



SEW
EURODRIVE



MOVIFIT[®]

Function Level "Technology"

with PROFINET-IO Interface

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Manual





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1 General Notes

1.1 Use of the manual

The manual is part of the product and contains important information on operation and service. The manual is written for everyone starting up or servicing this product.

The manual must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the manual carefully and understood it. Consult SEW-EURODRIVE if you have any questions or if you require further information.

1.2 Structure of the safety notes

The safety notes in this manual are designed as follows:

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

Symbol	Signal word	Meaning	Consequences if disregarded
Example: General danger	DANGER	Imminent danger	Severe or fatal injuries
 Specific danger, e.g. electric shock	WARNING	Possible hazardous situation	Severe or fatal injuries
	CAUTION	Possible hazardous situation	Minor injuries
	NOTICE	Potential damage to property.	Damage to the drive system or its environment
 TIP		Useful information or tip. Simplifies handling of the drive system.	



1.3 Rights to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the MOVIFIT® documentation. Therefore, read the manual before you start operating the device.

Make sure that the MOVIFIT® documentation is available to persons responsible for the system and its operation as well as to persons who work independently on the unit. You must also ensure that the documentation is legible.

1.4 Exclusion of liability

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

1.5 Copyright notice

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Unauthorized reproduction, copying, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

1.6 Other applicable documentation

- This manual does not replace the detailed operating instructions.
- Only qualified personnel observing all applicable accident prevention guidelines and the MOVIFIT®-MC, MOVIFIT®-SC or MOVIFIT®-FC (depending on the MOVIFIT® version in use) operating instructions may install and take these units into operation.

1.7 General safety notes for bus systems

You are now in possession of a communication system that lets you adapt MOVIMOT® and MOVIFIT® inverters and MOVIFIT® motor starters to the particulars of your system. As with all bus systems, there is a danger of invisible, external (as far as the inverter/motor starter is concerned) modifications to the parameters which give rise to changes in the inverter/motor starter behavior. This may result in unexpected (not uncontrolled) system behavior.



1.8 Safety functions

MOVIFIT® may not perform any safety functions unless they are described and expressly approved.

For safety applications, ensure that the information in the following publication is observed:

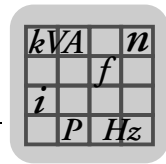
- MOVIFIT® functional safety

Use only those components in safety applications that were explicitly designed and delivered for this purpose by SEW-EURODRIVE.

1.9 Hoist applications

- With MOVIFIT®-FC in conjunction with function level "Technology", hoist applications are only permitted if certain requirements are met:
 - A hoist startup must be performed.
- MOVIFIT®-FC must not be used as a safety device in hoist applications.

Use monitoring systems or mechanical protection devices as safety equipment to avoid possible damage to property or injury to people.

