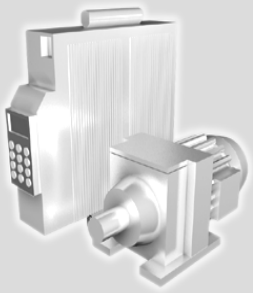
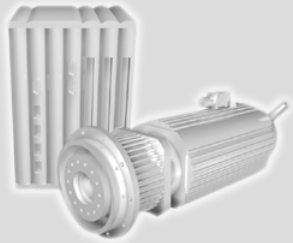
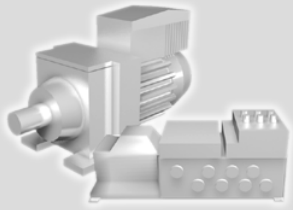
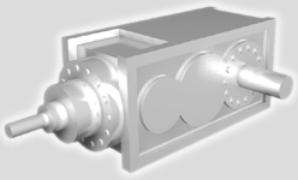
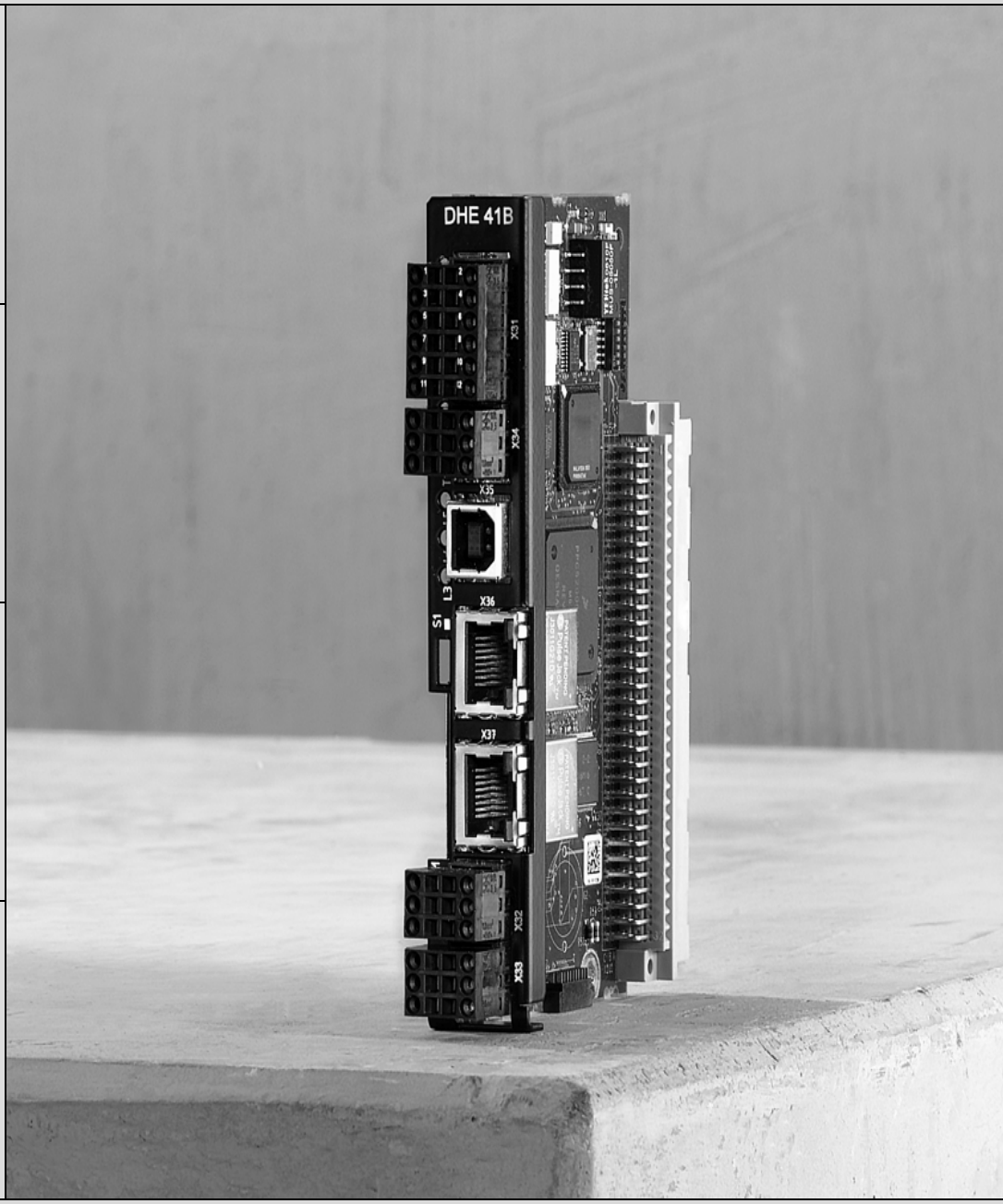
SEW EURODRIVE









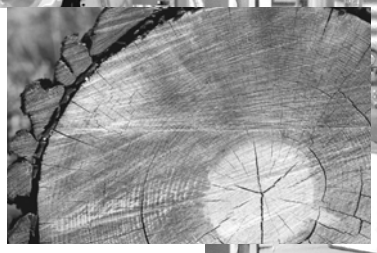


MOVI-PLC® *advanced* DH.41B Controller

Edition 04/2007

11497416 / EN

Manual



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, MOVITRAC® B or MOVIAXIS® operating instructions!**
- **Additional measures are required for the protection of people and equipment. It is not sufficient to use MOVI-PLC® advanced DH.41B – even in conjunction with inverters!**

Documentation

- Read this manual carefully before installing and starting up MOVIDRIVE® MDX60B/61B, MOVITRAC® B or MOVIAXIS® with the MOVI-PLC® *advanced* DH.41B control card.
- This manual assumes that the user has access to and is familiar with the MOVIDRIVE® B / MOVITRAC® B / MOVIAXIS® documentation.
- 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 of fault-free operation and fulfillment of warranty claims, you must adhere to the information in the documentation.

Product names and trademarks

- The brands and product names contained within this manual are trademarks or registered trademarks of the titleholders.

Explanation of symbols safety and warning notes

Always observe the safety and warning information in this documentation.

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

Content of this manual

This user manual describes:

- How to install the MOVI-PLC® *advanced* DH.41B control card in MOVIDRIVE® MDX61B
- The interfaces and LEDs of the MOVI-PLC® *advanced* DH.41B controller
- How to install the MOVI-PLC® *advanced* DH.41B control card in the MOVIDRIVE® MDX61B and MOVITRAC® B inverters and the MOVIAXIS® servo drive and as a compact controller
- Engineering access to the MOVI-PLC® *advanced* DH.41B controller
- Configuration and startup of the MOVI-PLC® *advanced* DH.41B control card and the inverters and servo drives it controls
- Operation on the PROFIBUS fieldbus system

Additional documentation

For simple and effective engineering for the MOVI-PLC® *advanced* DH.41B control card, you should also order the following publications in addition to this manual:

- "MOVI-PLC® programming in the PLC Editor" system manual
- "MPLCMotion_MDX and MPLCMotion_MX Libraries for MOVI-PLC®" manual
- "MPLCMotion_MC07 and MPLCMotion_MM Libraries for MOVI-PLC®" manual
- MOVIDRIVE® MDX60/61B system manual
- MOVITRAC® B system manual
- MOVIAXIS® system folder

The "MOVI-PLC® programming in the PLC Editor" system manual contains instructions on how to program MOVI-PLC® in accordance with the IEC 61131-3 standard.

The library manuals describe the motion libraries for MOVI-PLC® to control the MOVIDRIVE® MDX60B/61B, MOVIAXIS®, MOVITRAC® B, and MOVIMOT® inverters.

2.1 MOVI-PLC® – universal, scalable, powerful

Features

MOVI-PLC® is a series of programmable logic control cards for inverters. It enables drive solutions, logic processes and sequence controls to be automated simply and efficiently using programming languages in accordance with the IEC 61131-3 standard.

- MOVI-PLC® is a **universal** solution as it is able to control the entire portfolio of SEW inverters and offers a simple upgrade to a more powerful MOVI-PLC® version due to universal execution of the programs.
- MOVI-PLC® is **scalable** due to several different hardware platforms (basic, advanced, etc.) and modular software concepts (libraries for numerous applications).
- MOVI-PLC® is **powerful** due to extensive technologies (such as electronic cam, synchronous operation) and the control of demanding applications (such as material handling).

Control classes

- MOVI-PLC® *basic* DHP11B enables the coordination of single axis movements and the integration of external inputs / outputs and Drive Operator Panels (DOP). This means MOVI-PLC® *basic* DHP11B is suitable as a module controller or a stand-alone controller for machines of medium complexity.
- MOVI-PLC® *advanced* DH.41B is characterized by a greater variety of interfaces and higher performance, which allows complex calculations and, for example, interpolated movements. MOVI-PLC® *advanced* is suitable for automating machines and cells. The integrated Ethernet interface means that MOVI-PLC® *advanced* can be connected directly to the control level.

2.2 MOVI-PLC® advanced DH.41B control card

Features

The MOVI-PLC® *advanced* DH.41B control card is available in two mounting versions:

- As the **control card** MOVI-PLC® *advanced* DH.41B as an option for the MOVIDRIVE® B and MOVITRAC® B inverters and the MOVIAXIS® servo drive
- As the **compact controller** MOVI-PLC® *advanced* DH.41B for installation on a DIN rail. The compact controller version is designed to control inverters (→ Sec. 8 "Technical Data").

Unit versions

The MOVI-PLC® *advanced* DH.41B control card is available in 2 versions, differing in the fieldbus interfaces installed:

MOVI-PLC® *advanced* DH.41B unit version	Fieldbus interfaces
DHE41B	Ethernet TCP/IP, UDP
DHF41B	Ethernet TCP/IP, UDP, PROFIBUS DP-V1

Engineering

Engineering of the MOVI-PLC® *advanced* DH.41B control card includes the following activities:

- Configuration
- Parameter setting
- Programming

These activities are carried out using the MOVITOOLS® MotionStudio engineering software. The software has a number of useful features for startup and diagnostics of all SEW-EURODRIVE units. MOVI-PLC® *advanced* DH.41B is connected to the engineering PC either via the Ethernet 2 or USD interface (in preparation).

Communication interfaces

The MOVI-PLC® *advanced* DH.41B control card is equipped with a number of communication interfaces.

The two system bus interfaces CAN 1 and CAN 2 are used primarily for connection, controlling several inverters and integrating decentralized I/O modules. SEW-EURODRIVE recommends connecting no more than 256 inputs and 256 outputs to the MOVI-PLC® *advanced* DH.41B control card.

Once you have set up a machine module in this way, you can operate it on a higher-level controller via an integrated fieldbus interface.

Engineering is performed via the integrated Ethernet 2 or USB interface (in preparation).

An operator terminal (e.g. DOP11A) or a MOVIMOT® gearmotor with integrated frequency inverter is connected to the RS485 interface.

Automation topologies

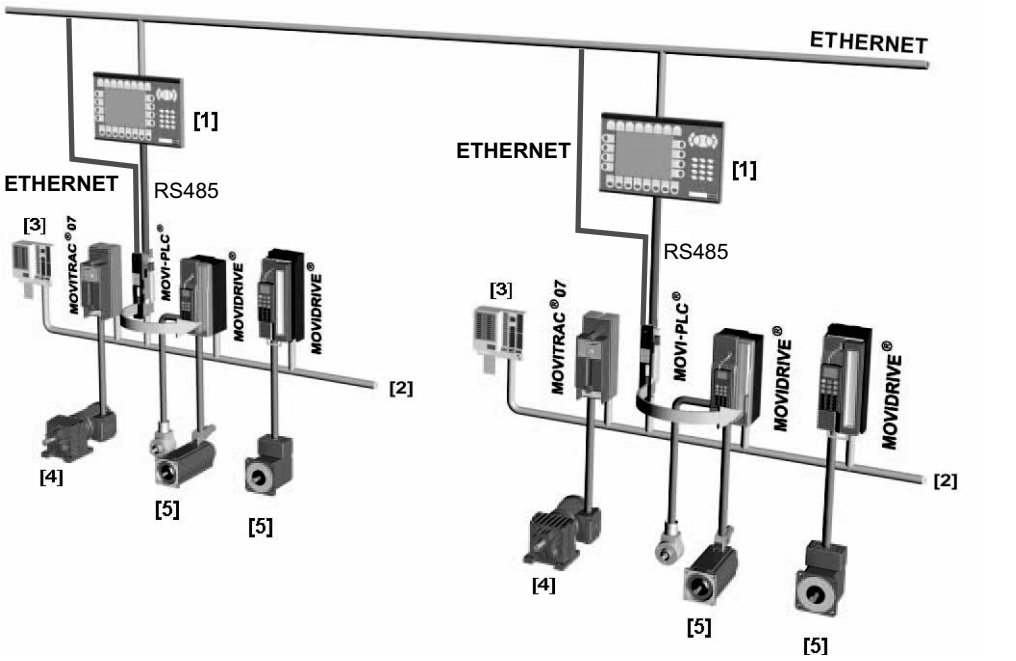
Use as a stand-alone machine controller

You can use the MOVI-PLC® *advanced* DH.41B control card as the control unit for a complete machine.

When no higher-level PLC is used, MOVI-PLC® *advanced* DH.41B takes over all control tasks. This means the control card controls drives and other actuators and evaluates decentralized inputs and outputs.

In this standalone topology, operator terminals (DOP11A) function as the interface between the operator and machine.

You can connect MOVI-PLC® *advanced* DH.41B directly to the Ethernet network.



60544AXX

Figure 1: Sample topology for controlling a complete machine as a stand-alone solution using the MOVI-PLC® advanced DH.41B control card

[1] Operator terminal (e.g. Drive Operator Panel DOP11A)

[2] System bus (CAN 1, CAN 2, Ethernet 1)

[3] Inputs and outputs (terminals)

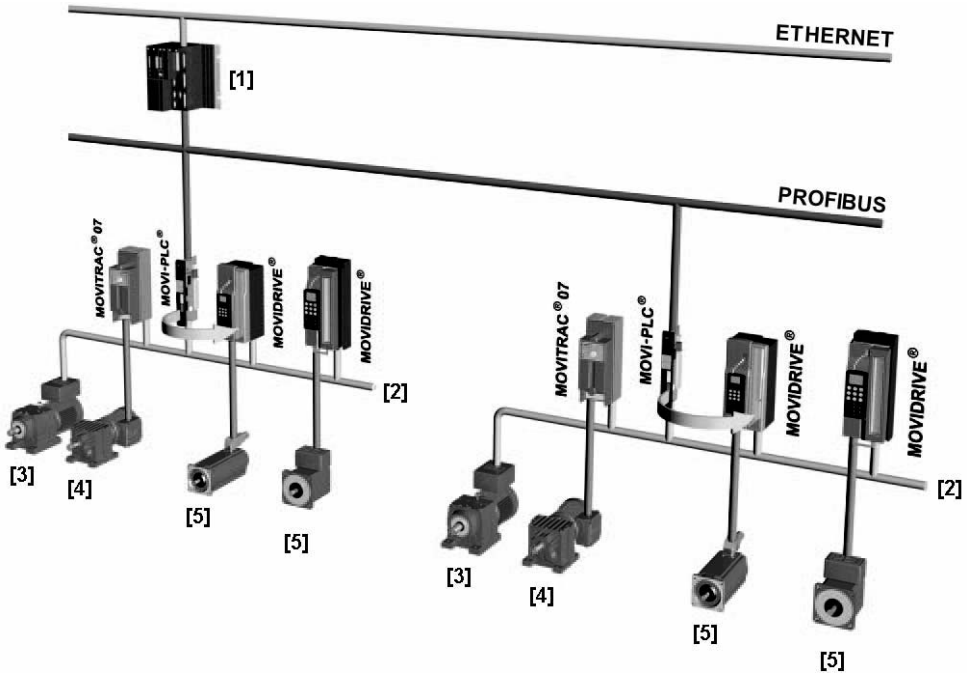
[4] Asynchronous motor

[5] Synchronous servomotor / asynchronous servomotor

Use as a module controller

You can also use the MOVI-PLC® *advanced* DH.41B control card for decentralized automation of a machine module (→ following figure). In this type of setup, the MOVI-PLC® *advanced* DH.41B control card coordinates the motion sequences in the axis system.

As an option, the control card can be connected to a higher-level PLC via one of the integrated fieldbus interfaces.



58621AXX

Figure 2: Sample topology for controlling machine modules each with a MOVI-PLC® advanced DH.41B control card

[1] Higher-level PLC

[2] System bus (CAN 1, CAN 2)

[3] MOVIMOT® (via fieldbus interface DeviceNet MFD... / connected directly to MOVI-PLC® via RS485 interface COM2)

[4] Asynchronous motor

[5] Synchronous / asynchronous servomotor

System buses CAN 1, CAN 2 and Ethernet 1

You can use MOVI-PLC® *advanced* DH.41B to control a machine module by connecting several inverters via one system bus. In this way, MOVI-PLC® *advanced* DH.41B controls all the drives within the machine module and thereby takes off load from the higher-level controller (e.g. machine or system PLC). You can connect up to **64** of the following units to MOVI-PLC® *advanced* DH.41B via system buses CAN 1, CAN 2 and Ethernet 1:

- MOVITRAC® 07A or MOVITRAC® B frequency inverters
- MOVIDRIVE® MDX60B/61B drive inverters
- MOVIAXIS® servo drives
- MOVIMOT® gearmotors with integrated frequency inverter (DeviceNet MFD... fieldbus interface required)

Configuration of the PROFIBUS interface

The PROFIBUS station address is set using the DIP switches on the front of the MOVI-PLC® *advanced* DH.41B controller. You can use these manual settings to integrate and switch on the MOVI-PLC® *advanced* DH.41B control card in the PROFIBUS environment in next to no time. The higher-level PROFIBUS master can set the parameters automatically (parameter download).

This option offers the following advantages:

- Shorter start up times
- Simple documentation of the application program as all important parameter data can be transferred from the program of the higher-level controller.

Cyclical and acyclical data exchange via PROFIBUS DP

While process data is usually exchanged cyclically, drive parameters are read or written acyclically using functions such as *Read* and *Write* or via the MOVILINK® parameter channel. This parameter data exchange enables you to implement applications in which all the important drive parameters are stored in the higher-level programmable controller, so that there is no need to make parameter settings manually on the drive inverter itself.

Cyclical and acyclical data exchange via PROFIBUS DP-V1

The PROFIBUS DP-V1 specification introduced new acyclical *Read*/*Write* services within the context of the PROFIBUS DP-V1 expansions. These acyclical services are inserted in special telegrams during cyclical bus operation to ensure compatibility between PROFIBUS DP (version 0) and PROFIBUS DP-V1 (version 1).

PROFIBUS monitoring functions

Using a fieldbus system requires additional monitoring functions for the drive technology, for example, time monitoring of the fieldbus (PROFIBUS timeout). The function module that addresses the PROFIBUS issues a PROFIBUS timeout using the relevant fault information. This allows the application to respond to the PROFIBUS timeout.

RS485 interfaces COM1 and COM2

Connect one of the following devices to RS485 interface COM1 or COM2:

- DOP11A operator terminal
- MOVIMOT® gearmotor with integrated frequency inverter

Binary inputs and outputs

Binary inputs and outputs enable you to switch actuators (e.g. valves) and evaluate binary input signals (e.g. sensors) You can use binary inputs and outputs as required when programming in the PLC editor of the MOVITOOLS® MotionStudio software.

Diagnostics

The LEDs of the MOVI-PLC® *advanced* DH.41B control card indicates the following status:

- Voltage supply of the binary inputs and outputs
- General status of the MOVI-PLC® *advanced* DH.41B control card
- Status of the control program
- Status of the PROFIBUS interface
- Status of the DeviceNet interface
- Status of both CAN interfaces

You can connect operator terminals to perform diagnostics. We recommend connecting the operator terminal to the RS485 interface. Connection to the CAN 1 or CAN 2 interface is in preparation.

3 Assembly / Installation Notes

3.1 Installation options for the MOVI-PLC® advanced DH.41B control card

Observe the following installation instructions:

- **You can plug the MOVI-PLC® advanced DH.41B control card into the MOVIDRIVE® MDX61B drive inverter, but never into the MOVIDRIVE® MDX60B drive inverter.**
- **Option cards can only be installed or removed for MOVIDRIVE® MDX61B drive inverters sizes 1 to 6.**
- **Only SEW-EURODRIVE engineers may install or remove option cards for MOVIDRIVE® MDX61B size 0 drive inverters.**
- **Only SEW-EURODRIVE engineers may install or remove the MOVI-PLC® advanced DH.41B control card in MOVIAXIS® or assemble a MOVI-PLC® DH.41B/UOH..B compact controller.**

3.2 Installing MOVI-PLC® advanced DH.41B in MOVIDRIVE® MDX61B

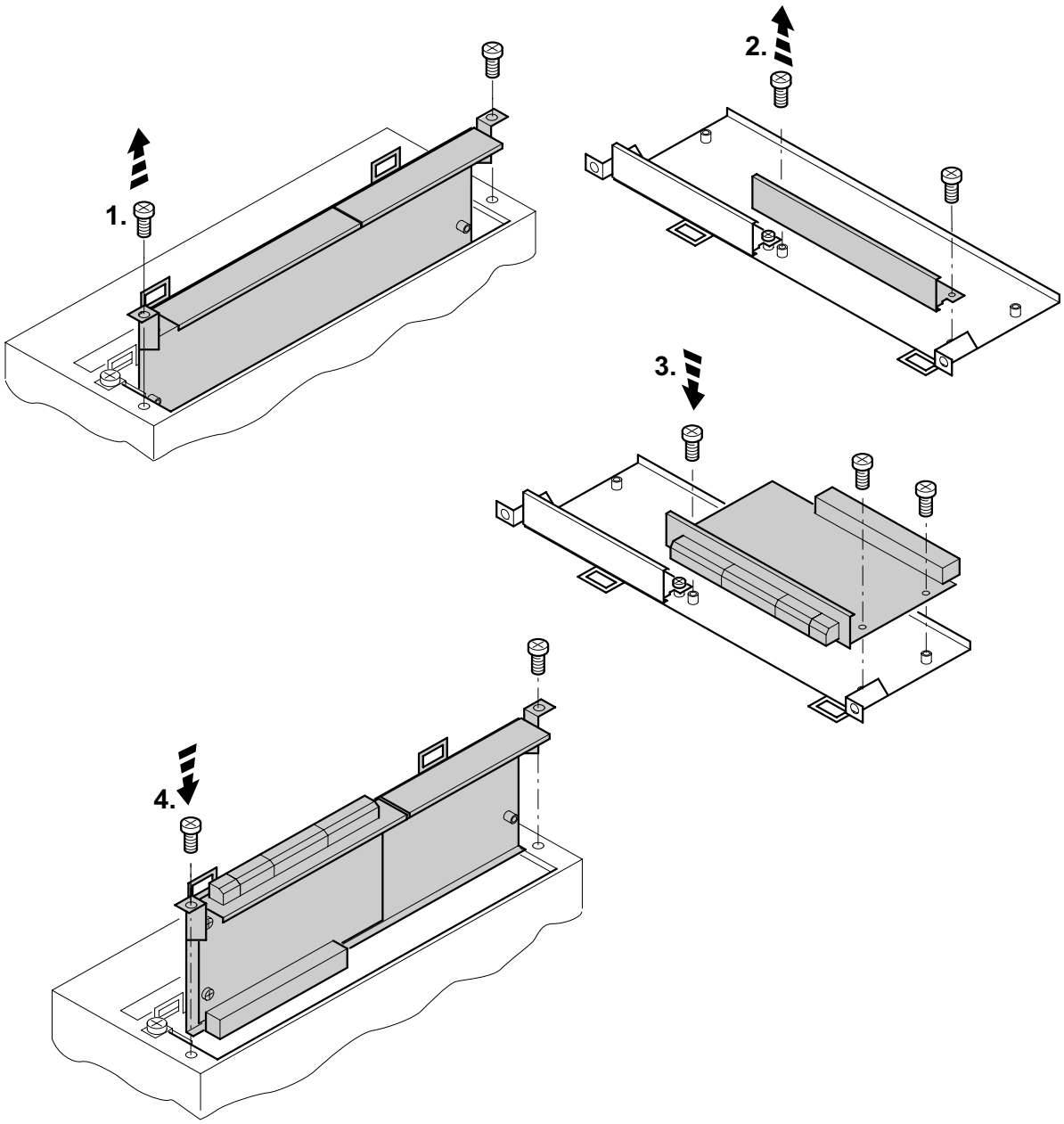
Plug the MOVI-PLC® *advanced* DH.41B control card into the fieldbus slot or expansion slot on MOVIDRIVE® MDX61B.

