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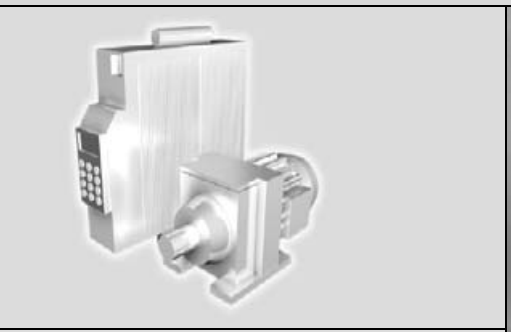

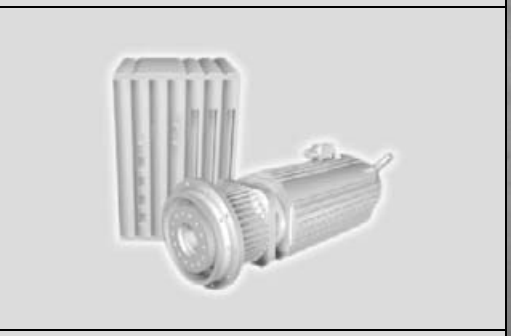

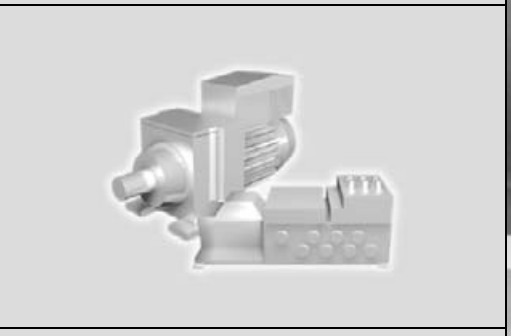

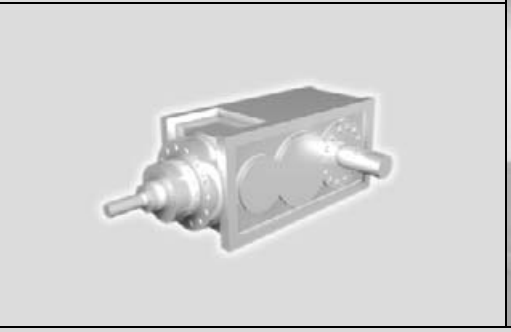

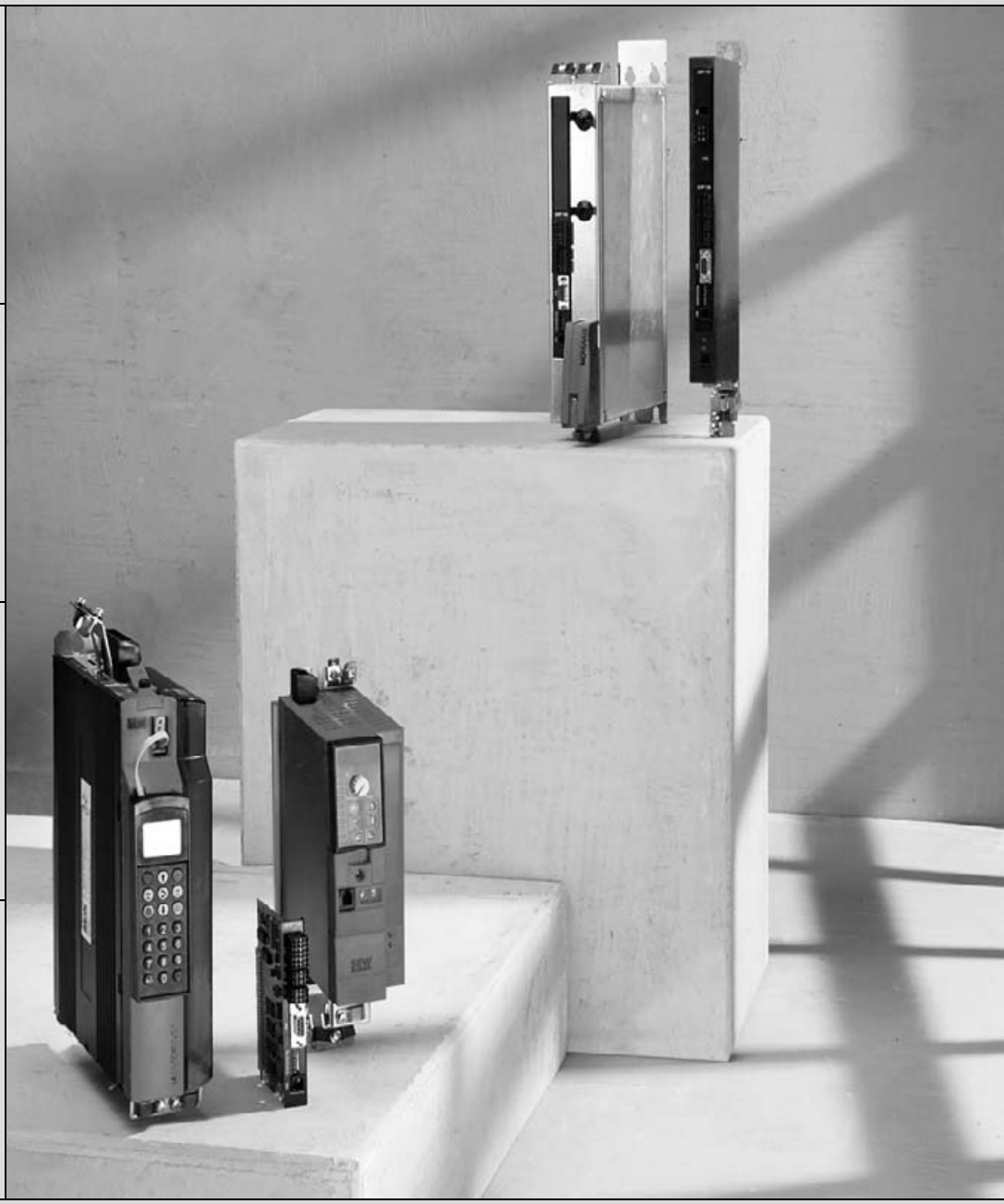

MOVI-PLC® basic DHP11B.. Controller

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Manual

SEW
EURODRIVE

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1 Important Notes

- **This manual does not replace the detailed operating instructions!**
- **Only trained personnel are allowed to perform installation and startup observing valid accident prevention regulations and the MOVIDRIVE® MDX60B/61B, MOVITRAC® B or MOVIAXIS® operating instructions!**

Documentation

- Read through this manual carefully before you start installation and startup of MOVIDRIVE® MDX60B/61B, MOVITRAC® B or MOVIAXIS® with the MOVI-PLC® *basic* DHP11B.. controller.
- This manual assumes that the user has access to, and is familiar with, 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 to 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 named in these operating instructions are trademarks or registered trademarks of the titleholders.

Explanation of the safety and warning symbols

Always follow the safety and warning notes in this publication.

Electrical hazard
Possible consequences: Severe or fatal injuries.

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the unit and the environment.

Tips and useful information.

2 Introduction

Content of the manual

This user manual describes:

- How to install the MOVI-PLC® *basic* DHP11B.. controller in MOVIDRIVE® MDX61B
- Assembly and installation of the OST11B option
- Interfaces and LEDs of the MOVI-PLC® *basic* DHP11B.. controller and the OST11B option
- The installation of the MOVI-PLC® *basic* DHP11B.. controller in the MOVIDRIVE® MDX61B und MOVITRAC® B inverters, in the MOVIAXIS® servo inverter and as compact control
- Engineering access to the MOVI-PLC® *basic* DHP11B.. controller
- The project planning and startup of the MOVI-PLC® *basic* DHP11B.. controller and of the controlled inverters and servo inverters
- Operation with the PROFIBUS fieldbus system

Additional documentation

To configure and startup the MOVI-PLC® *basic* DHP11B.. controller simply and effectively, you should also request the following publications in addition to this manual:

- "MOVI-PLC® Programming in the PLC Editor" system manual
- "Libraries MPLCMotion_MDX and MPLCMotion_MX for MOVI-PLC® "manual
- "Libraries MPLCMotion_MC07 and MPLCMotion_MM for MOVI-PLC® "manual
- MOVIDRIVE® MDX60B/61B system manual
- MOVITRAC® B system manual
- MOVIAXIS® system folder

The MOVI-PLC® system manual "MOVI-PLC® programming in the PLC-Editor" contains instructions for IEC 61131-3 compliant MOVI-PLC® programming.

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

2.1 MOVI-PLC® – comprehensive, scalable, powerful

Features

MOVI-PLC® is a series of programmable logic controllers for inverters. It enables the convenient and efficient automation of drive solutions, as well as logic processing and sequence control using IEC 61131-3 compliant programming languages.

- MOVI-PLC® is a **comprehensive** solution because 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 (e.g. electronic cam, synchronous operation) and the control of demanding applications (e.g. material handling).

Control classes

- MOVI-PLC® *basic* DHP11B.. allows coordinated single axis movements and integration of external inputs / outputs as well as Drive Operator Panels (DOP). This makes MOVI-PLC® *basic* DHP11B.. suitable for the task of module controller and also for that of stand-alone controller for machines of medium complexity.
- MOVI-PLC® *advanced* 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 cells and machines. The integrated Ethernet interface allows direct connection of the MOVI-PLC® *advanced* to the control level.

2.2 MOVI-PLC® basic DHP11B.. controller

Features

MOVI-PLC® *basic* DHP11B.. is available in two designs:

- As **control card** MOVI-PLC® *basic* DHP11B.. , as an option for the MOVIDRIVE® B, and MOVITRAC® B inverters, and for MOVIAXIS® servo inverters.
- The MOVI-PLC® *basic* control is also available as **compact control** for mounting on a DIN rail. As compact control, it is designed for controlling inverters (→ Sec. 8 "Technical Data").

Unit types

The MOVI-PLC® *basic* DHP11B.. controller is available in three designs, which differ according to different POUs from various libraries:

Unit Type MOVI-PLC® *basic* DHP11B..	Functions
DHP11B-T0	Administration, speed control, positioning, e.g. with the MPLCMotion_MDX library
DHP11B-T1 (application version 1)	Additionally, e.g. cam disk, electronic gear, cam controller
DHP11B-T2 (application version 2)	Additionally, e.g. material handling

Engineering

Engineering of the MOVI-PLC® *basic* DHP11B.. control includes the following activities:

- Configuration
- Parameter settings
- Programming

These activities are carried out using MOVITOOLS® MotionStudio engineering software. This software has a number of useful features for the startup and diagnostics of all SEW-EURODRIVE units. The MOVI-PLC® *basic* DHP11B.. controller is connected to the engineering PC using one of the interfaces described in the following sections.

Communication interfaces

The MOVI-PLC® DHP11B.. control is equipped with numerous communication interfaces.

The two system bus interfaces CAN 1 and CAN 2 are used primarily for connection. They also serve to control several inverters and to integrate decentralized I/O modules. SEW-EURODRIVE recommends connecting a maximum of 64 inputs and 64 outputs to the MOVI-PLC® *basic* DHP11B.. controller.

This machine module can be operated via a PROFIBUS slave interface with a higher-level controller.

The RS485 interface is used as an engineering interface or to connect terminals (e.g. DOP11A).

Automation topologies

Use as a stand-alone machine controller

You can also use the MOVI-PLC® *basic* DHP11B.. controller as a control unit for an entire machine.

If used without a higher-level PLC, the MOVI-PLC® *basic* DHP11B.. controller takes over all control tasks, including controlling drives and other actuators, as well as evaluating decentralized inputs and outputs.

In this type of stand-alone topology, operator terminals (DOP11A) function as the interface between the operator and machine. The operator terminals (DOP11A) come equipped with an integrated Web server and act as interface to the company's Ethernet network.

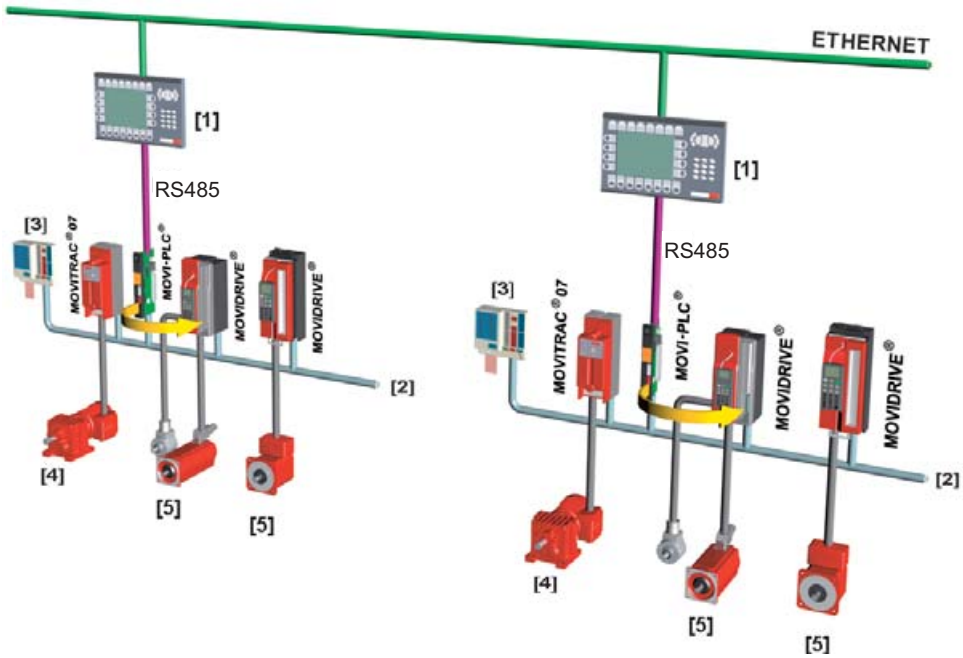

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Figure 1: Example of a topology for using the MOVI-PLC® basic DHP11B.. controller as the stand-alone control for an entire machine

[1] Operator terminal (e.g. DOP11A drive operator panel)

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

[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® *basic* DHP11B.. controller for decentralized automation of a machine module (see following figure). In this way, the MOVI-PLC® *basic* DHP11B.. controller coordinates motion sequences in the axis system.

The control card is connected to a higher-level PLC via the PROFIBUS interface.

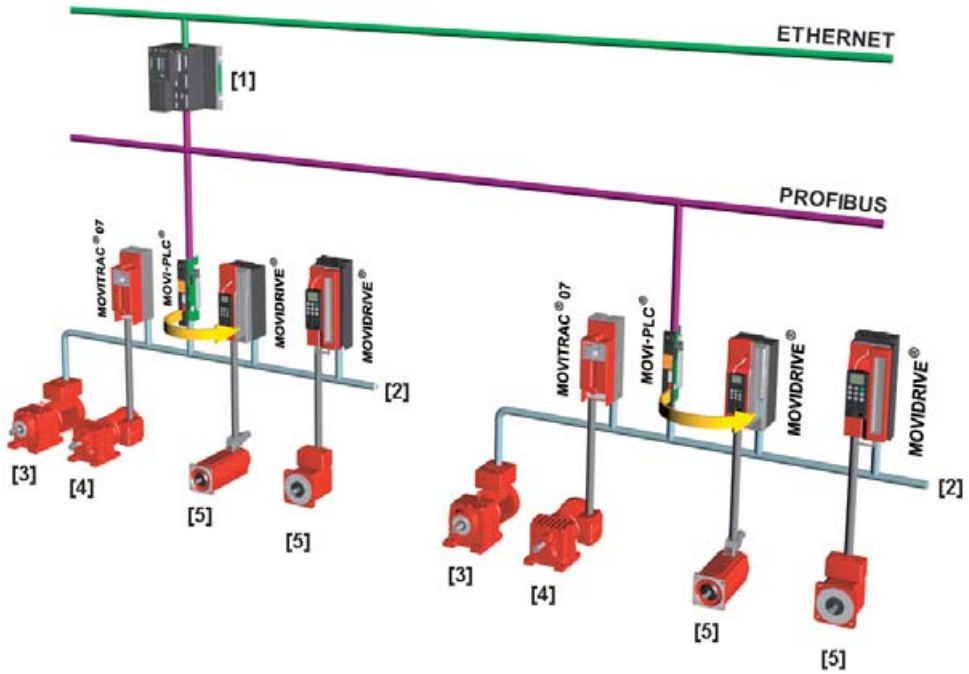

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Figure 2: Example of a topology for controlling each machine module with MOVI-PLC® basic DHP11B.. controller

[1] Higher-level PLC

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

[3] MOVIMOT® (via fieldbus interface CANopen MFO... / direct connection with MOVI-PLC® via RS485 interface COM2)

[4] Asynchronous motor

[5] Synchronous servomotor / asynchronous servomotor

System buses CAN 1 and CAN 2

You can use the MOVI-PLC® *basic* DHP11B.. controller to control a machine module by coupling several inverters via the system bus. The MOVI-PLC® *basic* DHP11B.. controller controls all the drives in the machine module and thereby relieves the higher-level control (e.g. machine or system PLC) of load. You can connect a maximum of **twelve** of the following devices to the MOVI-PLC® *basic* DHP11B.. controller using system buses CAN 1 and CAN 2, which means a maximum of **six** per CAN interface:

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

In the case of manual setup of SCOM objects, more than 12 inverters can be controlled depending on the data to be transferred (→ Sec. 8.1).

