorrectly set baud rate

LED U_L "U Logic" (green)

State	Meaning	Fault correction
On	Supply voltage applied to bus electronics	-
Off	Supply voltage for bus electronics missing	Check that the connection unit is correctly seated and the DC 24 V voltage supply for the inverter is present.

LED RC "Remote Cable Check" (green)

State	Meaning	Fault correction
On	Incoming remote bus connection OK	-
Off	Incoming remote bus connection not OK	Check the incoming FO remote bus.

LED BA "Bus Active" (green)

State	Meaning	Fault correction
On	Data transfer active on INTERBUS	-
Off	No data transfer; INTERBUS stopped	Check the incoming remote bus cable. Use the diagnostic display of the INTERBUS interface module (master) for further fault localization

LED RD "Remote Bus Disable" (red)

State	Meaning	Fault correction
On	Outgoing remote bus switched off	-
Off	Outgoing remote bus not switched off	-

LED TR "Transmit" (green)

State	Meaning	Fault correction
The color of the LED TR corresponds to the INTERBUS standard.		
Off	No PCP communication	-
Green	PCP communication active or INTERBUS startup (parameter access via INTERBUS PCP channel)	-

LED TR "Transmit" (yellow or red)

State	Meaning	Fault correction
The yellow or red LED TR indicates states within the system that usually do not occur during INTERBUS operation.		
Off or green	Normal mode (see table for TR = green)	-
Yellow flashing	Inverter in initialization phase	-
Steady red	Incorrect DIP switch configuration selected, no INTERBUS operation possible.	Check the settings of DIP switch S1. Correct the DIP switch settings if necessary and switch the unit on again.
Flashing red	Incorrect DIP switch configuration or INTERBUS interface defective, no INTERBUS operation possible.	Check the setting of DIP switches S1 to S6. Contact SEW Electronics Service if the fault persists although the setting is correct.

4 Project Planning and Startup

This section describes how to configure and start up the MOVIDRIVE® drive inverter with the DFI11B option in the INTERBUS interface module.

4.1 Startup of the drive inverter

The parameters of the MOVIDRIVE® drive inverter can be set straight away via the fieldbus system without any further settings once the fieldbus option card has been installed. For example, after power-on all parameters of the higher-level programmable controller can be set.

However, to control the drive inverter via the INTERBUS system, the drive inverter must first be switched to control signal source and setpoint source = FIELDBUS. The FIELDBUS setting means the inverter parameters are set for control and setpoint entry via INTERBUS. The drive inverter then responds to the process output data transmitted from the master programmable controller.

Activation of the control signal source/setpoint source FIELDBUS is signaled to the machine control using the "Fieldbus mode active" bit in the status word. For safety reasons, the drive inverter must also be enabled at the terminals for control via the fieldbus system. Consequently, the terminals must be wired or programmed 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 DIØØ (function /CONTROLLER INHIBIT) input terminal to a +24 V signal and to program input terminals DIØ1 ... DIØ3 to NO FUNCTION. Figure 8 shows by way of example how to startup the MOVIDRIVE® drive inverter with fieldbus interface.

Startup procedure

1. Enable the power output stage at the terminals.

   To do this, apply a "1" signal to X13:1 (DIØØ "/CONTROLLER INHIBIT"), for example using a jumper to X13:8 (VO24).

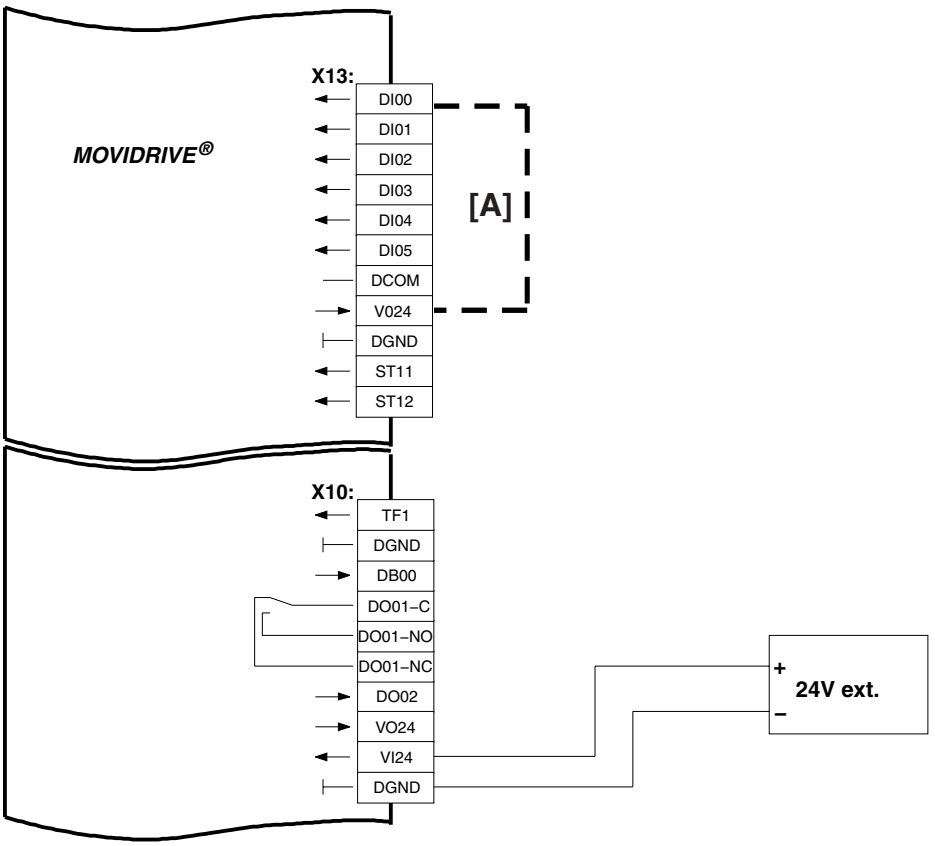


Figure 8: Wiring for enable

[A] Use this jumper to enable the drive inverter via the terminals!			
X13	DI00: /Controller inhibit	**X10**	TF1: TF input
	DI01 ... X13:DI05: No function		DGND: Reference potential for binary signals
	DCOM: Reference DI00 ... DI05		BB00: /Brake
	VO24: + 24 V		DO01-C: Relay contact
	DGND: Reference potential for binary signals		DO01-NO: Normally open contact relay
	ST11: RS-485 +		DO01-NC: Normally closed contact relay
	ST12: RS-485 -		DO02: /Fault
			VO24: + 24 V
			VI24: + 24 V (external)

2. Switch on the DC 24 V supply.

   Only switch on the external 24 V voltage supply (not the mains voltage!) to set the parameters for 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 fieldbus.