Before you begin

Observe the following notes before installing or removing the MOVI-PLC® advanced DH.41B control card:

- Disconnect the drive inverter from the power. Switch off the DC 24 V and the supply voltage.
- Take appropriate measures to protect the MOVI-PLC® *advanced* DH.41B control card from electrostatic charge (discharge strap, conductive shoes, etc.) before touching it.
- Remove the keypad and front cover **before installing** the MOVI-PLC® *advanced* DH.41B controller.
- Replace the front cover and keypad **after installing** the MOVI-PLC® *advanced* DH.41B control card.
- Keep the MOVI-PLC® *advanced* DH.41B control card in its original packaging until immediately before you are ready to install it.
- Only touch the edges of the MOVI-PLC® *advanced* DH.41B control card. Do not touch any of the components.
- Never put MOVI-PLC® *advanced* DH.41B down on a conductive surface.

Basic procedure for installing/removing an option card in MOVIDRIVE® MDX61B

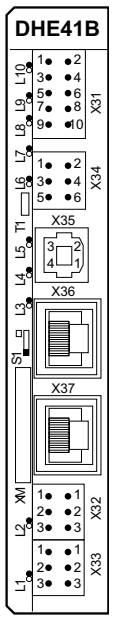


53001AXX

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 from the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the retaining bracket so that the 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. Follow the instructions in reverse order when removing the option card.

3.3 Installing the MOVI-PLC® advanced DHE41B control card

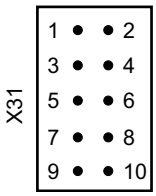
3.3.1 Functional description of the terminals, DIP switches and LED

Front view of the MOVI-PLC® advanced DHE41B control card	Designation	LED DIP switches Terminal		Function
 60108AXX	**LED**	**LED 1** **LED 2** **LED 3** **LED 4** **LED 5** **LED 6** **LED 7** **LED 8** **LED 9** **LED10**	CAN 1 status CAN 2 status IEC progr. status PLC status User LED DIO6/7 DIO4/5 DIO2/3 DIO0/1 24 V / I/O OK	Status of CAN 1 system bus Status of CAN 2 system bus Status of control program Status of control firmware User-programmable Status of input or output DIO 6/7 Status of input or output DIO 4/5 Status of input or output DIO 2/3 Status of input or output DIO 0/1 Status of voltage supply I/O
	Terminal X31: **Binary inputs and outputs** **(plug-in terminals)**	**X31:1** **X31:2** **X31:3** **X31:4** **X31:5** **X31:6** **X31:7** **X31:8** **X31:9** **X31:10**	+24 V input REF24V DIO 0 DIO 1 DIO 2 DIO 3 DIO 4 DIO 5 DIO 6 DIO 7	Voltage input DC+24 V Reference potential for binary signals Binary input or output (DIO 0) Binary input or output (DIO 1) Binary input or output (DIO 2) Binary input or output (DIO 3) Binary input or output (DIO 4) Binary input or output (DIO 5) Binary input or output (DIO 6) Binary input or output (DIO 7)
	Terminal X34: **RS485 interface COM1, COM2** **(plug-in terminals)**	**X34:1** **X34:2** **X34:3** **X34:4** **X34:5** **X34:6**	RS+ RS+ isolated RS– RS– isolated DGND GND isolated	Signal RS485+ Signal RS485+ isolated Signal RS485– Signal RS485– isolated Reference potential Reference potential
	Terminal X35: **USB connection** **(In preparation)**	**X35:1** **X35:2** **X35:3** **X35:4**	USB+5 V USB– USB+ DGND	DC 5 V voltage supply Signal USB– Signal USB+ Reference potential
	Terminal X36: **Ethernet 1 connection** **System bus (RJ45 socket)**	**X36**		Standard Ethernet assignment
	Terminal X37: **Ethernet 2 connection** **(RJ45 socket)**	**X37**		
	Terminal X32: **System bus CAN 2** **(electrically isolated)** **(plug-in terminals)**	X32:1 X32:2 X32:3	REF_CAN 2 CAN 2H CAN 2L	Reference potential for system bus CAN 2 System bus CAN 2 high System bus CAN 2 low
	Terminal X33: **System bus CAN 1** **(plug-in terminals)**	**X33:1** **X33:2** **X33:3**	DGND CAN 1H CAN 1L	Reference potential for system bus CAN 1 System bus CAN 1 high System bus CAN 1 low
	DIP switches **Default IP address**	**S1**		Default IP address Ethernet 2 connection

3.3.2 Connecting binary inputs and outputs (terminal X31)

Terminal X31 provides eight binary inputs or outputs (e.g. for controlling external actuators / sensors).

You can define the binary inputs and outputs in the PLC editor of the MOVITOOLS® MotionStudio software.



61018AXX

Figure 3: 12-pin connector for connecting binary inputs and outputs

Binary inputs

- The binary inputs are electrically isolated by optocouplers.
- The permitted input voltages are defined according to IEC 61131.
  +13 V ... +30 V = "1" = Contact closed
  –3 V ... +5 V = "0" = Contact open

Interrupt inputs

- You can use binary inputs X31:6 to X31:10 as interrupt inputs. The response time until the ISR (interrupt service routine) is processed is less than 100 µs.

Binary outputs

- The binary outputs are electrically isolated by optocouplers.
- The binary outputs are short-circuit proof but not protected against external voltage.
- The maximum permitted output current is 150 mA per binary output. All eight binary outputs can be operated simultaneously with this current.

- To prevent the MOVI-PLC® control card from being damaged and to ensure the specified function of the binary inputs and outputs is achieved, the supply voltage must be applied to X31:1/2 when using the binary inputs and outputs. If the supply voltage is switched off, you must switch off all other voltages at X31:1 ... 10 , e.g. DC 24 V of switches and sensors at the binary inputs.
- To prevent dangerous voltage peaks from occurring, do not connect inductive loads to the supply voltage or the binary inputs or outputs without free running diodes.

Cable specification

- Only connect cables with a core cross section of minimum 0.25 mm^2 (AWG23) and maximum 1 mm^2 (AWG18). Clamping without conductor end sleeves is possible in accordance with IEC 60999.
- Choose the type and core cross section of the connected cable depending on the required cable length and the load expected from your application.

For more information on binary inputs or outputs, refer to section 8 Technical Data on page 82.

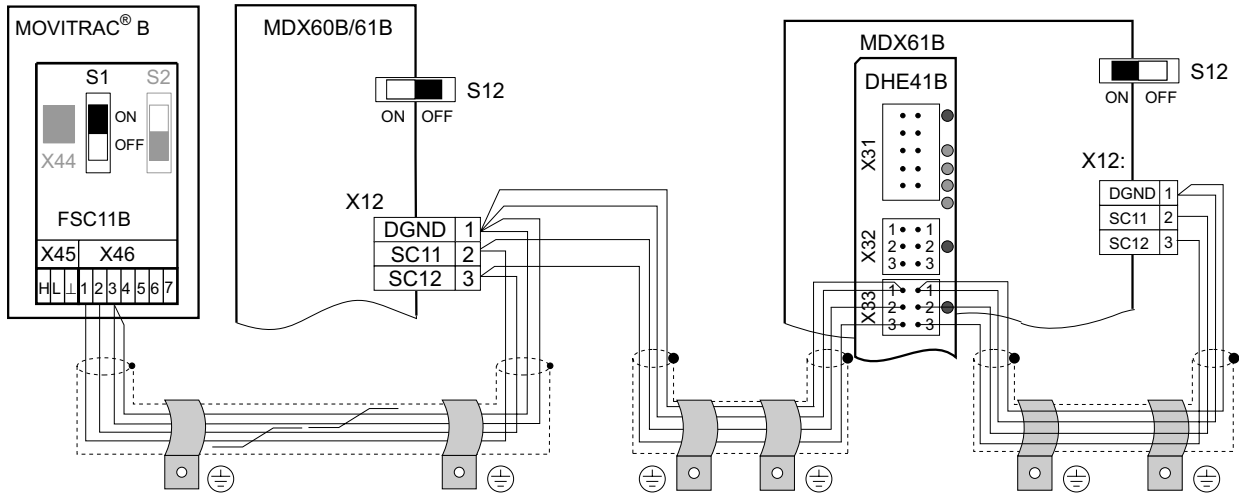
3.3.3 Connecting system bus CAN 2 (terminal X32) / CAN 1 (terminal X33)

Do not connect more than 64 units to the CAN 2 or CAN 1 system bus. The system bus supports the address range 0 ... 127.

- The CAN 2 system bus is electrically isolated. Therefore, interface CAN 2 (X32) is preferred for connecting field devices (e. g. CANopen inputs and outputs).
- The CAN 1 system bus is **not** electrically isolated. Therefore, use the CAN 1 (X33) interface to connect the inverter via the system bus in the control cabinet.
- SEW-EURODRIVE connecting a maximum of 64 inputs and 64 outputs to the MOVI-PLC® *basic* DHP11B.. control card via I/O modules.
- If you use the "DPRAM" channel (→ "MOVI-PLC® Programming in the PLC-Editor" system manual), you do not need a CAN system bus connection for communication between MOVIDRIVE® MDX61B and the installed MOVI-PLC® *advanced* control card. However, a CAN system bus connection is required if modules from the MPLCMotion_MDX libraries and MPLCProcessdata are used.

Use a repeater after 20 or 30 CAN bus stations, depending on the length of the cables and the cable capacity. The CAN system bus supports transmission systems compliant with ISO 11898. The "Serial Communication" manual contains detailed information on the system bus. This manual can be ordered from SEW-EURODRIVE.

Wiring diagram for CAN 2 system bus



60526AXX

Figure 4: CAN 2 system bus connection using the example of MOVIDRIVE® MDX60B/61B / MOVITRAC® B drive inverters

Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). Clamping without conductor end sleeves is possible in accordance with IEC 60999. The cable must meet the following specifications:
  - Core cross section 0.25 ... 1.0 mm^2 (AWG 23 ... AWG 18)
  - Line resistance 120 Ω at 1 MHz
  - Capacitance per unit length ≤ 40 pF/m at 1 kHz

  Suitable cables include CAN bus or DeviceNet cables.

Cable length

- The permitted total cable length depends on the baud rate setting of the system bus:
  - 125 kbaud → 320 m
  - 250 kbaud → 160 m
  - **500 kBaud → 80 m**
  - 1000 kbaud → 40 m

Terminating resistor

- Switch on the system bus terminating resistor at the start and end of the CAN system bus connection (MOVIDRIVE® B, DIP switch S12 = ON; MOVITRAC® B, DIP switch S1 = ON). Switch off the terminating resistors on all other units (MOVIDRIVE® B, DIP switch S12 = OFF; MOVITRAC® B, DIP switch S1 = OFF). If, for example, the MOVI-PLC® *advanced* DH.41B control card is at the end of the CAN 2 system bus, connect a terminating resistor with 120 Ω between pin X32:2 and pin X32:3 (with CAN 1: terminating resistor between X33:2 and pin X33:3).

- There **should not** be any potential displacement between the units connected via the CAN 2 system bus.
- There **must not** be any potential displacement between the units connected via the CAN 1 system bus.
- Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.

3.3.4 Connecting the RS485 interface (terminal X34)

You can connect one of the following units to each of the RS485 interfaces COM1/2 (terminal X34).

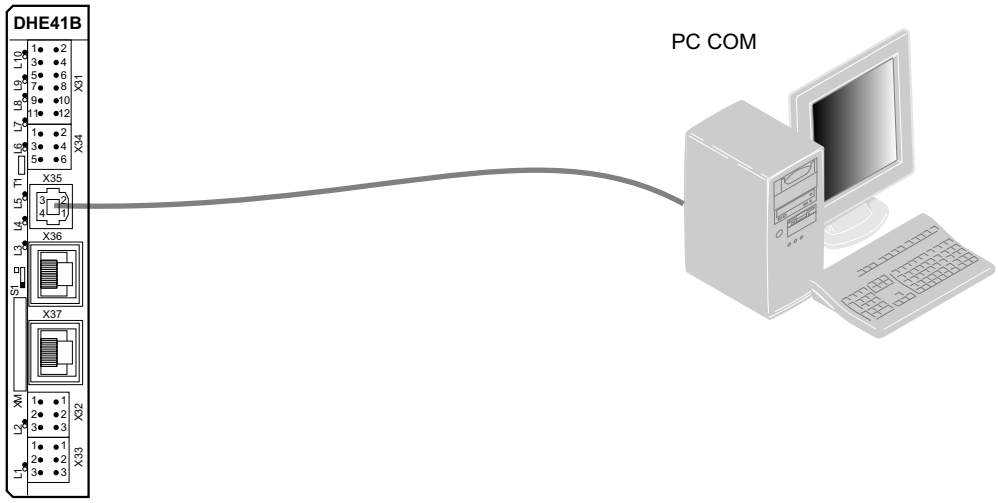
- DOP11A operator terminal
- MOVIMOT® gearmotor with integrated frequency inverter

- There must not be any potential displacement between the units connected via the RS485. Take suitable measures to avoid a potential displacement, e.g. by connecting the unit ground connectors using a separate lead.
- Dynamic terminating resistors are installed. **Do not connect any external terminating resistors.**

For more information on how to connect the DOP11A operator terminal, refer to the sections "Installation" and "Pin assignment" in the "DOP11A Operator Terminals" manual.

3.3.5 Connecting the USB interface (terminal X35)

You can connect an engineering PC (→ Sec. 3.8) to the USB interface (in preparation, terminal X35)



60537AXX

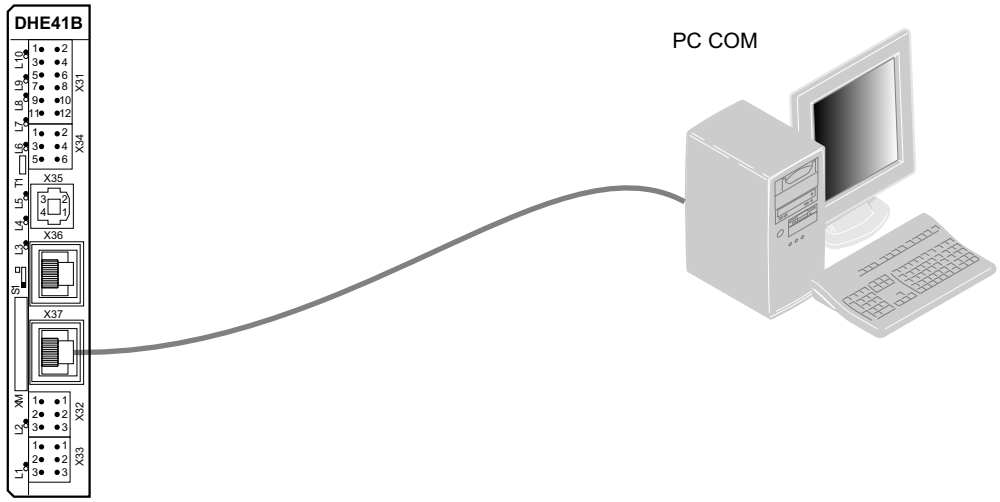
Figure 5: Example: Connecting an engineering PC to X35 via the USB interface

3.3.6 Connecting the Ethernet 1 system bus (terminal X36)

The Ethernet 1 interface (terminal X36) is reserved as a system bus.

3.3.7 Connecting the Ethernet 2 interface (terminal X37)

You can connect an engineering PC (→ Sec. 3.8) to the Ethernet 2 interface (terminal X37).



61522AXX

Figure 6: Example: Connecting an engineering PC to X37 via the Ethernet 2 interface

The Ethernet 2 interface can also be used to exchange data between MOVI-PLC® *advanced* DHE41B and another controller via UDP/TCP.

3.3.8 Operating displays of the MOVI-PLC® *advanced* DHE41B control card

The MOVI-PLC® *advanced* DHE41B control card has ten LEDs that display the current status of MOVI-PLC® *advanced* DHE41B and its interfaces.

CAN 1 status LED (L1)

The **CAN 1 status** LED indicates the status of the CAN 1 system bus.

CAN 1 status	Diagnostics	Remedy
Orange	• The CAN 1 system bus is being initialized.	-
Green	• The CAN 1 system bus is initialized.	-
Flashing green (0.5 Hz)	• The CAN 1 system bus is currently in SCOM suspend mode.	-
Flashing green (1 Hz)	• The CAN 1 system bus is currently in SCOM On mode.	-
Red	• The CAN 1 system bus is off (BUS-OFF).	1. Check and correct the cabling of the CAN 1 system bus. 2. Check and correct the baud rate set for the CAN 1 system bus. 3. Check and correct the terminating resistors of the CAN 1 system bus.
Flashing red (1 Hz)	• Warning on the CAN 1 system bus.	1. Check and correct the cabling of the CAN 1 system bus. 2. Check and correct the baud rate set for the CAN 1 system bus.

CAN 2 status LED (L2)

The **CAN 2 status** LED indicates the status of the CAN 2 system bus.

CAN 2 status	Diagnostics	Remedy
Orange	• The CAN 2 system bus is being initialized.	-
Green	• The CAN 2 system bus is initialized.	-
Flashing green (0.5 Hz)	• The CAN 2 system bus is currently in SCOM suspend mode.	-
Flashing green (1 Hz)	• The CAN 2 system bus is currently in SCOM On mode.	-
Red	• The CAN 2 system bus is off (BUS-OFF).	1. Check and correct the cabling of the CAN 2 system bus. 2. Check and correct the baud rate set for the CAN 2 system bus. 3. Check and correct the terminating resistors of the CAN 2 system bus.
Flashing red (1 Hz)	• Warning on the CAN 2 system bus.	1. Check and correct the cabling of the CAN 2 system bus. 2. Check and correct the baud rate set for the CAN 2 system bus.

IEC program status LED (L3)

The **IEC program status** LED indicates the status of the IEC -61131 control program.

IEC program status	Diagnostics	Remedy
Green	• IEC program is running.	-
Off	• No program is loaded.	Load a program into the control card.
Flashing orange (1 Hz)	• Program has stopped.	-

PLC status LED (L4)

The **PLC status** LED indicates the firmware status of the MOVI-PLC® *advanced* DHE41B control card.

PLC status	Diagnostics	Remedy
Flashing green (1 Hz)	• The firmware of the MOVI-PLC® *advanced* DHE41B is running without any problems.	-

User LED (L5)

The **User** can be programmed as required by the user in the IEC program.

DIO n/m LED (L6, L7, L8, L9)/

The **DIO n/m LED (e.g. DIO2/3)** indicates the status of the binary inputs and outputs n or m.

DIO n/m	Diagnostics	Remedy
Off	• No voltage applied.	-
Green	• Voltage at LED n.	-
Red	• Voltage at LED m.	-
Orange	• Voltage at LED n and m.	-

24V / I/O OK LED (L10)

The **24V / I/O OK** LED indicates the status of the voltage supply for binary inputs / outputs.

24V / I/O OK	Diagnostics	Remedy
Green	• Voltage supply for the binary inputs and outputs is OK.	-
Off	• Voltage supply is not applied at the binary inputs and outputs.	1. Switch off the drive inverter in which the MOVI-PLC® *advanced* DHE41B control card is installed. 2. Check and correct the cabling of the binary inputs and outputs in accordance with the electrical wiring diagram. 3. Check the current consumption of the connected actuators (max. current → Sec. 8). 4. Switch on the drive inverter in which the MOVI-PLC® *advanced* DHE41B control card is installed.
Orange	Voltage supply for the binary inputs and outputs is applied. However, one of the following faults has occurred: • Overload on one or more binary inputs or outputs • Overtemperature of the output driver • Short circuit in at least one of the binary inputs or outputs	

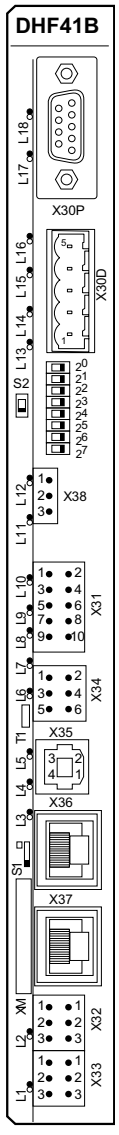
3.3.9 DIP switch S1 default IP address

You can use the DIP switch S1 to set a fixed IP address for the Ethernet 2 connection. This IP address will become effective when the system is restarted.