Configuring the PROFIBUS interface

The PROFIBUS station address is set using the DIP switches on the front of the MOVI-PLC® *basic* DHP11B.. controller. This manual setting means the MOVI-PLC® *basic* DHP11B.. controller can be integrated into the PROFIBUS environment and switched on within a very short period of time. The higher-level PROFIBUS master can automatically set the parameters (parameter download).

This option offers the following advantages:

- Less time required to start up the system
- Simple documentation of the application program, since 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 exchange usually takes place cyclically, drive parameters are read or written acyclically via functions such as *read* or *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 master 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 as part of the PROFIBUS-DP 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 demands additional monitoring functions for the drive technology, e.g. 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 interface COM1

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

- Engineering PC, or
- DOP11A operator terminal

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 freely use the binary inputs and outputs in the PLC Editor of the MOVITOOLS® MotionStudio software in programming.

Diagnostics

The seven LEDs of the MOVI-PLC® *basic* DHP11B.. controller indicate the following states:

- Voltage supply of the binary inputs and outputs (LED 1)
- General status of the MOVI-PLC® *basic* DHP11B.. controller (LED 2)
- Status of the control program (LED 3)
- Status of the PROFIBUS interface (LED 4, 5)
- Status of the two CAN interfaces (LED 6, 7)

You can connect operator terminals to perform diagnostics. It is recommended to connect an operator terminal to RS485. Connection to interfaces CAN 1 or CAN 2 is in preparation.

2.3 OST11B option

Features

In conjunction with MOVI-PLC® basic DHP11B.. controller, the OST11B option offers you a further RS485 interface COM2 in terminal design or as an engineering interface (RJ10-socket).

RS485 interface COM2

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

- Engineering PC, or
- DOP11A operator terminal, or
- Gearmotor with integrated frequency inverter MOVIMOT®

Diagnostics

An LED indicates correct connection to the MOVI-PLC® *basic* DHP11B.. controller.

3 Assembly / Installation Instructions

3.1 Mounting options for the MOVI-PLC® basic DHP11B.. controller

Observe the following installation instructions:

- **You can plug the MOVI-PLC® basic DHP11B.. controller into the MOVIDRIVE® MDX61B drive inverter but not into the MOVIDRIVE® MDX60B drive inverter.**
- **Option cards can only be installed or removed for MOVIDRIVE® MDX61B sizes 1 to 6.**
- **The installation or removal of option cards for MOVIDRIVE® MDX61B size 0 drive inverters can only be carried out by SEW-EURODRIVE engineers .**
- **Only SEW-EURODRIVE engineers are authorized to install or remove the MOVI-PLC® *basic* DHP11B.. controller in or from MOVITRAC® B or MOVIAXIS® and to mount the MOVI-PLC® DHP11B../UOH..B compact control.**

3.2 Installing MOVI-PLC® basic DHP11B.. in MOVIDRIVE® MDX61B

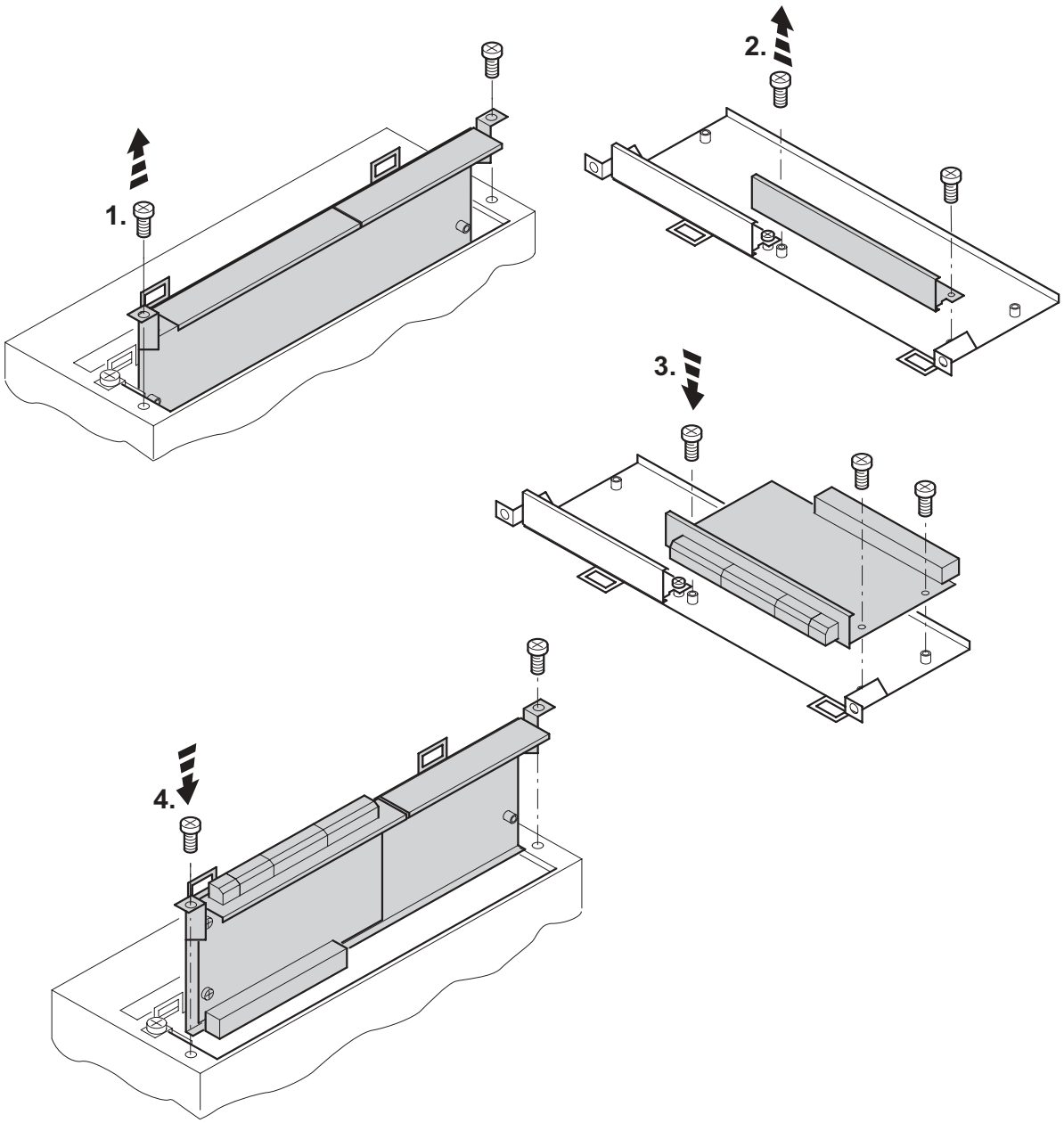
The MOVI-PLC® *basic* DHP11B.. controller must be plugged into the fieldbus slot or expansion slot of the MOVIDRIVE® MDX61B.

Before you start

Read the following notes before installing or removing the MOVI-PLC® basic DHP11B.. controller:

- Disconnect the drive inverter from power. Switch off the DC 24 V and the supply voltage.
- Take appropriate measures to avoid electrostatic charges (use discharge strap, conductive shoes, etc.) before touching the MOVI-PLC® *basic* DHP11B...
- **Before installing** the MOVI-PLC® *basic* DHP11B.. controller, remove the keypad and the front cover.
- **After installing** the MOVI-PLC® *basic* DHP11B.. controller, replace the front cover and the keypad.
- Keep the MOVI-PLC® *basic* DHP11B.. controller in its original packaging until immediately before you are ready to install it.
- Hold the MOVI-PLC® *basic* DHP11B.. controller by its edges only. Do not touch any components.
- Never place the MOVI-PLC® *basic* DHP11B.. controller on a conductive surface.

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



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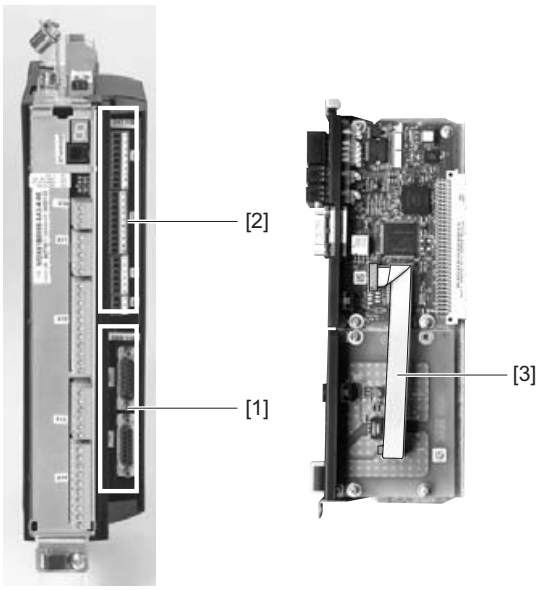
1. Remove the retaining screws holding the card retaining bracket. Pull the card retaining bracket out evenly from the slot (do not twist!).
2. Remove the retaining screws of the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the retaining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

3.3 Installation of OST11B option in MOVIDRIVE® MDX61B

Installation options

- If the MOVI-PLC® *basic* DHP11B.. controller is installed in the fieldbus slot [2], you must install the OST11B option in the encoder slot [1]. Observe the instructions in section 3.2. Connect the OST11B option and the MOVI-PLC® *basic* DHP11B.. controller using the supplied ribbon cable [3] and install the completely assembled option card holder in MOVIDRIVE® MDX61B.



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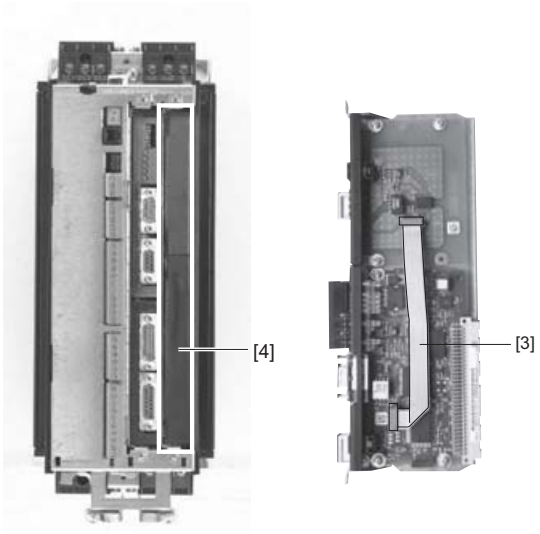
- If the MOVI-PLC® *basic* DHP11B.. controller is installed in the expansion slot [4], you must install the OST11B option in the expansion slot above the MOVI-PLC® *basic* DHP11B.. controller. Observe the instructions in section 3.2. Connect the OST11B option and the MOVI-PLC® *basic* DHP11B.. controller using the supplied ribbon cable [3] and install the completely assembled option card holder in MOVIDRIVE® MDX61B.



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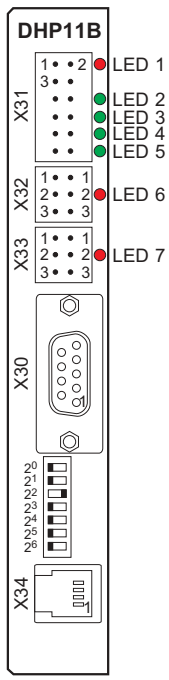
3.4 Installation of MOVI-PLC® basic DHP11B.. controller

3.4.1 Functional description of the terminals, DIP switches and LED

Front view MOVI-PLC® *basic* DHP11B.. controller	Designation	LED DIP switches Terminal		Function
 58473AXX	**LED**	**LED 1** **LED 2** **LED 3** **LED 4** **LED 5** **LED 6** **LED 7**	24V / I/O OK PLC status IEC progr. status Run Profibus Fault Profibus CAN 2 status CAN 1 status	Status of voltage supply I/O Status of control firmware Status of control program Status of PROFIBUS bus electronics Status of PROFIBUS communication Status of CAN 2 system bus Status of CAN 1 system bus
	Connector 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** **X31:11** **X31:12**	+ 24 V input REF24V DIO 0 DIO 1 DIO 2 DIO 3 DIO 4 DIO 5 DIO 6 DIO 7 VO24 REF24V	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 Voltage output DC+24V Reference potential for binary signals
	Connector X32: **System bus CAN 2** **(electrically isolated)** **(plug-in terminals)**	**X32:1** **X32:2** **X32:3**	BZG_CAN 2 CAN 2H CAN 2L	Ref. potential for system bus CAN 2 System bus CAN 2 high System bus CAN 2 low
	Connector X33: **System bus CAN 1** **(plug-in terminals)**	**X33:1** **X33:2** **X33:3**	DGND CAN 1H CAN 1L	Ref. potential for system bus CAN 1 System bus CAN 1 high System bus CAN 1 low
	Connector X30: **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 termination Reference potential for PROFIBUS PROFIBUS control signal for repeater Signal receive transmit positive Terminal unassigned Terminal unassigned
	Connector X34: **RS485 interface COM1** **(RJ10 socket)**	**X34:4** **X34:3** **X34:2** **X34:1**	DGND RS- RS+ 5V	Reference potential Signal RS485 Signal RS485+ Voltage output DC+5 V
	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

3.4.2 Connecting binary inputs and outputs (connector X31)

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

You can program the binary inputs / outputs in the PLC Editor of the MOVITOOLS® MotionStudio software.

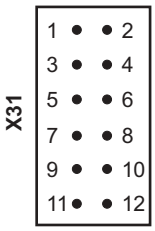


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Figure 3: 12-pin connector for connecting binary inputs and outputs

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 ms.

Binary outputs

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

- To avoid damage to the MOVI-PLC® *basic* DHP11B.. controller and to preserve the specified function of the binary inputs and outputs, the supply voltage must be present on pins X31: 1/2 when using the inputs and outputs. If the supply voltage is stopped, you must turn off all other current supplies to X31:1 ... 12, e.g. the DC 24 V from switches and sensors at the binary inputs.
- To avoid the danger of maximum voltage peaks, you may not connect inductive loads to the supply voltage or to the binary inputs or outputs without free-wheeling diodes.

Cable specification

- Only connect cables with a minimum core cross section of 0.25 mm^2 (AWG23) and a maximum core cross section of 1 mm^2 (AWG18). IEC 60999 does allow clamping without conductor end sleeves.
- Choose the type and core cross section of the connected cable in dependency of 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 78.

3.4.3 Connecting CAN 2 system bus (connector X32) / CAN 1 (connector 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, it is recommended to use the CAN 2 (X32) interface for connecting field devices (e.g. CANopen inputs and outputs).
- The CAN 1 system bus is **not** electrically isolated. Therefore, it is recommended to use the CAN 1(X33) interface to connect inverters via the system bus in the control cabinet.
- SEW-EURODRIVE recommends connecting a maximum of 64 inputs and 64 outputs via I/O modules to the MOVI-PLC® *basic* DHP11B.. .
- No CAN system bus connection is necessary for communication between MOVIDRIVE® MDX61B and its installed controller MOVI-PLC® *basic* DHP11B.. if you use the "DPRAM" channel (→ System manual "MOVI-PLC® programming in PLC-Editor). A CAN system bus connection is, however, necessary if POUs from the MPLCMOTION_MDX and MPLCprocessdata libraries are employed.