   - P100 setpoint source = FIELDBUS
   - P101 control signal source = FIELDBUS

4. Input terminals DIØ1 ... DIØ3 = NO FUNCTION

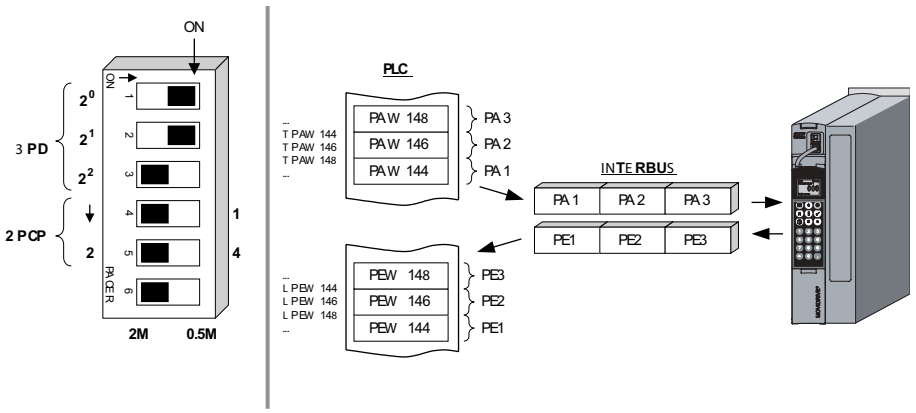
   Set the function of the input terminals X13.2, X13.3 and X13.4 to NO FUNCTION.

   - P600 Program terminal DIØ1 (X13.2) = NO FUNCTION
   - P601 Program terminal DIØ2 (X13.3) = NO FUNCTION
   - P602 Program terminal DIØ3 (X13.4) = NO FUNCTION

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

4.2 Configuring the INTERBUS system

Project planning for the drive inverter in the INTERBUS interface module using the "CMD tool" project planning software (CMD = Configuration Monitoring-Diagnosis) involves two steps. The bus structure is created in the first step. After this, the process data are described and addressed.



53581AXX

Figure 9: Project planning example for 3PD + 2PCP

The following figures show the settings in the CMD tool for a drive inverter that is configured with 3PD + 2PCP as shown in Figure 9 with input/output addresses 144 to 149 of the controller.

Configuring the bus structure

The bus structure can be configured online or offline using the CMD tool.

Offline configuration: Insert with ID code

In offline status, the inverter is configured in the CMD tool using the "Edit / Insert with ID code" menu command. Enter ID code, process data channel and device type as shown in Figure 10.

03714AXX

Figure 10: Offline configuration using the CMD tool

Note!

Not all combinations are possible because the drive inverter can occupy up to six words in the INTERBUS!

The following table shows possible settings. The ID code setting must match the setting of DIP switches S1-4 and S1-5 on the DFI11B option card. The process data channel setting must match the setting of DIP switches S1-1 and S1-3 on the DFI11B option card. Otherwise, INTERBUS operation is not possible.

Information for offline configuration of DFI11B in the CMD tool

	Program setting	Function (MOVIDRIVE® display)
ID code	227 dec (E3 hex)	Parameter channel: 1 word
Process data channel:	16 bits	1 process data word (Param + 1 PD)
	32 bits	2 process data words (Param + 2 PD)
	48 bits	3 process data words (Param +3 PD)
	64 bits	4 process data words (Param +4 PD)
	80 bits	5 process data words (Param +5 PD)
ID code	224 dec (E0 hex)	Parameter channel: 2 words
Process data channel:	16 bits	1 process data word (Param + 1 PD)
	32 bits	2 process data words (Param + 2 PD)
	48 bits	3 process data words (Param +3 PD)
	64 bits	4 process data words (Param +4 PD)
ID code	225 dec (E1 hex)	Parameter channel: 4 words
Process data channel:	16 bits	1 process data word (Param + 1 PD)
	32 bits	2 process data words (Param + 2 PD)
ID code	3 dec (03 hex)	Parameter channel: -
Process data channel:	96 bits	6 process data words (6PD)

Online configuration: Configuration frame / Read in

The INTERBUS system can also be fully installed first and then DIP switches S1 to S6 on the DF11B set. Next, the CMD tool can be used for reading in the entire bus structure (configuration frame). All devices are automatically detected with their data width settings.

Creating a device description

The INTERBUS stations can be identified and described uniquely using an individual device description created for the inverter in the INTERBUS system.

The following entries are important:

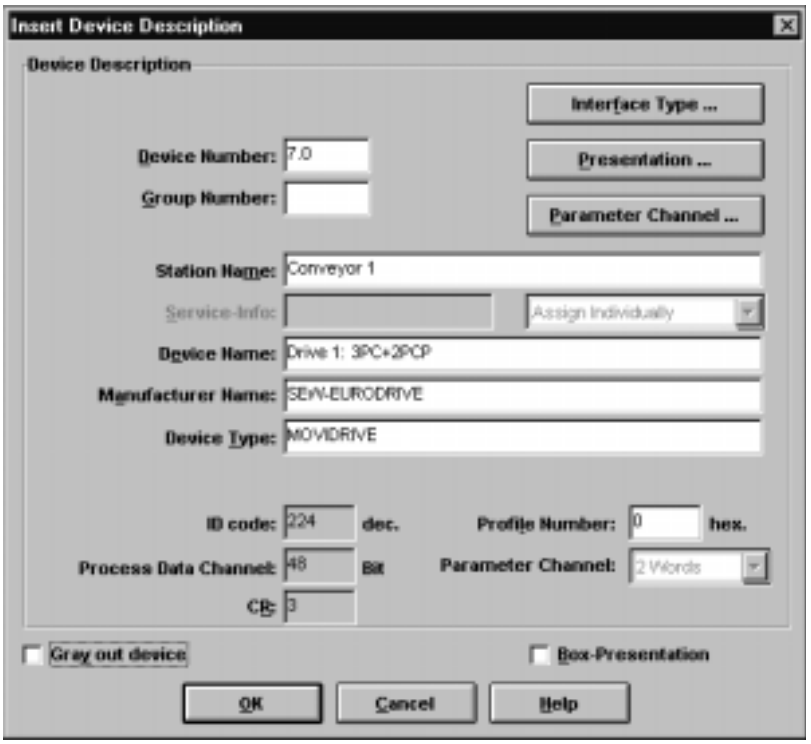
Device description

Make the following entries in the "Manufacturer Name " and "Device Type" fields

Manufacturer name: SEW-EURODRIVE

Device type: MOVIDRIVE

to allow, for example, that the drive parameters can be set using a management PC from the management level via the INTERBUS interface module (Figure 11).