S1 switch position	Meaning
Top	Fixed IP address 192.168.10.5
Bottom	Address entered in the configuration file (→ Sec. 4.1)

3.4 Installing the MOVI-PLC® advanced DHF41B control card

3.4.1 Functional description of the terminals, DIP switches and LED

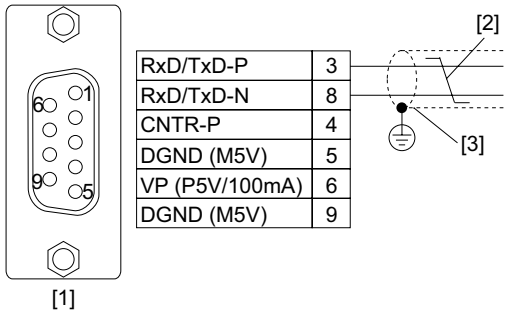
Front view of the MOVI-PLC® *advanced* DHF41B control card	Designation	LED DIP switches Terminal		Function
 61491AXX	**LED**	**LED 1** **LED 2** **LED 3** **LED 4** **LED 5** **LED 6** **LED 7** **LED 8** **LED 9** **LED 10** **LED 11** **LED 12** **LED 13** **LED 14** **LED 15** **LED 16** **LED 17** **LED 18**	CAN 1 status CAN 2 status IEC progr. status PLC status User LED DIO6/7 DIO4/5 DIO2/3 DIO0/1 24V / I/O OK - - BUSOFF Bit strobe I/O: Polled I/O Mod/Net Fault Profibus Run Profibus	Status of CAN 1 system bus Status of CAN 2 system bus Status of control program Status of control firmware User-programmable Status of input or output DIO6/7 Status of input or output DIO4/5 Status of input or output DIO2/3 Status of input or output DIO0/1 Status of voltage supply I/O Reserved Reserved The two-color LEDs 13 ... 16 display the current status of the fieldbus interface and the DeviceNet system Status of PROFIBUS bus electronics Status of PROFIBUS communication
	Terminal X30P: **PROFIBUS** **(Sub-D9)**	**X30:9** **X30:8** **X30:7** **X30:6** **X30:5** **X30:4** **X30:3** **X30:2** **X30:1**	GND (M5V) RxD/TxD-N N.C. VP (P5V/100 mA) GND (M5V) CNTR-P RxD / TxD-P N.C. N.C.	Reference potential for PROFIBUS Signal receive transmit negative Terminal unassigned DC+5 V potential for bus terminator Reference potential for PROFIBUS PROFIBUS control signal for repeater Signal receive transmit positive Terminal unassigned Terminal unassigned
	Terminal X30: **DeviceNet** **(In preparation)** **(plug-in terminals)**	**X39:1** **X39:2** **X39:3** **X39:4** **X39:5**	V– CAN_L DRAIN CAN_H V+	0V24 CAN_L DRAIN CAN_H 24 V

Front view of the MOVI-PLC® *advanced* DHF41B control card	Designation	LED DIP switches Terminal		Function
	For PROFIBUS operation: DIP switches for setting the PROFIBUS station address	**2^0** **2^1** **2^2** **2^3** **2^4** **2^5** **2^6**		Significance: 1 Significance: 2 Significance: 4 Significance: 8 Significance: 16 Significance: 32 Significance: 64
	For operation via DeviceNet: DIP switches for setting the MAC ID and the baud rate	**2^0** **2^1** **2^2** **2^3** **2^4** **2^5** **2^6** **2^7**		The MAC-ID (**M**edia **A**ccess **C**ontrol **Id**entifier) is set using DIP switches 2^0 ... 2^5. The MAC-ID represents the node address (address range 0 ... 63) Setting the baud rate Setting the baud rate
	Terminal X38: SafetyBus (plug-in terminals)	**X38:1** **X38:2** **X38:3**		Reserved Reserved Reserved
	Terminal X31: Binary inputs and outputs (plug-in terminals)	**X31:1** **X31:2** **X31:3** **X31:4** **X31:5** **X31:6** **X31:7** **X31:8** **X31:9** **X31:10**	+24 V input REF24V DIO 0 DIO 1 DIO 2 DIO 3 DIO 4 DIO 5 DIO 6 DIO 7	Voltage input DC+24 V Reference potential for binary signals Binary input or output Binary input or output Binary input or output Binary input or output Binary input or output Binary input or output Binary input or output Binary input or output
	Terminal X34: RS485 interface COM1, COM2 (plug-in terminals)	**X34:1** **X34:2** **X34:3** **X34:4** **X34:5** **X34:6**	RS+ RS+ isolated RS– RS– isolated DGND GND isolated	Signal RS485+ Signal RS485+ isolated Signal RS485– Signal RS485– isolated Reference potential Reference potential
	Terminal X35: USB connection (in preparation)	**X35:1** **X35:2** **X35:3** **X35:4**	USB+5 V USB– USB+ DGND	DC 5 V voltage supply Signal USB– Signal USB+ Reference potential
	Terminal X36: Ethernet 1 connection System bus (RJ45 socket)	**X36**		Standard Ethernet assignment
	Terminal X37: Ethernet 2 connection (RJ45 socket)	**X37**		
	Terminal X32: System bus CAN 2 (electrically isolated) (plug-in terminals)	X32:1 X32:2 X32:3	REF_CAN 2 CAN 2H CAN 2L	Reference potential for system bus CAN 2 System bus CAN 2 high System bus CAN 2 low
	Terminal X33: System bus CAN 1 (plug-in terminals)	**X33:1** **X33:2** **X33:3**	DGND CAN 1H CAN 1L	Reference potential for system bus CAN 1 System bus CAN 1 high System bus CAN 1 low
	DIP switch S1 Default IP address	**S1**		Default IP address Ethernet 2 connection
	DIP switch S2 Changeover PROFIBUS / DeviceNet	**S2**		PROFIBUS DeviceNet
	Reset button T1	**T1**		Reset

The connections that are identical to those of DHE41B are described in section 3.3.

3.4.2 PROFIBUS connection (terminal X30P)

Connection to the PROFIBUS system takes place using a 9-pin sub D plug according to IEC 61158. The T-bus connection must be made using a plug with the corresponding configuration. The following figure shows the PROFIBUS connector that is connected to X30P on the MOVI-PLC® *advanced* DHF41B control card.



61766AXX

Figure 7: Assignment of 9-pin sub D connector to IEC 61158

[1] 9-pin sub D connector

[2] Signal line, twisted

[3] Conductive connection over a large area is necessary between plug housing and the shield

Connecting MOVI-PLC® / PROFIBUS

As a rule, the MOVI-PLC® *advanced* DHF41B control card is connected to the PROFIBUS system using a shielded twisted-pair cable. Observe the maximum supported transmission rate when selecting the bus connector.

The twisted-pair cable is connected to the PROFIBUS connector using pins 3 (RxD/TxD-P) and 8 (RxD/TxD-N). Communication takes place using these two pins. The RS485 signals RxD/TxD-P and RxD/TxD-N must be connected to the same contacts in all PROFIBUS stations. Otherwise the bus components cannot communicate via the bus medium.

The PROFIBUS interface sends a TTL control signal for a repeater or fiber optic adapter (reference = pin 9) via pin 4 (CNTR-P).

Baud rates greater than 1.5 MBaud

The MOVI-PLC® *advanced* DHF41B control card with baud rates > 1.5 MBaud can only be operated with special 12-MBaud PROFIBUS connectors.

Bus terminator

The MOVI-PLC® *advanced* DHF41B control card is not provided with bus terminating resistors. This enables the PROFIBUS system to be taken into operation more easily and reduces the number of error sources during installation.

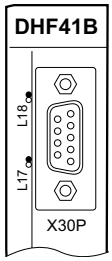
If the MOVI-PLC® *advanced* DHF41B control card is located at the start or end of a PROFIBUS segment and only one PROFIBUS cable leads into the MOVI-PLC® *advanced* DHF41B control card, you must use a connector with an integrated bus terminating resistor.

Switch on the bus terminating resistors for this PROFIBUS connector.

Setting the station address

The PROFIBUS station address is set using DIP switches 2^0... 2^6 on the MOVI-PLC® *advanced* DHF41B control card.

The MOVI-PLC® *advanced* DHF41B control card supports the address range 0...125.



61492AXX

The default setting for the PROFIBUS station address is 4:

$2^0 \rightarrow$ Significance: $1 \times 0 = 0$
$2^1 \rightarrow$ Significance: $2 \times 0 = 0$
$2^2 \rightarrow$ Significance: $4 \times 1 = 4$
$2^3 \rightarrow$ Significance: $8 \times 0 = 0$
$2^4 \rightarrow$ Significance: $16 \times 0 = 0$
$2^5 \rightarrow$ Significance: $32 \times 0 = 0$
$2^6 \rightarrow$ Significance: $64 \times 0 = 0$

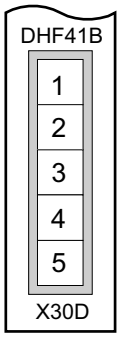
Any change made to the PROFIBUS station address during operation does not take effect immediately. You must restart the drive inverter with the MOVI-PLC® *advanced* DHF41B control card for the changes to take effect (power + 24 V off/on).

3.4.3 Connecting DeviceNet (terminal X30D)

Connection to the DeviceNet fieldbus system is in preparation.

Pin assignment

The assignment of the connecting terminals is described in the DeviceNet specification (Volume I, Appendix A).



61612AXX

The DHF41B option card is opto-decoupled on the driver side in accordance with the DeviceNet specification (Volume I, Chapter 9). This means the CAN bus driver must be powered with 24 V voltage via the bus cable. The DeviceNet specification (Volume I, Appendix A) also explains which cable you should use. The connection must be made according to the color code specified in the following table.

Pin no.	Signal	Meaning	Color coding
1	V–	0V24	BK
2	CAN_L	CAN_L	BU
3	DRAIN	DRAIN	blank
4	CAN_H	CAN_H	WH
5	V+	24 V	RD

Setting the baud rate

The baud rate is set using DIP switches 2^6 and 2^7.

DIP switches		Baud rate
2^6	2^7	
0	0	125 kbaud
0	1	250 kbaud
1	0	500 kbaud
1	1	Invalid

3.4.4 SafetyBus connection (terminal X38)

Connection to the SafetyBus bus system is in preparation.

3.4.5 Operating displays of the MOVI-PLC® *advanced* DHF41B control card

The LEDS that are identical to those of DHE41B are described in section 3.3.6.

LED 11, 12 LEDs 11 and 12 are reserved.

BUS-OFF (L13) LED The **BUS-OFF** LED indicates the physical status of the bus node.

State	Status	Meaning
Off	NO ERROR	The number of bus errors is in the normal range (error active status).
Flashing red (125 ms cycle)	BUS WARNING	The unit is performing a DUP-MAC check and cannot send any messages because no other stations are connected to the bus (error passive state).
Flashing red (1 s cycle)		The number of physical bus errors is too high. No more error telegrams are actively written to the bus (error passive state).
Lights up red	BUS ERROR	• BusOff state • The number of physical bus errors has increased despite a switch to the error-passive state. Access to the bus is deactivated.
Lights up yellow	POWER OFF	External voltage supply has been turned off or is not connected.

BIO LED (L14) The **BIO** LED (bit strobe I/O) checks the bit-strobe I/O connection.

State	Status	Meaning
Flashing green (125 ms cycle)	DUP-MAC check	Unit is performing DUP-MAC check
Off	Not switched on / offline but not DUP-MAC check	• Unit is offline • Unit is switched off
Flashing green (1 s cycle)	Online and in operational mode	• Unit is online • DUP MAC check performed successfully • A BIO connection is being established with a master (configuring state) • Missing, incorrect or incomplete configuration
Green light	Online, in operational mode and connected	• Online • A BIO connection has been established (established state)
Flashing red (1 s cycle)	Minor fault or connection timeout	• A correctable error has occurred • Bit-strobe I/O connection is in timeout state
Lights up red	Critical fault or critical link failure	• An error that cannot be remedied has occurred • BusOff • DUP-MAC check has detected an error

PIO LED (L15)

The **PIO** LED (polled I/O) checks the polled I/O connection.

State	Status	Meaning
Flashing green (125 ms cycle)	DUP-MAC check	Unit is performing DUP-MAC check
Off	Not switched on / offline but not DUP-MAC check	• Unit is offline • Unit is switched off
Flashing green (1 s cycle)	Online and in operational mode	• Unit is online • DUP MAC check performed successfully • A polled I/O connection is being established with a master (configuring state) • Missing, incorrect or incomplete configuration
Green light	Online, in operational mode and connected	• Online • A polled I/O connection has been established (established state)
Flashing red (1 s cycle)	Minor fault or connection timeout	• A correctable error has occurred • Polled I/O connection is in timeout status
Lights up red	Critical fault or critical link failure	• An error that cannot be remedied has occurred • BusOff • DUP-MAC check has detected an error

Mod/Net LED (L16)

The functionality of the **Mod/Net** LED (module/network status) described in the following table is contained in the DeviceNet specification.

State	Status	Meaning
Off	Not switched on / OffLine	• Unit is offline • Unit performs DUP MAC check • Unit is switched off
Flashing green (1 s cycle)	Online and in operational mode	• The unit is online and no connection has been established • DUP MAC check performed successfully • A connection has not yet been established with a master • Missing, incorrect or incomplete configuration
Green light	Online, in operational mode and connected	• Online • Connection has been established with a master • Connection is active (established state)
Flashing red (1 s cycle)	Minor fault or connection timeout	• A correctable error has occurred • Polled I/O or/and bit-strobe I/O connection are in timeout status • DUP-MAC check has detected an error
Lights up red	Critical fault or critical link failure	• A correctable error has occurred • BusOff • DUP-MAC check has detected an error

Fault Profibus LED (L17)

The **Fault** Profibus LED indicates that communication via the PROFIBUS interface is working properly.

BUS FAULT	Diagnostics	Remedy
Off	• The MOVI-PLC® *advanced* DHF41B control card exchanges data with the PROFIBUS-DP master (data exchange status).	-
Red	• Connection to the DP master has failed. • The MOVI-PLC® *advanced* DHF41B control card cannot detect the PROFIBUS baud rate. • Bus interruption has occurred. • PROFIBUS-DP master not in operation.	• Check the PROFIBUS connection on the unit. • Check the configuration of the PROFIBUS DP master. • Check all the cables in the PROFIBUS network.
Flashing red (1 Hz)	• The MOVI-PLC® *advanced* DHF41B control card detects the baud rate. However, the DP-Master does not address the MOVI-PLC® *advanced* DHF41B control card. • The MOVI-PLC® *advanced* DHF41B control card was either not configured in the DP Master or has been configured incorrectly.	• Check and correct the PROFIBUS station address set on the MOVI-PLC® *advanced* DHF41B control card and in the configuration software of the DP master. • Check and correct the configuration of the DP master. • Use the GSD file **SEW_6007.GSD** with the designation *MOVI-PLC* for configuration.

Run Profibus LED (L18)

The **Run Profibus** LED indicates the proper functioning of the PROFIBUS electronics (hardware).

RUN Profibus	Diagnostics	Remedy
Green	• PROFIBUS hardware OK.	-
Flashing green (1 Hz)	• The PROFIBUS station address set on the DIP switches is more than 125. When the PROFIBUS station address is set to a value higher than 125, the MOVI-PLC® *advanced* DHF41B control card uses PROFIBUS station address 4.	1. Check and correct the PROFIBUS station address on the DIP switches. 2. Switch on all drive inverters again. The modified PROFIBUS address will only take effect after a restart.

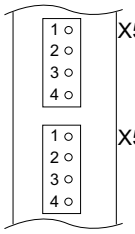
3.5 Installation option DH.41B in MOVIDRIVE® MDX61B

The MOVI-PLC® *advanced* DH.41B control card is installed as specified in section 3.4. Voltage is supplied to MOVI-PLC® *advanced* DH.41B via MOVIDRIVE® MDX61B. A separate voltage supply is only required for the binary inputs and outputs (terminal X31).

3.6 Installing the option DH.41B in the MOVIAXIS® master module

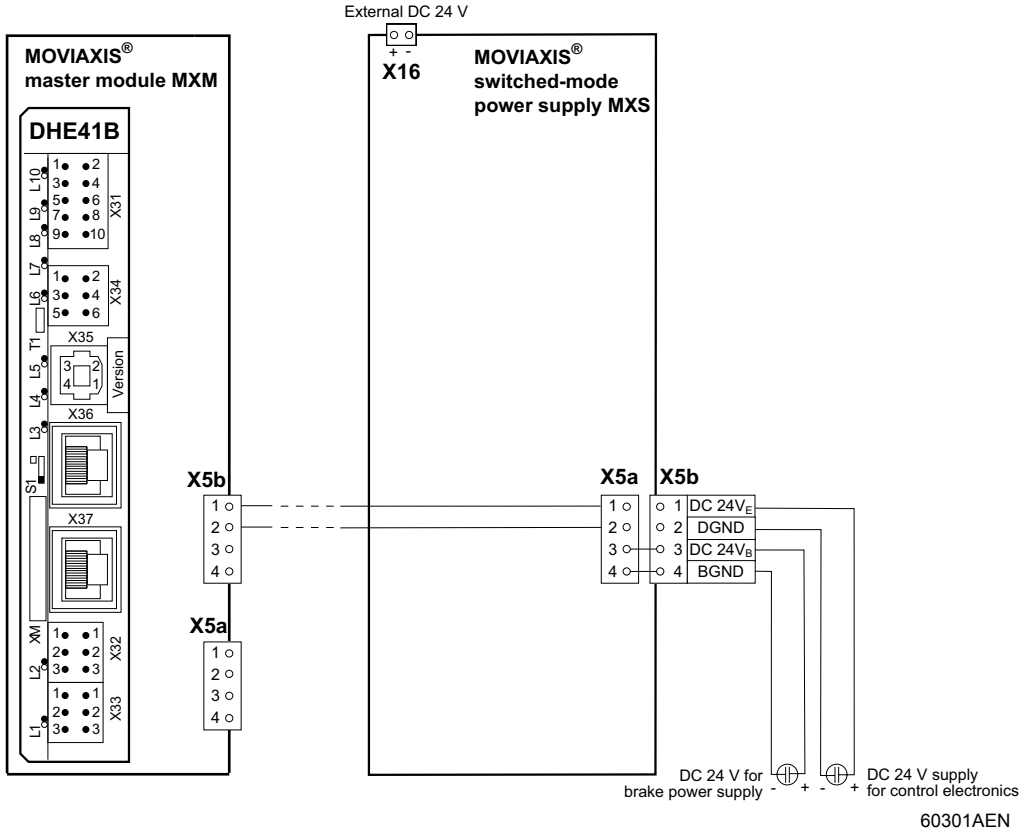
The MOVI-PLC® *advanced* DH.41B control card is installed as specified in section 3.4. To wire the system bus, connect terminal X33 (CAN1) or X32 (CAN2) on MOVI-PLC® *advanced* DH.41B to terminal X9 (signaling bus of the MOVIAXIS® supply module or a MOVIAXIS® axis module) or to terminal X12 (CAN2 bus of a MOVIAXIS® axis module). The MOVIAXIS® master module provides additional connections that are described in the following section.

3.6.1 Functional description of terminals X5a / X5b (MOVIAXIS® master module)

MOVIAXIS® master module MXM	Designation	Terminal		Function
	**Terminal X5b**	**X5b:1** **X5b:2** **X5b:3** **X5b:4**	DC 24 V_E DGND DC 24 V_B BGND	Voltage supply for control electronics Reference potential for control electronics Voltage supply for brake Reference potential for brake connection
	Terminal X5a	X5a:1 X5a:2 X5a:3 X5a:4	DC 24 V_E DGND DC 24 V_B BGND	Voltage supply for control electronics Reference potential for control electronics Voltage supply for brake Reference potential for brake connection

- The terminals X5a and X5b are connected in parallel. This means that the voltage supply for the MOVIAXIS® master module can be supplied from the right at X5b or from below at X5a. When the voltage supply is connected at X5a, X5b can be used to connected other modules (e.g. supply module, axis module). The voltage supply for the brake (X5a/b:3, 4) is fed through the MOVIAXIS® master module.
- Voltage can be supplied to the MOVI-PLC® *advanced* DH.41B control card either by the MOVIAXIS® switched-mode power supply module (MXS) or by an external voltage source. To do so, connect X5 between the individual units.
- If the MOVI-PLC® *advanced* DH.41B control card is supplied with DC 24 V via the MOVIAXIS® switched-mode power supply module, the functionality of the MOVI-PLC® *advanced* DH.41B control card is maintained when the power supply is disconnected. This feature requires an external DC 24 V supply for the MOVIAXIS® switched-mode power supply module.

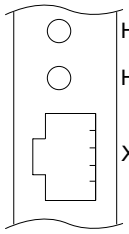
Wiring diagram

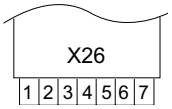


3.7 Installing option DH.41B in MOVITRAC® B / compact controller

The MOVI-PLC® *advanced* DH.41B control card is installed as specified in section 3.4. The MOVITRAC® B and compact controller option slots provide additional connections and operating displays for the MOVI-PLC® *advanced* DH.41B control card. They are described in the following section.

3.7.1 Functional description of the terminals and LEDs

Front view MOVITRAC® B / compact controller	Designation	LED Terminal		Function
 58905AXX	**LED**	**H1** **H2**		System error Reserved
	Connector X24: RS485 COM 1 (RJ10 socket)	X24:4 X24:3 X24:2 X24:1	DGND RS– RS+ 5 V	Reference potential COM 1 Signal RS485– Signal RS485+ Voltage output DC+5 V

Side view Compact controller	Designation	Terminal		Function
 58906AXX	**Connector X26: CAN 1 and voltage supply (plug-in terminal)**	**X26:1** **X24:2** **X24:3** **X24:4** **X26:5** **X26:6** **X26:7**	CAN1H CAN1L DGND Reserved Reserved DGND DC 24 V	System bus CAN1 High System bus CAN1 Low Reference potential control / CAN1 - - Reference potential control / CAN1 Voltage supply control

3.7.2 Connecting the RS485 interface COM 1 (terminal X24)

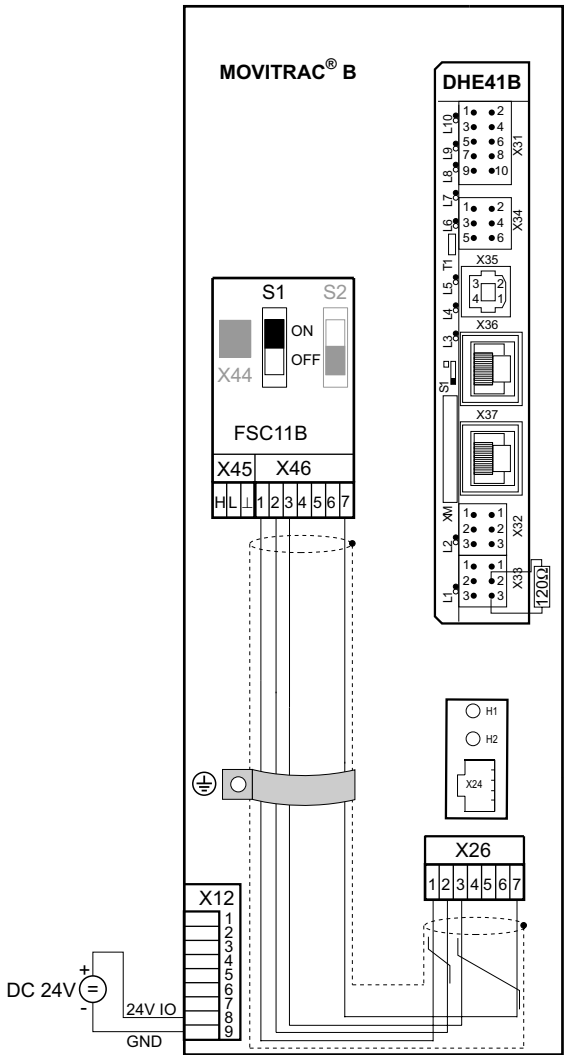
Terminals X24 and X34:1/3/5 are connected in parallel. You can connect a DOP11A operating terminal at X24. If X24 is not occupied, you can connect an operating terminal or a MOVIMOT® gearmotor with integrated frequency inverter at X34:1/3/5.