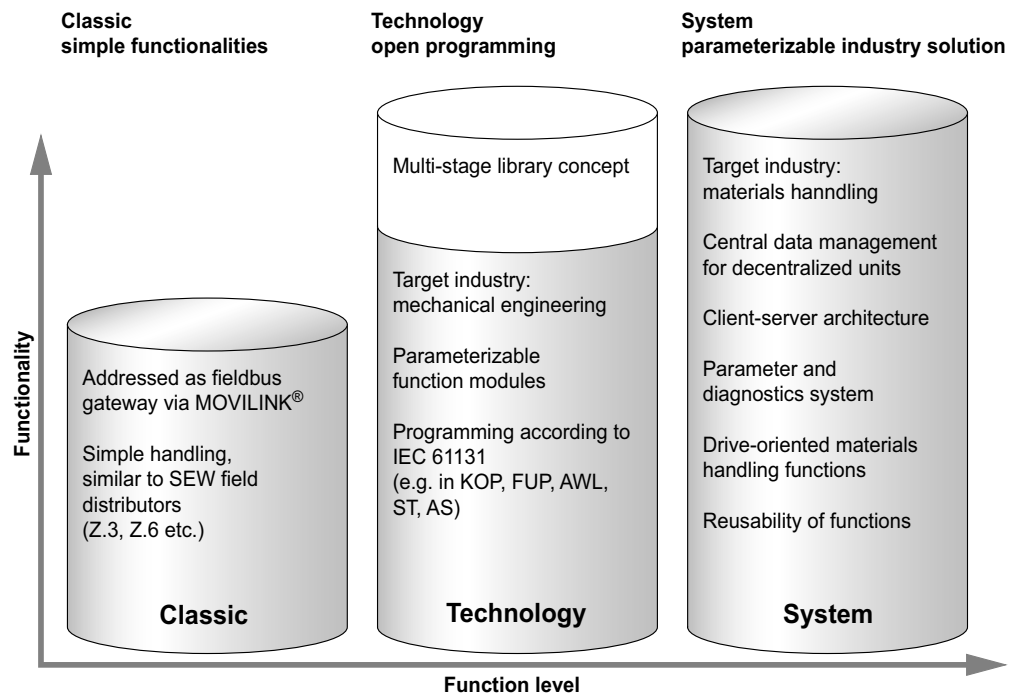


2 Introduction

2.1 MOVIFIT® function level

The function level describes the functions included in the software for MOVIFIT® units regarding operation, system control and diagnostics.

The following figure gives an overview of the MOVIFIT® function levels:

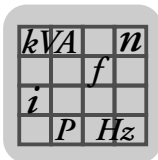


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TIP

This manual illustrates the MOVIFIT® function level "**Technology**". For information on the other MOVIFIT® function levels, refer to the relevant manuals.



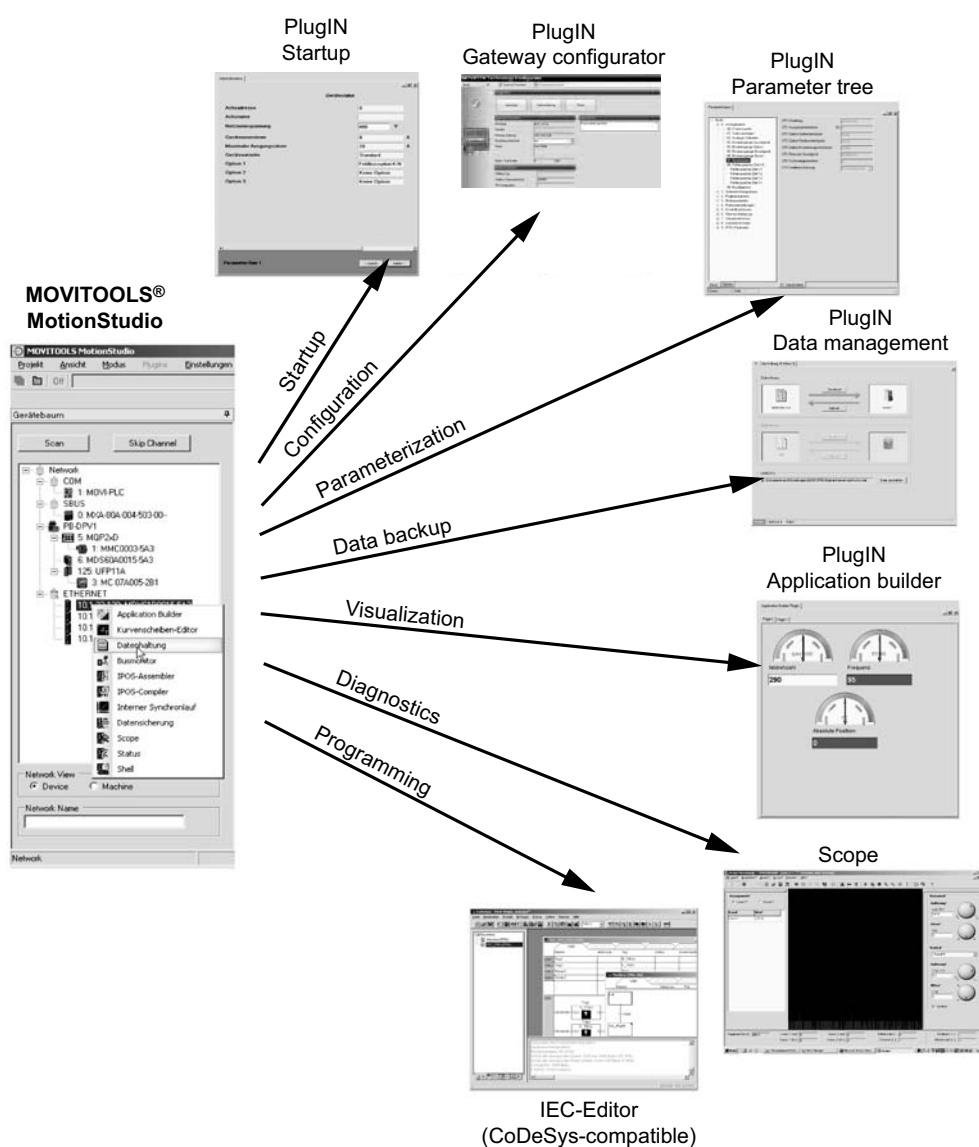
2.2 Function level "Technology" with MOVI-PLC®/MOVITOOLS® MotionStudio