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 about the CAN system bus. This manual can be ordered from SEW-EURODRIVE.

Wiring diagram for CAN 2 system bus

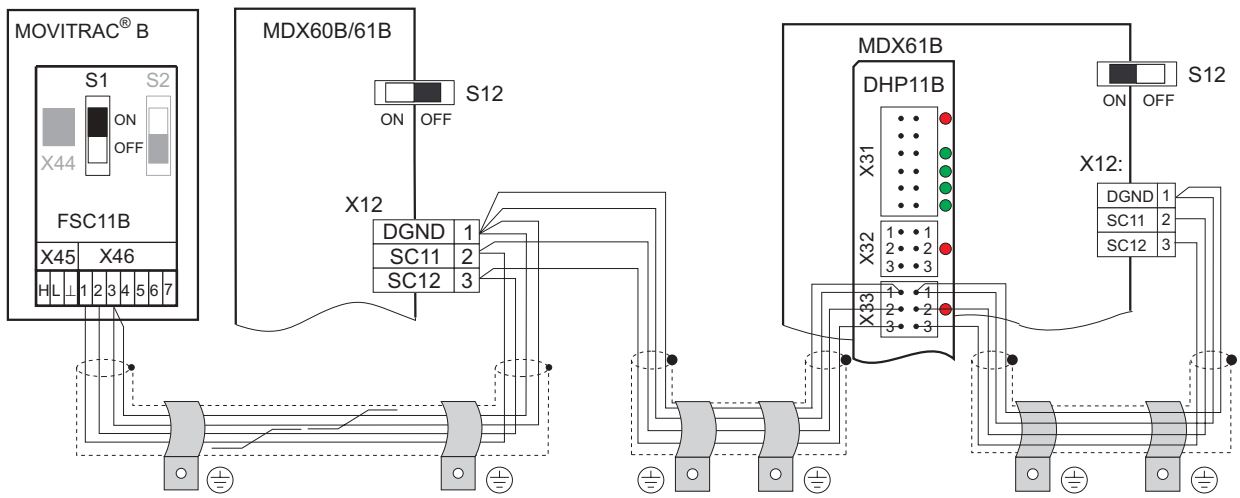

Figure 4: CAN 2 system bus connection using the example of MOVIDRIVE® MDX60B/61B / MOVITRAC® B

Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). IEC 60999 does allow clamping without conductor end sleeves. 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 2 system bus connection (MOVIDRIVE® B, DIP switch S12 = ON; MOVITRAC® B, DIP switch S1 = ON). For all other devices, turn off the terminating resistor (MOVIDRIVE® B, DIP switch S12 = OFF; MOVITRAC® B, DIP switch S1 = OFF). If the MOVI-PLC® *basic* DHP11B.. controller is, for example, located at the end of the CAN 2 system bus, you have to connect a terminating resistor of 120 between pins X32:2 and X32:3 (for CAN 1: terminating resistor between pin X33:2 and pin X33:3).

STOP

- There **should** not tbe 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.

3.4.4 Connecting PROFIBUS (connector X30)

Connection to the PROFIBUS system is made using a 9-pin sub D connector in compliance with IEC 61158. The T-bus connection must be made using a connector with the corresponding configuration. The following figure shows the PROFIBUS connector that is connected to X30 of the MOVI-PLC® *basic* DHP11B.. controller.

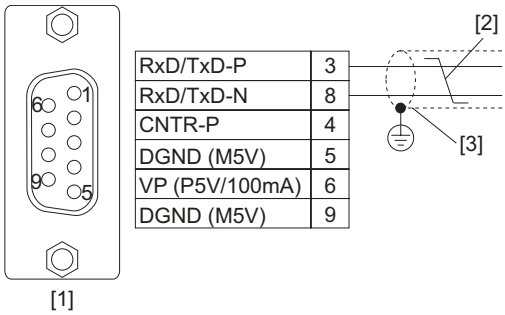

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Figure 5: Assignment of 9-pin sub D plug to IEC 61158

[1] 9-pin sub-D connector

[2] Signal line, twisted

[3] Conductive, wide area connection is necessary between the connector housing and the shield

Connecting MOVIDRIVE® / PROFIBUS

As a rule, the MOVI-PLC® *basic* DHP11B.. controller 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 at pin 3 (RxD/TxD-P) and pin 8 (RxD/TxD-N). Communication is carried out via these two pins. The RS485 signals RxD/TxD-P and RxD/TxD-N must all 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 operation of the MOVI-PLC® *basic* DHP11B.. controller with baud rates > 1.5 MBaud can only be operated with special 12 MBaud PROFIBUS connectors.

Bus termination

You do not need to equip the MOVI-PLC® *basic* DHP11B.. controller with bus terminating resistors. This allows the PROFIBUS system to be put into operation more easily and reduces the number of possible problems and faults during installation.

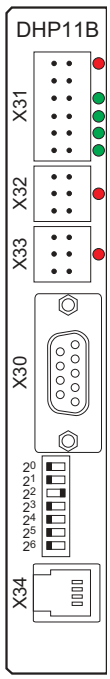
When the MOVI-PLC® *basic* DHP11B.. controller is located at the start or end of a PROFIBUS segment and when there is only one PROFIBUS cable connected to the MOVI-PLC® *basic* DHP11B.. controller, you must use a connector with an integrated bus terminating resistor.

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® *basic* DHP11B.. controller.

The MOVI-PLC® *basic* DHP11B.. controller supports the address range 0...125.



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The default setting for the PROFIBUS station address is 4:

2^0 → Significance: 1 0 = 0
2^1 → Significance: 2 0 = 0
2^2 → Significance: 4 1 = 4
2^3 → Significance: 8 0 = 0
2^4 → Significance: 16 0 = 0
2^5 → Significance: 32 0 = 0
2^6 → Significance: 64 0 = 0

Any change made to the PROFIBUS station address during ongoing operation does not take effect immediately. You have to switch the compact controller or the inverter in which MOVI-PLC® *basic* DHP11B.. controller is installed on and off again for the changes to take effect (power + 24 V off/on).

3.4.5 Connecting RS485 interface COM 1 (connector X34)

You can connect one of the following devices to the RS485 interface COM 1:

- Engineering PC, (→ Sec. 3.8) or
- DOP11A operator terminal

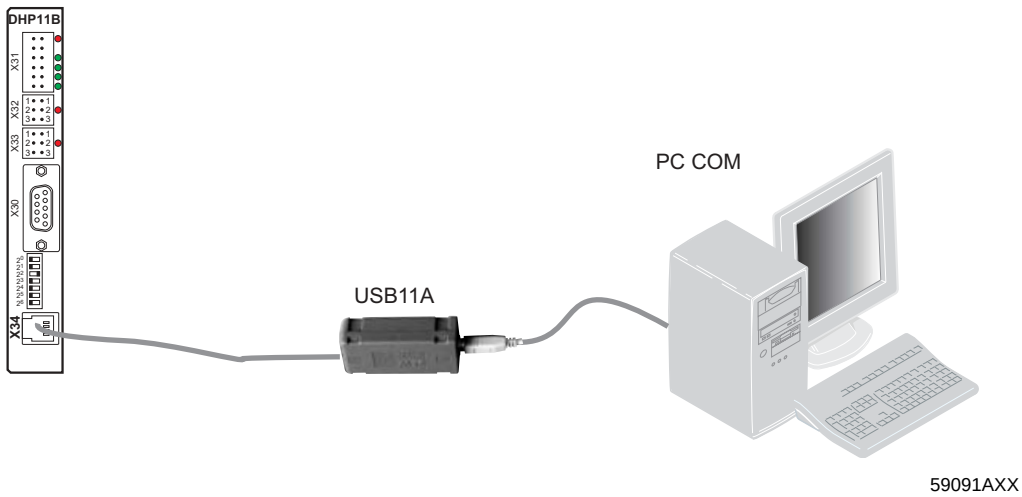


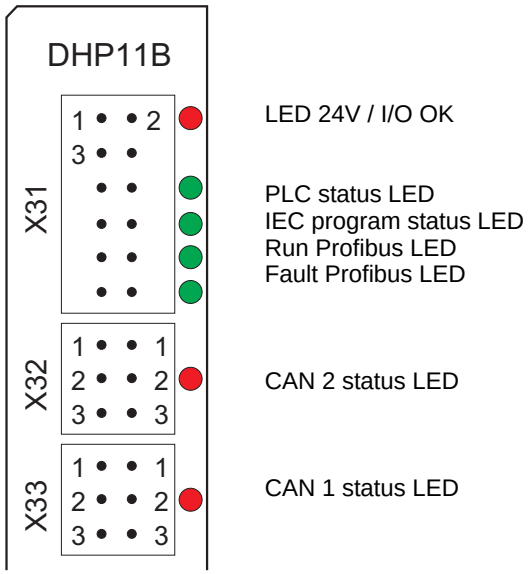
Figure 6: Example: Connection of an engineering PC

- There must not be any potential displacement between the units connected via the RS485. Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.
- 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 terminal manual.

3.4.6 Operating displays of the MOVI-PLC® basic DHP11B.. controller

The MOVI-PLC® *basic* DHP11B.. controller comes equipped with seven LEDs that indicate the current status of the MOVI-PLC® *basic* DHP11B.. controller and its interfaces.



24V / I/O OK LED The **24 V / 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 / outputs is OK.	-
Off	• Voltage supply for the binary inputs / outputs is not applied.	1. Switch off the drive inverter in which the MOVI-PLC® *basic* DHP11B.. controller is installed. 2. Check and correct the cabling of the binary inputs / outputs according to the electrical wiring diagram. 3. Check current consumption of the connected actuators (max. current, see section 8). 4. Switch on the drive inverter in which the MOVI-PLC® *basic* DHP11B.. controller is installed.
Orange	Voltage supply for the binary inputs/outputs is applied. However, one of the following faults has occurred: • Overload on one or several binary inputs / outputs • Overtemperature of the output driver • Short circuit in at least one of the binary inputs / outputs	

PLC status LED

The **PLC status** LED indicates the firmware status of the MOVI-PLC® *basic* DHP11B.. controller.

PLC status	Diagnostics	Remedy
Flashing green (1 Hz)	• Firmware of the MOVI-PLC® *basic* DHP11B.. controller is running correctly.	-

IEC program status LED

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 the program into the controller.
Flashing orange (1 Hz)	• Program has stopped.	-

Run Profibus LED

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. If the PROFIBUS station address is set to a value higher than 125, the MOVI-PLC® *basic* DHP11B.. controller will use 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.

Fault Profibus LED

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

BUS FAULT	Diagnostics	Remedy
Off	• The MOVI-PLC® *basic* DHP11B.. controller exchanges data with the PROFIBUS-DP master (data exchange status).	-
Red	• Connection to the DP master has failed • The MOVI-PLC® *basic* DHP11B.. controller does not recognize the PROFIBUS baud rate. • Bus interruption has occurred. • PROFIBUS-DP master not in operation.	• Check the PROFIBUS connection on the unit. • Check project planning of the PROFIBUS-DP master. • Check all the cables in the PROFIBUS network.
Flashing red (1 Hz)	• The MOVI-PLC® basic DHP11B.. controller recognizes the baud rate. However, the DP master does not address the MOVI-PLC® basic DHP11B.. controller. • The MOVI-PLC® *basic* DHP11B.. controller was either not configured in the DP master or it was configured incorrectly.	• Check and correct the PROFIBUS station address set in the MOVI-PLC® *basic* DHP11B.. controller 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.

CAN 2 status LED

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.	-
Flashes green (0.5 Hz)	• The CAN 2 system bus is currently in SCOM suspend mode.	-
Flashes 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.
Flashes 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.

CAN 1 status LED

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.	-
Flashes green (0.5 Hz)	• The CAN 1 system bus is currently in SCOM suspend mode.	-
Flashes 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.
Flashes 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.

3.5 Installation of OST11B option

3.5.1 Description of terminal and LED functions

Front view OST11B option	Designation	LED Terminal		Function
58586BXX	**Connector X35: RS485 COM 2 (RJ10 socket)**	X35:4 X35:3 X35:2 X35:1	BZG_COM 2 RS RS+ 5 V	Reference potential COM2 Signal RS485 Signal RS485+ Voltage output DC+5 V
	Connector X36: RS485 COM 2 (plug-in terminal)	**X36:1** **X36:2** **X36:3**	BZG_COM 2 RS+ RS	Reference potential COM2 Signal RS485+ Signal RS485
	LED	**CTRL.**		Status communication with MOVI-PLC basicDHP11B..

3.5.2 Connection RS485 interface COM 2 (connector X35 / X36)

You can connect one of the following devices to the RS485 interface COM 2:

- Engineering PC
- DOP11A operator terminal
- Gearmotor with integrated frequency inverter MOVIMOT®

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

We recommend you connect an engineering PC (→ Sec. 3.6) or a DOP11A operator terminal to X35. For more information on how to connect the DOP11A operator terminal, refer to the sections "Installation" and "Pin assignment" in the DOP11A operator terminal manual.

Connect a gearmotor with integrated MOVIMOT® frequency inverter to X36. Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:

- Core cross section: 0.25 ... 1.04 mm^2 (AWG 23 ... 17)
- Cable resistance: 100 ... 150 Ω at 1 MHz
- Capacitance per unit length ≤ 40 pF/m at 1 kHz

For example, the following cable is suitable:

- BELDEN (www.belden.com), data cable type 3107A

The permitted total cable length is 200 m.

3.5.3 OST11B option operating display

CTRL LED

The **CTRL** LED indicates correct communication with the MOVI-PLC® *basic* DHP11B.. controller.

CTRL	Diagnostics	Remedy
Green	• Communication between OST11B option and the MOVI-PLC® *basic* DHP11B.. controller is running correctly.	-
Off	• There is no communication between OST11B option and the MOVI-PLC® *basic* DHP11B.. controller.	• Provide the respective supply voltage to the unit in which the option is installed. • Check for correct wiring between OST11B option and the MOVI-PLC® *basic* DHP11B.. controller. (⟶ Sec. 3.3)

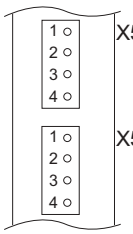
3.6 Installation of MOVI-PLC® basic DHP11B.. controller in MOVIDRIVE MDX61B

MOVI-PLC® *basic* DHP11B.. controller is installed as stipulated in section 3.4. The MOVI-PLC® *basic* DHP11B.. controller is supplied with voltage by MOVIDRIVE® MDX61B. A separate voltage supply is only required for the digital inputs and outputs (connector X31).

3.7 Installation of MOVI-PLC® basic DHP11B.. in the MOVIAXIS® master module

MOVI-PLC® *basic* DHP11B.. controller is installed as stipulated in section 3.4. To wire the system bus, connect connector X33 (CAN1) or X32 (CAN2) of the MOVI-PLC® *basic* DHP11B.. with connector X9 (MOVIAXIS supply module signalizing bus or of a MOVIAXIS® axis module) or with connector X12 (CAN2 bus of a MOVIAXIS® axis module). The MOVIAXIS® master module also provides further connections as described below.

3.7.1 Functional description of the terminals, X5a / X5b (MOVIAXIS® master module)

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

- The connectors X5a and X5b are connected in parallel. In this way, the voltage supply of the MOVIAXIS® master module can be provided from the right to X5b or from below to X5a. With connection to X5a, further modules can be connected via X5b (e.g. supply module, axis module). The voltage supply of brake (X5a/b:3, 4) is conducted by the MOVIAXIS® master module.
- The MOVI-PLC® *basic* DHP11B.. controller can be supplied by the MOVIAXIS® switched-mode power supply module (MXS) or from an external voltage supply. For this purpose, connect X5 between the individual devices.
- If the MOVI-PLC® *basic* DHP11B.. controller is supplied with DC 24 V by the MOVIAXIS® switched-mode power supply module, the function of the MOVI-PLC® *basic* DHP11B.. controller is maintained after disconnection from the power supply. This requires an external DC 24 V supply of the MOVIAXIS® switched-mode power supply module.