See section 3.4.5. for additional information.

3.7.3 Connecting the system bus CAN 1 / voltage supply (terminal X26)

X26:1/2/3 and terminal X33 are connected in parallel (→ Sec. 3.3.3). In the compact controller, the voltage supply of the MOVI-PLC® *advanced* DH.41B control card is connected at X26:6/7.

MOVITRAC® B can provide the MOVI-PLC® *advanced* DH.41B control card with the required voltage. To do so, connect X26:3 (6) / 7 to X46:3 (6) / 7 or to X12:9 / 8. If the MOVI-PLC® *advanced* DHE41B control card is supplied with DC 24 V from MOVITRAC® B, the functionality of the MOVI-PLC® *advanced* DHE41B control card is maintained when the power supply is disconnected. To do so, an external DC 24 V supply must be connected at X12:8 / 9 on MOVITRAC® B.



60302AXX

Figure 8: Installing MOVI-PLC® advanced DHE41B in MOVITRAC® B

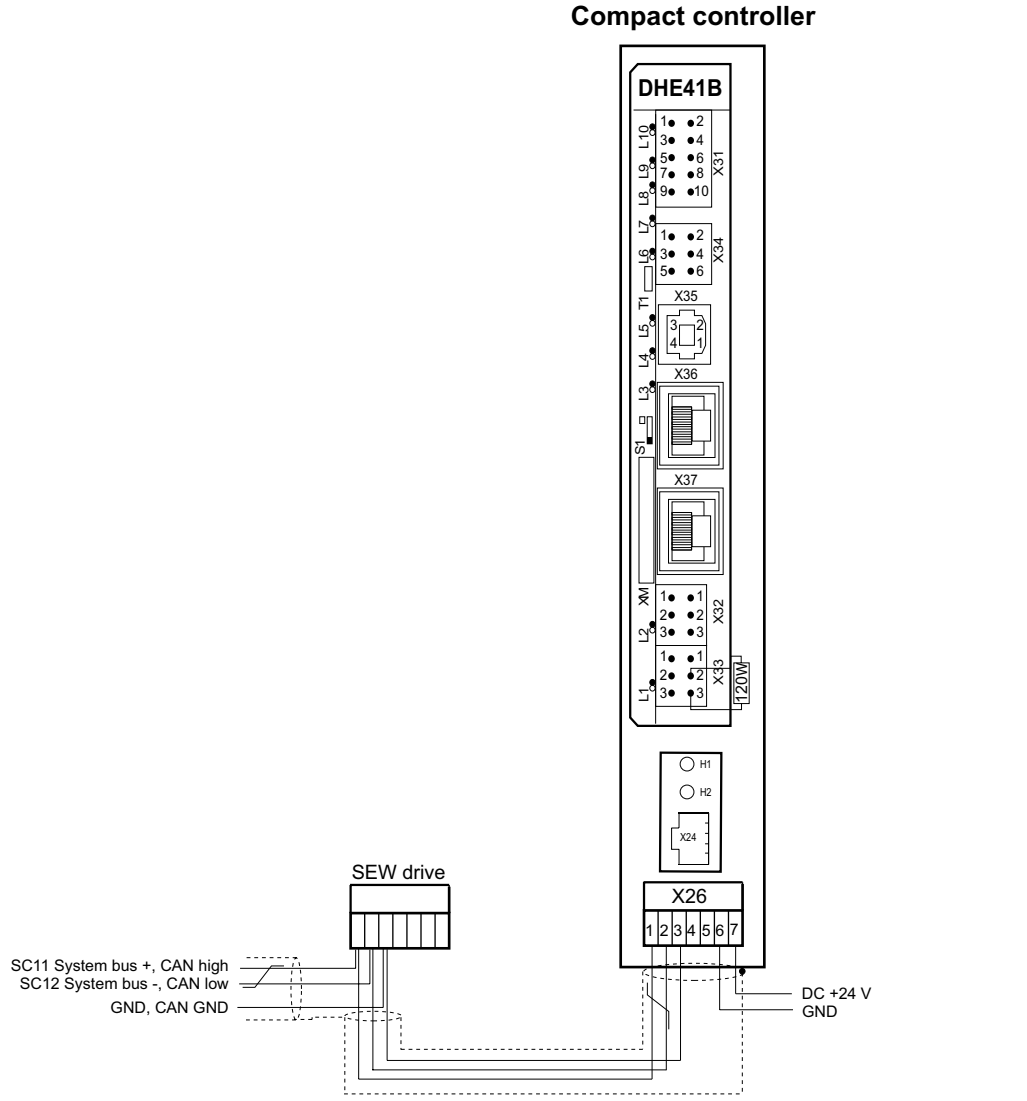


Figure 9: Installing the compact controller MOVI-PLC® advanced DHE41B / UOH..B

3.7.4 Operating displays of the MOVITRAC® B / compact controller option slot

LED H1 The LED **H1** signals correct operation via connection X26.

H1	Diagnostics	Remedy
OFF	• Correct operation of connection X26	-

LED H2 LED H2 is reserved.

3.8 Engineering interfaces of the MOVI-PLC® advanced DH.41B control card

One of the following interfaces is required for engineering access to the MOVI-PLC® *advanced* DH.41B control card:

- Ethernet 2 (terminal X37)
- In preparation: USB (terminal X35)

3.9 Shielding and routing bus cables

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

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

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

In case of fluctuations in the ground potential, a compensating current may flow via the bilaterally connected shield that is also connected to the protective earth (PE). Make sure you supply adequate equipotential bonding according in accordance with relevant VDE regulations in such a case.

4 Configuration and Startup

This section gives you information on configuration and startup for

- MOVI-PLC® *advanced* DH.41B control card
- Inverters that are controlled via the MOVI-PLC® *advanced* DH.41B control card
- A PROFIBUS DP master

4.1 Configuration with the MOVITOOLS® MotionStudio PC software

Project selection

- Start the MOVITOOLS® MotionStudio software.

58335AXX

Figure 10: MOVITOOLS® MotionStudio initial screen

[1] Option [New Project]

[2] Option [Open project]

- If you want to create a new project, select the option [New project] [1].
- If you want to open an existing project, select the option [Open project] [2].

Options for engineering access

You have two options for establishing engineering access to MOVI-PLC® *advanced* DH.41B via the Ethernet 2 interface (X37).

- With point-to-point connection, connect the Ethernet 2 interface (X37) of the MOVI-PLC® *advanced* DH.41B directly to the Ethernet interface of the engineering PC. On the engineering PC, choose an interface that is not used to connect the PC to the intranet/Internet. This prevents the interface from being reconfigured.
- Integrate the MOVI-PLC® *advanced* DH.41B control card in a network using the Ethernet 2 interface (X37). Make the necessary address settings by editing the *NetConfig.cfg* configuration file in the "System" folder of the SD memory card. The following options are available for accessing the *NetConfig.cfg* configuration file:
  - Remove the SD memory card from the MOVI-PLC® *advanced* DH.41B controller and plug it into a memory card reader/writer.
  - First establish a point-to-point connection with the MOVI-PLC® *advanced* DH.41B control card. Then access the *NetConfig.cfg* configuration file via an FTP client.

  For older network interfaces, it may be necessary to use a cross cable for point-to-point connection.

Address settings for a point-to-point connection

- Set the default IP address:
  - Disconnect the MOVI-PLC® *advanced* DH.41B control card from the voltage supply.
  - Change DIP switch S1 to the top position.
  - Apply voltage to the MOVI-PLC® *advanced* DH.41B control card. The IP address 192.168.10.5 and the net mask 255.255.255.0 is automatically assigned to the Ethernet 2 interface of the MOVI-PLC® *advanced* DH.41B control card.

- Set a different address:

  You can set other addresses by editing the <Ethernet2...> section manually in the *NetConfig.cfg* configuration file in the "System" folder of the SD memory card.

  Example:

```
<!-- Ethernet2 is engineering interface -->
<Ethernet2>
<IPAddress>192.168.10.5</IPAddress>
<Netmask>255.255.255.0>/Netmask>
<Gateway>192.168.10.1</Gateway>
<Nameserver>0.0.0.0</Nameserver>
<Hostname>MOVI-PLC_Eth2>/Hostname>
</Ethernet2>
```

  Change DIP switch S1 to the bottom position. Doing so makes sure that the addresses will take effect when the MOVI-PLC® *advanced* DH.41B is restarted.

- Set the IP address of the PC interface:
  - Under [Start] / [Settings] / [Network connections], choose the PC interface you require and select the properties window of the PC interface from the context menu.
  - In the properties of the "Internet protocol (TCP/IP)" option, select the entry "Use following IP address".
  - Enter the net mask that is set in the MOVI-PLC® *advanced* DH.41B control card (e.g. 255.255.255.0 when DIP switch S1 is in the top position).
  - Set the IP address depending on the net mask. The IP addresses of the MOVI-PLC® *advanced* DH.41B control card (Ethernet 2) and the PC interface must differ with the exception of the areas defined by the net mask. In the area defined by the net mask, the IP addresses have to be identical. Do not set the last byte of the IP address to either 0 or 255.
    Example:

Net mask	
Decimal	**Binary**
255.255.255.0	11111111.11111111.11111111.00000000

In this example, the last 8 bits of the IP address of the MOVI-PLC® *advanced* DH.41B control card and the PC interface must differ.

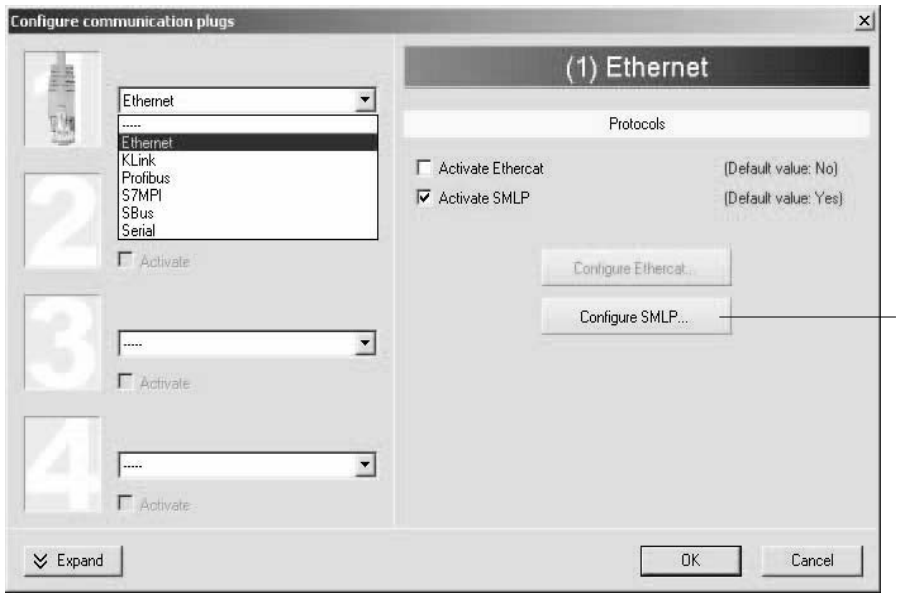
Address settings for engineering access via a network

Proceed as follows to establish engineering access to the MOVI-PLC® *advanced* DH.41B control card via an existing network:

- In the <Ethernet2...> section of the *NetConfig.cfg* configuration file in the "System" folder of the SD memory card, enter the following data in accordance with the specifications of your network administration:
  - IP address
  - Net mask
  - Gateway address
- Change DIP switch S1 to the bottom position. Doing so makes sure that the new address settings will take effect when the MOVI-PLC® *advanced* DH.41B control card is restarted.

Setting the engineering access in the MOVITOOLS® MotionStudio

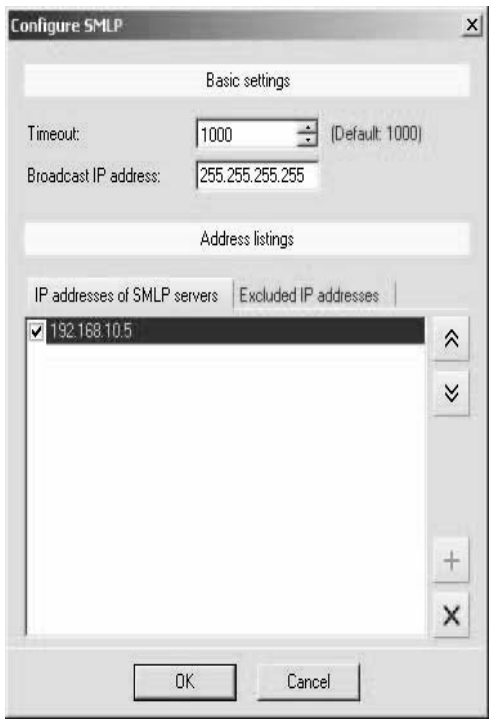
- In the MOVITOOLS® MotionStudio, choose the menu item "Network" / "Configure communication plugs".



61025AXX

- Choose "Ethernet" from the dropdown menu. Click on the Configure SMLP... button. Confirm your selection by clicking <OK>.

- Click the right mouse button in the empty field "IP addresses of SMLP servers" and select "Add IP address" from the menu to add the IP address of the Ethernet 2 interface of the MOVI-PLC® *advanced* DH.41B control card (→ following Figure). Confirm your entry by clicking <OK>.



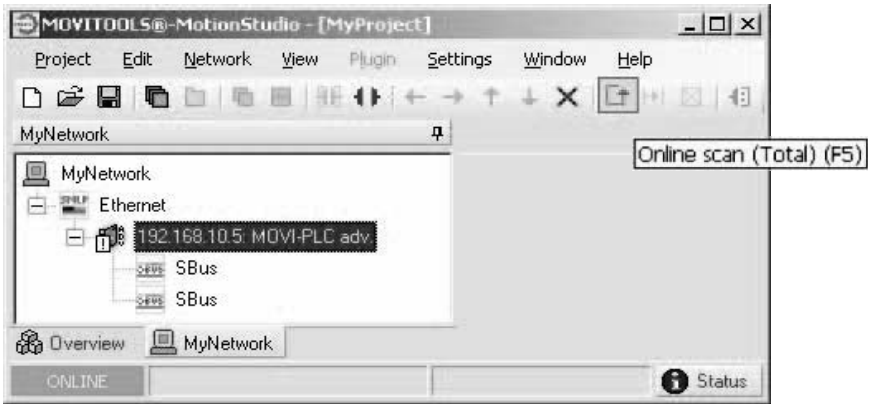
61026AXX

- Alternatively, when integrating the MOVI-PLC® *advanced* DH.41B control card in an existing network, you can enter the network address (the part of the IP address in which the bits of the net mask are set) in the "Broadcast IP Address" input field, filled with set bits for sending broadcast messages in the specified network. In this case, you do not have to make an entry in the "IP address" field.

  Example:

  – IP address: 10.3.71.38
  – Net mask: 255.255.255.0
  – Broadcast IP address: 10.3.71.255

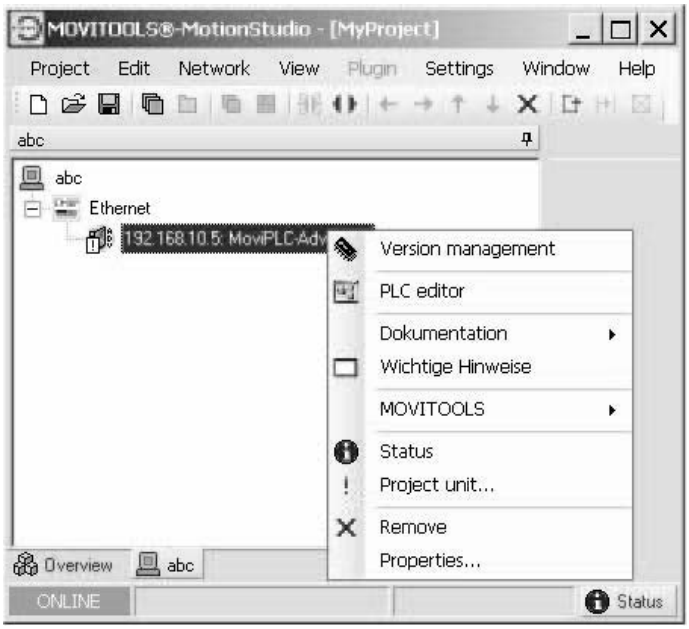
- Next, perform an online scan. To do so, click on the "Online scan" icon in MOVITOOLS® MotionStudio (→ Following figure).



61027AXX

Device-specific tool selection

- Click on the < > icon (online scan) in the MOVITOOLS® MotionStudio. The software now displays all the devices connected to the engineering PC in a device tree (→ following Figure).



61023AXX

- Start the PLC Editor. To do so, click, for example, with the right mouse button on the entry "MOVI-PLC advanced DH.41B".
- The PLC Editor is used for programming the MOVI-PLC® *advanced* DH.41B control card. For more information on programming the MOVI-PLC® *advanced* DH.41B control card, refer to the "MOVI-PLC® Programming in the PLC Editor" system manual and the following manuals:
  - MPLCMotion_MDX and MPLCMotion_MX Libraries for MOVI-PLC®
  - MPLCMotion_MC07 and MPLCMotion_MM libraries for MOVI-PLC®

4.2 Configuration and startup for drives

Configuration and startup for drives is described in the following library manuals:

Drive	Manual
MOVIDRIVE® B MOVIAXIS®	MPLCMotion_MDX and MPLCMotion_MX Libraries for MOVI-PLC®
MOVITRAC® 07 / B MOVIMOT®	MPLCMotion_MC07 and MPLCMotion_MM libraries for MOVI-PLC®

If the MOVI-PLC® *advanced* DH.41B is to be operated in MOVIDRIVE® MDX61B, the MOVIDRIVE® MDX61B inverter must have firmware status ".16" or higher.

This applies irrespective of whether the inverter is controlled by the installed MOVI-PLC® *advanced* DH.41B control card or whether the inverter slot is only used to install the MOVI-PLC® *advanced* DH.41B when other inverters are controlled at the same time (e.g. MOVITRAC® B).

4.3 Configuration and startup in the PLC Editor

For information on configuration and startup of the MOVI-PLC® *advanced* DH.41B control card, refer to the "MOVI-PLC® Programming in the PLC Editor" system manual.

4.4 Configuration for a PROFIBUS DP master

You need a GSD file to configure a PROFIBUS DP master for controlling MOVI-PLC® *advanced* DHF41B.

The current version of the GSD file for controlling MOVI-PLC® *advanced* DHF41B is available on the SEW website (http://www.sew-eurodrive.de) in the "Software" section.

GSD file for PROFIBUS DP/DP-V1

The **GSD file SEW_6007.GSD** corresponds to GSD revision 4. The device master data files standardized by the PROFIBUS user group can be read by all PROFIBUS DP masters.

Configuration tool	DP master	File name
All DP configuration tools to IEC 61158	for DP master standard	SEW_6007.GSD
Siemens S7 hardware configuration	for all S7 DP masters	

Do not change or expand entries in the GSD file! SEW assumes no liability for malfunctions that occur in MOVI-PLC® or connected inverters if a GSD file has been modified!

General configuration procedure

Proceed as follows to configure the MOVI-PLC® *advanced* DHF41B control card with PROFIBUS DP interface:

1. Read the *README_GSD6007.PDF* file that you received with the GSD file to obtain further up-to-date information on configuration.
2. Install (copy) the GSD file according to the requirements of your configuration software (→ manuals of your configuration software or the section "Installing the GSD file in STEP7", below). Once the file has been installed correctly, the device appears next to the slave stations with the designation *MOVI-PLC*.
3. For configuration, add the MOVI-PLC® *advanced* DHF41B control card under the name *MOVI-PLC* to the PROFIBUS structure and assign the PROFIBUS station address.
4. Select the process data configuration required for your application (→ Section "DP Configuration").
5. Enter the I/O or peripheral addresses for the configured data widths.

After configuration you can start PROFIBUS-DP. The *Fault Profibus* LED indicates the status of the configuration (OFF → configuration OK).

Installing the GSD file in STEP7

Proceed as follows to install the GSD file in STEP7:

1. Start the Simatic Manager.
2. Open an existing project and start the hardware configuration.
3. Close the project window in the HW Config. A new file version can only be installed when the project window is closed.
4. Click on "Extras" / "Install new GSD..." and select the new GSD file with the name SEW_6007.GSD.

The software installs the GSD file and the associated bitmap files in the STEP7 system.

The SEW drive is available under the following path in the hardware catalog: PROFIBUS DP

+--Additional PERIPHERAL UNITS

+--Drives

+---SEW

+--DPV1

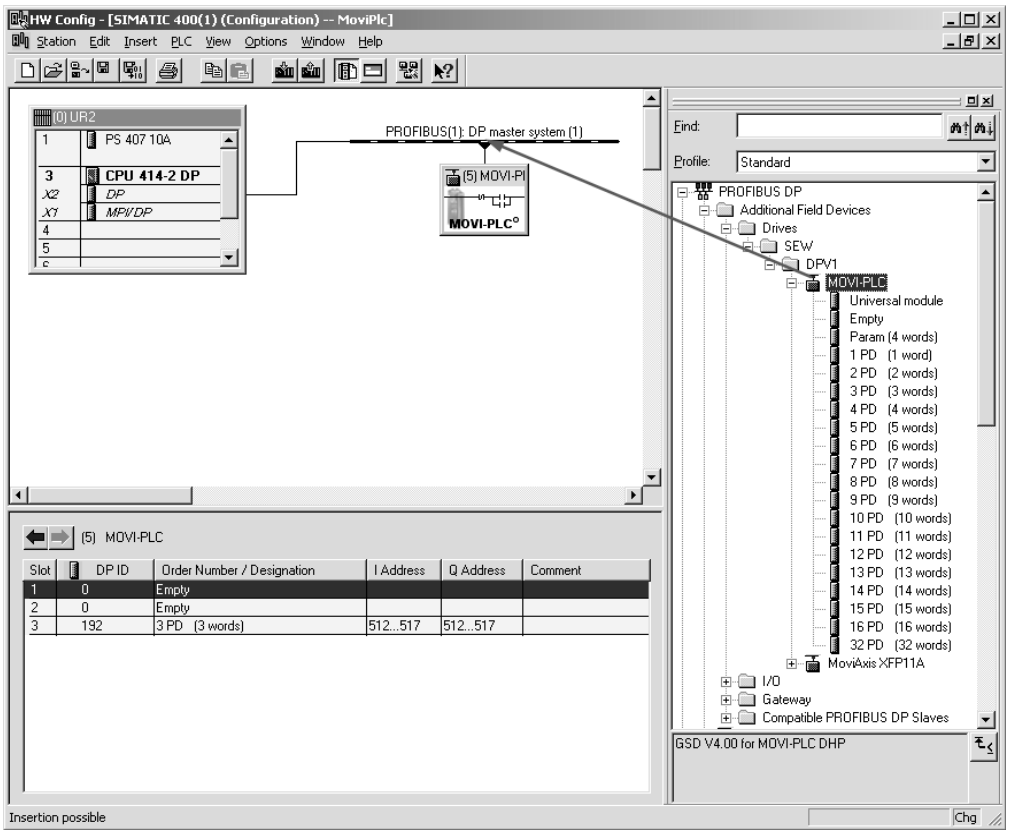
+---MOVI-PLC

The installation of the new GSD file is now complete.