2.2.1 Open programming via MOVI-PLC®/MOVITOOLS® MotionStudio

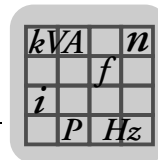
Regardless of whether it is used to control a machine module or as a stand-alone system, Demanding drive tasks can easily be configured using the "Technology" function level. Direct programming in the MOVI-PLC® development environment lets customers turn their application-specific requirements into drive applications.

Tasks can be programmed using the standard IEC 61131 languages (LD, FBO, IL, ST, SFC) (MOVI-PLC®). Furthermore, function blocks from different libraries can be combined into a program to implement complex motion sequences.

The new MOVITOOLS® Motion Studio allows for a complete engineering concept. This software offers all the tools necessary for automation and startup of drives.



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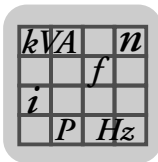


2.2.2 Libraries

A multi-level library concept guarantees user-friendly programming. SEW-EURODRIVE offers a complete range of programming modules, from the standard IEC 61131 functions, through PLCopen certified motion blocks, right up to application-specific and customer-specific solutions. This means you can design individual and customized solutions quickly and easily.

2.2.3 MOVI-PLC® – advantages

- Flexible programming of the application
- Standardized programming languages in accordance with IEC 61131-3
- PLCopen libraries for convenient automation
- On request: customized, application-specific programs
- Existing program libraries
- Configuration, startup, monitoring, diagnostics and updates of all SEW components



3 Application Modules in MOVITOOLS® MotionStudio

3.1 Application modules for MOVIFIT® function level "Technology"

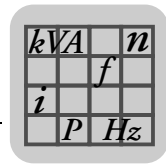
3.1.1 Description

<i>Drive task</i>	Industrial drive tasks usually require more than motor speed control. The inverter often has to control complex motion sequences and take on typical PLC tasks.
<i>Application modules for MOVIFIT® function level "Technology"</i>	SEW-EURODRIVE offers various standardized control programs, so-called application modules, for positioning. The application module has a user-friendly GUI to assist with parameterization. You merely have to specify the parameters required for your application. The application module uses this information to create the control program and loads it into the inverter. MOVIFIT® function level "Technology" is in charge of the entire motion control. Thus the application module takes load off the higher-level controller.
<i>Benefits</i>	The application modules represent the following benefits: • Wide range of functions • User-friendly GUI • All you have to do is enter the parameters needed for the application • Guided parameter setting process instead of complicated programming • No programming experience required • Quick training, therefore quick project planning and startup • All movement functions are controlled directly in MOVIFIT®
<i>Scope of delivery and documentation</i>	The application modules are included in the MOVITOOLS® MotionStudio operating software. They can be used with MOVIFIT® function level "Technology".



TIP

In most cases, information on how to operate the application modules is contained in separate manuals. They are available via the SEW homepage.

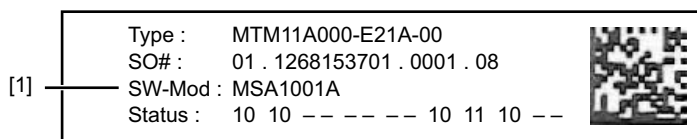


3.1.2 Available application modules

The following application modules are available for MOVIFIT®.