Wiring diagram

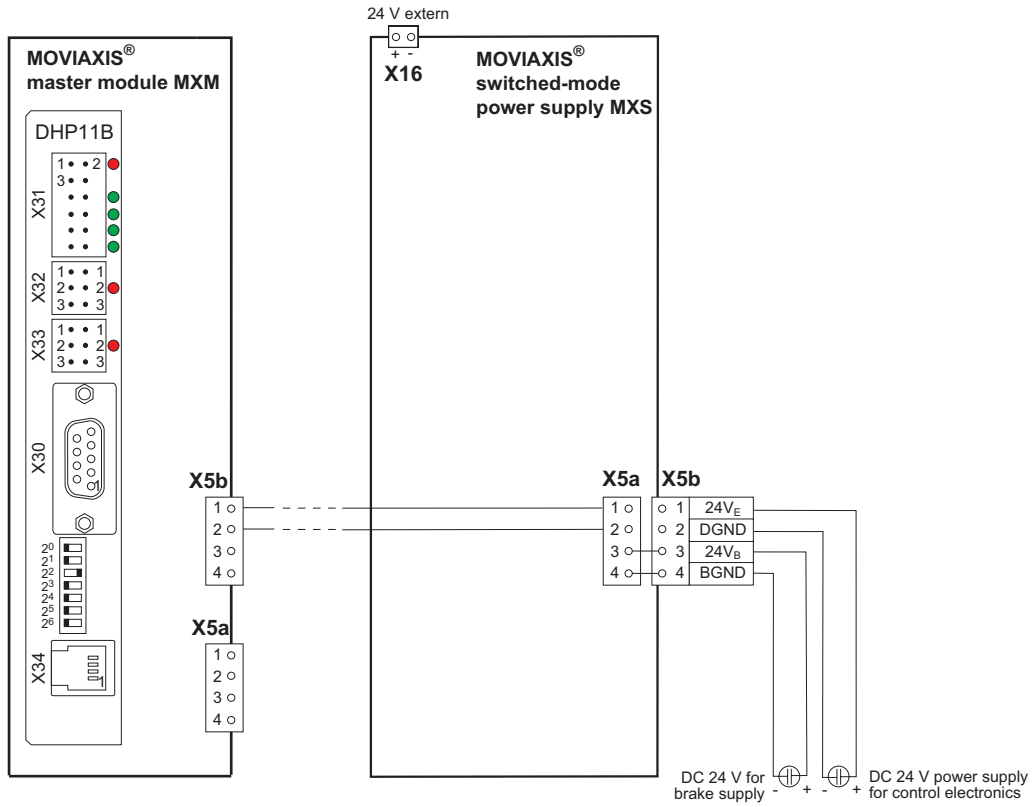
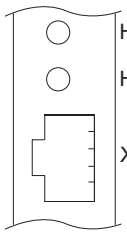


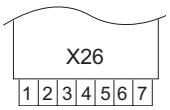
Figure 7: Installation of MOVI-PLC® basic DHP11B.. in MOVIAXIS®

3.8 Installation of MOVI-PLC® basic DHP11B in MC 07B / compact control

MOVI-PLC® *basic* DHP11B.. controller is installed as stipulated in section 3.4. The MOVITRAC® B optional slot and the compact control provide additional connections and operating displays of the MOVI-PLC® *basic* DHP11B.. controller as described below.

3.8.1 Description of terminal and LED functions

Front view MOVITRAC® B / compact control	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 control	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

3.8.2 Connection of RS485 interface COM 1 (connector X24)

The connectors X24 and X34 are connected in parallel. You can connect one of the following devices to both connectors:

- Engineering PC, or
- DOP11A operator terminal

For more information, refer to section 3.4.5.

3.8.3 Connection of CAN 1 system bus / voltage supply (connector X26)

X26:1/2/3 and connector X33 are connected in parallel (→ Sec. 3.4.3). Voltage for the MOVI-PLC® *basic* DHP11B.. controller in MOVITRAC® B or in the compact controller is supplied via X26:6/7.

The MOVI-PLC® *basic* DHP11B.. controller can be supplied with the required voltage by MOVITRAC® B. For this purpose, connect X26:3 (6) / 7 with X46:3 (6) / 7 or with X12:9 / 8. If the MOVI-PLC® *basic* DHP11B.. controller is supplied with DC 24 V by MOVITRAC® B, the function of MOVI-PLC® *basic* DHP11B.. controller is maintained after disconnection from the power supply. This requires an external DC 24 V supply to X12:8 / 9 of MOVITRAC® B.

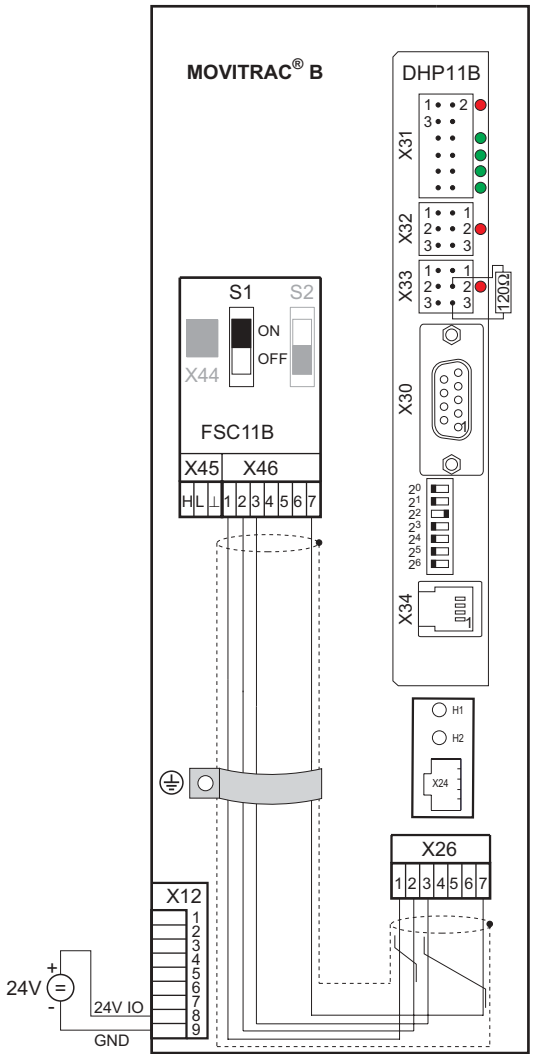


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Figure 8: Installation in MOVITRAC® B

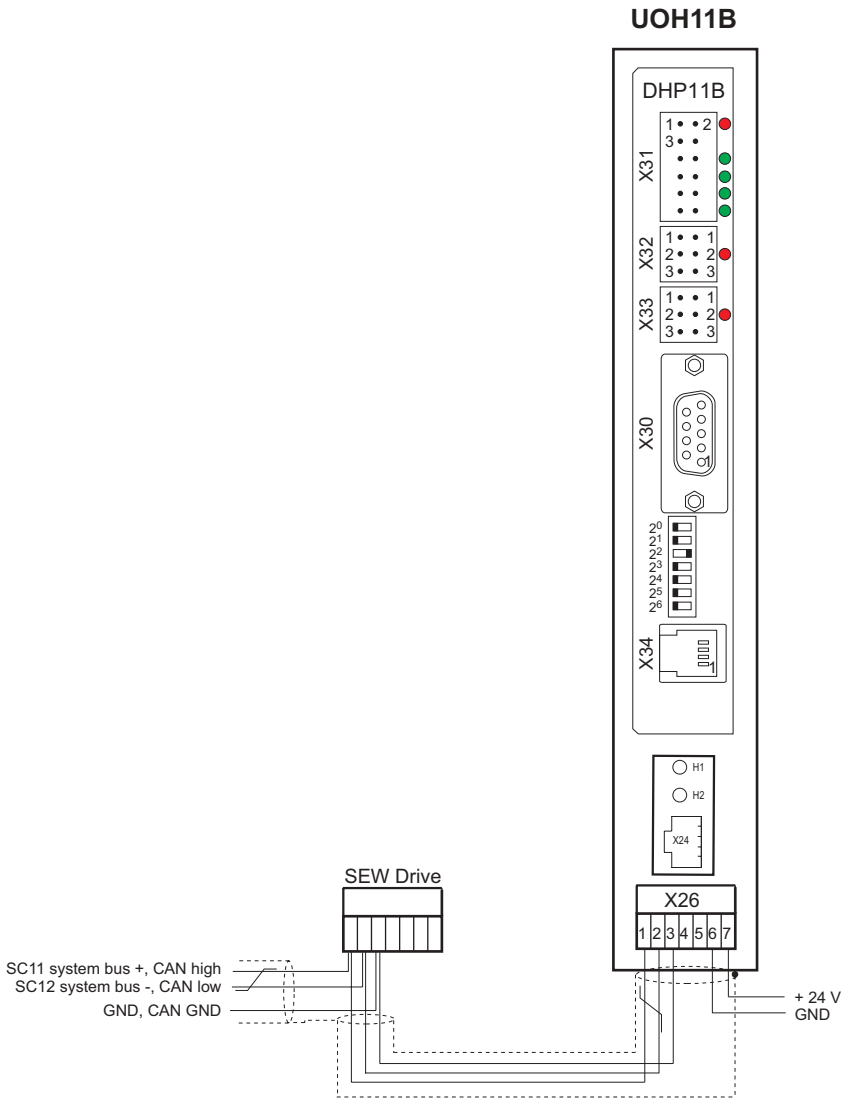

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Figure 9: Installation of MOVI-PLC® basicDHP11B.. compact control / UOH..B

3.8.4 Operating displays option slot MOVITRAC® B / compact control

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.

3.9 Engineering interfaces of the MOVI-PLC® basic DHP11B.. controller

Use one of the following interfaces for engineering access to the MOVI-PLC® basic DHP11B.. controller:

- RS485 (connector X34, X24, X35)
- CAN 1 (connector X33, X26)
- CAN 2 (connector X32)
- PROFIBUS (connector X30)

Use one of the following adapters if the engineering of the MOVI-PLC® *basic* DHP11B.. controller takes place via the USB interface of the engineering PC:

- Interface adapter USB11A (USB → RS485)
- Commercially available USB CAN dongle (e.g. PCAN USB adapter supplied by PEAK-System Technik GmbH)

If the MOVI-PLC® *basic* DHP11B.. controller is to be configured via the PROFIBUS interface, use the C2 Profibus master cards CP5511, CP5611 or CP5512 and the "STEP7 V5.3" software and "SIMATIC Net PB Softnet-DP 6.1" from Siemens AG.

Read the installation instructions and information (e.g. for using suitable drivers) in the MOVITOOLS® MotionStudio software (in the section "Documentation and additional information" of the initial pages or in the "Tools_and_Drivers" directory.

When engineering over the PROFIBUS or RS485 interfaces of the MOVI-PLC® *basic* DHP11B.. controller, inverters connected to the control are routed through the control.

3.10 Shielding and routing bus cables

Having the bus cables correctly shielded attenuates parasitic interference, which can occur in an industrial environment. 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 metal-plated or metallic 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 Project Planning and Startup

This section provides information on project planning and startup

- for the MOVI-PLC® *basic* DHP11B.. controller
- for inverters controlled using the MOVI-PLC® *basic* DHP11B.. controller
- for the PROFIBUS-DP master

4.1 Project planning using the MOVITOOLS® MotionStudio PC software

Project selection

- Start the MOVITOOLS® MotionStudio software.

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Figure 10: MOVITOOLS® MotionStudio startup window

[1] Option [New project]

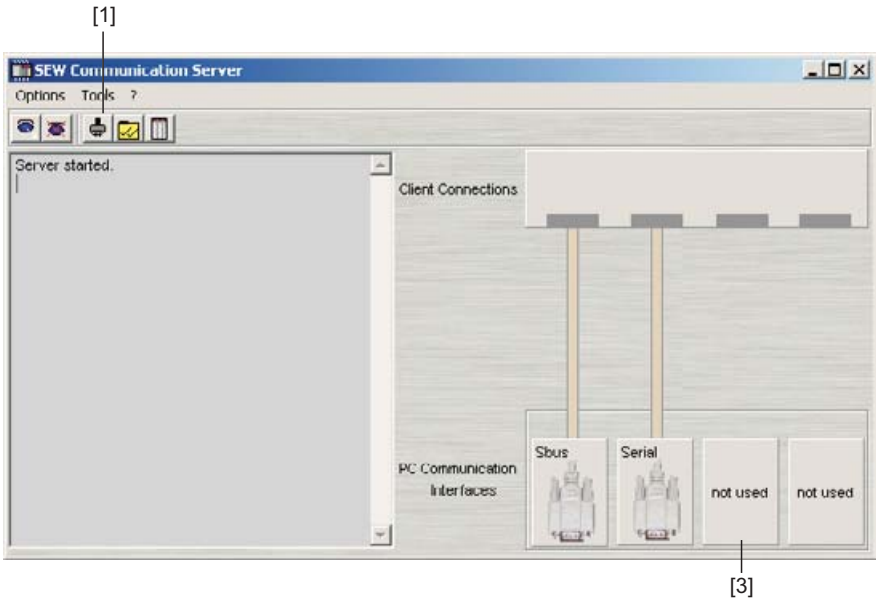
[2] Option [Open Project]

- To create a new project, select the option [New project] [1].
- To open an existing project, select the option [Open project] [2].

Configuring the engineering interface

The SEW communication server SECOS is started automatically and appears in the task bar.

To open the SEW communication server SECOS, double-click the icon < > on the task bar.



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Configure the PC interface according to the units connected to the engineering PC as follows:

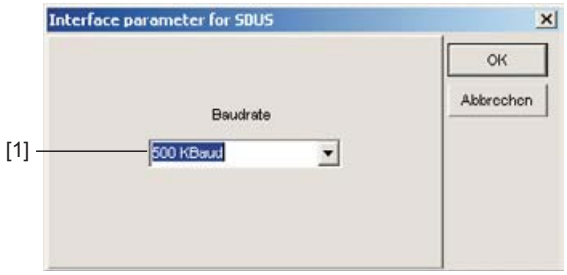
- Click the icon < > [1].
- Copy the required interface type from the field [Available Plugs] [2] by drag & drop into the field [not used] [3].

Configure the parameters of the PC interfaces as follows:

- Click the right mouse button on the required "PC Communication Interface" and select [Configure] in the [Options] menu.
- The following window opens. Set the parameters in accordance with the used interfaces.

Settings for a system bus interface

Set the baud rate [1] depending on the number of stations connected to the CAN bus.



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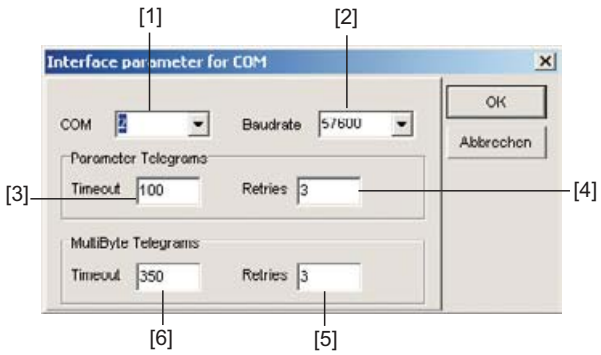
– SEW default: 500 kBaud
– CANopen module: 125 kBaud

Settings for COM interface



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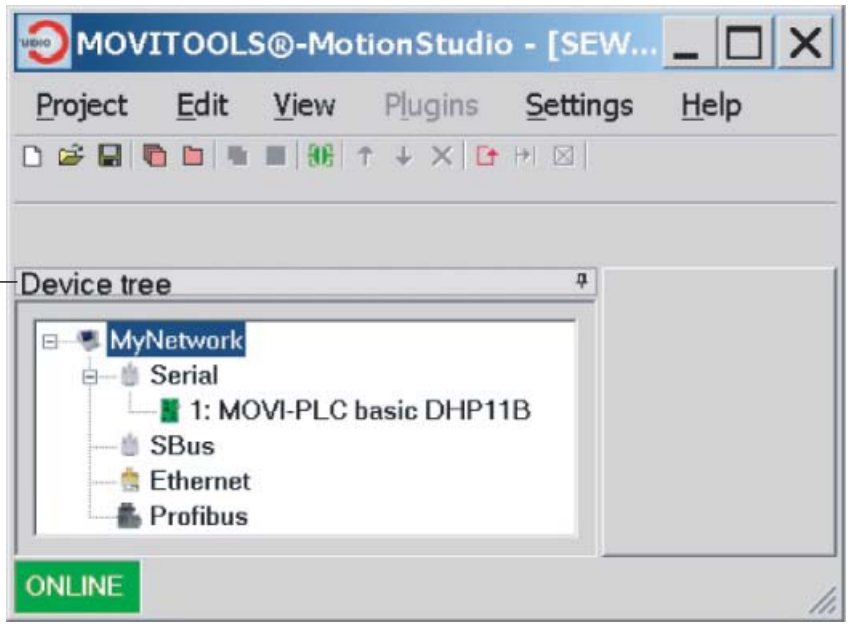
– Dropdown menu COM [1]: according to bus connection

  If you use a USB-RS485 interface adapter, select the corresponding interface identified in parentheses by "USB".
– Dropdown menu baud rate [2]: 57600 kBaud
– Group parameter telegrams, input window timeout [3]: 100
– Group parameter telegrams, input window retries [4]: 3
– Group multibyte telegrams, input window timeout [6]: 350
– Group multibyte telegrams, input window retries [5]: 3

Unit-specific tool selection

- Click on the icon < > (Scan) in MOVITOOLS® MotionStudio. The software now displays all units connected to the engineering PC (→ following figure) in a tree structure [1].