03715AXX

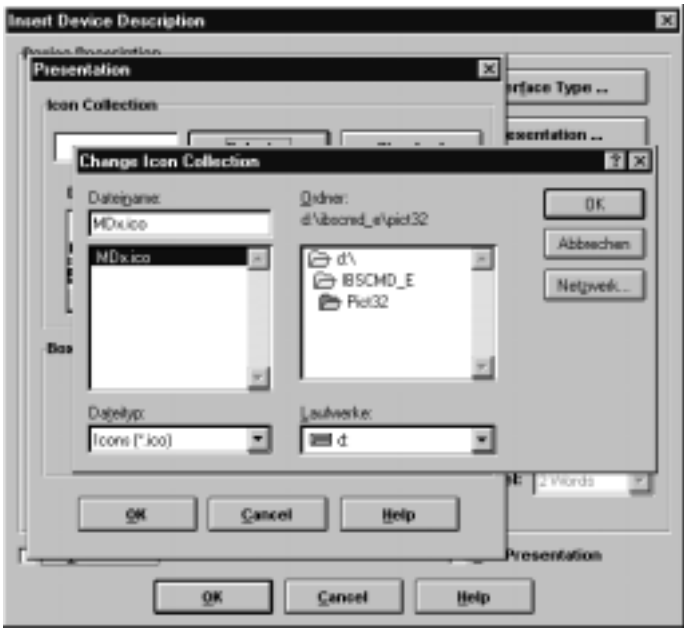
Figure 11: Device description for MOVIDRIVE® with DFI11B

Interface type

Press the "Interface Type" button and select "Universal."

Representation

To easily identify the inverter, CMD tool version 4.50 and higher allows to copy your own ICO files into the ".\IBSCMD\Pict32\" directory (Figure 12). The INTERBUS description files for the CMD tool are available for download on the SEW website, http://www.SEW-EURODRIVE.com, in the "Software" section.



03716AXX

Figure 12: Linking the device description with the ICO file

Parameter channel

You must make the following settings for the parameter channel if you want to use the PCP channel for setting the inverter parameters in your application.

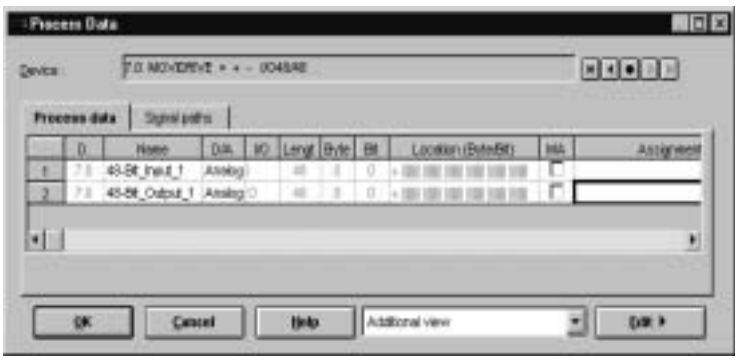
- Message lengths / Transmit / Receive:
  each 243 bytes
- Supported parameter channel services (standard): Read / Write

03717AXX

Figure 13: Setting the parameter channel (PCP)

Assigning process data

INTERBUS process data of the drive inverter are assigned to the program addresses of the control system using the "Process Data" context menu.



03718AXX

Figure 14: Assigning INTERBUS process data and PLC program addresses

Refer to the section "Control via process data" for a programming example (STEP7) for controlling the inverter using the INTERBUS process data.

4.3 Testing the PCP connection

You can use the MONITOR mode of the CMD tool for testing the PCP connection to the

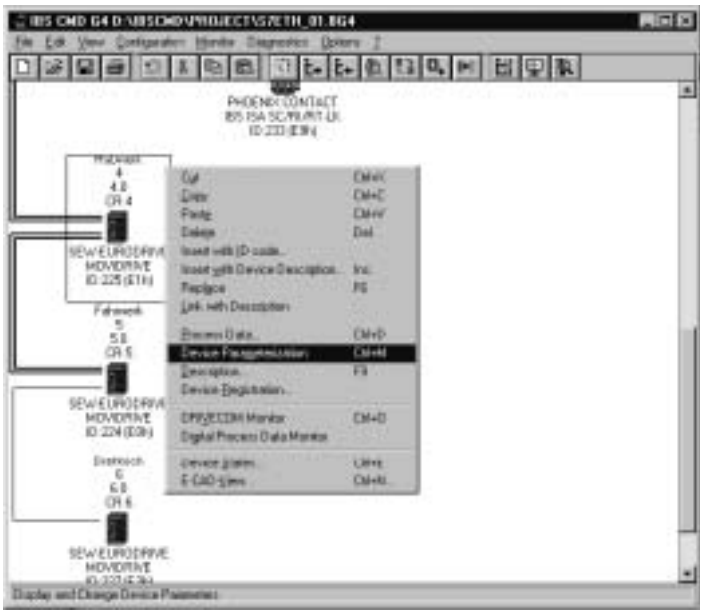
inverter. The following figures illustrate the PCP test procedure. Basically, this method involves establishing a PCP connection to the device and reading the parameter list (object list) stored in the device.

Set the CMD tool to "Monitoring" operating state.

03719AXX

Figure 15: Setting the CMD tool to "MONITORING" operating state

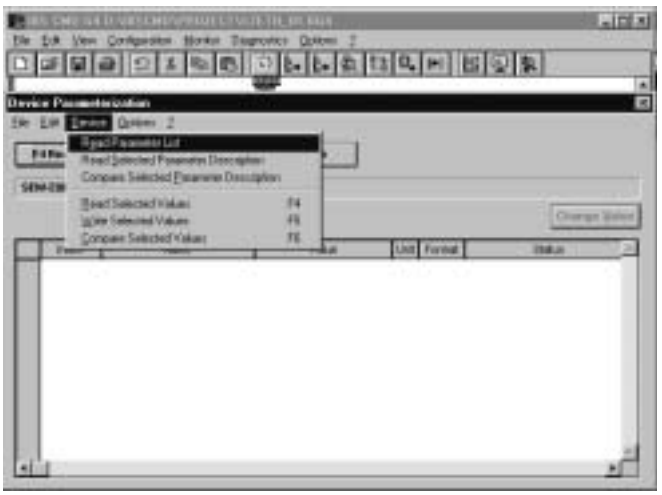
Click the drive inverter to which you want to establish a PCP connection. Open the context menu by pressing the right mouse button and select the "Device Parameterization" menu command.



03721AXX

Figure 16: Testing the PCP device parameterization

In the "Device Parameterization" window, select "Device / Read Parameter List" from the menu.



03722AXX

Figure 17: Window for device parameterization using the CMD tool

The configuration of the PCP channel has been performed correctly once the device parameters have been imported. You can cancel the read procedure.

If an error message appears instead of the progress bar, check the PCP configuration and the assignment of CRs. If necessary, reformat the parameterization memory of the interface module and then write the current project into the parameterization memory again. Now run the parameterization procedure for the interface module again and repeat this test sequence to check the PCP connection.

03723AXX

Figure 18: The CMD tool is reading device parameters, i.e. PCP communication is OK.