- Transparent mode (implemented on delivery as a standard)
- Binary control (only for MOVIFIT®-FC)
- Cam positioning (only for MOVIFIT®-FC/-MC)
- Bus positioning (Basic) (only for MOVIFIT®-FC)

The EBOX nameplate indicates the application module installed on delivery, see following figure:



[1] Designation of the application module

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The following table shows the designations of the application modules on the EBOX nameplate:

Designation	Application module installed on delivery
"MSA1001A"	Cam positioning
"MSA1002A"	Binary control
"MSA1003A"	Bus positioning (Basic)
–	Transparent mode If the "SW-Mod" field on the EBOX nameplate is empty, the transparent mode is installed.

Transparent mode

The transparent mode provides a range of convenient functions:

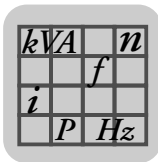
- Process data received via the fieldbus is transmitted
 - from and to the binary inputs/outputs
 - from and to the integrated power section (only MOVIFIT®-FC/-SC)
 - from and to the connected MOVIMOT® inverter (only MOVIFIT®-MC)
 - from and to the connected MOVIFIT® slave units
- Data backup for potential replacements
- Process data monitor as diagnostics and startup assistance for communication with the higher-level controller

Binary control

With the binary control application module, you can control MOVIFIT®-FC without fieldbus via digital inputs. Further you can switch between 2 parameterizable setpoint speeds.

The binary control application module has the following features:

- 2 setpoint speeds
- 3 ramps (ramp up, ramp down and rapid stop ramp)
- User-guided startup



Cam positioning

The cam positioning application module is an application module for cam and positioning applications.

Typical applications are:

- Roller and chain conveyors
- Elevating tables
- Rotary tables

The cam positioning application module has the following features:

- Bidirectional rapid/creep speed positioning to one limit switch at each end
- Control via fieldbus or binary inputs
- Jog mode
- Run time monitoring during positioning
- Monitoring of the creep speed when the stop limit switch is reached.
- User-guided startup and diagnostics

Bus positioning (Basic)

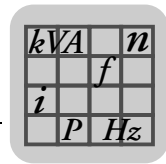
The Bus positioning (Basic) application module is for all applications with a high number of target positions. The movement records are managed in the central controller for this application module. The target position and the travel velocity are determined via the fieldbus.

The bus positioning (Basic) application module has the following features:

- Any number of target positions can be defined and selected via fieldbus.
- The travel velocity of each positioning cycle can be specified as required.
- Software limit switches can be defined and evaluated.
- Any low-resolution (max. 96 increments/revolution) built-in and add-on HTL encoder can be evaluated.

The following operating modes are available as control method:

- Jog mode: You control the drive manually.
- Automatic mode: The higher-level PLC controls the drive.
- Reference travel: The drive is referenced to a reference switch or without enable.



3.2 Motion library for MOVIFIT® function level "Technology"

3.2.1 Description

MOVIFIT® function level "Technology" is equipped with a MOVI-PLC® controller freely programmable according to IEC 61131-3 and PLCopen

The PLC Editor is used as programming software. It is included in the MOVITOOLS® MotionStudio operating software.

	TIPS
	• For information on how to control the frequency inverter in the MOVIFIT®-FC, refer to "Libraries – MPLCMotion_MC07 and MPLCMotion_MM for MOVI-PLC®" • For more information on the MPLCProcessdata library, refer to the "MOVI-PLC® Programming in PLC Editor" system manual.

3.2.2 Functions

MPLCProcessdata, MPLCMotion_MTF and MPLCMotion_MM provide the following functions for the connected drive:

- Administrative functions
- Inverter operation (speed specification)
- Reference travel
- Positioning mode

3.2.3 Positioning applications

Positioning applications require encoders with suitable encoder signals. The encoder is connected directly to the MOVI-PLC®, see "MOVIFIT®-MC"/"MOVIFIT®-FC" operating instructions.