Configuration with STEP7

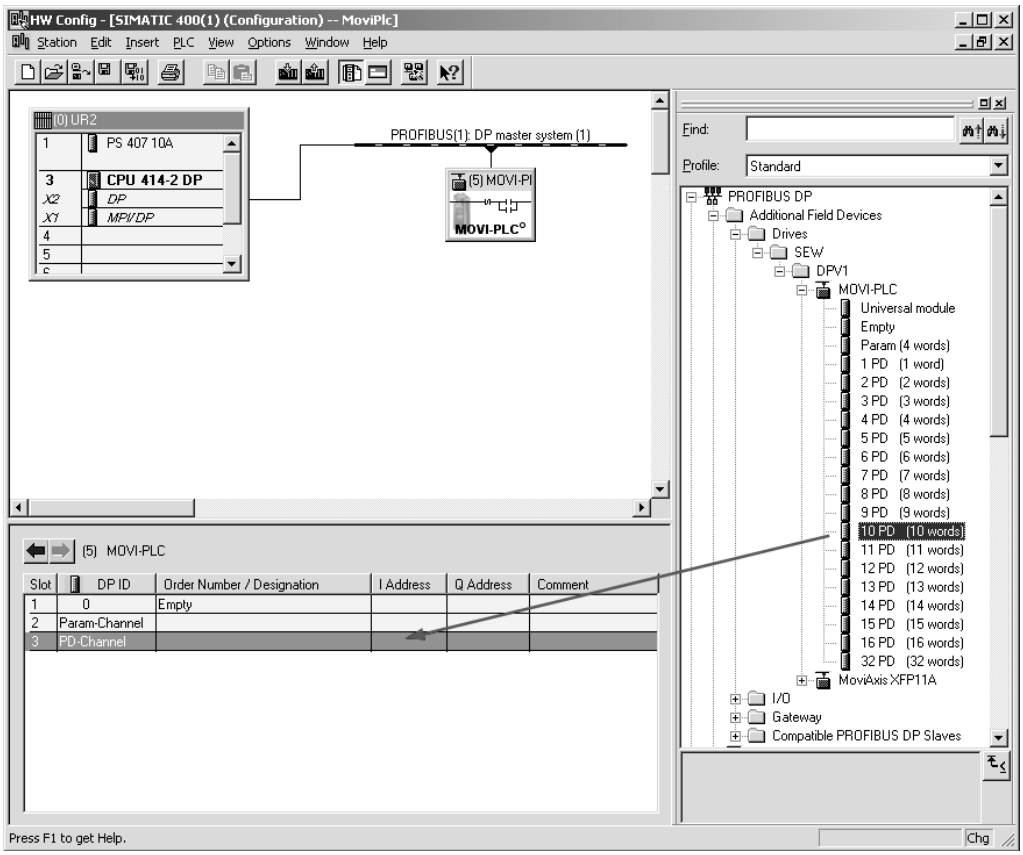
Proceed as follows to configure the MOVI-PLC® *advanced* DHF41B control card with PROFIBUS DP interface:

1. Add the interface module with the name "MOVI-PLC" to the PROFIBUS structure using the drag and drop function and enter the station address (→ following Figure).



58365AXX

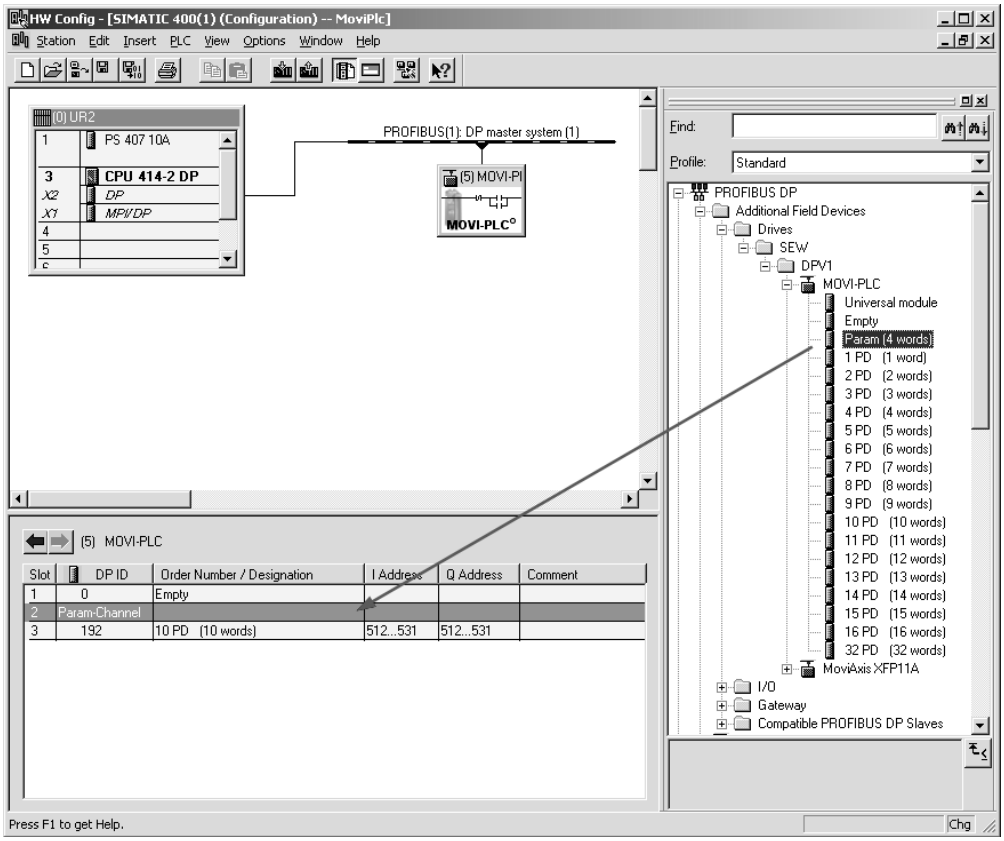
2. The MOVI-PLC® *advanced* DHF41B control card is now preconfigured with the configuration 3PD. To change the PD configuration, you have to delete the 3PD module in slot 3. Next, use the drag & drop function to insert another PD module (e.g. 10PD) from the "MOVI-PLC" folder into slot 3 (→ following Figure).



58367AXX

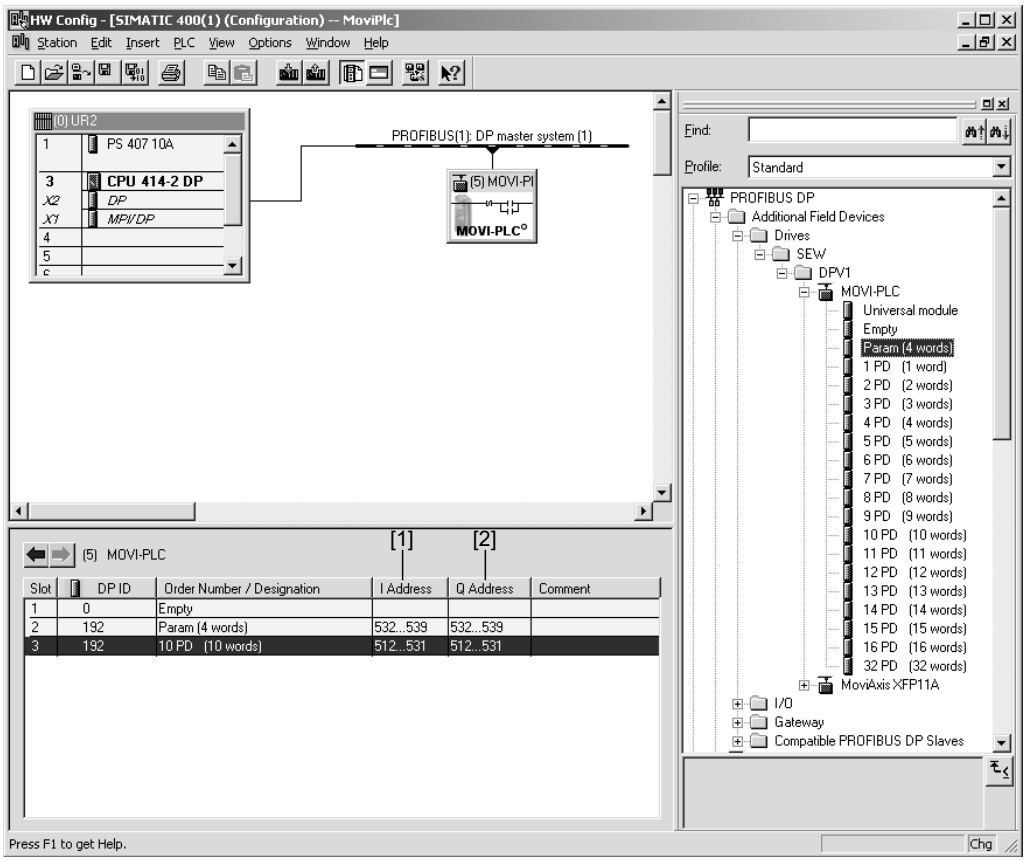
For more information, see the section "DP configurations".

3. Optionally, you can configure a MOVILINK® parameter channel in the cyclic process data (→ following Figure). To do so, delete the "Empty" module from slot 2 and replace it with the module "Param (4 words)" using the drag and drop function.



58370AXX

4. Enter the I/O or peripheral addresses for the configured data widths in the "I Address" [1] and "Q Address" [2] columns.



58375AXX

DP configurations

To enable the MOVI-PLC® *advanced* DHF41B control card to support the type and amount of input and output data to be transmitted, the DP master on the MOVI-PLC® *advanced* DHF41B control card must transmit the corresponding DP configuration. The configuration telegram comprises the DP configurations for slots 1 to 3.

You can:

- control the MOVI-PLC® *advanced* DHF41B control card using process data
- read or write parameters using the parameter channel
- or use definable data exchange between MOVI-PLC® *advanced* DHF41B and the higher-level controller (→ section "Universal DP configuration" for slot 3, page 48).

The following tables contain additional information on possible DP configurations.

- The "Parameter data/Process data configuration" column displays the name of the configuration. These names also appear in a selection list in the configuration software for the DP master.
- The "DP configurations" column shows the configuration data that is sent to the MOVI-PLC® *advanced* DHF41B control card when the link to the PROFIBUS DP system is being established.

Slot 1:

Parameter data configuration	Meaning / notes	DP configuration
Empty	Reserved	0x00

Slot 2:

Parameter data configuration	Meaning / notes	DP configuration
Empty	Reserved	0x00
Param (4words)	MOVILINK® parameter channel configured	0xC0, 0x87, 0x87

Slot 3:

Process Data configuration	Meaning / notes	DP configuration
1 PD	Process data exchange via 1 process data word	0xC0, 0xC0, 0xC0
2 PD	Process data exchange via 2 process data words	0xC0, 0xC1, 0xC1
3 PD	Process data exchange via 3 process data words	0xC0, 0xC2, 0xC2
4 PD	Process data exchange via 4 process data words	0xC0, 0xC3, 0xC3
5 PD	Process data exchange via 5 process data words	0xC0, 0xC4, 0xC4
6 PD	Process data exchange via 6 process data words	0xC0, 0xC5, 0xC5
7 PD	Process data exchange via 7 process data words	0xC0, 0xC6, 0xC6
8 PD	Process data exchange via 8 process data words	0xC0, 0xC7, 0xC7
9 PD	Process data exchange via 9 process data words	0xC0, 0xC8, 0xC8
10 PD	Process data exchange via 10 process data words	0xC0, 0xC9, 0xC9
11 PD	Process data exchange via 11 process data words	0xC0, 0xCA, 0xCA
12 PD	Process data exchange via 12 process data words	0xC0, 0xC7, 0xC7
13 PD	Process data exchange via 13 process data words	0xC0, 0xCC, 0xCC
14 PD	Process data exchange via 14 process data words	0xC0, 0xCD, 0xCD
15 PD	Process data exchange via 15 process data words	0xC0, 0xCE, 0xCE

Process Data configuration	Meaning / notes	DP configuration
16 PD	Process data exchange via 16 process data words	0xC0, 0xCF, 0xCF
32 PD	Process data exchange via 32 process data words	0xC0, 0xDF, 0xDF

Configuration examples

Slot 1: Empty

Slot 2: Param (4 words)

Slot 3: 10 PD

Configuration telegram sent to the MOVI-PLC® *advanced* DHF41B control card: 0x00 0xC0 0xC87 0x87 0xC0 0xC9 0xC9

Universal DP configuration

After selecting the "Universal Module" DP configuration (S7 HW Config), you can structure the DP configuration individually, although the following conditions must be complied with:

Module 0 (DP identifier 0) defines the parameter channel of the control card.

To ensure the parameter settings are made correctly, you must always transfer the parameter channel consistently for the entire length.

Length	Function
0	Parameter channel deactivated
8 I/O bytes or 4 I/O words	Parameter channel is used

Module 1 (DP identifier 1) defines the process data channel of the control card.

In addition to the process data configurations predefined in the GSD file, you can also specify process data configurations with 4, 5, 7, 8 and 9 process data words. Ensure that the number of input and output words is always the same. If the lengths are different, data cannot be exchanged. In this case, the *Profibus Fault* LED will continue to flash.

Length	Function
2 I/O bytes or 1 I/O word	1 process data word
4 I/O bytes or 2 I/O words	2 process data words
6 I/O bytes or 3 I/O words	3 process data words
8 I/O bytes or 4 I/O words	4 process data words
10 I/O bytes or 5 I/O words	5 process data words
12 I/O bytes or 6 I/O words	6 process data words
14 I/O bytes or 7 I/O words	7 process data words
16 I/O bytes or 8 I/O words	8 process data words
18 I/O bytes or 9 I/O words	9 process data words
20 I/O bytes or 10 I/O words	10 process data words

The following figure shows the configuration data structure defined in IEC 61158. This configuration data is transferred to the MOVI-PLC® *advanced* DHF41B control card when the DP master is started.

7 / MSB	6	5	4	3	2	1	0 / LSB
				Data length 0000 = 1 byte/wort 1111 = 16 bytes/words			
		Input/output 00 = Special identifier formats 01 = Input 10 = Output 11 = Input/output					
	Format 0 = Byte structure 1 = Word structure						
Integrity over 0 = Byte or word 1 = Entire length							

Note:

The MOVI-PLC® *advanced* DHF41B control card does not support the "Special identifier formats" coding! Only use the setting "Integrity over entire length" for data transmission.

Data integrity

Integral data is data that always has to be transmitted between the higher-level controller and the MOVI-PLC® *advanced* DHF41B control card as one block and must never be transmitted separately.

Data integrity is particularly important for transmitting position values or complete positioning tasks. The reason that data integrity is so important is that data which is not transmitted integrally could come from different program cycles of the higher-level controller, which would lead to undefined values being transmitted to MOVI-PLC® *advanced* DHF41B controller.

For PROFIBUS DP, data communication between the higher-level control and the MOVI-PLC® *advanced* DHF41B control card is carried out with the setting "Data integrity over entire length".

4.5 Procedure for replacing a unit

Proceed as detailed in sections 4.2 and 4.3 to replace a MOVI-PLC® *advanced* DHF41B control card, a compact controller or a controlled drive.

The "Version management" tool (MOVITOOLS® MotionStudio → [Network] \ [MOVI-PLC] \ [Version management context menu]) will help you load stored configuration data on the current MOVI-PLC® *advanced* DHF41B control card (firmware, project) to the new MOVI-PLC® *advanced* DHF41B control card.

The variable values saved in the volatile memory of the MOVI-PLC® *advanced* DHF41B control card cannot be transferred when replacing the MOVI-PLC® *advanced* DHF41B control card.

For information on replacing the drives, please refer to the manual of the inverter in question.

5 Operating Characteristics on PROFIBUS-DP

This section describes the principle characteristics of the MOVI-PLC® *advanced* DHF41B control card when operated on the PROFIBUS-DP system.

5.1 Process data exchange with MOVI-PLC® advanced DHF41B

MOVI-PLC® *advanced* DHF41B is controlled via the process data channel which is up to 32 I/O words in length. These process data words are mapped in the I/O or peripheral area of the MOVI-PLC® *advanced* DHF41B control card, for example when a higher-level PLC is used as the DP master. As a result, the process data words can be addressed in the usual manner.

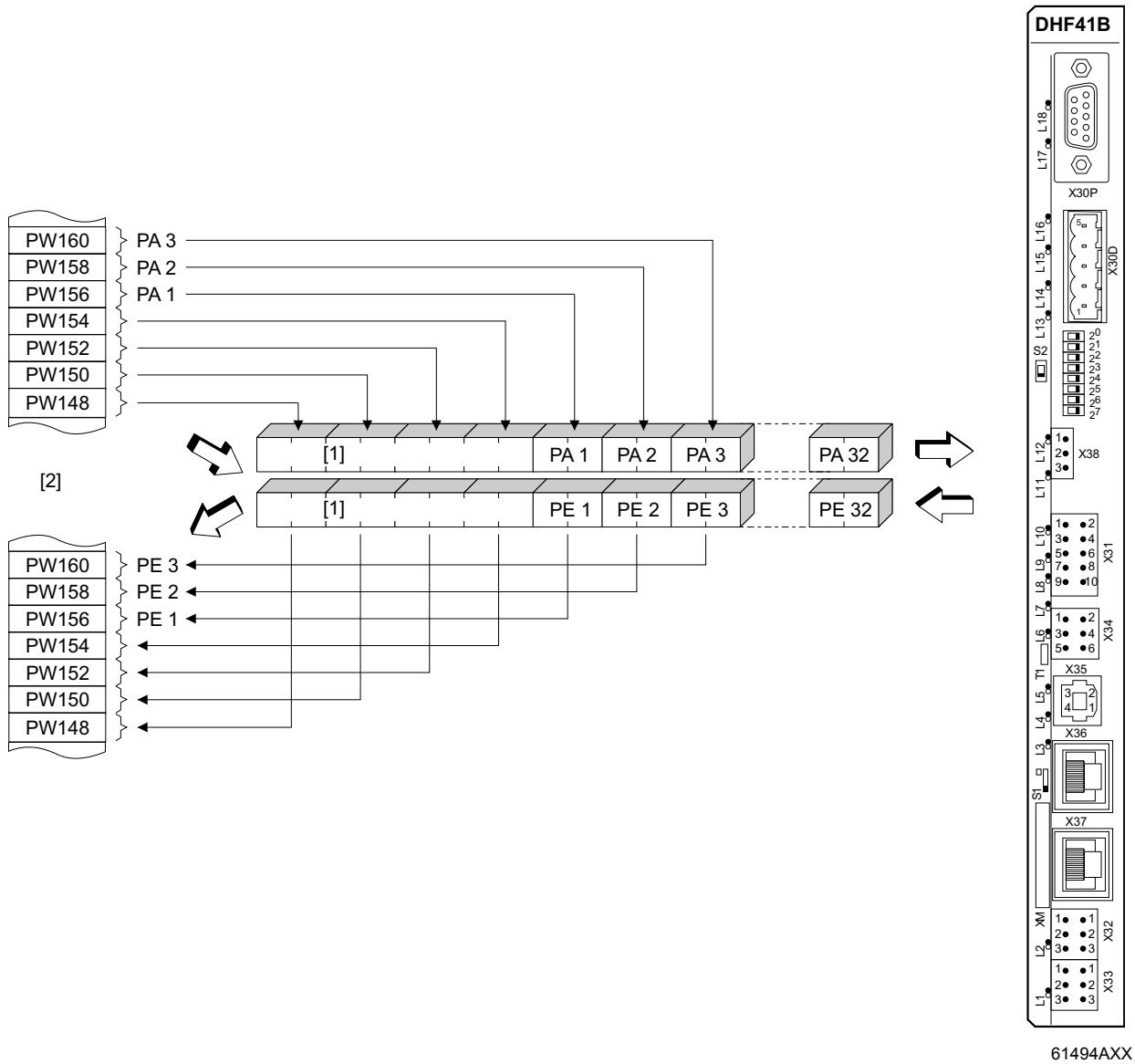


Figure 11: Mapping PROFIBUS data in the PLC address range

[1] 8 byte MOVILINK® parameter channel

[2] Address range of the higher-level PLC

PE1 ... PE32 Process input data

PA1 ... PA32 Process output data

For additional information on programming and configuration, refer to the README_GSD6007.PDF file included with the GSD file.

Control example for Simatic S7

The data exchange process with MOVI-PLC® *advanced* DHF41B is controlled using Simatic S7 in accordance with the selected process data configuration either directly using load and transfer commands or by means of special system functions, *SFC 14 DPRD_DAT* and *SFC15 DPWR_DAT*.

STEP7 sample program

In this example, the MOVI-PLC® *advanced* DHF41B control card is configured with the process data configuration *10 PD* on input addresses PEW512... and output addresses PAW512....

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

When SFC14 is called, the process input data is copied to data block DB3, data words 0 to 18. When SFC15 is called after the control program has been processed, the process output data is copied from data words 20...38 to the output address PAW 512....

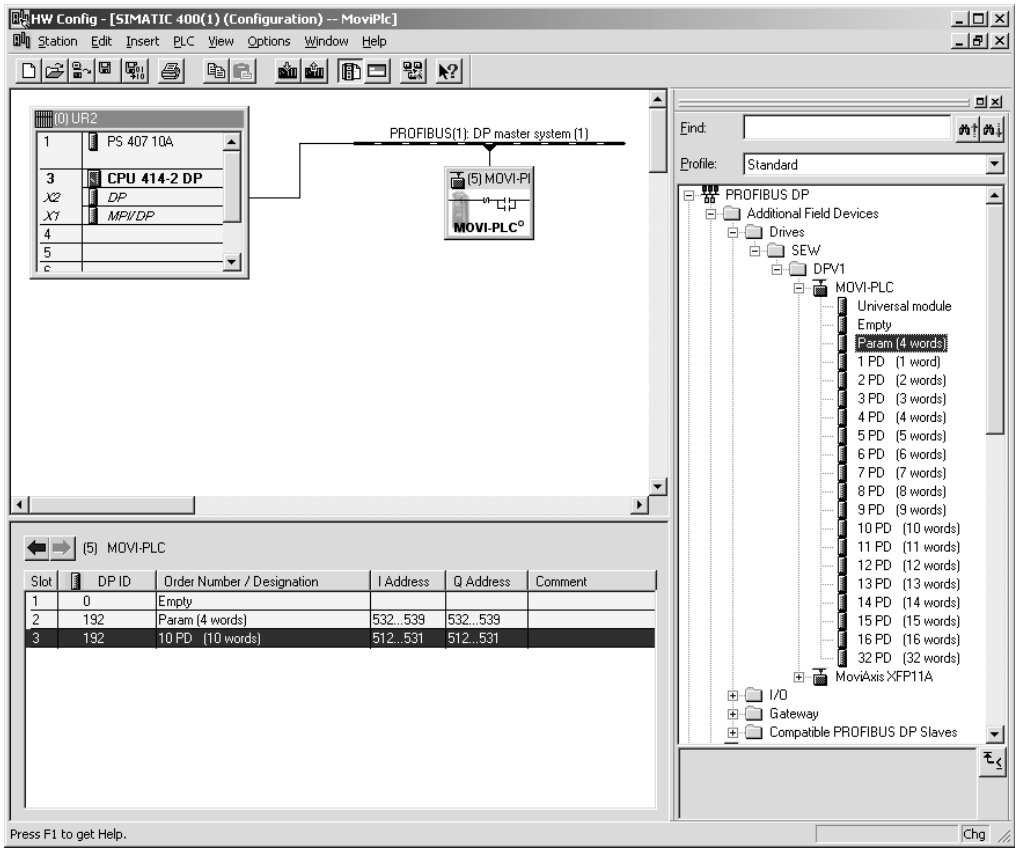
Note the length information in bytes for the *RECORD* parameter. The length information must correspond to the configured length.