5 The PCP Interface

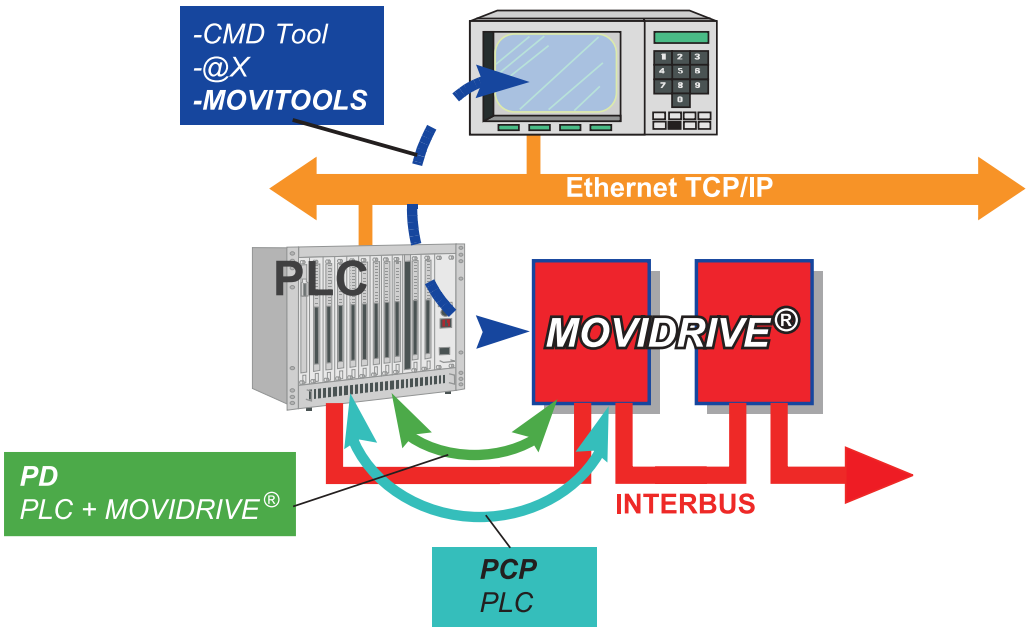
With the DFI11B option, the MOVIDRIVE® drive inverter offers a standardized interface for parameterization using the "**P**eripherals **C**ommunication **P**rotocol" (PCP). This INTERBUS communication channel gives you complete access to all drive parameters of the MOVIDRIVE® drive inverter.

5.1 Basic structure

The PCP channel must be configured with the corresponding ID code so you can access parameter values in the drive inverter. There are one, two or four words available in the INTERBUS protocol for the PCP channel. Changing the number of PCP words varies the access speed to parameter values via the PCP channel.

Additional PCP channel for startup and diagnostics

The PCP interface is implemented using PCP version 3.0 in the DF11B. Apart from the familiar PCP channel between the controller (PLC) and the drive inverter, it is now possible to establish an additional (logical) PCP channel between the interface module and the drive inverter. This additional PCP channel can be used by a higher-level computer, for example, to access the drive inverter parameter values via the Ethernet / Interbus communications path.



03725AXX

Figure 19: Communication channels with PCP version 3

The above figure shows an example of a system topology with Ethernet TCP/IP level and INTERBUS level. In this case, an INTERBUS interface module with Ethernet TCP/IP interface is used, which functions as gateway between the two communication levels.

Apart from the "CMD tool", the higher-level computer (Windows® NT) also runs INTERBUS "@utomationXplorer" and "MOVITOOLS®" for programming and setting the parameters of the SEW drive inverter on the INTERBUS. This arrangement means existing bus infrastructures can be used for startup and maintenance. This facilitates startup and diagnostics of the entire automation system because the INTERBUS cable is now not only used for control purposes but also for startup and diagnostics of all components used on the fieldbus.

5.2 PCP services

With the DFI11B option, the MOVIDRIVE® drive inverter supports the PCP services shown in the following figure. For setting the inverter parameters, only the following services are important:

- Establishing a connection ("Initiate")
- Reading parameter values ("Read")
- Writing parameter values ("Write")
- Disconnecting a connection ("Abort")

Refer to the PCP communication user manual for your INTERBUS interface module for a detailed description of the PCP services.

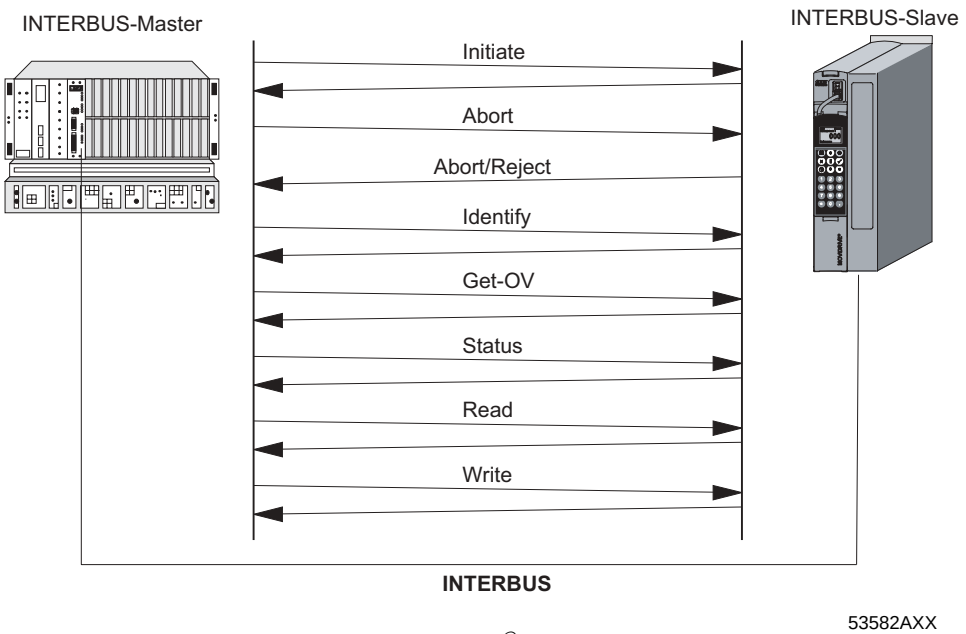


Figure 20: PCP services supported by the MOVIDRIVE® MDX61B drive inverter

Establishing the communication connection with "Initiate"

With the PCP service "Initiate", a communication link is established between an INTERBUS interface module and the MOVIDRIVE® drive inverter. The connection is always established by the INTERBUS interface module. As the connection is being established, various conventions regarding the communication link are checked, such as supported PCP services, user data length, etc. If the connection is established successfully, the inverter answers with a positive "Initiate Response." If the connection could not be established, then the arrangements for the communication link on the INTERBUS interface module do not match those on the MOVIDRIVE® inverter. The drive inverter answers with an "Initiate Error Response." In this case, compare the configured communications relationship list of the INTERBUS interface module with that of the drive inverter.