Observe the following notes when selecting the encoder:

- Permitted encoders: HTL encoders
- Encoder resolution: max. 96 increments/revolution
- Number of encoders: max. 3
- The encoder evaluation must be activated for each encoder

The program modules required for positioning are included in the MPLC MPLCMotion_MTF library. It is part of the MOVITOOLS® MotionStudio operating software and is available after installation.

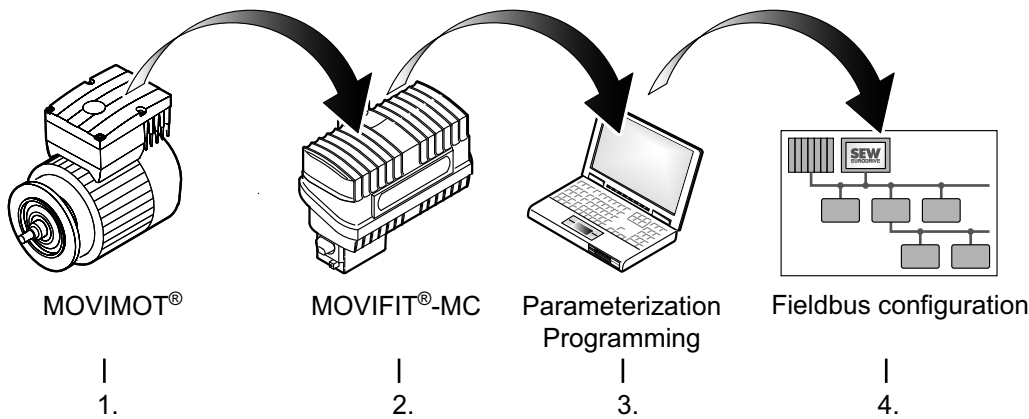


4 Startup

This publication describes the parameter settings and fieldbus configuration required for MOVIFIT® in connection with the function level "Technology".

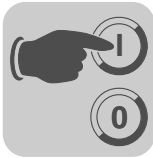
4.1 Startup procedure for MOVIFIT®-MC

The following table gives an overview of the MOVIFIT®-MC startup procedure and lists other application documentation:



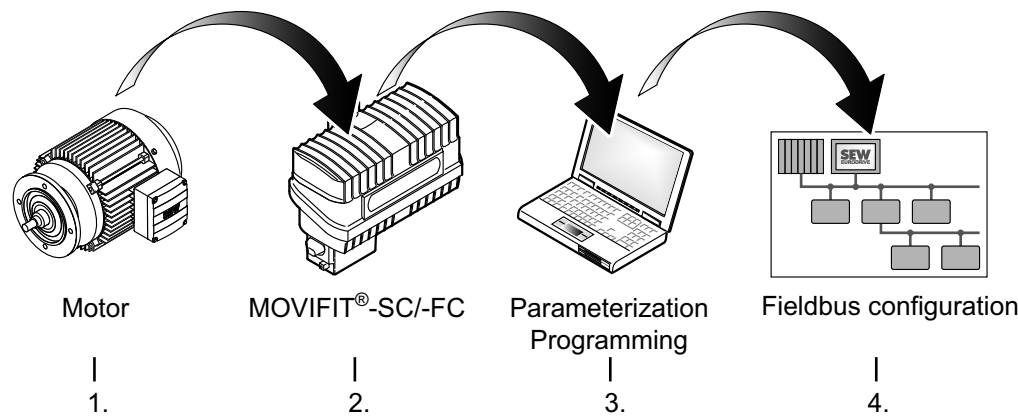
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Function level	1. Startup MOVIMOT®	2. Startup MOVIFIT®-MC	3. Parameterization, pro- gramming	4. Fieldbus configu- ration
Technology	"MOVIFIT®-MC" operating instructions "MOVIMOT®" operating instructions	"MOVIFIT®-MC" operating instructions	- Chapter "Application modules in MOVITOOLS MotionStudio" (see page 12) - Chapter "Configuration in transparent mode" (see page 162) "MOVI-PLC® Pro-gramming in the PLC Editor" manual - MPLCMotion_MC07 and MPLCMotion_MM Libraries for MOVI-PLC®m manual	- Chapter "Project planning and startup" - Chapter "Process data description in transparent mode (see page 78)" - Chapter "Fault responses"