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- Start the PLC Editor. To do so, click (for example) the right mouse button on the "MOVI-PLC® basic DHP11B" entry.
- The PLC Editor serves for programming the MOVI-PLC® basic DHP11B.. controller. For further information on programming the MOVI-PLC® *basic* DHP11B.. controller, refer to the system manual "MOVI-PLC® programming in the PLC Editor" and the following manuals:
  - Libraries MPLCMotion_MDX and MPLCMotion_MX for MOVI-PLC®
  - Libraries MPLCMotion_MDX and MPLCMotion_MM for MOVI-PLC®

4.2 Configuring and starting up drives

How to configure and startup drives is described in the following library manuals:

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

If the MOVI-PLC® *basic* DHP11B.. controller installed in MOVIDRIVE® MDX61B is to be operated, the MOVIDRIVE® MDX61B inverter must have at least firmware version .16 or higher.

This applies regardless of whether the inverter is controlled via the installed MOVI-PLC® *basic* DHP11B.. controller, or whether the slot of the inverter is only used for assembly of the MOVI-PLC® *basic* DHP11B.. controller whilst simultaneously used to control other inverters (e.g. MOVITRAC® B).

4.3 Configuration and startup in the PLC Editor

For further information on configuration and startup of the MOVI-PLC® *basic* DHP11B.. controller, refer to the system manual "MOVI-PLC® programming in the PLC Editor".

4.4 Configuring a PROFIBUS-DP master

You require a GSD file for configuring a PROFIBUS-DP master for the MOVI-PLC® *basic* DHP11B.. controller

The current version of the GSD file for the MOVI-PLC® *basic* DHP11B.. controller is available on the SEW homepage (http://www.sew-eurodrive.de) under the heading "Software."

GSD file for PROFIBUS-DP/DP-V1

The **GSD file SEW_6007.GSD** corresponds to GSD revision 4. The unit master data files, which were standardized by the PROFIBUS Nutzerorganisation [users' organization], can be read by all PROFIBUS-DP masters.

Project planning tool	DP master	File name
All DP project planning 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 MOVI-PLC® or connected inverter malfunctions caused by a modified GSD file.

Project planning procedure

Proceed as follows to configure the MOVI-PLC® *basic* DHP11B.. controller with the PROFIBUS-DP interface:

1. Read the *README_GSD6007.PDF* file, which you receive with the GSD file for further current information on configuration.
2. Install (copy) the GSD file according to the requirements of your configuration software (→ manuals for your configuration software or section "Installing the GSD file in STEP7", below). Once the file has been installed correctly, the unit appears next to the slave stations with the designation *MOVI-PLC*.
3. Add the MOVI-PLC® *basic* DHP11B.. controller 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 project planning you can start PROFIBUS-DP. The *Fault Profibus* LED indicates the status of the project planning (OFF => project planning 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. You cannot install a new file version if the project window is open.
4. In the menu 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

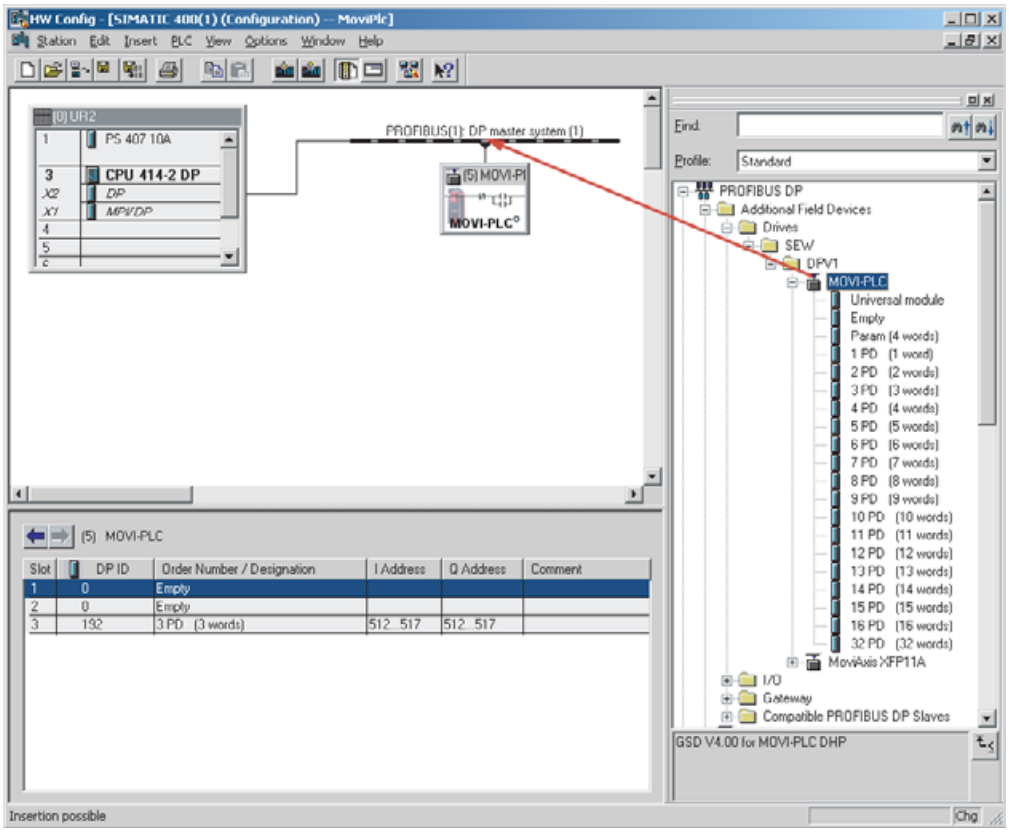
+---MOVI-PLC

The installation of the new GSD file is now complete.

Project planning with STEP7

Proceed as follows to configure the MOVI-PLC® *basic* DHP11B.. controller with the PROFIBUS-DP interface:

1. Add the interface module with the name "MOVI-PLC" to the PROFIBUS structure and assign the PROFIBUS station address (→ following figure).



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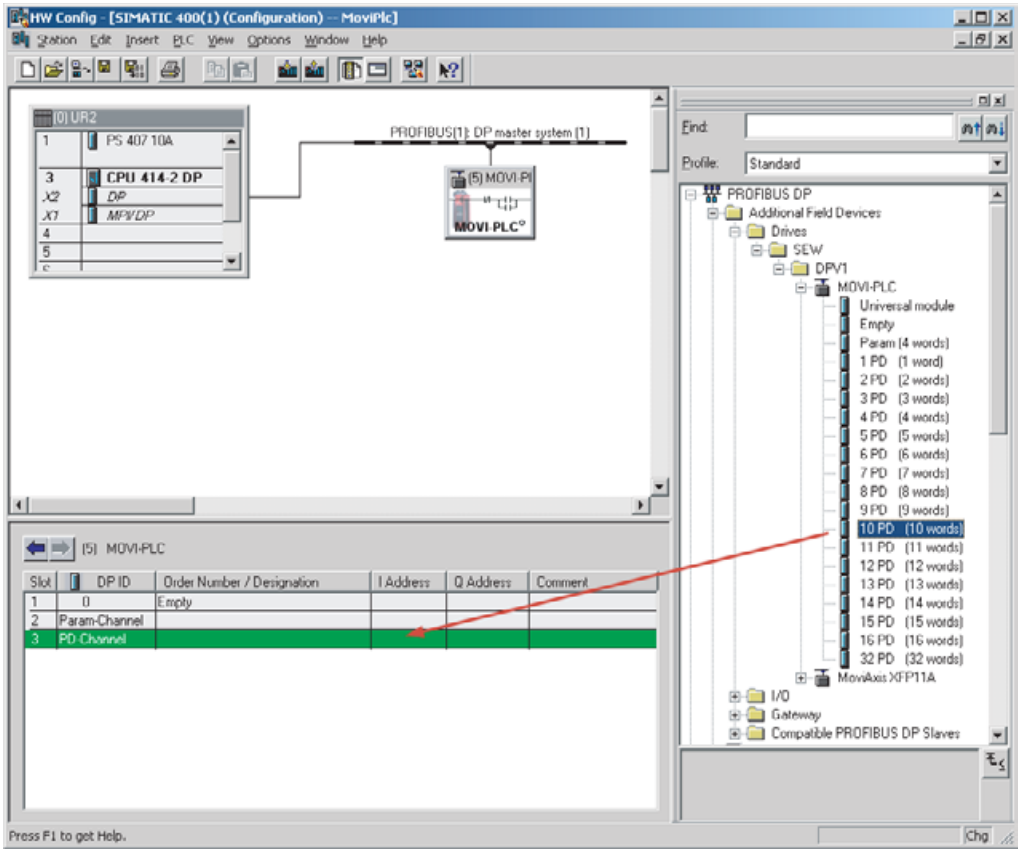
2. The MOVI-PLC® *basic* DHP11B.. controller is now preconfigured with the 3PD configuration. To change the PD configuration, you have to delete the 3 PD module in slot 3. Next, add another PD module (e.g. 10PD) from the "MOVI-PLC" folder at slot 3 using the drag & drop function (→ following figure).



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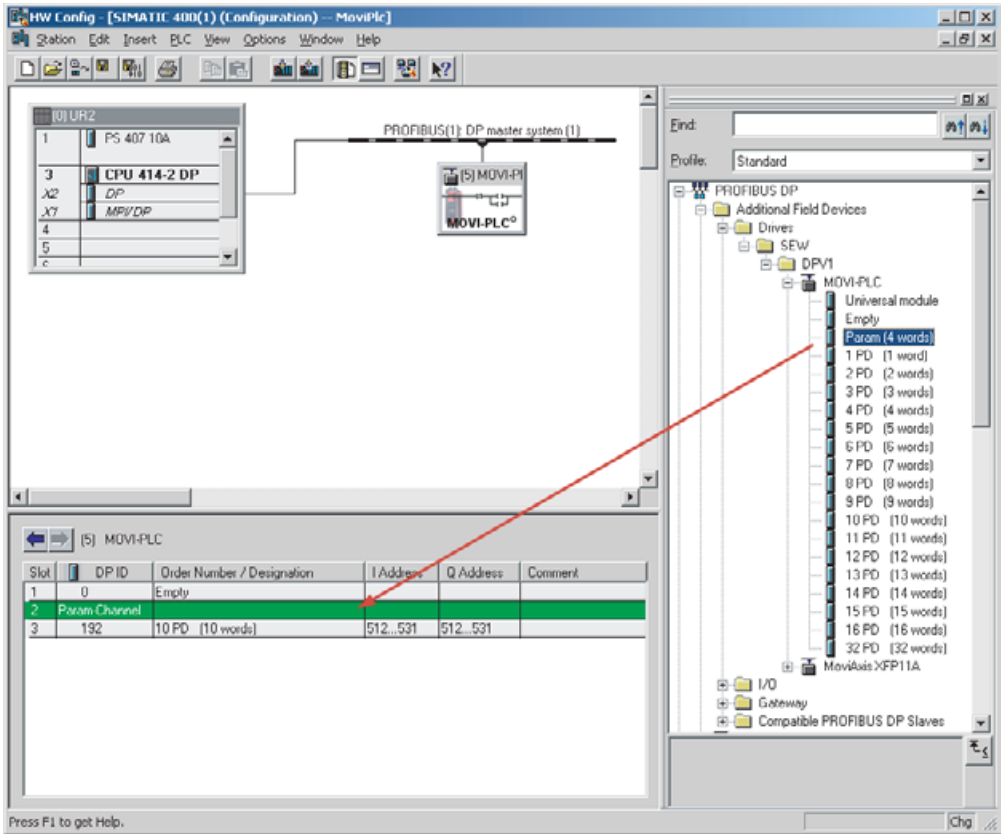
For more information, refer to the section "DP Configuration".

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 by the module "Param (4 words)" using drag & drop.



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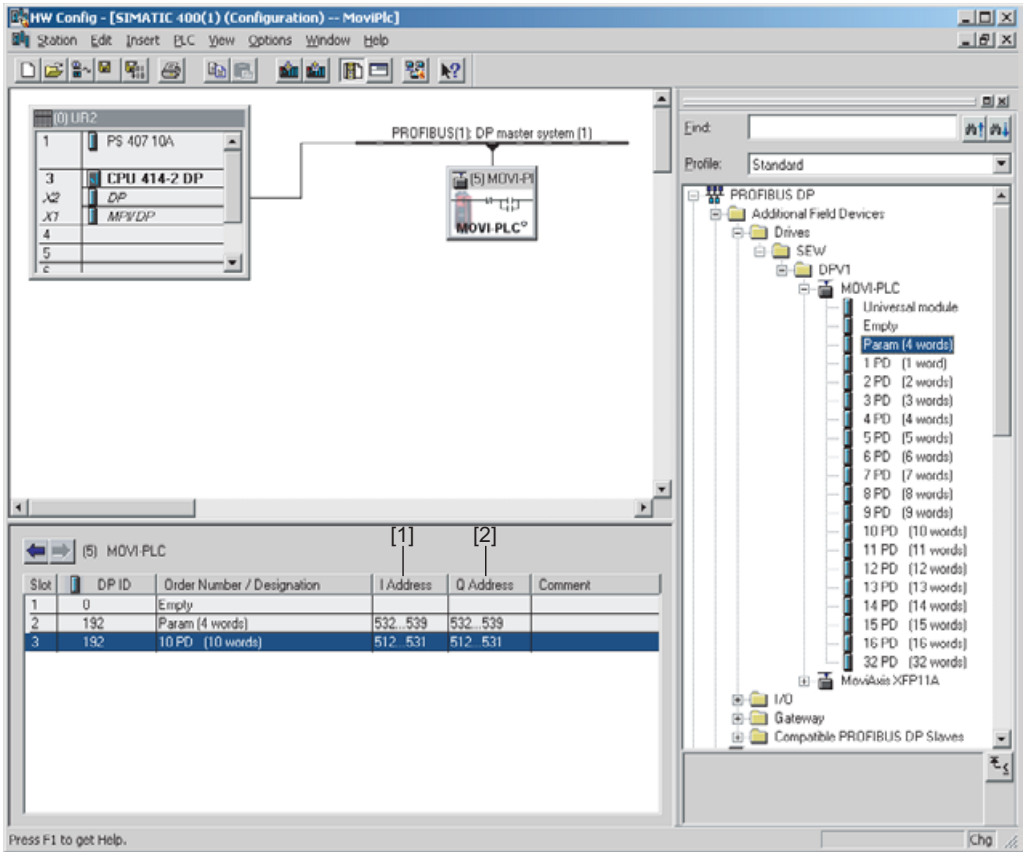
4. Enter the I/O or peripheral addresses for the configured data widths in the "I Address" [1] and "Q Address" [2] columns.



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DP configuration

To enable MOVI-PLC® *basic* DHP11B.. controller to support the type and number of the input and output data used for transmission, the DP master must transmit the corresponding DP configuration to the MOVI-PLC® *basic* DHP11B.. controller. The configuration telegram comprises the DP configurations for slots 1 to 3.