The attempt to establish an existing communication link usually leads to an "Abort." The communication link then no longer exists so the "Initiate" PCP service has to be performed a third time to re-establish the communication connection.

Canceling the communication connection with "Abort"

An existing communication connection between the INTERBUS interface module and the MOVIDRIVE® drive inverter is cleared using the PCP service "Abort." Abort is an unacknowledged PCP service and can be initiated both by the INTERBUS interface module as well as by the MOVIDRIVE®.

Reading parameter values wtih "Read"

With the PCP service "Read", the INTERBUS interface module can read all the communication objects (drive parameters) of the MOVIDRIVE® drive inverter. All drive parameters as well as their codes are listed in detail in the MOVIDRIVE® Fieldbus Unit Profile and Parameter List documentation.

Writing parameter values with "Write"

With the PCP service "Write", the INTERBUS interface module can write all the drive parameters of the MOVIDRIVE®. If an incorrect value (e.g. value too high) is assigned to a drive parameter, the drive inverter generates a "Write Error Response" giving the precise cause of the error.

5.3 Parameters in the object list

With the PCP services "Read" and "Write", the INTERBUS interface module can access all parameters defined in the object list. All drive parameters that can be accessed via the bus system are described as communications objects in the static object list. All objects in the static object list are addressed using indices. The following table shows the structure of the object list of the DFI11B for the MOVIDRIVE® drive inverter.

The index area is divided into three logical areas. The drive parameters are addressed with indices 8300 ... 8800dec. The parameter index can be obtained from the SEW MOVIDRIVE® Parameter List documentation. Indices below 8300dec are handled directly by the option card and should not be regarded as drive parameters of the inverter.

Parameter index (decimal)	Name of the communications object
8296	Download parameter block
8297	Last PCP index
8298	MOVILINK® parameter channel, cyclic
8299	MOVILINK® parameter channel, acyclic
8300 ... 8800	Drive parameter for MOVIDRIVE® (can be accessed directly with the PCP services "Read" and "Write"; parameter index see SEW MOVIDRIVE® Parameter List documentation).
8801... 9999	Drive parameters for MOVIDRIVE® (these parameters can only be accessed via the MOVILINK® parameter channel)
>10000	Table, program and variable memory (these parameters can only be accessed via the MOVILINK® parameter channel)

Object description of the drive parameters

The drive parameters of the MOVIDRIVE® drive inverters are described in detail in the SEW MOVIDRIVE® Parameter List documentation. In addition to the parameter index, you find further information about coding, range of values and meaning of the parameter data.

The object description in the object list is identical for all drive parameters. Even parameters that can only be read are given the attribute Read all/Write all in the object list because the drive inverter itself carries out the appropriate testing and, if necessary, supplies a return code. The following table shows the object description of all drive parameters.

Index:	8300 ... 8800
Object code:	7 (simple variable)
Data type index:	10 (octet string)
Length:	4
Local address:	
Password:	
Access groups:	
Access rights:	Read all / Write all
Name[16]:	-
Extension length:	-

"Download Parameter Block" object

The "Download Parameter Block" object enables a maximum of 38 MOVIDRIVE® drive parameters to be written at the same time with a single write service. This means you can use this object to parameterize the drive inverter, for example, in the start-up phase with only one write service call. As a rule, only a few parameters need to be altered. Consequently, this parameter block with its max. 38 parameters is adequate for almost all applications. The user data area is defined as 38 x 6 + 2 bytes = 230 bytes (octet string type). The following table shows the structure of the "Download Parameter Block" object.

Octet	Meaning	Comment
0	reserved (0)	
1	Number of parameters	1 ... 38 parameters
2	Index high	1st parameter
3	Index low	
4	Data MSB	
5	Data	
6	Data	
7	Data LSB	
8	Index high	
...	...	
223	Data LSB	
224	Index high	38th parameter
225	Index low	
226	Data MSB	
227	Data	
228	Data	
229	Data LSB	

The "Download Parameter Block" object is only handled locally on the fieldbus option card and is defined as shown in the following table.

Index:	8296
Object code:	7 (simple variable)
Data type index:	10 (octet string)
Length:	230
Local address:	
Password:	
Access groups:	
Access rights:	Write all
Name[16]:	-
Extension length:	-

With the WRITE service to the "Download Parameter Block" object, a parameterization mechanism is started in the fieldbus option card that successively sends all parameters in the user data area of the object to the DPRAM, and by doing so sets the parameters of the drive inverter. After successfully processed download parameter block, i.e. all parameters transferred from the INTERBUS interface module have been written, the write service is ended with a positive write response. In the event of an error, a negative write response is returned. In this event, the return code contains more details about the type of error and, in addition, the parameter number (1 to 38) where the error occurred (see example).

```
Example: Error writing the 11th parameter Write Error Response:
Error class: 8  Other
Error code: 0   Other
Additional code high: 11dec Error writing parameter 11
Additional code low: 15hex Value too large
```

When using the download parameter block, note the following:

- Do not activate a factory setting within the download parameter block!
- After activating a parameter lock, all parameters subsequently written are rejected.

"Last PCP index" object

This object is 4 bytes long and, when read access is made, it returns the numerical value of the last index which can be addressed directly using the PCP services. PCP accesses to indices greater than this numerical value must be made using the "MOVILINK® acyclic parameter channel" object.

Index:	8297
Object code:	7 (simple variable)
Data type index:	10 (octet string)
Length:	4
Local address:	
Password:	
Access groups:	
Access rights:	Read all
Name[16]:	-
Extension length:	-

" MOVILINK® cyclic parameter channel" object

This object is 8 bytes long and comprises the cyclic MOVILINK® parameter channel. All MOVILINK® communication services can be performed by cyclically alternating reading and writing of this object. The communication service is not performed until the handshake bit in the management byte has changed. The MOVILINK® parameter channel permits access to all indices, including the IPOS$^{plus®}$ variable and program memory.

The following table shows the structure of this communication object. Refer to the MOVIDRIVE® "Fieldbus Unit Profile and Parameter List" document for information about the structure of the parameter channel.

Octet	0	1	2	3	4	5	6	7
Meaning	Manage-ment	reserved	Index high	Index low	MSB data	Data	Data	LSB data
Comment	Manage-ment	reserved	Parameter index		4-byte data			

The "MOVILINK® cyclic parameter channel" object is only handled locally on the fieldbus option card.

Index:	8298
Object code:	7 (simple variable)
Data type index:	10 (octet string)
Length:	8
Local address:	
Password:	
Access groups:	
Access rights:	Read all / Write all
Name[16]:	-
Extension length:	-

The following table shows the sequence of a parameter access via the cyclic MOVILINK® parameter channel. The inverter only starts executing the service when the master has changed the handshake bit in the parameter channel. To do this, the master must read the parameter channel at the beginning of parameterization to obtain the current status of the handshake bit in the inverter. The master can now initiate the evaluation of the parameter channel in the inverter by changing the handshake bit.