4.2 Startup procedure for MOVIFIT®-SC and -FC

The following table gives an overview of the MOVIFIT®-SC/FC startup procedure and lists other applicable documentation:



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Function level	1. Startup Motor	2. Startup MOVIFIT®-SC/-FC	3. Parameterization, programming	4. Fieldbus Configuration
Technology	• "DR/DV/DT/DTE/DVE AC Motors, CT/CV Asynchronous Servomotors" operating instructions • "AC Motors DRS/DRE/DRP" operating instructions	• "MOVIFIT®-SC" operating instructions • "MOVIFIT®-FC" operating instructions	• Chapter "Parameterization and Diagnostics (see page 119)" • "MOVI-PLC® Programming in the PLC Editor" manual • MPLCMotion_MC07 and MPLCMotion_MM Libraries for MOVI-PLC® manual	• Chapter "Project planning and startup" • Chapter "Process data description in transparent mode (see page 78)" • Chapter "Fault responses"



TIP

- A parameterization in function level technology is only required when the "Expert mode" is activated.
- For information about "easy mode", see the relevant MOVIFIT® operating instructions.



4.3 *Startup procedure with encoder*

**TIPS**

- MOVIFIT® units in conjunction with function level "Technology" support positioning applications by using the following encoders:
 - Proximity encoder NV..
 - Incremental encoder ES..
 - Incremental encoder EI.
- For detailed information on how to program positioning applications, refer to the "MPLCMotion_MC07 and MPLCMotion_MM Libraries for MOVI-PLC®" manual.



5 Installation Notes



TIP

For information on the assembly and installation of MOVIFIT® refer to the following operating instructions "MOVIFIT®-MC", "MOVIFIT®-SC" or "MOVIFIT®-FC".

For a simple application, this section contains information on how to install the Ethernet.

5.1 Bus connection in the ABOX

5.1.1 Ethernet pin assignment X30/X11 and X31/X12 (RJ 45 socket)

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

	Pin	Assignment
Push-Pull RJ45 plug connector 	1	TX+
	2	TX-
	3	RX+
	4	res.
	5	res.
	6	RX-
	7	res.
	8	res.



NOTICE

Do not use push-pull RJ45 sockets without the mating push-pull RJ45 connector according to IEC PAS 61076-3-117. Conventional RJ45 patch cables without push-pull connector housing do not latch when plugged. This may damage the socket.

5.1.2 Ethernet pin assignment X11/X12 (M12 socket)

	Pin	Assignment
M12 plug connector, D-coded, female 	1	TX+
	2	RX+
	3	TX-
	4	RX-



5.1.3 MOVIFIT® – Ethernet connection

Connect one of the following Ethernet interfaces to connect the MOVIFIT® unit to the Ethernet network:

- X30/X11 (RJ45)
- X31/X12 (RJ45)
- X11 (M12)
- X12 (M12)

Use a twisted-pair line according to category 5, class D to IEC 11801 edition 2.0. The integrated switch provides support for realizing a line topology and offers auto crossing functions.



TIP

According to IEC 802.3, the maximum cable length for 10/100 MBaud Ethernet (10BaseT / 100BaseT), e.g. between 2 network stations, is 100 m.



5.2 The integrated Ethernet switch

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

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

5.2.1 Auto-crossing

The two ports leading out of the Ethernet switch have auto-crossing functionality. This means that they can use both patch and cross-over cables to connect to the next Ethernet station.

5.2.2 Auto-negotiation

The baud rate and the duplex mode is negotiated by both Ethernet nodes when establishing the connection. For this purpose, both Ethernet ports of the EtherNet connection support an auto-negotiation functionality and work with a baud rate of either 100 Mbit or 10 Mbit in full duplex or half-duplex mode.

5.2.3 LINK status monitoring

Both ports allow for a monitoring of the LINK status. You can set up this function via the STEP 7 hardware configuration as follows:

- Select slot 0 in STEP 7.
- Select "Object properties" from the context menu.
- Select the "Parameters" tab.