Refer to the online help for STEP7 for further information about the system functions.

```
//Start of cyclical program processing in OB1
BEGIN
NETWORK
TITLE = Copy PI data from the DHF41B control card to DB3, words 0...18
CALL SFC  14 (DPRD_DAT)    //Read DP slave record
  LADDR  := W#16#200 //Input address 512
  RET_VAL:= MW 30          //Result in flag word 30
  RECORD := P#DB3.DBX 0.0 BYTE 20 //Pointer

NETWORK
TITLE =PLC program with drive application
// PLC program uses the process data in DB3 for data exchange
// with the DHF41B control card

L  DB3.DBW 0   //Load PI1
L  DB3.DBW 2   //Load PI2
L  DB3.DBW 4   //Load PI3
// etc.

L  W#16#0006
T DB3.DBW 20   //Write 6hex to PO1
L 1500
T DB3.DBW 22   //Write 1500dec to PO2
L  W#16#0000
T DB3.DBW 24   //Write 0hex to PO3
// etc.

NETWORK
TITLE = Copy PO data from DB3, words 20...38 to DHF41B control card
CALL SFC  15 (DPWR_DAT)             //Write DP slave record
  LADDR  := W#16#200                //Output address 512 = 200hex
  RECORD := P#DB3.DBX 20.0 BYTE 20  //Pointer to DB/DW
  RET_VAL:= MW 32                   //Result in flag word 32
```

This sample program is a free service that demonstrates only the basic approach to generating a PLC program as a non-binding sample. SEW is not liable for the contents of the sample program.

The following figure shows the corresponding configuration for the MOVI-PLC® *advanced* DHF41B control card in the hardware configuration of STEP7 (→ section "DP configurations", page 46).



58376AXX

5.2 PROFIBUS-DP timeout

The response monitoring time on the MOVI-PLC® *advanced* DHF41B control card elapses (if configured in the DP master) if data transmission via the PROFIBUS-DP system is interrupted or disrupted. The *Fault Profibus* LED lights up to indicate that no new user data is being received.

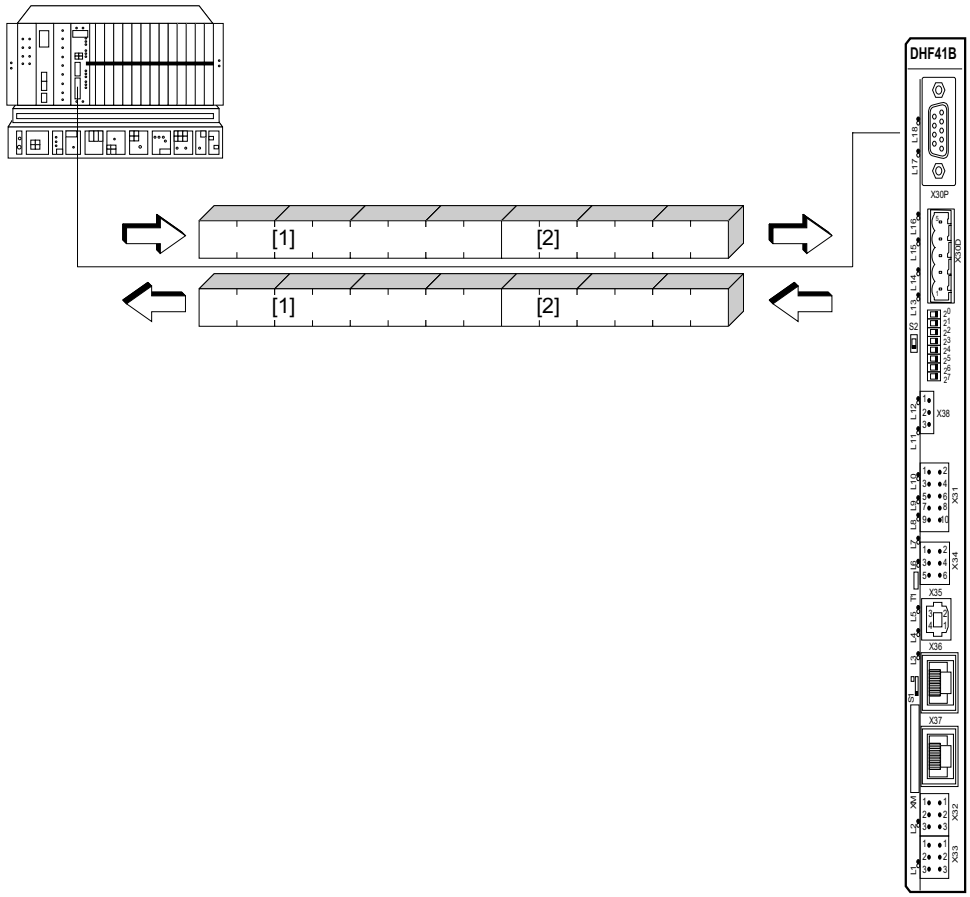
The *ProfibusGetInfo* function module in the MPLCInterface_Profibus library, which is run cyclically, displays this PROFIBUS timeout. The fault response can be programmed explicitly. The application flow can be influenced accordingly.

5.3 Parameter setting via PROFIBUS-DP

In the PROFIBUS-DP system, the parameters are accessed via the 8-byte MOVILINK® parameter channel. This parameter channel offers extra parameter services in addition to the conventional *Read* and *Write* services.

Structure of the 8-byte MOVILINK® parameter channel

PROFIBUS-DP enables access to the MOVI-PLC® *advanced* DHF41B control card parameters via the "parameter process data object" (PPO). This PPO is transmitted cyclically and contains the process data channel [2] and a parameter channel [1] that can be used to exchange acyclical parameter values (→ following Figure).



61495AXX

Figure 12: Communication via PROFIBUS-DP

The following table shows the structure of the 8-byte MOVILINK® parameter channel. Its basic structure is as follows:

- One management byte
- One reserved byte
- Two index bytes
- Four data bytes

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Manage-ment	Reserved	Index high	Index low	Data MSB	Data	Data	Data LSB
		Parameter index		4-byte data			

Management of the 8-byte MOVILINK® parameter channel

The entire procedure for setting parameters is coordinated using management byte 0. This byte provides important service parameters such as service identifier, data length, version and status of the service performed.

The following table shows the structure of the 8-byte MOVILINK® parameter channel.

7 / MSB	6	5	4	3	2	1	0 / LSB
				Service identifier 0000 = No service 0001 = Read parameter 0010 = Write parameter 0011 = Write parameter volatile 0100 = Read minimum 0101 = Read maximum 0110 = Read default 0111 = Read scale 1000 = Read attribute			
		Data length 00 = 1 byte 01 = 2 bytes 10 = 3 bytes 11 = 4 bytes (must be set)					
	Handshake bit Must be changed on every new task in cyclical transmission.						
Status bit 0 = No error during execution of service 1 = Error during execution of service							

- Bits 0, 1, 2 and 3 contain the service identifier. These bits determine which service is to be executed.
- Bits 4 and 5 specify the data length in bytes for the *write* service. The data length should be set to 4 bytes for the MOVI-PLC® *advanced* DHF41B control card.
- Bit 6 is used as the handshake bit between the higher-level controller and the MOVI-PLC® *advanced* DHF41B control card. Bit 6 triggers the implementation of the transmitted service in the control card. With PROFIBUS-DP, the parameter channel is transmitted cyclically with the process data. For this reason, the execution of the service in the MOVI-PLC® *advanced* DHF41B control card must be triggered by edge control using the handshake bit 6. For this purpose, the value of this bit is altered (toggled) for each new service that is to be executed. The MOVI-PLC® *advanced* DHF41B control card uses handshake bit 6 to signal whether the service was executed or not. The service is executed as soon as the handshake bit received in the control card is the same as the one that was sent.
- Status bit 7 indicates whether the service was carried out properly or if errors occurred.

Index addressing

Byte 2: Index high and byte 3: Index low determines the parameter that is to be read or written via the fieldbus system. The parameters of the MOVI-PLC® *advanced* DHF41B control card are addressed using a standard index regardless of the fieldbus system that is connected.

Byte 1 is reserved and must always be set to 0x00.

Data range

As shown in the following table, the data is contained in byte 4 through byte 7 of the parameter channel. This means up to 4 bytes of data can be transmitted per service. The data is always entered with right-justification; that is, byte 7 contains the least significant data byte (Data LSB) whereas byte 4 is the most significant data byte (Data MSB).

<table>
<tr><th>Byte 0</th><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th><th>Byte 5</th><th>Byte 6</th><th>Byte 7</th></tr>
<tr><td rowspan="4">Manage-ment</td><td rowspan="4">Reserve d</td><td rowspan="4">Index high</td><td rowspan="4">Index low</td><td>Data MSB</td><td>Data</td><td>Data</td><td>Data LSB</td></tr>
<tr><td>High byte 1</td><td>Low byte 1</td><td>High byte 2</td><td>Low byte 2</td></tr>
<tr><td colspan="2">High word</td><td colspan="2">Low word</td></tr>
<tr><td colspan="4">Double word</td></tr>
</table>

Incorrect execution of a service

The status bit in the management byte 0 is set to indicate that a service has been executed incorrectly. If the received handshake bit is identical to the transmitted handshake bit, the MOVI-PLC® *advanced* DHF41B control card has executed the service. If the status bit now signals an error, the error code is entered in the data range of the parameter telegram. Byte 4 ... 7 send back the return code in a structured format (→-Sec. "Return codes for parameter setting").

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Manage-ment	Reserved	Index high	Index low	Error class	Error code	Add. code high:	Add. code low
Status bit = 1: Incorrect execution of a service							

Reading a parameter via PROFIBUS-DP

Due to the cyclical transfer of the parameter channel, to execute a *read* service via the 8-byte MOVILINK® parameter channel, the handshake bit may only be changed if the complete parameter channel has been set up for the specific service. As a result, adhere to the following sequence when reading a parameter:

1. Enter the index of the parameter to be read in byte 2 (Index high) and byte 3 (Index low).
2. Enter the service identifier for the *read* service in the management byte (byte 0).
3. Transfer the *read* service to the MOVI-PLC® *advanced* DHF41B control card by changing the handshake bit.

Since this is a read service, the sent data bytes (bytes 4...7) and the data length (in the management byte) are ignored and do not have to be set.

The MOVI-PLC® *advanced* DHF41B control card now processes the *read* service and sends the service confirmation back by changing the handshake bit.

7 / MSB	6	5	4	3	2	1	0 / LSB
0	0/1[1]	X[2]	X[2]	0	0	0	1
				Service identifier 0001 = Read parameter			
		Data length Not relevant for Read service					
	Handshake bit Must be changed on every new task in cyclical transmission.						
Status bit 0 = No error during execution of service 1 = Error during execution of service							

1) Bit value is changed

2) Not relevant

The above table shows how a *read* service is coded in management byte 0. The data length is irrelevant, only the service identifier for the *read* service must be entered. This service is now activated in the MOVI-PLC® *advanced* DHF41B control card when the handshake bit changes. For example, it would be possible to activate the *read* service with the management byte coding 01hex or 41hex.

Writing a parameter via PROFIBUS-DP

Due to the cyclical transfer of the parameter channel, to execute a *write* service via the 8-byte MOVILINK® parameter channel, the handshake bit may only be changed if the complete parameter channel has been set up for the specific service. Observe the following sequence when writing a parameter:

1. Enter the index of the parameter to be written in byte 2 (Index high) and byte 3 (Index low).
2. Enter the data to be written in bytes 4...7.
3. Enter the service identifier and the data length for the *write* service in the management byte (byte 0).
4. Transfer the *write* service to the MOVI-PLC® *advanced* DHF41B control card by changing the handshake bit.

The MOVI-PLC® *advanced* DHF41B control card now processes the *write* service and returns the service confirmation by changing the handshake bit.

The following table shows how a *write* service is coded in management byte 0. The data length for all parameters in the MOVI-PLC® *advanced* DHF41B control card is four bytes. This service is now transferred to the MOVI-PLC® *advanced* DHF41B control card when the handshake bit changes. Consequently, a *write* service on the MOVI-PLC® *advanced* DHF41B control card always has the management byte coding 32hex or 72hex.

7 / MSB	6	5	4	3	2	1	0 / LSB
0	0/1[1)]	1	1	0	0	1	0
				Service identifier 0010 = Write parameter			
		Data length 11 = 4 bytes					
	Handshake bit Must be changed on every new task in cyclical transmission.						
Status bit 0 = No error during execution of service 1 = Error during execution of service							

1) Bit value is changed

Parameter setting sequence with PROFIBUS-DP

Taking the example of the *write* service, the following table shows the parameter setting sequence between higher-level controller and MOVI-PLC® *advanced* DHF41B control card via PROFIBUS-DP. To simplify the sequence, only the management byte of the parameter channel is shown here.

While the higher-level controller prepares the parameter channel for the *write* service, the parameter channel is only received and returned by the MOVI-PLC® *advanced* DHF41B control card. The service is not activated until the moment the handshake bit is changed (in this example, when it changes from 0 to 1). The MOVI-PLC® *advanced* DHF41B control card now interrupts the parameter channel and processes the *write* service. However, it continues to respond to all telegrams with handshake bit = 0.

The executed service is acknowledged with a change of the handshake bit in the response message of the MOVI-PLC® *advanced* DHF41B control card. The higher-level controller now detects that the received handshake bit is the same as the one that was sent. It can now prepare another parameter setting procedure.

Control	PROFIBUS-DP(V0)			MOVI-PLC® advanced DHF41B control card (slave)
	--	0**0**110010XXX...	→	Parameter channel is received, but not evaluated
	←	0**0**110010XXX...	--	
Parameter channel is prepared for the write service				
Handshake bit is changed and the service is transferred to the MOVI-PLC® DHF41B control card	--	0**1**110010XXX...	→	
	←	0**0**110010XXX...	--	
	--	0**1**110010XXX...	→	
	←	0**0**110010XXX...	--	Write service is performed, handshake bit is changed
Service confirmation is received as the send and receive handshake bits are the same again	←	0**1**110010XXX...	--	
	--	0**1**110010XXX...	→	Parameter channel is received, but not evaluated

Parameter data format

When parameters are set via the fieldbus interface, the same parameter coding is used as with the serial RS485 interface or the system bus.

5.4 Return codes for parameter setting

Elements

If parameters are set incorrectly, the MOVI-PLC® *advanced* DHF41B control card returns various return codes to the parameter setting master, providing detailed information on the cause of the error. Generally, these return codes are structured. SEW distinguishes between the elements

- *Error class*
- *Error code*
- *Additional code*

These return codes are described in detail in the Fieldbus Communications Profile manual and are not included in this documentation. However, the following special cases can occur in connection with PROFIBUS:

Error class

The *error class* element provides a more exact classification of the error type. The MOVI-PLC® *advanced* DHF41B control card supports the following error classes in accordance with EN 50170(V2):

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

Error code

The *error code* element provides a means of 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. For *Error class 8 = Other error*, only *Error code = 0 (Other error code)* is defined. In this case, detailed identification is made using the *additional code*.

Additional code

The *Additional code* contains SEW-specific return codes for errors in the parameter settings for MOVI-PLC® *advanced* DHF41B. These codes are returned to the master under *Error class 8 = Other error*. The following table shows all possible codes 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 for parameter too large
00	16	Value for parameter too small
00	17	Reserved
00	18	Error in system software
00	19	Reserved
00	1A	Parameter access only via RS485 interface
00	1B	Parameter is access-protected
00	1C	Reserved
00	1D	Invalid value for parameter
00	1E	Factory setting was activated
00	1F	Reserved
00	20	Reserved

5.5 Special cases

Special return codes

Errors in parameter settings, which cannot be identified either automatically by the application layer of the fieldbus system or by the system software of the MOVI-PLC® *advanced* DHF41B control card, are treated as special cases. The following errors can occur depending on the control card used:

- Incorrect coding of a service via parameter channel
- Incorrect length specification of a service via parameter channel
- Internal communication error

Incorrect service code in the parameter channel

An incorrect code was specified for the management byte or reserved byte during parameter setting via the parameter channel. The following table shows the return code for this special case.

	Code (dec)	Meaning
Error class:	5	Service
Error code:	5	Illegal parameter
Add. code high:	0	-
Add. code low:	0	-

Troubleshooting:

Check bits 0 and 1 in the parameter channel.

Incorrect length specification in parameter channel

A data length other than 4 data bytes was specified in a *read* or *write* service during parameter setting via the parameter channel. The following table displays the return codes.

	Code (dec)	Meaning
Error class:	6	Access
Error code:	8	Type conflict
Add. code high:	0	-
Add. code low:	0	-

Troubleshooting:

Check bit 4 and bit 5 for the data length in management byte 0 of the parameter channel. Both bits must be set to "1".

Internal communication error

The return code listed in the following table is sent back if an internal communication error has occurred. The parameter service transferred via the fieldbus may not have been performed and should be repeated. If this error persists, switch the MOVI-PLC® *advanced* DHF41B control card off and on again. In this way, the control card is reinitialized.

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

Troubleshooting:

Repeat the *read* or *write* service. If this error occurs again, disconnect the MOVI-PLC® *advanced* DHF41B control card from the power source and switch the system on again. If the error persists, consult SEW Service.

6 PROFIBUS-DP-V1 Functions

6.1 Introduction to PROFIBUS-DP-V1

This section describes the functions and terms used for operating the MOVI-PLC® *advanced* DHF41B control card on PROFIBUS-DP-V1. Refer to the PROFIBUS user organization or visit www.profibus.com for detailed technical information on PROFIBUS-DP-V1.

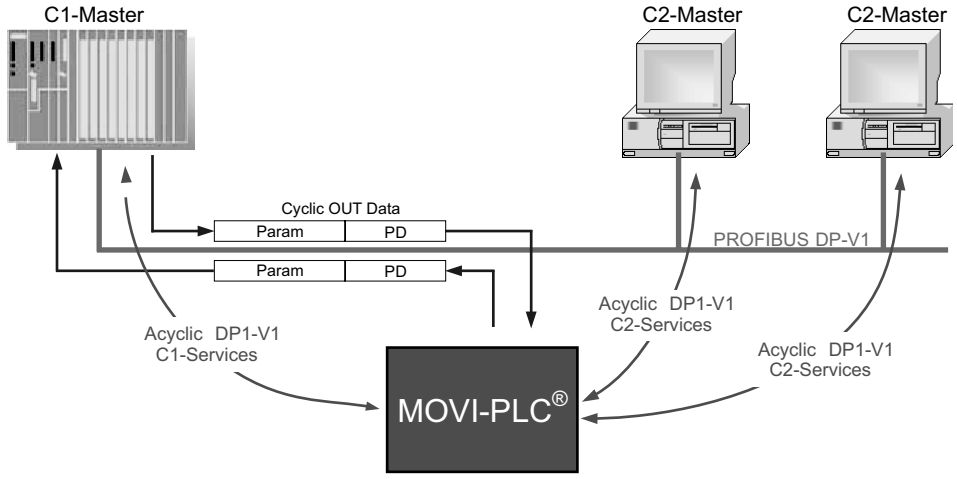
The PROFIBUS-DP-V1 specification introduced new acyclical *read/write* services within the context of the PROFIBUS-DP-V1 expansions. These acyclical services are inserted into special telegrams during cyclical bus operation and thus ensure compatibility between PROFIBUS-DP (version 0) and PROFIBUS-DP-V1 (**V**ersion **1**).

Acyclical *read/write* services can be used to exchange larger volumes of data between master and slave (MOVI-PLC® *advanced* DHF41B control card) than it would be possible to transfer with the cyclical input or output data via the 8-byte parameter channel. The advantage of the acyclical data exchange via DP-V1 is the minimum load on the cyclical bus operation. DP-V1 telegrams are only added to the bus cycle if required.

The DP-V1 parameter channel offers the following options:

- The higher-level controller can access all the device information of the SEW DP-V1 slaves. This means that cyclical process data and unit settings can be read, stored in the higher-level controller and modified in the slave.
- It is also possible to route the MOVITOOLS® MotionStudio service and startup software via the DP-V1 parameter channel instead of using a proprietary RS485 connection. Once you have installed the MOVITOOLS® MotionStudio software, you can access detailed information in the folder...\SEW\Movitools\Fieldbus.

The main features of PROFIBUS DP-V1 are shown in the figure below.



58378AXX

The PROFIBUS-DP-V1 network differentiates between various master classes.

Class 1 master (C1 master)

The C1 master performs the cyclical data exchange with the slaves. Typical C1 masters include control systems, such as PLCs, which exchange cyclical process data with the slave. If the DP-V1 function has been activated via the GSD file, the acyclical connection between C1 master and slave is established automatically when the cyclical connection of the PROFIBUS-DP is being established. Only one C1 master can be operated in a PROFIBUS DP-V1 network.

Class 2 master (C1 master)

The C2 master itself does not perform cyclical data exchange with the slaves. Examples of a typical C2 master are visualization systems or temporarily installed programming devices (Notebook / PC). The C2 master uses exclusively acyclic connections for communication with the slaves. The acyclic connections between C2 master and slave are established by the *Initiate* service. The connection is established once the *Initiate* service has been performed successfully. An established connection enables cyclical data exchange with the slaves using *Read* or *Write* services. Several C2 masters can be active in a DP-V1 network. The number of C2 connections, established simultaneously for a slave, is determined by the slave. The MOVI-PLC® *advanced* DHF41B control card supports two parallel C2 connections.

Datasets (DS)

User data transported via a DP-V1 service is collected in datasets. Each dataset is identified uniquely by its length, a slot number and an index. The structure of dataset 47 is used for DP-V1 communication with the MOVI-PLC® *advanced* DHF41B control card. This dataset is defined as the DP-V1 parameter channel for drives as of V3.1 in the PROFIdrive profile drive engineering of the PROFIBUS Nutzerorganisation (user group). Different procedures for accessing parameter data in the MOVI-PLC® *advanced* DHF41B control card are provided via this parameter channel.