The inverter then executes the service coded in the parameter channel and enter the service acknowledgment in the parameter channel. The master receives the service confirmation with the next read access to the "MOVILINK® cyclic parameter channel." The following table shows the sequence of the cyclically called read/write services for the "MOVILINK cyclic parameter channel."

Control (master)	MOVIDRIVE® (slave)
1. "READ MOVILINK® cyclic parameter channel" to evaluate the status of the handshake bit.	
READ 8298 (parameter channel) →	
← Data = Parameter channel	
2. Initiate execution of the service coded in the parameter channel with WRITE to the "MOVILINK® cyclic parameter channel" object and toggling of the handshake bit.	
WRITE 8298 (parameter channel) →	
← OK	
3. READ "MOVILINK® cyclic parameter channel" and evaluate service confirmation in the parameter channel.	
READ 8298 (parameter channel) →	
← Data = Parameter channel with result	

"MOVILINK® acyclic parameter channel" object

The "MOVILINK® acyclic parameter channel" object is 8 bytes long and comprises the MOVILINK® parameter channel. This object can be used for acyclic parameter accesses, i.e. the drive inverter executes the service coded in the parameter channel each time it receives a WRITE service to this object. The handshake bit is not evaluated! The following table shows the structure of the "MOVILINK® acyclic parameter channel". Refer to the MOVIDRIVE® "Fieldbus Unit Profile and Parameter List" document for information about the structure of the parameter channel.

Octet	0	1	2	3	4	5	6	7
Meaning	Manage-ment	reserved	Index high	Index low	Data MSB	Data	Data	Data LSB
Comment	Manage-ment	reserved	Parameter index		4-byte data			

There are two different operations involved when setting the drive inverter parameters via the acyclic MOVILINK® parameter channel:

- Parameter channel executes a write service
- Parameter channel executes a read service

Parameter channel executes a write service

If a write type service is executed via the acyclic parameter channel (e.g. write parameter or write parameter volatile), the inverter returns the service confirmation for this service after it has executed the service. If an error occurs during the write access, the corresponding error code is returned.

This variant has the advantage that the write services are already processed by sending a WRITE "MOVILINK® parameter channel" once and the service be acknowledged by the evaluation of the "Write Confirmation." The following table shows how write services are executed via the acyclic MOVILINK® parameter channel.

Control (master)	MOVIDRIVE® (slave)
1. Initiate execution of the service coded in the parameter channel with WRITE to the "MOVILINK® acyclic parameter channel" object.	
WRITE 8299 (parameter channel) →	
← Service confirmation (OK/error code)	

The WRITE service coded in the parameter channel is executed and the service confirmation immediately returned as the response.

Parameter channel executes a read service

A PCP WRITE service has to be executed before a parameter can be read via the parameter channel. The PCP WRITE service defines where the inverter data should be available. A read service to the acyclic parameter channel must be executed so the master can receive these data. This means that a PCP WRITE followed by a PCP READ service are required to carry out read services via the parameter channel. The following table shows how read services are executed via the acyclic MOVILINK® parameter channel.

Control (master)	MOVIDRIVE® (slave)
1. Initiate the execution of the service coded in the parameter channel with WRITE to the "MOVILINK® acyclic parameter channel" object.	
WRITE 8299 (parameter channel) →	
← OK	
2. READ "MOVILINK® acyclic parameter channel" and evaluate service confirmation in the parameter channel.	
READ 8298 (parameter channel) →	
← Data = Parameter channel with result	

1. Receipt is confirmed immediately, parameter channel is evaluated and the required service executed.
2. Service confirmation is entered in the parameter channel and can be evaluated in the master with a READ access.

The MOVILINK® acyclic parameter channel is handled only locally on the fieldbus option card and is defined as shown in the following table.

Index:	8299
Object code:	7 (simple variable)
Data type index:	10 (octet string)
Length:	8
Local address:	
Password:	
Access groups:	
Access rights:	Read all / Write all
Name[16]:	-
Extension length:	-

5.4 Return codes for parameter setting

If a parameter setting is incorrect, the drive inverter sends back various return codes to the master that set the parameters. These codes provide detailed information about the cause of the error. All of these return codes are structured in accordance with EN 50170. The system distinguishes between the following elements:

- Error class
- Error code
- Additional code

These return codes apply to all communications interfaces of MOVIDRIVE®.

Error class

The error class element classifies the type of error more precisely. In accordance with EN 50170, the system differentiates between the error classes listed in the following table.

Class (hex)	Designation	Meaning
1	vfd-state	Status error of the virtual field unit
2	application-reference	Error in application program
3	definition	Definition error
4	resource	Resource error
5	service	Error in execution of service
6	access	Access error
7	ov	Error in object list
8	other	Other error (see additional code)

The error class is generated by the communication software of the fieldbus interface if there is an error in communication. This does not apply to error class 8 = other error, however. Return codes sent from the drive inverter system are all in error class 8 = other error. The error can be identified more precisely using the additional code element.

Error code

The error code element provides a means for more precisely identifying the cause of the error within the error class. It is generated by the communication software of the fieldbus card in the event of an error in communication. Only error code 0 (other error code) is defined for error class 8 = other error. In this case, detailed identification is made using the additional code.

Additional code

The additional code contains the return codes specific to SEW dealing with incorrect parameter settings of the drive inverter. They are sent back to the master in error class 8 = other error. The following table shows all possible codings for the additional code.

Add. code high (hex)	Add. code low (hex)	Meaning
00	00	No error
00	10	Illegal parameter index
00	11	Function/parameter not implemented
00	12	Read access only
00	13	Parameter lock is active
00	14	Factory setting is active
00	15	Value too large for parameter
00	16	Value too small for parameter
00	17	Option card required for this function/parameter is missing
00	18	Error in system software
00	19	Parameter access only via RS-485 process interface on X13
00	1A	Parameter access only via RS-485 diagnostic interface
00	1B	Parameter has access protection
00	1C	Controller inhibit required
00	1D	Illegal value for parameter
00	1E	Factory setting was activated
00	1F	Parameter was not saved in EEPROM
00	20	Parameter cannot be changed with output stage enabled

Special case "Internal communication error"

The return code listed in the following table is sent back if a communication error has occurred between the option card and the inverter system. The PCP service transferred via the fieldbus may not have been performed and should be repeated. If this error re-occurs, switch off the drive inverter completely and then back on again so it is re-initialized.

	Code (dec)	Meaning
Error class:	6	Access
Error code:	2	Hardware fault
Add. code high:	0	-
Add. code low:	0	-

Error rectification

Repeat the read or write service. If this error occurs again, switch the drive inverter off completely and back on again. If this error persists, consult the SEW Electronics Service.

6 Application Examples

This section describes brief examples for the exchange of process data and setting of parameters via the PCP interface.