The following options are available:

- Controlling the MOVI-PLC® *basic* DHP11B.. controller via process data
- reading or writing parameters using the parameter channel
- or using a definable data exchange between MOVI-PLC® *basic* DHP11B.. controller and higher-level controller (→ section "Universal DP configuration" for slot 3, page 44).

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® *basic* DHP11B.. controller 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 (4 words)	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 example

Slot 1: Empty

Slot 2: Param (4 words)

Slot 3: 10 PD

Configuration telegram sent to the MOVI-PLC® *basic* DHP11B.. controller:
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 basic conditions must be adhered to:

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 configuration predefined in the GSD file, you can also specify process data configuration 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 transmitted to the MOVI-PLC® *basic* DHP11B.. controller during the initial start of the DP master.

7 / MSB	6	5	4	3	2	1	0 / LSB
				Data length 0000 = 1 byte/word 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® *basic* DHP11B.. controller does not support the "Special identified formats" coding! Only use the "Integrity over entire length" setting for data transmission.

Data consistency

Consistent data is data that always has to be transmitted between the higher-level controller and the MOVI-PLC® *basic* DHP11B.. controller as one block and must never be transmitted separately.

Data consistency is very important when transmitting position values or complete positioning tasks. Data consistency is particularly important, as inconsistent transmission may lead to data originating from different program cycles of the higher-level controller, which would lead to undefined values being transmitted to the MOVI-PLC® *basic* DHP11B.. controller.

For PROFIBUS-DP, data communication between the higher-level controller and the MOVI-PLC® *basic* DHP11B.. controller is carried out with the setting "Data integrity over entire length".

4.5 Procedure for replacing the unit

When exchanging a MOVI-PLC® *basic* DHP11B.. controller, a compact control or a controlled drive, proceed as described in sections 4.2 and 4.3.

The "Version Management Tool" (MOVITOOLS® MotionStudio → [Network] \ [MOVI-PLC] \ [Context menu Version Management]) supports you in transferring previously saved configuration data of the MOVI-PLC® *basic* DHP11B.. controller (firmware, project) to the new MOVI-PLC® *basic* DHP11B.. controller.

Remanent variables on the MOVI-PLC® *basic* DHP11B.. controller cannot be transferred when replacing the MOVI-PLC® *basic* DHP11B.. controller.

You can find important information on changing drives in the manuals of the respective inverters.

5 PROFIBUS-DP Operating Characteristics

This section describes the basic characteristics of the MOVI-PLC® *basic* DHP11B.. controller connected to the PROFIBUS-DP system.

5.1 Process data exchange with the MOVI-PLC® basic DHP11B.. controller

The MOVI-PLC® *basic* DHP11B.. controller 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® *basic* DHP11B.. controller, for example, when a master PLC is used as the DP master. As a result, the process data words can be addressed in the usual manner.

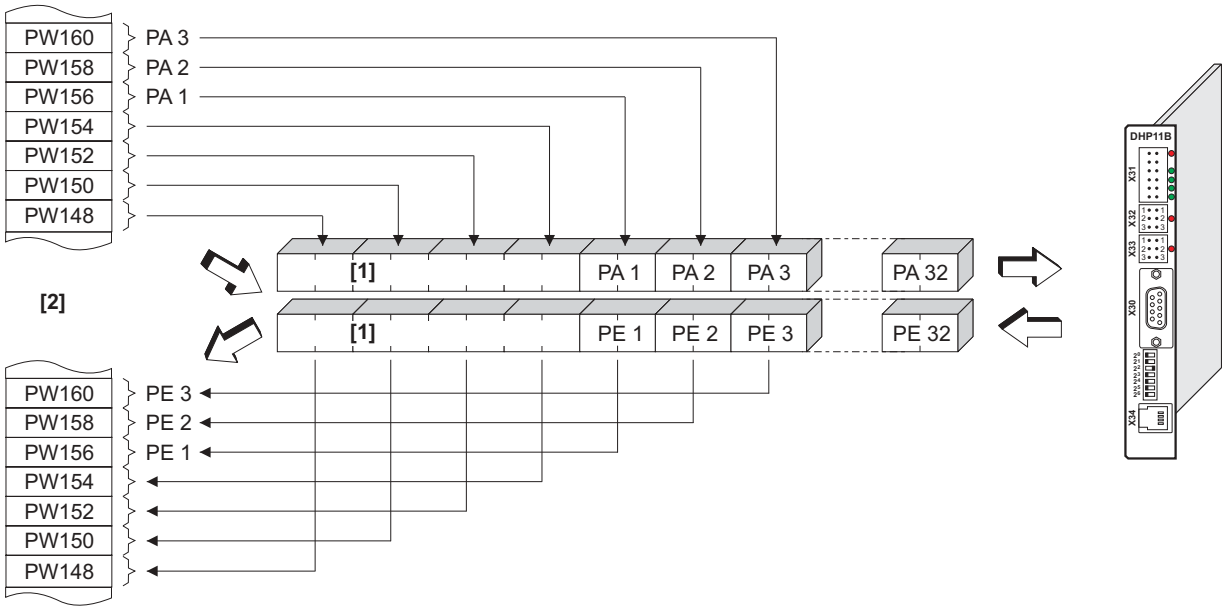

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Figure 11: Mapping PROFIBUS data in the PLC address range

[1] 8 byte MOVILINK® parameter channel

[2] Address range of the master PLC

PE1 ... PE32 Process input data

PA1 ... PA32 Process output data

For additional information on programming and project planning, refer to the README_GSD6007.PDF file received with the GSD file.

Control example for Simatic S7

The exchange of process data with the MOVI-PLC® *basic* DHP11B.. controller via Simatic S7 takes place in dependence on 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 example program

In this example, project planning for the MOVI-PLC® *basic* DHP11B.. controller has the process data configuration *10 PD* on input addresses PEW512... and output addresses POW512... .

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

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 are copied from data words 20...38 to the output address POW 512 ...

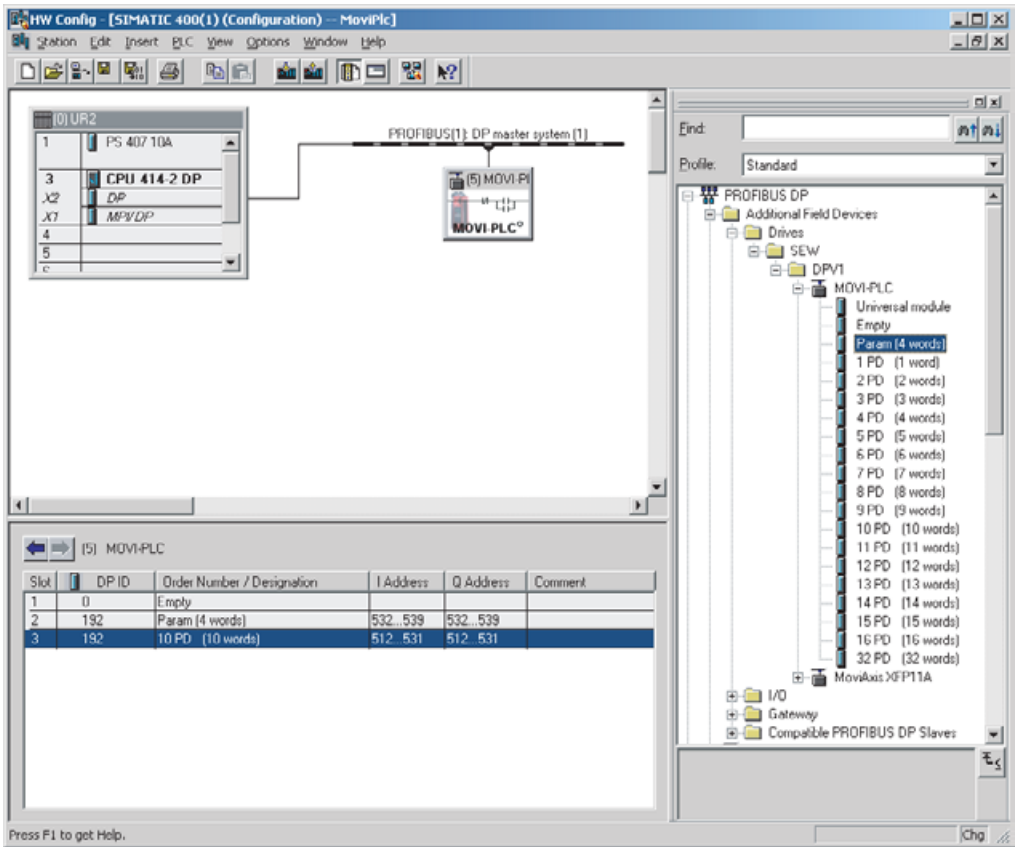
Note the length specification in bytes for the *RECORD* parameter. The length information must correspond to the configured length.

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 DHP11B 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 DHP11B control card

L  DB3.DBW 0   //Load PE1
L  DB3.DBW 2   //Load PE2
L  DB3.DBW 4   //Load PE3
// 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 DHP11B 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 program example is a special and free service that demonstrates only the basic principles of generating a PLC program as a non-binding sample. We are not liable for the contents of the sample program.

The following figure shows the corresponding project planning for the MOVI-PLC® *basic* DHP11B.. controller in the hardware configuration of STEP7 (→ Section "DP configuration", page 42).



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5.2 PROFIBUS-DP timeout

The response monitoring time on the MOVI-PLC® *basic* DHP11B.. controller elapses (if configured in the DP master) if data transfer via the PROFIBUS-DP system is disrupted or interrupted. The *Fault Profibus* LED lights up to indicate that no new user data is being received.

The cyclically executable *ProfibusGetInfo* POU in the MPLCInterface_Profibus library indicates 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® *basic* DHP11B.. parameters via the "parameter process data object" (PPO). This PPO is transmitted cyclically and in addition to the process data channel [2], contains a parameter channel [1], which can be used to exchange acyclical parameter values.

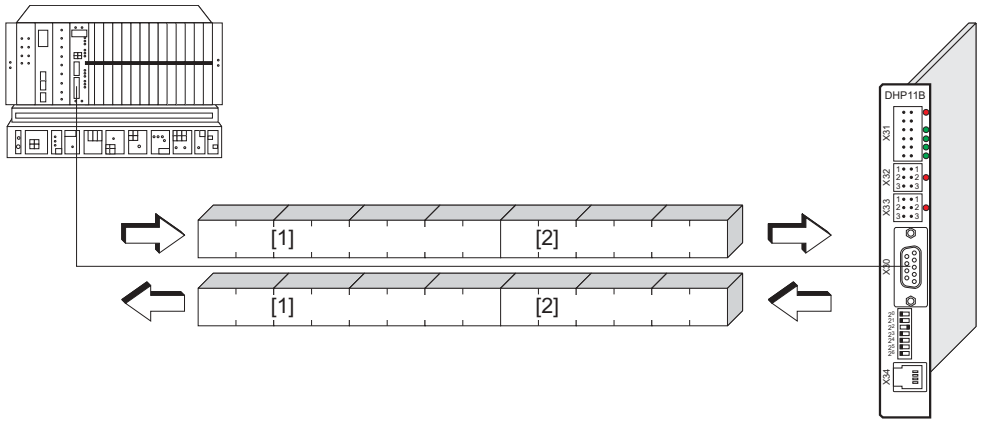

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Figure 12: Communication via PROFIBUS-DP

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	MSB data	Data	Data	LSB data
		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 the 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 fault in service execution 1 = Fault 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® *basic* DHP11B.. controller.
- Bit 6 serves as the handshake between the higher-level controller and the MOVI-PLC® *basic* DHP11B.. controller. Bit 6 triggers the implementation of the transmitted service in the control card. In PROFIBUS-DP, the parameter channel is transmitted cyclically with the process data. For this reason, the implementation of the service in the MOVI-PLC® *basic* DHP11B.. controller must be triggered by edge control using 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® *basic* DHP11B.. controller uses handshake bit 6 to signal whether the service was executed or not. The service was executed if the handshake bit received in the controller is identical with the transmitted handshake bit.
- 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 read or written via the fieldbus system. The parameters of the MOVI-PLC® *basic* DHP11B.. controller are addressed with a uniform index regardless of the connected fieldbus system.

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 (LSB data) whereas byte 4 is the most significant data byte (MSB data).

<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">Reserved</td><td rowspan="4">Index high</td><td rowspan="4">Index low</td><td>MSB data</td><td>Data</td><td>Data</td><td>LSB data</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® *basic* DHP11B.. controller 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. Bytes 4 ... 7 send back the return code in a structured format. (→ Section "Return Codes").

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 with PROFIBUS-DP (Read)

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® *basic* DHP11B.. controller 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 need to be set.

The MOVI-PLC® *basic* DHP11B.. controller now processes the *read* service and sends the service confirmation back when the handshake bit changes.

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 fault in service execution 1 = Fault 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 not relevant, you only need to enter the service identifier for the *read* service. This service is now activated in the MOVI-PLC® *basic* DHP11B.. controller 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 (Write)

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®*basic* DHP11B.. controller by changing the handshake bit.

The MOVI-PLC® *basic* DHP11B.. controller now processes the *write* service and sends the service confirmation back by changing the handshake bit.

The following table shows how a *write* service is coded in the management byte 0. The data length is 4 bytes for all parameters of the MOVI-PLC® *basic* DHP11B.. controller. This service is now transferred to the MOVI-PLC® *basic* DHP11B.. controller when the handshake bit changes. As a result, a *write* service on the MOVI-PLC® *basic* DHP11B.. controller 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 service execution 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 figure shows the parameter setting sequence between higher-level controller and the MOVI-PLC® *basic* DHP11B.. controller via PROFIBUS-DP. To simplify the sequence, the following figure only shows the management byte of the parameter channel.

The parameter channel is only received and returned by the MOVI-PLC® *basic* DHP11B.. controller while the higher-level controller is preparing the parameter channel for the *write* service. The service is not activated until the moment when the handshake bit is changed (in this example, when it changes from 0 to 1). The MOVI-PLC® *basic* DHP11B.. controller now interprets 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® *basic* DHP11B.. controller. 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)			Control card MOVI-PLC® DHP11B (Slave)
	--	00110010XXX...	→	Parameter channel is received, but not evaluated
	←	00110010XXX...	--	
Parameter channel is prepared for the write service				
Handshake bit is changed and the service is transferred to the MOVI-PLC® *basic* DHP11B.. controller	--	01110010XXX...	→	
	←	00110010XXX...	--	
	--	01110010XXX...	→	
	←	00110010XXX...	--	Write service is performed, handshake bit is changed
Service confirmation is received as the send and receive handshake bits are the same again	←	01110010XXX...	--	
	--	01110010XXX...	→	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® *basic* DHP11B.. controller returns various return codes to the parameter setting master, providing detailed information about 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® *basic* DHP11B.. controller supports the following error classes defined 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	Fault during execution of service
6	access	Access error
7	ov	Error in the object directory
8	other	Other error (→ Additional code)

Error code

The *error code* element allows for a more detailed identification of the error cause within the *error class* and is generated by the communications software of the fieldbus card in case of a faulty 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 MOVI-PLC® *basic* DHP11B.. controller configuration. They are returned to the master under *error class 8 = other error*. The following table shows all possible codings for the *additional code*.

Add. code high (hex)	Add. code low (hex)	Meaning
00	00	No error
00	10	Illegal parameter index
00	11	Function/parameter not implemented
00	12	Read access only
00	13	Parameter lock is active
00	14	Factory setting is active
00	15	Value 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 that cannot be identified either automatically by the application layer of the fieldbus system or by the system software of the MOVI-PLC® *basic* DHP11B.. controller 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

Incorrect code was specified in 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® *basic* DHP11B.. controller 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 the error occurs again, briefly disconnect the MOVI-PLC ®*basic* DHP11B.. controller from the power supply and switch the system on again. If the error persists, consult the SEW Electronics 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® *basic* DHP11B.. controller on PROFIBUS-DP-V1. Refer to the PROFIBUS user organization or visit www.profibus.com for detailed technical information on PROFIBUS-DP-V1.