DP-V1 services

The DP-V1 expansions offer new services, which can be used for acyclical data exchange between master and slave.

The system distinguishes between the following services:

C1 master	Connection type: MSAC1 (master/slave acyclical C1)
Read	Read dataset
Write	Write dataset

C2 master	Connection type: MSAC2 (master/slave acyclical C2)
INITIATE	Establish C2 connection
ABORT	Disconnect C2 connection
Read	Read dataset
Write	Write dataset

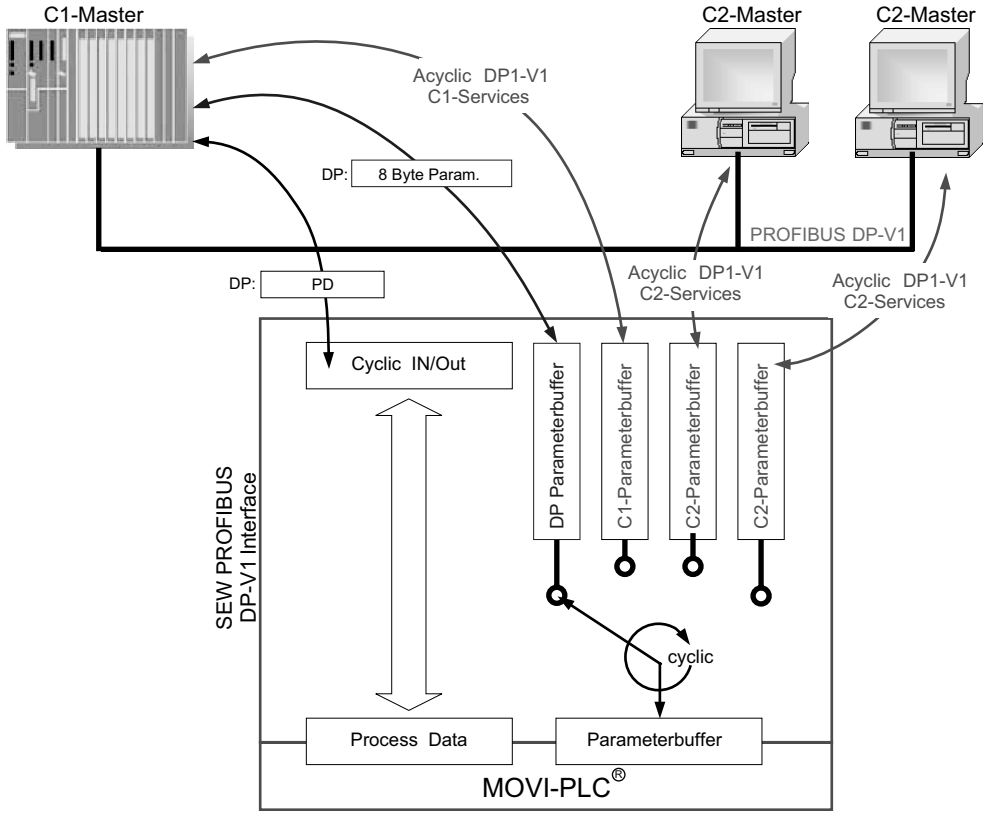
DP-V1 Alarm handling

In addition to the acyclical services, the DP-V1 specification also defines extended alarm handling. The PROFIBUS-DP-V1 system differentiates between various alarm types. As a result, unit-specific diagnostics cannot be evaluated in DP-V1 operation via the 'DDLM_SlaveDiag' DP-V1 service. DP-V1 alarm handling has not been defined for drive engineering.

6.2 Features of the SEW DP-V1 interfaces

The SEW fieldbus interfaces to PROFIBUS DP-V1 have the same communication features as the DP-V1 interface. The MOVI-PLC® *advanced* DHF41B control card is controlled via a C1 master with cyclical process data in accordance with the DP-V1 standard. This C1 master (usually a PLC) can also use an 8-byte MOVILINK® parameter channel during cyclical data exchange to execute the parameter services with the MOVI-PLC® *advanced* DHF41B control card. The *read* and *write* services allow the C1 master access to connected stations via the DP-V1 C1 channel.

Parallel to these two parameter channels, a further two C2 channels can be set up. For example, the first C2 master (visualization) could use these channels to read parameter data, and a second C2 master (notebook) could use them to configure the MOVI-PLC® *advanced* DHF41B control card using the MOVITOOLS® software.



58379AXX

Figure 13: Parameter channels for PROFIBUS DP-V1

6.3 Structure of the DP-V1 parameter channel

Dataset index 47 is used to set parameters of the MOVI-PLC® *advanced* DHF41B control card in accordance with the PROFIdrive-DP-V1 parameter channel of profile version 3.0. The *Request ID* entry is used to distinguish between parameter access based on the PROFIdrive profile or via SEW-MOVILINK® services. The following table shows the possible codes of the individual elements. The dataset structure is the same for PROFIdrive and MOVILINK® access.

53125AXX

The following MOVILINK® services are supported:

- 8-byte MOVILINK® parameter channel with all the services supported by the MOVI-PLC® *advanced* DHF41B control card:
  - Read parameter
  - Write parameter
  - Write parameter volatile
  - etc.

The following PROFIdrive services are supported:

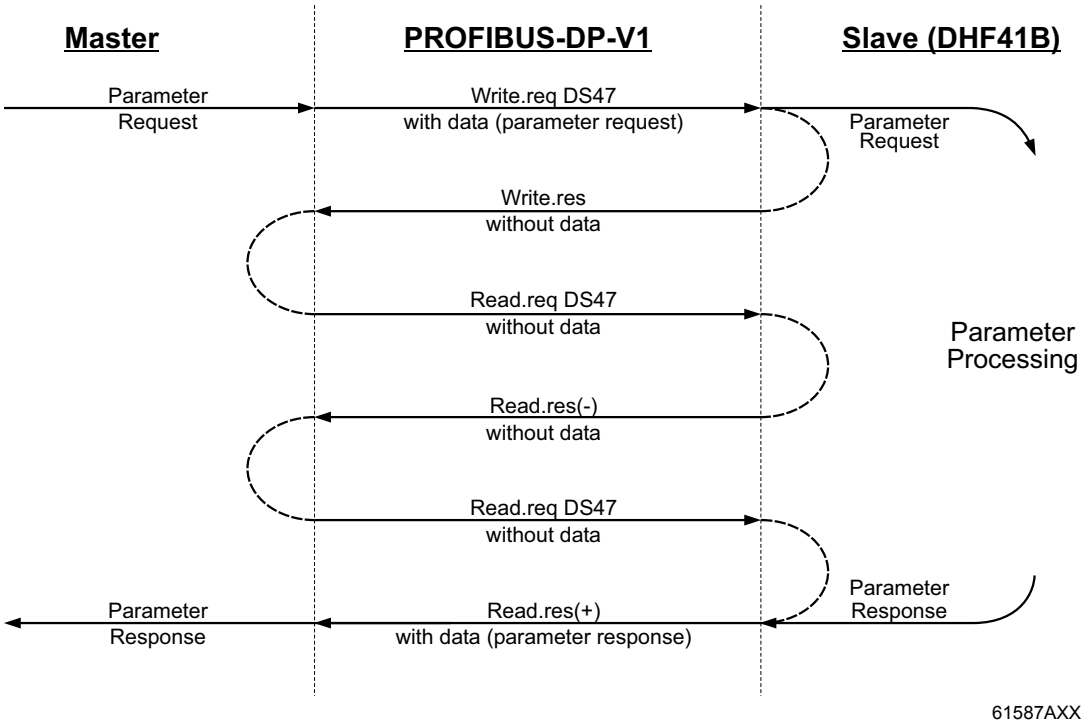
- Reading (request parameter) individual parameters of the type *double word*
- Writing (change parameter) individual parameters of the type *double word*

Field	Data Type	Values
Request Reference	Unsigned8	0x00 Reserved 0x01 ... 0xFF
Request ID	Unsigned8	0x01 Request parameter (PROFIdrive) 0x02 Change parameter (PROFIdrive) 0x40 SEW MOVILINK® service
Response ID	Unsigned8	Response (+): 0x00 Reserved 0x01 Request parameter (+) (PROFIdrive) 0x02 Change parameter (+) (PROFIdrive) **0x40 SEW MOVILINK® service (+)** Response (–): 0x81 Request parameter (–) (PROFIdrive) 0x82 Change parameter (–) (PROFIdrive) **0xC0 SEW MOVILINK® service (–)**
Axis	Unsigned8	0x00 ... 0xFF Number of axis 0 ... 255
No. of parameters	Unsigned8	0x01 ... 0x13 1 ... 19 DWORDs (240 DPV1 data bytes)
Attributes	Unsigned8	0x10 Value **For SEW MOVILINK® (Request ID = 0x40):** **0x00 No service** **0x10 Read parameter** **0x20 Write parameter** **0x30 Write parameter volatile** **0x40 ... 0xF0 Reserved**
No. of elements	Unsigned8	0x00 For non-indexed parameters 0x01 ... 0x75 Quantity 1 ... 117
Parameter Number	Unsigned16	0x0000 ... 0xFFFF MOVILINK® parameter index
Subindex	Unsigned16	0x0000 SEW: always 0
Format	Unsigned8	0x43 Double word 0x44 Error
No. of Values	Unsigned8	0x00 ... 0xEA Quantity 0 ... 234
Error Value	Unsigned16	0x0000 ... 0x0064 PROFIdrive error codes 0x0080 + MOVILINK®-AdditionalCode Low **For SEW MOVILINK® 16 Bit error value**

Parameter setting procedure via dataset 47

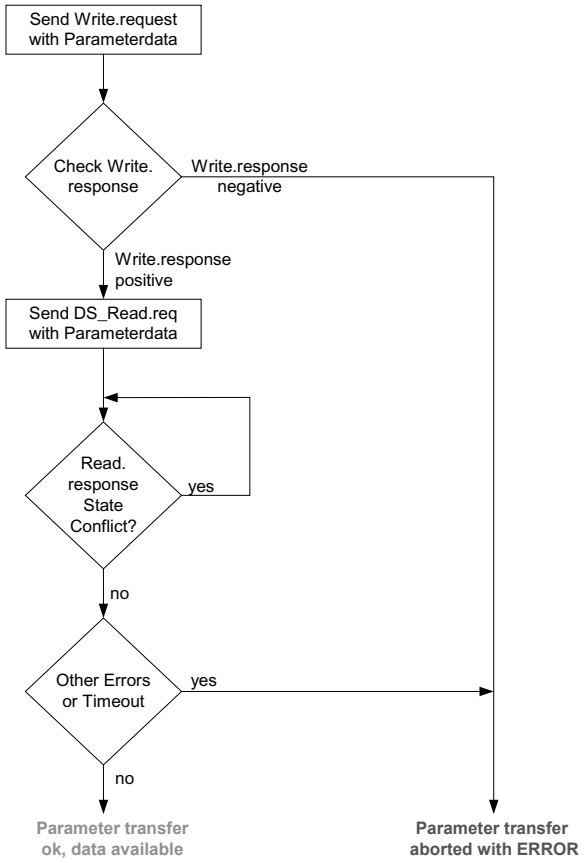
Parameter access takes place with the combination of the DP-V1 services *write* and *read*. The master transfers the parameter setting job to the slave by sending *Write.req*. followed by slave-internal processing.

The master now sends a *Read.req* to request the parameter setting response. The master repeats the *Read.req* if the *Read.res* from the slave is negative. As soon as parameter processing in the MOVI-PLC® *advanced* DHF41B control card (slave) is completed, the control card answers with a positive response *Read.res*. The user data now contains the parameter setting response of the parameter setting request that was previously sent with *Write.req* (→ following figure). This telegram sequence applies to both a C1 and a C2 master.



Processing sequence for the DP-V1 master

If the bus cycles are very short, the request for the parameter response arrives before the MOVI-PLC® *advanced* DHF41B control card has concluded parameter access in the device. This means that the response data from MOVI-PLC® *advanced* DHF41B is not yet available. In this case, the MOVI-PLC® *advanced* DHF41B control card sends a negative answer with the **Error_Code _1 = 0xB5 (status conflict)** to the DP-V1 level. The DP-V1 master then repeats the request with the above *Read.req header* until it receives a positive response from the MOVI-PLC® *advanced* DHF41B control card.



53127AXX

MOVILINK® parameter requests

The MOVILINK® parameter channel of the MOVI-PLC® *advanced* DHF41B control card is directly mapped in the structure of dataset 47. The Request ID *0x40* (SEW MOVILINK® service) is used to exchange MOVILINK® parameter requests. Parameter access with MOVILINK® services usually takes place according to the structure described below. The typical message sequence for dataset 47 is used.

Request ID: 0x40 SEW MOVILINK® service

The actual service is defined by the dataset element *Attribute* in the MOVILINK® parameter channel. The high nibble of this element corresponds to the service nibble in the management byte of the DP parameter channel.

Example for reading a parameter via MOVILINK®

The following tables give an example of the structure of the *Write.request* and *Read.req* user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending parameter request

The following table displays the code of the user data for the *Write.req* service specifying the DP-V1 header.

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

The *Write.req* service is used to transfer the parameter setting request to the MOVI-PLC® *advanced* DHF41B control card. The firmware version is read.

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

Query parameter response

The following table shows the code of the *Read.req* user data including the DP-V1 header.

Service	Read.request	
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	240	Maximum length of response buffer in the DP-V1 master

Positive MOVILINK® parameter response

The following tables show the *Read.req* user data with the positive response data of the parameter setting request. For example, the parameter value for index 8300 (firmware version) is returned.

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

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

Example for writing a parameter via MOVILINK®

The following tables give an example of the structure of the *Write* and *Read* services for writing the value *12345* to variable *H0* (parameter index 11000) in the volatile memory. The MOVILINK® service *Write Parameter volatile* is used for this purpose.

Send „Write parameter volatile“ request

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

Byte	Field	Value	Description
0	Request reference	0x01	Individual reference number for the parameter setting request is mirrored in the parameter response
1	Request ID	0x40	SEW MOVILINK® service
2	Axis	0x00	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x30	MOVILINK® service Write parameter volatile
5	No. of elements	0x00	0 = access to direct value, no subelement
6..7	Parameter Number	0x2AF8	Parameter index 11000 = "IPOS variable H0"
8..9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12..13	Value HiWord	0x0000	Higher-order part of the parameter value
14..15	Value LoWord	0x3039	Lower-order part of the parameter value

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

Query parameter response

The following table shows the code of the *write.req* user data data including the DP-V1 header.

Field	Value	Description
Function_Num		Read.req
Slot_Number	X	Slot_Number not used
Index	47	Index of dataset
Length	240	Maximum length of response buffer in DP master

Positive response to "Write Parameter volatile"

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

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

Negative parameter response

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

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

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0xC0	Negative MOVILINK® response
2	Axis	0x00	Reflected axis number; 0 for single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Error
5	No. of values	0x01	1 error code
6..7	Error value	0x0811	MOVILINK® return code e. g. ErrorClass 0x08, add. code 0x11 (→ table MOVILINK® return codes for DP-V1)

MOVILINK® return codes of parameter setting for DP-V1

The following table shows the return codes that are returned by the SEW DP-V1 interface in case of an error in the DP-V1 parameter access.

MOVILINK® Return code (hex)	Description
0x0810	Invalid index, parameter index does not exist in the unit
0x0811	Function / parameter not implemented
0x0812	Read access only
0x0813	Parameter lock activated
0x0814	Factory setting is active
0x0815	Value for parameter too large
0x0816	Value for parameter too small
0x0817	Reserved
0x0818	Error in system software
0x0819	Reserved
0x081A	Parameter access only via RS485 interface
0x081B	Parameter is access-protected
0x081C	Reserved
0x081D	Invalid value for parameter
0x081E	Factory setting was activated
0x081F	Reserved
0x0820	Reserved
0x0821	Reserved
0x0822	Reserved
0x0823	Reserved
0x0824	Reserved
0x0505	Incorrect coding of management and reserved byte
0x0602	Reserved
0x0502	Reserved

PROFIdrive parameter requests

The PROFIdrive parameter channel of the MOVI-PLC® *advanced* DHF41B control card is directly mapped in the structure of dataset 47. Parameter access with PROFIdrive services takes place according to the structure described below. The typical message sequence for dataset 47 is used. PROFIdrive only defines the two request IDs

- **Request ID: 0x01request parameter (PROFIdrive)**
- **Request ID: 0x02change parameter (PROFIdrive)**

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

The request ID *0x02* = *change parameter* (PROFIdrive) ensures remanent write access to the selected parameter. Consequently, the internal Flash of the MOVI-PLC® *advanced* DHF41B control card is written with each write access. Use the MOVILINK® *Write parameter volatile* service if parameters must be written cyclically at short intervals. With this service, you only alter the parameter values in the RAM of the MOVI-PLC® *advanced* DHF41B control card.

Example for reading a parameter via PROFIdrive

The following tables show an example of the structure of the *Write.request* and *Read.req* user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending parameter request

The following table shows the coding of the user data for the *Write.req* service including the DP-V1 header. The *Write.req* service is used to transfer the parameter setting request to the MOVI-PLC® *advanced* DHF41B control card.

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

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

Query parameter response

The following table shows the code of the *Read.req* user data including the DP-V1 header.

Service	Read.request	
Slot_Number	0	Random (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	240	Maximum length of response buffer in the DP-V1 master

Positive PROFIdrive parameter response

The following table shows the *Read.res* user data with the positive response data of the parameter setting order. For example, the parameter value for index *8300* (firmware version) is returned.

Service	Read.request	
Slot_Number	0	Random (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	10	10 byte user data in response buffer

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

Example for writing a parameter via PROFIdrive

The following tables show an example of the structure of the *Write* and *Read* services for the **remanent** writing of the value 12345 to variable H0 (parameter index 11000) (→ "Example for writing a parameter via MOVILINK®"). The PROFIdrive *change parameter* service is used for this purpose.

Send *Write parameter* request

Service	Write.request	
Slot_Number	0	Random (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	16	16 byte user data for order buffer

Byte	Field	Value	Description
0	Request reference	0x01	Individual reference number for the parameter setting order is reflected in the parameter response
1	Request ID	0x02	Change parameter (PROFIdrive)
2	Axis	0x00	Axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Attributes	0x10	Access to parameter value
5	No. of elements	0x00	0 = access to direct value, no subelement
6..7	Parameter Number	0x2AF8	Parameter index 11000 = Variable H0
8..9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12..13	Value HiWord	0x0000	Higher-order part of the parameter value
14..15	Value LoWord	0x3039	Lower-order part of the parameter value

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

Query parameter response

The following table shows the code of the *write.req* user data data including the DP-V1 header.

Field	Value	Description
Function_Num		Read.req
Slot_Number	X	Slot_Number not used
Index	47	Index of dataset
Length	240	Maximum length of response buffer in DP-V1 master

Positive response *Write Parameter*

Service	Read.response	
Slot_Number	0	Random (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	4	4 byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0x02	Positive PROFIdrive response
2	Axis	0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter

Negative parameter response

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

Service	Read.response	
Slot_Number	0	Random (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	8	8 byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0x810x82	Negative response for Request Parameter Negative response for Change Parameter
2	Axis	0x00	Reflected axis number; 0 = Single axis
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Error
5	No. of values	0x01	1 error code
6..7	Error value	0x0811	MOVILINK® return code e. g. ErrorClass 0x08, add. code 0x11 (→ table MOVILINK® return codes for DP-V1)

PROFIdrive return codes for DP-V1

The following table shows the codes of the *error number* in the PROFIdrive DP-V1 parameter response according to PROFIdrive profile V3.1. This table applies if you use the PROFIdrive services *Request parameter* or *Change parameter*.

Error no.	Meaning	Used at	Supplem. information
0x00	Impermissible parameter number	Access to unavailable parameter	0
0x01	Parameter value cannot be changed	Change access to a parameter value that cannot be changed	Subindex
0x02	Low or high limit exceeded	Change access with value outside the value limits	Subindex
0x03	Faulty subindex	Access to unavailable subindex	Subindex
0x04	No array	Access with subindex to non-indexed parameter	0
0x05	Incorrect data type	Change access with value that does not match the data type of the parameter	0
0x06	Setting not permitted (can only be reset)	Change access with value unequal to 0 where this is not permitted	Subindex
0x07	Description element cannot be changed	Change access to a description element that cannot be changed	Subindex
0x08	Reserved	(PROFIdrive Profile V2: PPO-Write requested in IR not available)	-
0x09	No description data available	Access to unavailable description (parameter value is available)	0
0x0A	Reserved	(PROFIdrive Profile V2: Access group wrong)	-
0x0B	No operation priority	Change access without rights to change parameters	0
0x0C	Reserved	(PROFIdrive Profile V2: wrong password)	-
0x0D	Reserved	(PROFIdrive Profile V2: Text cannot be read in cyclic data transfer)	-
0x0E	Reserved	(PROFIdrive Profile V2: Name cannot be read in cyclic data transfer)	-
0x0F	No text array available	Access to text array that is not available (parameter value is available)	0
0x10	Reserved	(PROFIdrive Profile V2: No PPO-Write)	
0x11	Request cannot be executed because of operating state	Access is temporarily not possible for reasons that are not specified in detail	0
0x12	Reserved	(PROFIdrive Profile V2: other error)	
0x13	Reserved	(PROFIdrive Profile V2: Data cannot be read in cyclic interchange)	
0x14	Value impermissible	Change access with a value that is within the value limits but is not permissible for other long-term reasons (parameter with defined single values)	Subindex
0x15	Response too long	The length of the current response exceeds the maximum transmittable length	0
0x16	Parameter address impermissible	Illegal value or value which is not supported for the attribute, number of elements, parameter number or subindex or a combination	0
0x17	Illegal format	Write request: Illegal format or format of the parameter data which is not supported	0
0x18	Number of values is not consistent	Write request: Number of parameter data values that do not match the number of elements in the parameter address	0

Error no.	Meaning	Used at	Supplem. information
0x19	axis nonexistent	Access to an axis which does not exist	-
up to 0x64	Reserved	-	-
0x65..0xFF	Manufacturer-specific	-	-

6.4 Configuration of a C1 master

The GSD file *SEW-6007.GSD* is also required for configuring a DP-V1 C1 master. This file activates the DP-V1 functions of the MOVI-PLC® *advanced* DHF41B control card.

Operating mode (DP-V1 mode)

The DP-V1 operating mode is usually when a C1 master is configured. All DP slaves which have the DP-V1 functions enabled in their GSD file and which support DP-V1 are operated in the DP-V1 mode. Standard DP slaves will still be run via PROFIBUS-DP. This ensures that mixed mode is run for DP-V1 and DP-capable modules. Depending on the specification of the master functions, a DP-V1-capable station that was configured using the DP-V1 GSD file, can also be run in the DP operating mode.