6.1 Control via process data

The drive inverter is controlled using the process data by reading/writing the program addresses where the INTERBUS process data of the drive inverter are mapped. Example for a simple STEP7 program for the Simatic S7:

```
L  W#16#0006
T  PAW  144   //Writing 6hex to PO1 (control word = enable)
L  1500
T  PAW  146   //Writing 1500dec to PO2 (speed setpoint = 300 1/min)
L  W#16#0000
T  PAW  148  //Writing 0hex to PO3 (no function after factory setting)
```

Please refer to the Fieldbus Unit Profile manual for more information about controlling the inverter via the process data channel, in particular regarding the coding of the control and status word.

6.2 Setting parameters via the PCP interface

This section describes how parameters and IPOS$^{plus®}$ variables can be read and written using the standardized INTERBUS PCP services "Read" and "Write". The example applies to all 4th generation (G4) INTERBUS interface modules and is explained using PHOENIX terminology.

The coding examples in the following sections are shown in the same way as in the "Peripherals Communication Protocol (PCP)" INTERBUS user manual by Phoenix Contact.

Prerequisite

You should have the following user manuals:

- "Peripherals Communication Protocol (PCP)" INTERBUS user manual, PHOENIX CONTACT, IBS SYS PCP G4 UM
- MOVIDRIVE® Fieldbus Unit Profile manual

6.3 Presentation of coding examples

The coding examples in the following sections are shown in the same way as in the "Peripherals Communication Protocol (PCP)" INTERBUS user manual by Phoenix Contact.

All information in a PCP service is presented word-by-word in column format. This means you can regard a word as a PLC word (e.g. Simatic data word). There is a coding example for the MOVIDRIVE® drive inverter in the right column of each table. All codings in bold and red indicate system and project-specific codings. All other codings do not change for accessing different drives or drive parameters.

The "communication reference (CR)" is used for selecting the inverter for which you want to set the parameters. In the examples below, CR = 02 hex was assigned to the inverter in the CMD tool. The index defines the drive parameter that should be accessed.

Word	Meaning	Coding (hex)
1	Command_Code	00 81
2	Parameter_Count	00 03

Device description of the inverter in the CMD tool

Before you can use the PCP channel of the inverter, you have to configure the device description for the inverter in the CMD tool.

6.4 Process of a parameterization sequence

The peripherals communication protocol (PCP) of the INTERBUS standardizes access to the parameter data of INTERBUS participants and prescribes the following procedure:

- Initializing the PCP connection with the "Initiate" service.
- Reading or writing parameters with the "Read" and "Write" services.
- The communication link can be disconnected with the "Abort" service if it is no longer required (not described here because there is often no need for it, refer to the PCP manual).
- Initializing the PCP connection with the "Initiate" service.

The drive parameters of the inverter are not accessed until the PCP connection has been established with "Initiate_Request". The can be done once during system startup, for example.

Word	Meaning		Coding (hex)
1	Command_Code = Initiate_Request		00 8B
2	Parameter_Count		00 02
3	-	Comm._Reference	00 02
4	Password	Access_Groups	00 00
Bits	15 ... 8	7 ... 0	

You should receive the positive message "Initiate_Confirmation" after the service has been sent (refer to the PCP manual in case of a negative message).

6.5 Reading a drive parameter

The "Read" service is used for reading a drive parameter (with index 8800). All drive parameters are 4 bytes long (1 double word).

Example

Reading P130 Ramp t11 UP CW (index 8470dec = 2116hex)

Word	Meaning		Coding (hex)
1	Command_Code = Read_Request		00 81
2	Parameter_Count		00 03
3	Invoke_ID	Comm._Reference	00 02
4	Index		21 16
5	Subindex	-	00 00
Bits	15 ... 8	7 ... 0	

You should receive the positive "Write_Confirmation" message after this service has been sent.

Word	Meaning		Coding (hex)
1	Message_Code = Read_Confirmation (+)		80 81
2	Parameter_Count		00 05
3	Invoke_ID	Comm._Reference	00 02
4	Result (+)		00 00
5	-	Length	00 04
6	Data [1]	Data [2]	00 00
7	Data [3]	Data [4]	07 D0
Bits	15 ... 8	7 ... 0	

The parameter data are represented in Motorola format (Simatic format) as follows:

Data [1] = High byte	Data [2] = Low byte	Data [3] = High byte	Data [4] = Low byte
00 hex	00 hex	07 hex	D0 hex

00 00 07 D0 hex = 2000 dec (= 2000 ms ramp)

Refer to the appendix to the "MOVIDRIVE®"Fieldbus Unit Profile" manual for more information about coding the drive parameters.

Word	Meaning		Coding (hex)
1	Message_Code = Read_Confirmation (-)		80 81
2	Parameter_Count		00 03
3	Invoke_ID	Comm._Reference	00 02
4	Error_Class	Error_Code	08 00
5	Additional_Code		00 15
Bits	15 ... 8	7 ... 0	

The table shows the return code "Value for parameter too great" as example.

6.6 Writing a drive parameter

The "Write" service is used for writing a drive parameter (with index 8800). All drive parameters are 4 bytes long (1 double word).

Example

Writing the ramp time 1.65 s to P130 "Ramp t11 UP CW"

Index: 8470dec = 2116hex

Value: 1.65s = 1650ms = 1650 dec = 0000 0672 hex)

The parameter data are represented in Motorola format (Simatic format) as follows:

Data [1] = High byte	Data [2] = Low byte	Data [3] = High byte	Data [4] = Low byte
00 hex	00 hex	06 hex	72 hex

Refer to the appendix to the "MOVIDRIVE®"Fieldbus Unit Profile" manual for more information about coding the drive parameters.

Word	Meaning		Coding (hex)
1	Command_Code = Write_Request		00 82
2	Parameter_Count		00 05
3	Invoke_ID	Comm._Reference	00 02
4	Index		21 16
5	Subindex	Length	00 04
6	Data [1]	Data [2]	00 00
7	Data [3]	Data [4]	06 72
Bits	15 ... 8	7 ... 0	

Word	Meaning		Coding (hex)
1	Message_Code = Write_Confirmation (+)		80 82
2	Parameter_Count		00 02
3	Invoke_ID	Comm._Reference	00 02
4	Result (+)		00 00
Bits	15 ... 8	7 ... 0	

You should receive the positive message "Write_Confirmation" after this service has been sent.

Word	Meaning		Coding (hex)
1	Message_Code = Write_Confirmation (-)		80 82
2	Parameter_Count		00 03
3	Invoke_ID	Comm._Reference	00 02
4	Error_Class	Error_Code	08 00
5	Additional_Code		00 15
Bits	15 ... 8	7 ... 0	

The table shows the return code "Value for parameter too great" as example.

6.7 Writing IPOS variables/parameters via MOVILINK® parameter channel

The drive inverters offer special parameter access via the MOVILINK® parameter channel for universal write access to all drive inverter data (parameters, IPOS$^{plus®}$ variables, IPOS$^{plus®}$ program code,etc.). The following section illustrates the mechanism by which, for example, IPOS$^{plus®}$ variables can be changed via the parameter channel.