Only set the monitoring for the port that sends data packages to other nodes and not to the control. If a LINK DOWN is detected when the monitoring function is switched on, the PROFINET device sends a diagnostics alarm to the control via the other port.



5.3 TCP/IP addressing and subnetworks

5.3.1 Introduction

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

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

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

5.3.2 MAC address

The MAC address (Media Access Controller) is the basis for all address settings. The MAC address is a worldwide unique 6-byte value (48 bits) assigned to the Ethernet device. SEW Ethernet devices have the MAC address 00-0F-69-xx-xx-xx. The MAC address is difficult to handle for larger networks. This is why freely assignable IP addresses are used.

5.3.3 IP address

The IP address is a 32 bit value that uniquely identifies a station in the network. An IP address is represented by 4 decimal numbers separated by decimal points.

Example: 192.168.10.4

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

Byte 1		Byte 2		Byte 3		Byte 4
11000000	.	10101000	.	00001010	.	00000100

The IP address comprises a network address and a station address (see following table).

Network address	Station address
192.168.10	4

The part of the IP address that denotes the network and the part that identifies the station is determined by the network class and the subnetwork mask.

Station addresses cannot consist of only zeros or ones (binary) because they represent the network itself or a broadcast address.



5.3.4 Network classes

The first byte of the IP address determines the network class and as such represents the division into network addresses and station addresses.

Value range Byte 1	Network class	Complete network address (Example)	Meaning
0 – 127	A	10.1.22.3	10 = Network address 1.22.3 = Station address
128 – 191	B	172.16.52.4	172.16 = Network address 52.4 = Station address
192 – 223	C	192.168.10.4	192.168.10 = Network address 4 = Station address

This rough division is not sufficient for a number of networks. They also use an explicit, adjustable subnet mask.

5.3.5 Subnet mask

A subnet mask is used to divide the network classes into even finer sections. Like the IP address, the subnet mask is represented by 4 decimal numbers separated by decimal points.

Example: 255.255.255.128

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

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

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

		Byte 1		Byte 2		Byte 3		Byte 4
IP address	decimal	192	.	168.	.	10	.	129
	binary	11000000	.	10101000	.	00001010	.	10000001
Subnetwork mask	decimal	255	.	255	.	255	.	128
	binary	11111111	.	11111111	.	11111111	.	10000000

The class C network with the address 192.168.10. is further subdivided into 255.255.255.128 using the subnetwork mask. 2 networks are created with the address 192.168.10.0 and 192.168.10.128.

The following station addresses are permitted in the two networks:

- 192.168.10.1 ... 192.168.10.126
- 192.168.10.129 ... 192.168.10.254

The network stations use a logical AND operation for the IP address and the subnetwork mask to determine whether there is a communication partner in the same network or in a different network. If the communication partner is in a different network, the standard gateway is addressed for passing on the data.



5.3.6 Standard gateway

The standard gateway is also addressed via a 32-bit address. The 32-bit address is represented by 4 decimal numbers separated by decimal points.

Example: 192.168.10.1

The standard gateway establishes a connection to other networks. In this way, a network station that wants to address another station can use a logical AND operation with the IP address and the subnet mask to decide whether the desired station is located in the same network. If this is not the case, the station addresses the standard gateway (router), which must be part of the actual network. The standard gateway then takes on the job of transmitting the data packages.

5.4 *Setting the IP address parameters*

5.4.1 Initial startup

Depending on the S11 DIP switch setting:

- the MOVIFIT[®] unit has fixed parameters (DEF-IP)
- or the parameterized IP parameters are valid.

5.4.2 Changing the IP address parameters after initial startup

Usually the IP address parameters are set via the engineering tool of the PROFINET IO controller, e.g. Step 7 HW Config, see section "PROFINET IO – Project Planning (see page 36)".

If the MOVIFIT[®] unit was started using a valid IP address, you can also access the IP address parameters via the Ethernet interface.

There are various ways to change the IP address parameters via Ethernet:

- with the MOVITOOLS[®] MotionStudio software
- with the SEW Address Editor

In addition you can also change the IP address parameters via the other interface of the MOVIFIT[®] unit.

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

The type of IP address assignment is set with DIP switch S11/1 in the EBOX.