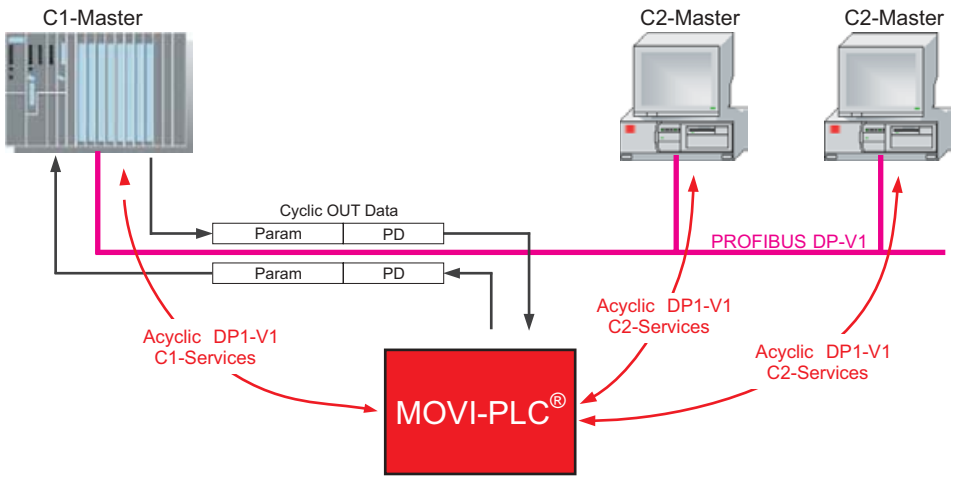
The PROFIBUS-DP-V1 specification introduced new acyclical *read / write* services as part of the PROFIBUS-DP expansions. These acyclical services are inserted in special telegrams during cyclical bus operation to ensure compatibility between PROFIBUS-DP (version 0) and PROFIBUS-DP-V1 (**v**ersion **1**).

The acyclical read/write services can be used to exchange larger volumes of data between master and slave (MOVI-PLC® *basic* DHP11B..) 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 tool 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.



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

Class 1 master (C1 master)

The C1 master essentially performs the cyclical data exchange with the slaves. A typical C1 master is a control system, such as a PLC, that exchanges cyclical process data with the slave. If the DP-V1 function has been activated via the GSD file, the acyclical connection between the C1 master and the slave is set up automatically when the cyclical connection of the PROFIBUS-DP-V1 is being established. Only one C1 master can be operated in a PROFIBUS-DP-V1 network.

Class 2 master (C2 master)

The C2 master itself does not perform cyclical data exchange with the slaves. Examples for a typical C2 master are visualization systems or temporary installed programming units (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 allows for cyclical data exchange with the slaves by means of *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® *basic* DHP11B.. control card supports two parallel C2 connections.

Data sets (DS)

The user data transported via a DP-V1 service are collected in data sets. Each data set is identified uniquely by its length, a slot number and an index. The structure of data set 47 is used for DP-V1 communication with the MOVI-PLC® *basic* DHP11B.. controller. This data set is defined as the DP-V1 parameter channel for drives as of V3.1 in the PROFIdrive profile drive engineering of the PROFIBUS user organization. Different procedures for accessing parameter data in the MOVI-PLC® *basic* DHP11B.. controller 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 data set
Write	Write data set

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

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 using 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® *basic* DHP11B.. controller is usually 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 perform parameter services with the MOVI-PLC® *basic* DHP11B.. controller. The *read* and *write* services give 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. 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® *basic* DHP11B.. controller using the MOVITOOLS® software.

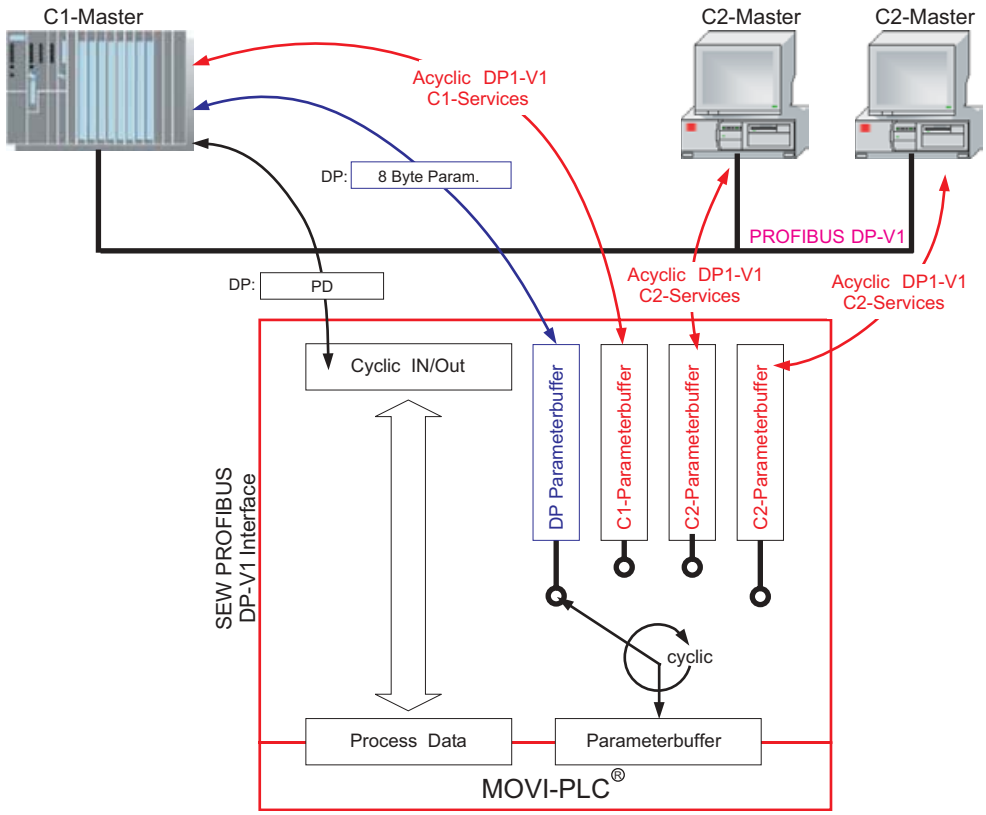


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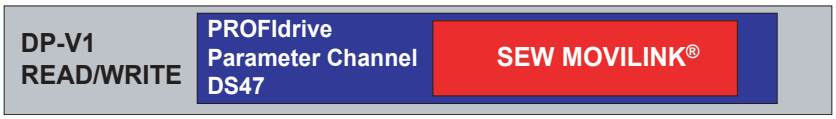
Figure 13: Parameter channels for PROFIBUS-DP-V1

6.3 Structure of the DP-V1 parameter channel

Generally, parameter settings for the MOVI-PLC® *basic* DHP11B.. controller based on the PROFIdrive DP-V1 parameter channel of profile version 3.0 are made via data set index 47. 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 data set structure is the same for PROFIdrive and MOVILINK® access.



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The following MOVILINK® services are supported:

- 8 byte MOVILINK® parameter channel with all the services supported by the MOVI-PLC® *basic* DHP11B.. controller, such as
  - Read parameter
  - Write parameter
  - Write parameter volatile
  - etc.

The following PROFIdrive services are supported:

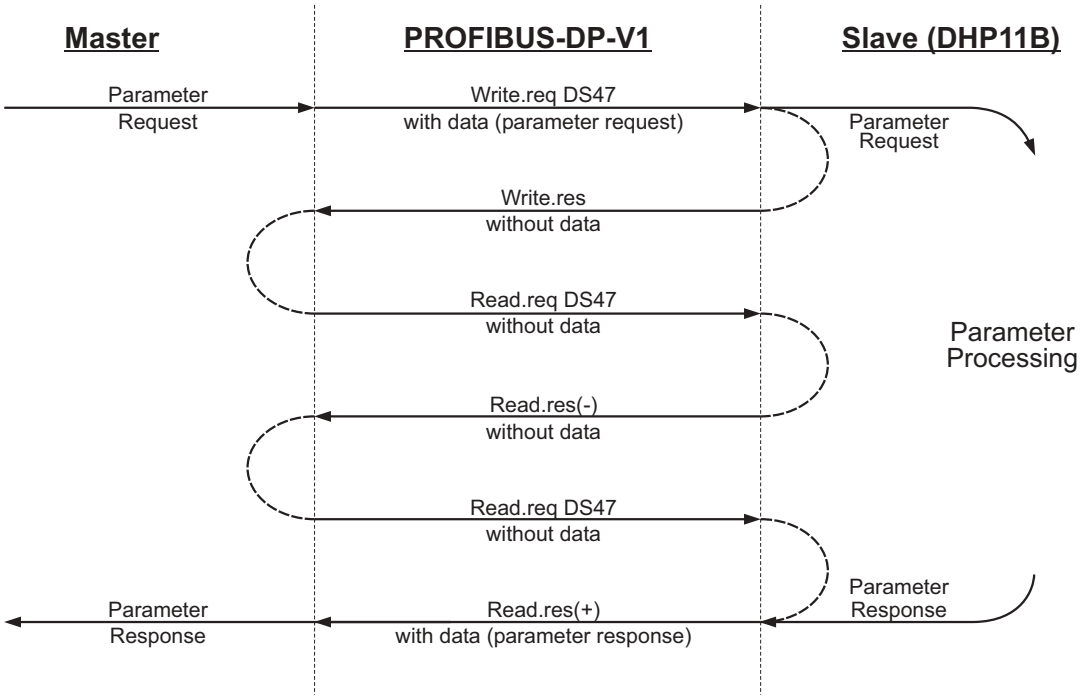
- Reading (request parameter) individual parameters of type *double word*
- Writing (change parameter) individual parameters of type *double word*

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**

Procedure for setting parameters via data set 47

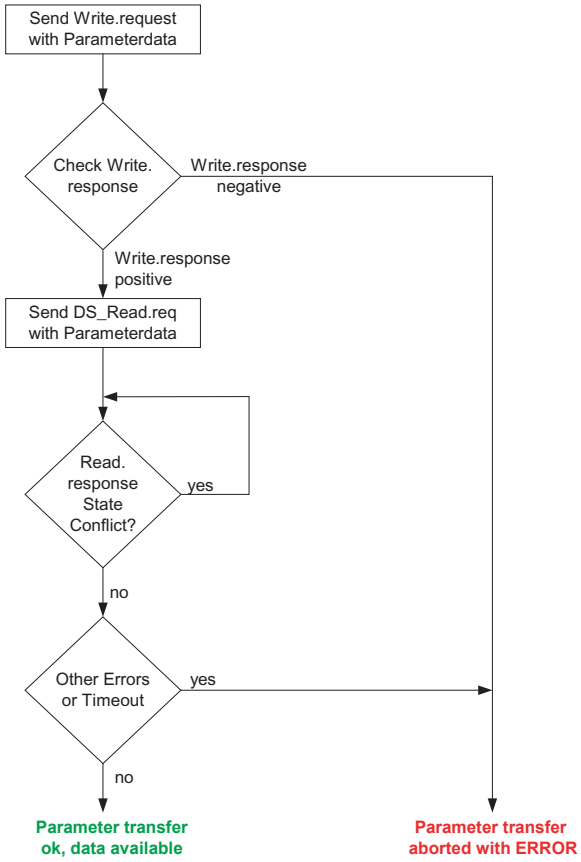
Parameter access is provided by the combination of the DP-V1 services *write* and *read*. The master transfers the parameter setting request to the slave by sending *Write.req*., followed by slave-internal processing.

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 is finished in the MOVI-PLC® *basic* DHP11B.. controller (slave), the controller answers with a positive *Read.res*. response. 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.



DP-V1 master processing sequence

If the bus cycles are very short, the request for the parameter setting response arrives before the MOVI-PLC® *basic* DHP11B.. controller has concluded parameter access in the device. This means that the response data from the MOVI-PLC® *basic* DHP11B.. controller is not available yet. In this case, the MOVI-PLC® *basic* DHP11B.. controller sends a negative answer with the **Error_Code 1 = 0xB5 (status conflict)** to the DP-V1 level. The DP-V1 master then sends another request with the above-mentioned *Read.req header* until it receives a positive response from the MOVI-PLC® *basic* DHP11B.. controller.



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MOVILINK® parameter requests

The MOVILINK® parameter channel of the MOVI-PLC® *basic* DHP11B.. controller is directly mapped in the structure of data set 47. The Request ID *0x40* (SEW MOVILINK® service) is used for the exchange of MOVILINK® parameter setting requests. Parameter access with MOVILINK® services usually takes place according to the structure described below. The typical telegram sequence for data set 47 is used.

Request ID:0x40 SEW MOVILINK® service

The actual service is defined by the data set element *Attribute* on 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 show an example of the structure of the *Write.request* and *Read.res* user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending parameter 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 data set; 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® *basic* DHP11B.. controller. The firmware version is read.

Byte	Field	Value	Description
0	Request reference	0x01	Individual reference number for the parameter setting request 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 data set; constant index 47
Length	240	Maximum length of response buffer in the DP-V1 master

Positive MOVILINK® parameter response

The two 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 data set; 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 request
1	Response ID	0x40	Positive MOVILINK® response
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 MOVILINK®

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

Send "Write parameter volatile" order

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

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 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 including the DP-V1 header.

Field	Value	Description
Function_Num		Read.req
Slot_Number	X	Slot_Number not used
Index	47	Index of data set
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 data set; 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 request
1	Response ID	0x40	Positive MOVILINK® 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 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 data set; constant index 47
Length	8	8 byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting request
1	Response ID	0xC0	Negative MOVILINK® response
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 (→ MOVILINK® table 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	Illegal 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® *basic* DHP11B.. controller is directly mapped in the structure of data set 47. Parameter access with PROFIdrive services usually takes place according to the structure described below. The typical telegram sequence for data set 47 is used. PROFIdrive only defines the two request IDs

- **Request ID: 0x01Request parameter (PROFIdrive)**
- **Request ID: 0x02Change parameter (PROFIdrive)**

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

If request ID *0x02 = change parameter* (PROFIdrive) is set, remanent write access to the selected parameters is preserved. Consequently, the internal flash of the MOVI-PLC® *basic* DHP11B.. controller is written with each write access. Use the MOVILINK® service *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® *basic* DHP11B.. controller.

Example for reading a parameter via PROFIdrive

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

Sending parameter request

The following table displays the code of the user data for the *Write.req* service specifying the DP-V1 header. The *Write.req* service is used to transfer the parameter setting request to the MOVI-PLC® *basic* DHP11B.. controller.

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

Byte	**Field**	**Value**	**Description**
0	Request reference	0x01	Individual reference number for the parameter setting request is mirrored 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 data set; 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 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 data set; 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 request
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 the variable H0 (parameter index 11000) (→ "Example for writing a parameter via MOVILINK®"). The PROFIdrive service *change parameter* is used for this purpose.

Send *Write parameter* request

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

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	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 conflict 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 including the DP-V1 header.

Field	Value	Description
Function_Num		Read.req
Slot_Number	X	Slot_Number not used
Index	47	Index of data set
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 data set; 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 request
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 data set; constant index 47
Length	8	8 byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting request
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. Error class 0x08, Add. code 0x11 (→ MOVILINK® table return codes for DP-V1)

PROFIdrive return codes for DP-V1

The following table shows the coding 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. Info.
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. Info.
0x19	Axis nonexistent	Access to an axis which does not exist	-
up to 0x64	Reserved	-	-
0x65..0xFF	Manufacturer-specific	-	-

6.4 Project planning for a C1 master

The GSD file *SEW-6007.GSD* is required for the project planning of a DP-V1 C1 master. This file activates the DP-V1 functions of the MOVI-PLC*basic* DHP11B.. controller.

Operating mode (DP-V1 mode)

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

6.5 Appendix

Example program for SIMATIC S7

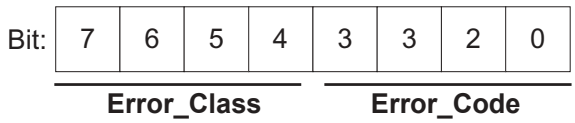
The STEP7 code stored in the GSD file shows how parameters are accessed via the STEP7 system function blocks SFB 52/53. You can copy the STEP7 code and import/compile it as STEP7 source.