The acyclic parameter channel can be used via index 8299 dec (206B hex).

Example

Writing the value 74565 of the IPOS variable H0 = Index 11000 dec (2AF8 hex)

Value to be written = 74565 dec (0001 2345 hex)

Word	Meaning		Coding (hex)
1	Command_Code = Write_Request		00 82
2	Parameter_Count		00 07
3	Invoke_ID	Comm._Reference	00 02
4	Index = MOVILINK® parameter channel		20 6B
5	Subindex	Length	00 08
6	Data [1] = Management byte	Data [2] = Reserved	32 00
7	Data [3/4] = Index (e.g. IPOS variable)		2A F8
8	Data [5]	Data [6]	00 01
9	Data [7]	Data [8]	23 45
Bits	15 ... 8	7 ... 0	

You receive the "Write_Confirmation" after this service was sent. Again, you can use the return codes for evaluating a negative message.

6.8 Reading IPOS variables/parameters via MOVILINK® parameter channel

The drive inverters offer special parameter access via the MOVILINK® parameter channel for universal read access to all drive inverter data (parameters, IPOS$^{plus®}$ variables, IPOS$^{plus®}$ program code, etc.). The following section illustrates the mechanism by which IPOS$^{plus®}$ variables can be read via the parameter channel, for example. A two-step procedure is required for this purpose:

- Writing the MOVILINK® parameter channel with the command "Read IPOS variable H0"
- Reading the MOVILINK® parameter channel

The MOVILINK® parameter channel (acyclic) can be used via index 8299 dec (206B hex).

Example

Reading the IPOS$^{plus®}$ variable H0 = Index 11000 dec (2AF8 hex)

Refer to the Fieldbus Unit Profile manual for a detailed description of the MOVILINK® parameter channel.

Word	Meaning		Coding (hex)
1	Command_Code = Write_Request		00 82
2	Parameter_Count		00 07
3	Invoke_ID	Comm._Reference	00 02
4	Index = MOVILINK® parameter channel		20 6B
5	Subindex	Length	00 08
6	Data [1] = Management byte	Data [2] = Reserved	31 00
7	Data [3/4] = Index (z. B. IPOS$^{plus®}$ variable)		2A F8
8	Data [5]	Data [6]	00 00
9	Data [7]	Data [8]	00 00
Bits	15 ... 8	7 ... 0	

Once the positive "Write_Confirmation (+)" has been received, read access takes place on the MOVILINK® parameter channel, which means the data that have been read during the previous read job defined by "Write_Request" are read into the interface module.

Word	Meaning		Coding (hex)
1	Command_Code = Read_Request		00 81
2	Parameter_Count		00 03
3	Invoke_ID	Comm._Reference	00 02
4	Index = MOVILINK® parameter channel		20 6B
5	Subindex	-	00 00
Bits	15 ... 8	7 ... 0	

You should receive the positive message "Write_Confirmation" after this service has been sent.

Word	Meaning		Coding (hex)
1	Message_Code = Read_Confirmation (+)		80 81
2	Parameter_Count		00 07
3	Invoke_ID	Comm._Reference	00 02
4	Result (+)		00 00
5	-	Length	00 08
6	Data [1] = Management byte	Data [2] = Reserved	31 00
7	Data [3/4] = Index (z. B. IPOS$^{plus®}$ variable)		2A F8
8	Data [5]	Data [6]	00 01
9	Data [7]	Data [8]	23 45
Bits	15 ... 8	7 ... 0	

Word	Meaning		Coding (hex)
1	Message_Code = Read_Confirmation		80 81
2	Parameter_Count		00 03
3	Invoke_ID	Comm._Reference	00 02
4	Error_Class	Error_Code	08 00
5	Additional_Code		00 10
Bits	15 ... 8	7 ... 0	

You can use the return codes for evaluating a negative message.

6.9 Writing IPOS variables/parameters using the download parameter block

MOVIDRIVE® drive inverters enable you to use the download parameter block to write several IPOS$^{plus®}$ variables and parameters at the same time using one PCP service.

The download parameter block is always 230 bytes long. It is possible to write up to 42 drive parameters and IPOS$^{plus®}$ variables in one block.

Example

Three values of the inverter are to be written with one "Write_Request":

Parameter/variable name	Index	Value to be written
IPOS$^{plus®}$ variable H0	11000 dec (2AF8 hex)	1 dec (1 hex)
IPOS$^{plus®}$ variable H1	11001 dec (2AF9 hex)	-40000 dec (FFFF63C0 hex)
P130 Ramp t11 UP CW	8470 dec (2116 hex)	1500 dec (05DC hex)

Word	Meaning		Coding (hex)
1	Command_Code = Write_Request		00 82
2	Paraemter_Count = 118 words (= 76 hex)		00 76
3	Invoke_ID	Comm._Reference	00 02
4	Index = Download parameter block		20 68
5	Subindex	Length = 230 bytes (= E6 hex)	00 E6
6	Data [1] = Reserved	Data [2] = Number of parameters	00 03
7	Data [3/4] = Index of the 1st parameter (e.g. IPOS$^{plus®}$ variable H0)		2A F8
8	Data [5]	Data [6]	00 00
9	Data [7]	Data [8]	00 01
10	Data [9/10] = Index of the 2nd parameter (e.g. IPOS$^{plus®}$ variable H1)		2A F9
11	Data [11]	Data [12]	FF FF
12	Data [13]	Data [14]	63 C0
13	Data [15/16] = Index of the 3rd parameter (P130 ramp t11)		21 16
14	Data [17]	Data [18]	00 00
15	Data [19]	Data [20]	05 DC
...	...	...	...
Bits	15 ... 8	7 ... 0	

You receive the "Write_Confirmation" after this service was sent. Again, you can use the return codes for evaluating a negative message. The individual parameters of the download parameter block in the inverter are written one after the other. This means if there is a negative "Write_Confirmation" in the high part of the Additional_Code, the parameter number at which the error occurred is entered (see also DFI manual).

7 Technical Data

7.1 DFI11B option

DFI11B option	
Part number	824 309 3
Supported baud rates	500 kbaud and 2 Mbaud, changeover via DIP switch
Connection technology	• Remote bus input: 9-pole sub D connector • Remote bus output: 9-pin sub D socket • RS-485 transmission technology, 6-core shielded and twisted-pair cable
DP identity numbers	• $E3_{hex} = 227_{dec}$ (1 PCP word) • $E0_{hex} = 224_{dec}$ (2 PCP words) • $E1_{hex} = 225_{dec}$ (4 PCP words) • $38_{hex} = 56_{dec}$ (microprocessor not ready) • $03_{hex} = 3_{dec}$ (no PCP word)
Max. number of process data	6 process data

8 Index

S

U

W

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

SEW EURODRIVE