6.5 Appendix

Sample program for SIMATIC S7

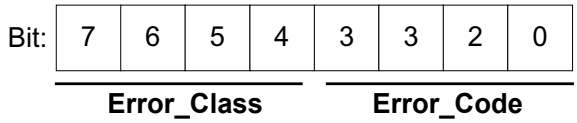
The STEP7 code stored in the GSD file shows how parameters are accessed via the STEP7 system function blocks SFB 52/53. You can copy the STEP7 code and import-compile it as STEP7 source.

DP-V1 technical data for the DHF41B control card

GSD file for DP-V1:	SEW-6007.GSD
Module name for configuration	MOVI-PLC
Number of parallel C2 connections:	2
Supported dataset:	Index 47
Supported slot number:	Recommendation: 0
Manufacturer code:	10A hex (SEW-EURODRIVE)
Profile ID:	0
C2 response timeout	1s
Max. length C1 channel:	240 bytes
Max. length C2 channel:	240 bytes

Error codes of the DP-V1 services

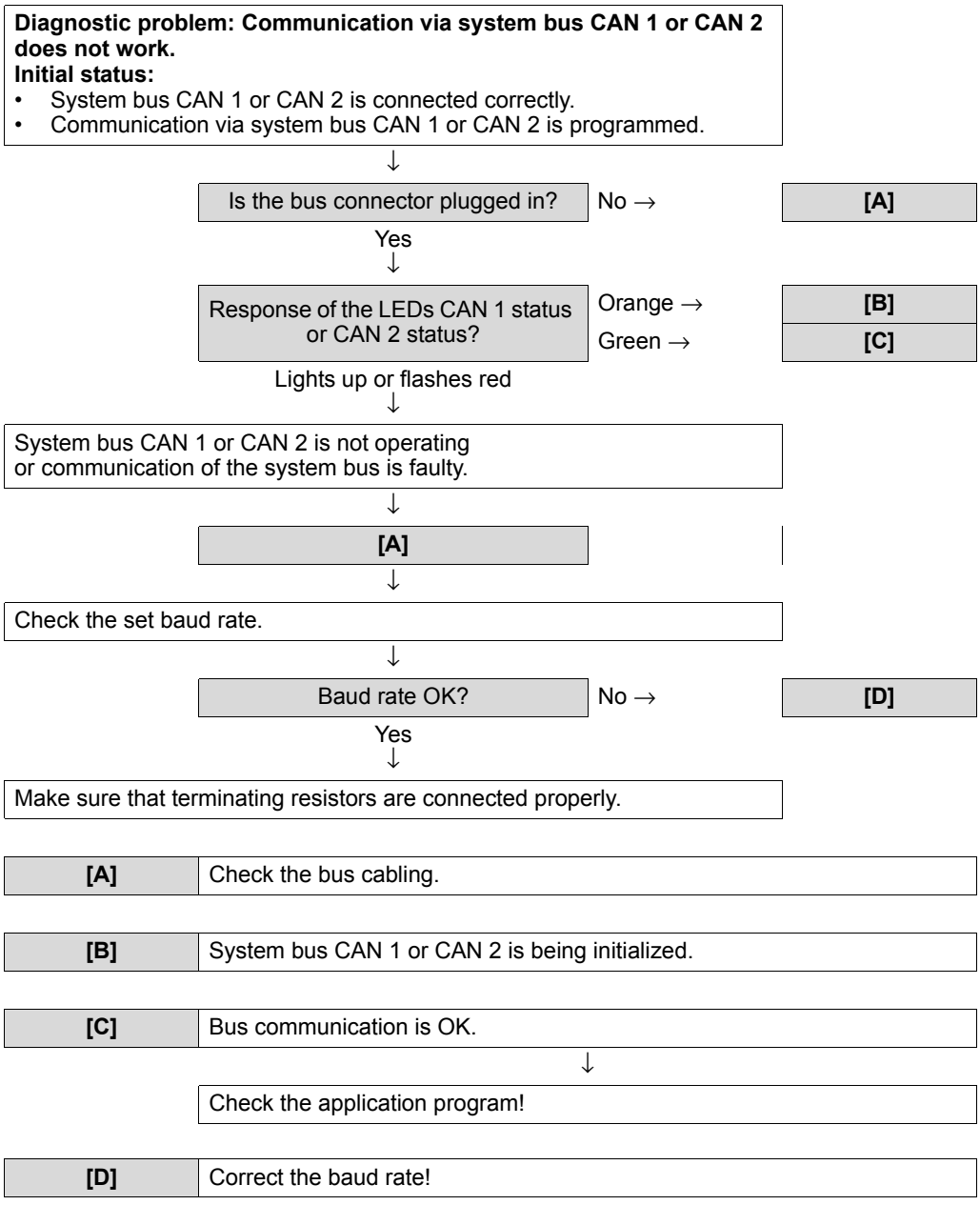
The following table shows possible error codes of DP-V1 services that may occur in the event of an error in the communication on DP-V1 telegram level. This table is relevant if you want to write your own parameter assignment block based on the DP-V1 services because the error codes are reported directly back on the telegram level.



Error_Class (from DP-V1 specification)	Error_Class (from DP-V1 specification)	DP-V1 parameter channel
0x0 ... 0x9 hex = reserved		
0xA = application	0x0 = read error 0x1 = write error 0x2 = module failure 0x3 to 0x7 = reserved 0x8 = version conflict 0x9 = feature not supported 0xA to 0xF = user specific	
0xB = access	0x0 = invalid index	0xB0 = No data block Index 47 (DB47); parameter requests are not supported
	0x1 = write length error 0x2 = invalid slot 0x3 = type conflict 0x4 = invalid area	
	0x5 = state conflict	0xB5 = Access to DB 47 temporarily not possible due to internal processing status
	0x6 = access denied	
	0x7 = invalid range	0xB7 = Write DB 47 with error in the DB 47 header
	0x8 = invalid parameter 0x9 = invalid type 0xA to 0xF = user specific	
0xC = resource	0x0 = read constraint conflict 0x1 = write constraint conflict 0x2 = resource busy 0x3 = resource unavailable 0x4..0x7 = reserved 0x8..0xF = user specific	
0xD...0xF = user specific		

7 Error Diagnostics

7.1 Diagnostic procedure for system buses CAN 1 / CAN 2



7.2 Diagnostic procedure for PROFIBUS-DP

Diagnostic problem: The MOVI-PLC® advanced DHF41B control card does not work on PROFIBUS.
Initial status:
- The MOVI-PLC® *advanced* DHF41B control card is connected physically to PROFIBUS.
- The MOVI-PLC® *advanced* DHF41B control card is configured in the DP master and bus communication is active.

↓

Is the bus connector plugged in? — No → **[A]**

Yes ↓

Response of the Profibus fault LED? — OFF → **[B]**; ON → **[C]**

FLASHES ↓

The MOVI-PLC® *advanced* DHF41B control card detects the baud rate, but was either not configured in the DP Master or has been configured incorrectly.

↓

Check whether the configured PROFIBUS address is the same as the address set on the DIP switches.

↓

PROFIBUS addresses identical? — No → **[D]**

Yes ↓

You may have configured an incorrect unit type or defined the configuration incorrectly.

↓

Delete the configuration for the MOVI-PLC® *advanced* DHF41B control card from the DP network.

↓

Reconfigure the MOVI-PLC® *advanced* DHF41B control card and select the unit designation "MOVI-PLC".
Use a predefined configuration to simplify the process. Do not change any of the preset configuration data!
Assign the address range for your control system.

↓

Load the configuration into the DP master and start the bus communication again.

[A]	Check the bus cabling.
[B]	The MOVI-PLC® *advanced* DHF41B control card is exchanging data cyclically with the DP master.
[C]	The MOVI-PLC® *advanced* DHF41B control card **cannot** detect the baud rate. Check the bus cabling.
[D]	Adapt the bus addresses.

8 Technical Data and Dimension Drawings

8.1 General technical data

The general technical data listed in the following table applies to:

- MOVI-PLC® *advanced* DH.41B control card installed in the inverter
- MOVI-PLC® *advanced* DH.41B / UOH..B compact controller

Interference immunity	Fulfills EN 61800-3
Ambient temperature	Integrated in MOVIDRIVE® MDX61B: • 0 °C ... +60 °C (Derating at 40 °C ... 60 °C → MOVIDRIVE® MDX60B/61B system manual) Integrated in MOVITRAC® B (AC 230 V; AC 400/500 V to 4 kW): • –10 °C ... +60 °C (Derating at 40 °C ... 60 °C → MOVITRAC® B system manual) Integrated in MOVITRAC® B (AC 400/500 V at 4 kW):: • 0 °C ... +60 °C (Derating at 40 °C ... 60 °C → MOVITRAC® B system manual) Integrated in MOVIAXIS® master module: • 0 °C ... +45 °C Compact controller: • –10 °C ... +60 °C
Climate class	EN 60721-3-3, class 3K3
Storage temperature	–25 °C ... +70 °C
Climate class	EN 60721-3-3, class 3K3
Type of cooling	Convection cooling
Enclosure	IP20
Operating mode	Continuous duty (see system manual MOVIDRIVE® MDX60B/61B, MOVITRAC® B, MOVIAXIS®)
Pollution class	2 according to IEC 60664-1 (VDE0110-1)
Installation altitude	max. 4000 m

8.2 MOVI-PLC® advanced DHE41B control card

MOVI-PLC® advanced DHE41B.. control card	
Part number	• MOVI-PLC® *advanced* DHE41B control card: 1821 160 7
Electrical supply	The following data applies to all units (MDX, MX, compact controller): • You must supply the binary inputs and outputs separately with DC 24 V (X31:1/2). Integrated in MOVIDRIVE® MDX61B: • Power consumption: P_{max} = 6.8 W • Voltage is supplied to the MOVI-PLC® *advanced* DHE41B control card through MOVIDRIVE® MDX61B via the backplane connector. • When the power supply is disconnected, the function of the control card is maintained through the DC 24 V back up supply (external DC 24 V supply must be provided at X10:9/10 on MOVIDRIVE®MDX61B. Integrated in MOVIAXIS® master module (MXM): • Power consumption: P_{max} = 8.5 W • U = DC 24 V (–15 % / +20 %) • I_{max} = 600 mA • Voltage can be supplied to the MOVI-PLC® *advanced* DHE41B control card either by the MOVIAXIS® switched-mode power supply module (MXS) or by an external voltage source. To do so, connect X5 between the individual units. • If the MOVI-PLC® *advanced* DHE41B control card is supplied with DC 24 V via the MOVIAXIS® switched-mode power supply module, the functionality of the MOVI-PLC® advanced DHE41B.. control card is maintained when the power supply is disconnected (external DC 24 V supply at X16 of the MOVIAXIS® switched-mode power supply module is required).
Potential levels	MOVI-PLC® *advanced* DHE41B has the following potential levels: • Potential control / CAN 1 / COM1 • Potential COM2 • Potential binary inputs and outputs • Potential system bus CAN 2
Memory	• Program memory: 8 MByte (for user program, incl. IEC libraries) • Data memory: 4 MByte (for IEC application) • Retain data: 32 kByte • System variables (retain): 8 kByte
Binary inputs X31:3...X31:10 Internal resistance Signal level	Isolated (optocoupler), PLC-compatible (IEC 61131-2), cycle time 1 ms, unfiltered and filtered (filter constant ca. 2 ms) Can be configured as binary inputs or outputs X31:6...X31:10 are interrupt-capable (response time <100 µs) $R_i \approx 3\ k\Omega$, $I_E \approx 10$ mA DC (+13 V...+30 V) = "1" = Contact closed (in accordance with IEC 61131) DC (–3 V...+5 V) = "0" = Contact open (in accordance with IEC 61131)
Binary outputs X31:3...X31:10 Signal level	PLC-compatible (IEC 61131-2), response time 1ms Can be configured as binary inputs or outputs Maximum permitted output current I_{A_max} = DC 150 mA per binary output All 8 binary outputs can be subject to the maximum permitted output current I_{A_max} at the same time. "0" = 0 V "1" = DC+24 V
System bus CAN 2 X32:1 ... X32:3 **System bus CAN 1** X33:1 ... X33:3	• System bus CAN 1 and CAN 2 to CAN specification 2.0, part A and B, transmission technology to ISO 11898 • The CAN 2 system bus is electrically isolated • Max. 64 stations per CAN system bus • Max. 64 SCOM transmit objects / 32 receive objects per CAN system bus • Address range 0...127 • Baud rate: 125 kBaud...1 MBaud • If X32 or X33 is the bus terminator, you must connect a terminating resistor (120 Ω) externally. • You can remove connector X32 or X33 without interrupting the system bus • The system bus can be run in layer 2 (SCOM cyclic, acyclic) or in accordance with the SEW-MOVILINK® protocol.
Ethernet 1	System bus, reserved
Ethernet 2	• TCP/IP • Connection options: engineering PC, other control, intranet
USB	USB 1.0 to connect an engineering PC (in preparation)

MOVI-PLC® advanced DHE41B.. control card	
RS485 interface COM1/2 X34:1 ... X34:4	• To connect a DOP11A operating terminal or a MOVIMOT® gearmotor with integrated frequency inverter • I/O standard, 57.6 / 9.6 kBaud, total max. cable length 200 m • Dynamic terminating resistor installed
SD memory card	• PC-readable • Contents: – Firmware – IEC program – Data • At least 128 MB memory • Versions, part numbers and functions: – OMH41B-T0: 1821 204 2 Functions: Management of speed control, positioning, e.g. with the MPLCMotion_MDX library – OMH41B-T1: 1821 205 0 Functions: In addition, e.g. electronic cam, electronic gear unit, cam controller – OMH41B-T2: 1821 206 9 Functions: In addition, e.g. handling
Engineering	Engineering takes place via one of the following interfaces: • Ethernet 2 (X37) • In preparation: USB (X35) Engineering for all SEW components connected to the MOVI-PLC® *advanced* DHE41B control card can be performed using the MOVI-PLC® *advanced* DHE41B control card. Engineering for the MOVI-PLC® *advanced* DHE41B control card cannot be performed using the inverter. • PC software MOVITOOLS® MotionStudio with PLC-Editor

8.3 MOVI-PLC® advanced DHF41B control card

The connections that are identical to those of DHE41B are described in section 8.2.

MOVI-PLC® advanced DHF41B control card	
Part number	• MOVI-PLC® *advanced* DHF41B control card: 1821 161 5
Potential levels	MOVI-PLC® *advanced* DHF41B has the following potential levels: • Potential control / CAN 1 / COM1 • Potential COM2 • Potential binary inputs and outputs • Potential system bus CAN 2 • Potential PROFIBUS
PROFIBUS connection X30P:1 ... X30P:9	9-pin sub D connector, pin assignment to IEC 61158
Bus terminator	Not integrated. Connect using a suitable PROFIBUS connector with terminating resistors that can be activated.
Automatic baud rate detection	9.6 kBaud ... 12 MBaud
Protocol options	PROFIBUS DP and DP-V1 to IEC 61158
GSD file	SEW_6007.GSD
DP ident. number	Not yet assigned
DeviceNet connection X30D:1 ... X30D:5	• 2-wire bus and 2-wire supply voltage DC 24 V with 5-pin Phoenix terminal • Pin assignment according to DeviceNet specification
Communication protocol	Master/slave connection set acc. to DeviceNet specification version 2.0
Number of process data words	Adjustable via DIP switches: • 1 ... 10 process data words • 1 ... 4 process data words with Bit-Strobe I/O
Baud rate	125, 250 or 500 kBaud; can be set using DIP switches 2^6 and 2^7
Bus cable length	For thick cable according to DeviceNet specification 2.0 Appendix B • 500 m at 125 kbaud • 250 m at 250 kbaud • 100 m at 500 kbaud
Transmission level	ISO 11 98 - 24 V
MAC-ID	0 ... 63; can be set using DIP switches 2^0 ... 2^5 Max. 64 stations
Supported services	• Polled I/O: 1 ... 10 words • Bit-Strobe I/O: 1 ... 4 words • Explicit message: – Get_Attribute_Single – Set_Attribute_Single – Reset – Allocate_MS_Connection_Set – Release_MS_Connection_Set

8.4 MOVI-PLC® advanced compact controller

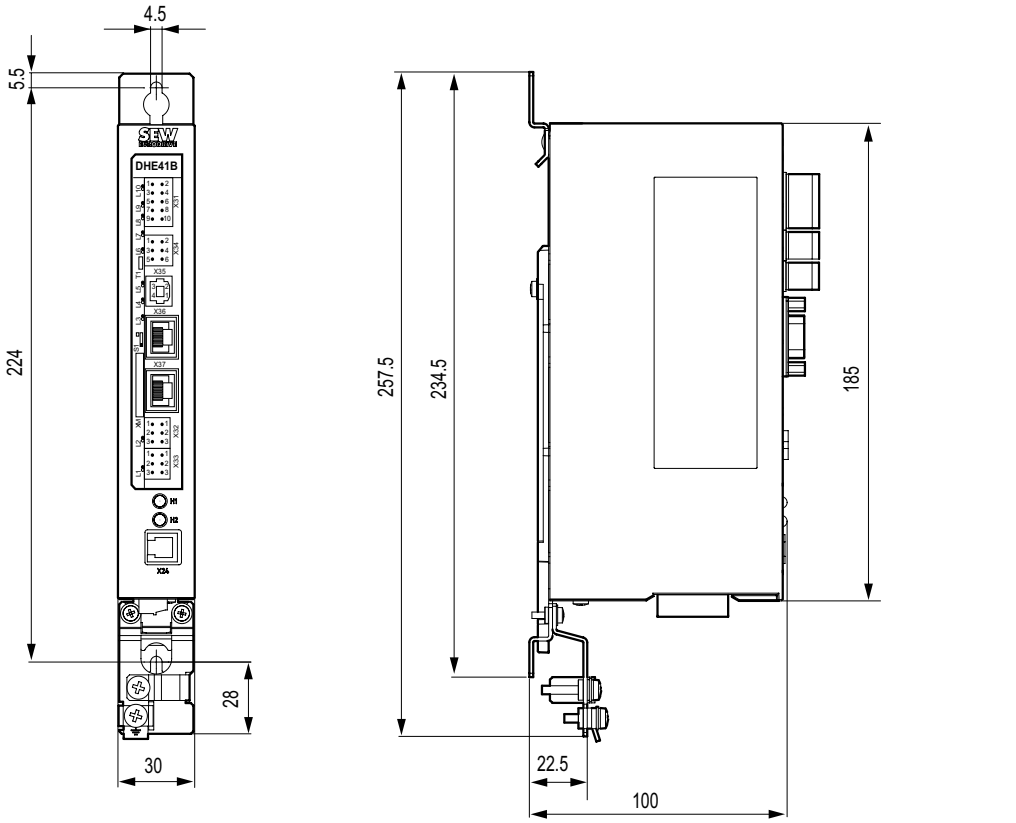
MOVI-PLC® *advanced* compact controller	
Unit types	• MOVI-PLC® *advanced* DHE41B / UOH11B • MOVI-PLC® *advanced* DHF41B / UOH21B
Electrical supply	• X26: U = DC 24 V (–15 % / +20 %) DGND is to be grounded (PELV) • Power consumption P_{max} = 8.5 W, I_{max} = 600 mA • X31: You will have to supply the binary inputs and outputs with DC 24 V separately.

Note the following:

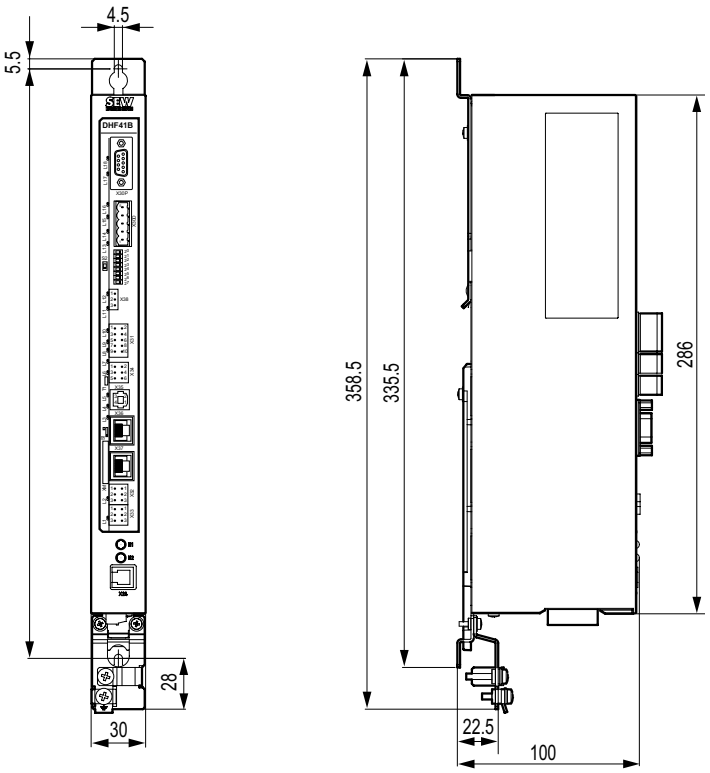
- The CAN1 system bus is connected in parallel to X33 and X26.
- The RS485 interface COM 1 is connected in parallel to X34 and X24.
- The remaining technical data is identical to that in Sec. 8.1 and 8.2.

8.5 Dimension drawings MOVI-PLC® advanced compact controller DH.41B/UOH..B

8.5.1 Dimension drawing for DHE41B / UOH11B



8.5.2 Dimension drawing for DHF41B / UOH21B



61496AXX

9 Index

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**	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@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 Dänkritzer 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
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@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.usocome.com sew@usocome.com
Production	**Forbach**	SEW-EUROCOME Zone Industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
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
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

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

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
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.sew-eurodrive.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 contact@sew-eurodrive.hk

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**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & 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

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr

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.sew-eurodrive.lu info@caron-vector.be

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 MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial 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

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	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@sentoo.sn

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. Rybničná 40 SK-83554 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. Rudlovská 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. UI. 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 94 43184-70 Fax +34 94 43184-71 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**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 5, Rue El Houdaibiah 1000 Tunis	Tel. +216 71 4340-64 + 71 4320-29 Fax +216 71 4329-76 tms@tms.com.tn

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 / 164 3838014/15 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr 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
Sales	**Kiev**	SEW-EURODRIVE GmbH S. Oleynika str. 21 02068 Kiev	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 kso@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

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 worldwide service network that is always close at hand.

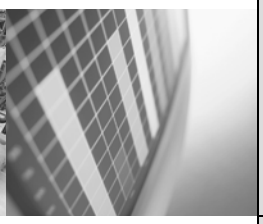
With drives and controls that automatically improve your productivity.

With comprehensive knowledge in virtually every branch of industry today.

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







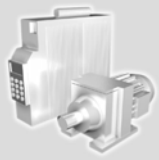
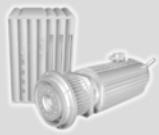
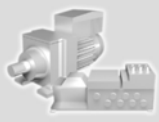
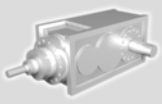


SEW-EURODRIVE
Driving the world

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

With innovative technology that solves tomorrow's problems today.

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

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**