Technical data DP-V1 for the DHP11B control card

GSD file for DP-V1:	SEW-6007.GSD
Module name for project planning:	MOVI-PLC
Number of parallel C2 connections:	2
Supported data set:	Index 47
Supported slot number:	Recommended: 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_Code (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

Diagnostic problem:Communication via system bus CAN 1 or CAN 2 does not work.
Initial status:
- System bus CAN 1 or CAN 2 is connected correctly.
- Communication via system bus CAN 1 or CAN 2 is programmed.

↓

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

yes ↓

Response of the LEDs CAN 1 status or CAN 2 status? — orange → **[B]** / green → **[C]**

Lights up or flashes red ↓

System bus CAN 1 or CAN 2 is not operating or communication of the system bus is faulty.

↓

[A]

↓

Check the set baud rate.

↓

Baud rate OK? — no → **[D]**

yes ↓

Make sure that terminating resistors are connected properly.

[A]	Check the bus cabling.
[B]	System bus CAN 1 or CAN 2 is being initialized.
[C]	Bus communication is OK.

↓

Check the application program!

[D]	Correct the baud rate!

7.2 Diagnostic procedure for PROFIBUS-DP

Diagnostic problem: The MOVI-PLC basic DHP11B.. controller does not work on PROFIBUS.
Initial status:
- The MOVI-PLC® *basic* DHP11B.. controller is connected physically to PROFIBUS.
- The MOVI-PLC® *basic* DHP11B.. controller was configured in the DP master and bus communication is active.

↓

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

yes ↓

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

FLASHES ↓

The MOVI-PLC® *basic* DHP11B.. controller detects the baud rate but was not configured in the DP master or was 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® *basic* DHP11B.. controller from the DP network.

↓

Configure the MOVI-PLC® *basic* DHP11B.. controller again, choosing 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 in the DP master and start the bus communication again.

[A]	Check the bus cabling.
[B]	The MOVI-PLC® *basic* DHP11B.. controller is currently exchanging data cyclically with the DP master.
[C]	The MOVI-PLC® *basic* DHP11B.. controller does **not** recognize 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 apply to:

- the MOVI-PLC® *basic* DHP11B.. controller installed in the inverter or OST11B option
- MOVI-PLC® *basic* DHP11B.. compact control / UOH..B

Interference immunity	Fulfills EN 61800-3
Ambient temperature	Installed in MOVIDRIVE® MDX61B: • 0 °C ... +60 °C (Derating at 40 °C... 60 °C ⟶ MOVIDRIVE® MDX60B/61B system manual) Installed 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) Installed in MOVITRAC® B (AC 400/500 V over 4 kW): • 0 °C... +60 °C (Derating at 40 °C... 60 °C ⟶ MOVITRAC® B system manual) Installed in the MOVIAXIS® master module: • 0 °C... +45 °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
Duty type	Continuous duty (see MOVIDRIVE® MDX60B/61B system manual, MOVITRAC® B, MOVIAXIS®)
Pollution class	2 according to IEC 60664-1 (VDE0110-1)
Installation altitude	max. 4000 m (NN)

8.2 MOVI-PLC® basic DHP11B.. controller

MOVI-PLC*basic* DHP11B.. controller	
Unit design and part number	• MOVI-PLC® *basic* DHP11B-T0: 1 820 472 4 • MOVI-PLC® *basic* DHP11B-T1: 1 820 822 3 • MOVI-PLC® *basic* DHP11B-T2: 1 820 823 1
Electrical supply	For all devices (MC07, MDX, MX, compact control) the following applies: You will have to supply the binary inputs and outputs with DC24 V (X31:1/2) separately. Installed in MOVIDRIVE® MDX61B: • Power consumption: P_{max} = 4.5 W • The MOVI-PLC® *basic* DHP11B.. controller is supplied with voltage by MOVIDRIVE® MDX61B via the backplane connector. • In the case of disconnection from the power supply, continued function is guaranteed by DC 24 backup (external DC 24 V supply to X10:9/10 of MOVIDRIVE® MDX61B required). Installed in MOVITRAC® B: • Power consumption: P_{max} = 5.6 W • U = DC 24 V (–15 % / +20 %) • I_{max} = 400 mA • The MOVI-PLC® *basic* DHP11B.. controller can be supplied by MOVITRAC® B. To this end, connect X26:3 (6) / 7 with X46:3 (6) /7 or with X12:9 / 8. • If MOVI-PLC® *basic* DHP11B.. controller is supplied by DC 24 V by MOVITRAC® B, the function of the controller is maintained after disconnection from the power supply. This requires an external DC 24 V supply to X12:8 / 9 of MOVITRAC® B. Installed in the MOVIAXIS® master module (MXM): • Power consumption: P_{max} = 5.6 W • U = DC 24 V (–15 % / +20 %) • I_{max} = 400 mA • The MOVI-PLC® *basic* DHP11B.. controller can be supplied by the MOVIAXIS switched mode power supply module (MXS) or from an external voltage supply. For this purpose, connect X5 between the individual devices. • If the MOVI-PLC® *basic* DHP11B.. controller is supplied by DC 24 V by the MOVIAXIS® switched mode power supply module, the function of the MOVI-PLC® *basic* DHP11B.. controller is maintained after disconnection from the power supply (external DC 24 V supply to X16 of the MOVIAXIS® switched-mode power supply required).
Potential levels	The MOVI-PLC® basic DHP11B.. controller has the following potential levels: • Potential control / CAN 1 / RS485 • Potential binary inputs and outputs • Potential system bus CAN 2 • Potential PROFIBUS
Memory	• Program memory: 512 kByte (for application program, incl. IEC libraries) • Data memory: 128k Byte (for IEC application) • Retain data: 16 kByte • System variables (retain): 8 kByte
Binary inputs X31:3...X31:10 Internal resistance Signal level	Isolated (optocoupler), PLC-compatible (IEC 61131-2), sampling time 1 ms, unfiltered and filtered (filter constant ca. 2 ms) available Can be configured as binary input or output X31:6...X31:10 are interrupt capable (response time <100 ms) $R_i \approx 3\ k\Omega$, $I_E \approx 10$ mA DC(+13 V...+30 V) = "1" = Contact closed (according to IEC 61131) DC (–3 V...+5 V) = "0" = Contact open (according to IEC 61131)
Binary outputs X31:3...X31:10 Signal level	PLC compatible, (IEC 61131-2) response time 1 ms Can be configured as binary input or output Maximum permitted output current I_{A_max} = DC 150 mA per binary output All 8 binary outputs can be subject to the maximum approved output current I_{A_max} load at the same time. "0" = 0 V "1" = DC +24 V

MOVI-PLC*basic* DHP11B.. controller	
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, parts A and B, transmission technology to ISO 11898, max. 64 stations, • 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 connectors 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.
PROFIBUS connection X30:1 ... X30:9 Bus termination Automatic baud rate recognition Protocol options GSD file DP ident. number	Via 9-pin sub D connector, pin assignment according to IEC 61158 Not integrated. Activate bus termination with suitable PROFIBUS connector with switchable terminating resistors 9.6 kBaud ... 12 MBaud PROFIBUS-DP and DP-V1 to IEC 61158 SEW_6007.GSD $6007_{hex} = 24583_{dec}$
RS485 interface COM1 X34:1 ... X34:4	• For connection of an engineering PC or a DOP11A operator terminal. • E/A standard, 57.6 / 9.6 kBaud, max. cable length 200 m • Dynamic terminating resistor with fixed installation
Engineering	Engineering takes place via one of the following interfaces: • RS485 interface (X34) • CAN 1 interface (X33) • CAN 2 interface (X32) • PROFIBUS interface (X30) Configuration and startup of all SEW components connected to the MOVI-PLC® *basic* DHP11B.. controller can take place on the MOVI-PLC® *basic* DHP11B.. controller itself. Configuration and startup of the MOVI-PLC® *basic* DHP11B.. controller cannot be performed via the inverters. • MOVITOOLS® MotionStudio PC software with PLC Editor

8.3 OST11B option

OST11B option	
Part number	1 820 544 5
Electrical supply	• Power consumption P_{max} = 1.5 W (only OST11B) • Power consumption P_{max} = 6 W (MOVI-PLC® *basic* DHP11B.. and OST11B installed in MOVIDRIVE® MDX61B) • The OST11B option is supplied by the MOVI-PLC® *basic* DHP11B.. controller with DC 24 V.
Potential level	COM2 is isolated from the MOVI-PLC® *basic* DHP11B.. controller
RS485 interface COM2 X35:1 ... X35:4 X36:1 ... X36:3	• For connection of an engineering PC, a DOP11A operator terminal or a gearmotor with integrated frequency inverter MOVIMOT® • I/O standard, 57.6 kBaud, max. total cable length 200 m, integrated dynamic terminating resistor permanently installed • X35 and X36 are connected in parallel • You can connect a gearmotor with integrated frequency inverter MOVIMOT® to X36. Do not connect an engineering PC or DOP11A operator terminal to COM2 at the same time.

8.4 MOVI-PLC® basic compact control

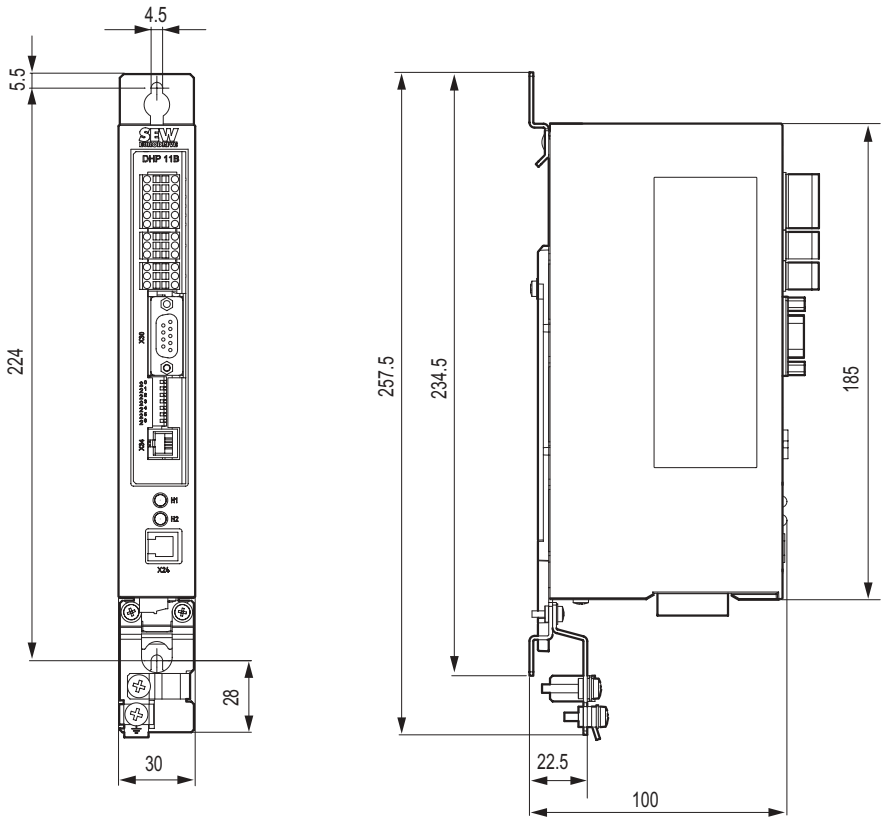
MOVI-PLC® *basic* compact control	
Unit types	• MOVI-PLC® *basic* DHP11B-T0 / UOH11B • MOVI-PLC® *basic* DHP11B-T1 / UOH11B • MOVI-PLC® *basic* DHP11B-T2 / UOH11B • MOVI-PLC® *basic* DHP11B-T0 / OST11B / UOH21B • MOVI-PLC® *basic* DHP11B-T1 / OST11B / UOH21B • MOVI-PLC® *basic* DHP11B-T2 / OST11B / UOH21B
Electrical supply	• X26: U = DC 24 V (–15 % / +20 %) DGND is to be grounded (PELV) • Power consumption P_{max} = 5.6 W, I_{max} = 400 mA ⟶ applies to: – MOVI-PLC® *basic* DHP11B-T0 / UOH11B – MOVI-PLC® *basic* DHP11B-T1 / UOH11B – MOVI-PLC® *basic* DHP11B-T2 / UOH11B • Power consumption P_{max} = 7.5 W, I_{max} = 500 mA ⟶ applies to: – MOVI-PLC® *basic* DHP11B-T0 / OST11B / UOH21B – MOVI-PLC® *basic* DHP11B-T1 / OST11B / UOH21B – MOVI-PLC® *basic* DHP11B-T2 / OST11B / UOH21B • X31: You must 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.
- Further technical data is identical to that of Sec. 8.1 and 8.2.

8.5 Dimension drawings of MOVI-PLC® basic DHP11B.. compact control / UOH..B

8.5.1 Dimensions drawing DHP11B.. / UOH11B



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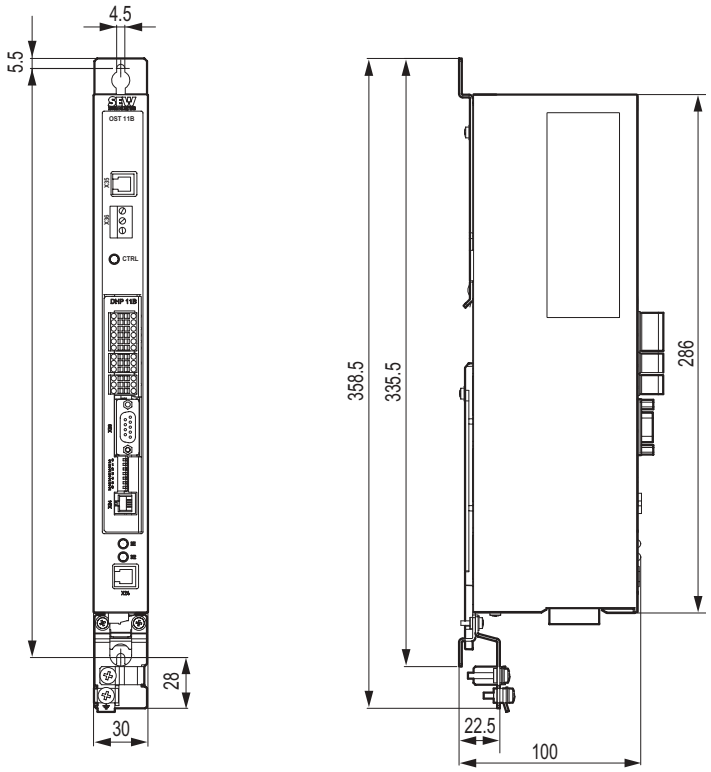
8.5.2 Dimensions drawing DHP11B../ OST11B / UOH21B



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9 Index of Changes

9.1 Changes to the previous version

The following section lists the changes made to the individual sections from edition 09/2005, publication number 11350717 (EN).

New additions include:

- The installation of the MOVI-PLC® *basic* DHP11B.. controller in the MOVIDRIVE® MDX61B und MOVITRAC® B frequency inverters, in the MOVIAXIS® servo inverters and as compact control.
- Project planning and startup of the MOVI-PLC® *basic* DHP11B.. controller and of the controlled inverters and servo inverters.
- Assembly and installation of the OST11B. option.
- Technical data and dimension drawings of the OST11B option and of the compact controller.
- Information of corrective document 11456612 (EN).

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	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

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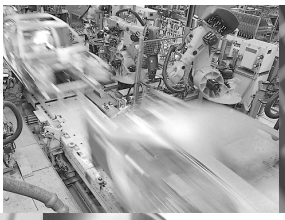
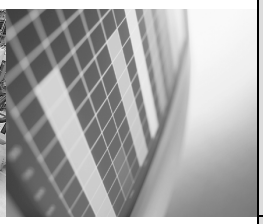

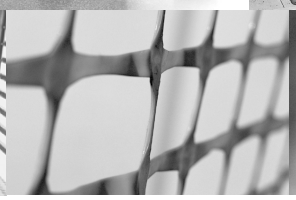

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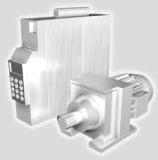
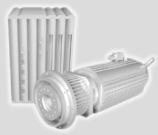
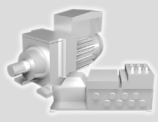
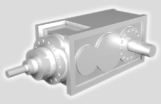

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