- S11/1 = "0" => stored IP parameters
- S11/1 = "1" => default IP parameters



5.4.3 Resetting the IP address parameters

You can use DIP switch "DEF IP" S11/1 = "1" to restore the default IP address parameter values.

The following IP parameters are set:

- IP address: 192.168.10.4
- Subnet mask: 255.255.255.0
- Default gateway:

Note: As the IP address in delivery condition corresponds to the gateway address, the gateway function is deactivated.

5.4.4 SEW Address Editor

You can also use the SEW Address Editor to access the IP settings of the MOVIFIT® unit without the Ethernet settings of the PC and MOVIFIT® having to match.

The Address Editor in MOVITOOLS® MotionStudio can be used to display and change the IP settings of all the SEW units in the local subnet, see section "MOVITOOLS® MotionStudio – operation (see page 97)".

- Thus, for a running installation, you can determine the PC settings required to provide for an access with the required diagnostics and engineering tools via Ethernet.
- This for assigning the IP settings for the MOVIFIT® unit without having to change the network connections or the PC settings.



5.5 Replacement procedure

If the ABOX is not replaced together with the EBOX, all settings regarding IP parameters and the MAC address remain the same. They are stored in the ABOX memory.

The "DEF IP" and "DHCP" (S11) DIP switch settings of the new EBOX must correspond to the settings of the old EBOX.

The IP parameters are also stored in the ABOX memory.

5.6 Shielding and routing the bus cables

Only use shielded cables and connection elements that also meet the requirements of category 5, class 2 in compliance with IEC 11801 edition 2.0.

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

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



NOTICE

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.



5.7 Connecting an external SBus to MOVIFIT® slave units



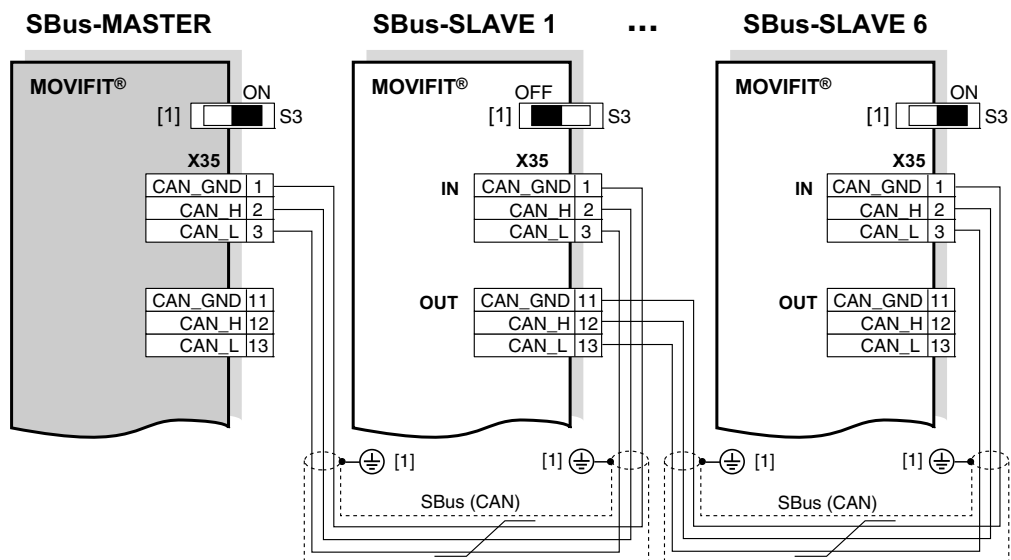
TIP

The example applies for the following ABOX:

- Standard ABOX "MTA...-S02.-...-00"
- Hybrid ABOX "MTA...-S42.-...-00"
- Hybrid ABOX "MTA...-S52.-...-00"
- Hybrid ABOX "MTA...-S62.-...-00"

The following figure shows the SBus connection:

- If MOVIFIT® is located at the end of an SBus segment, it is only connected via the incoming SBus cable (CAN).
- To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using bus terminating resistors at the first and last physical stations.
- The bus terminating resistors are already installed in the MOVIFIT® ABOX and can be activated using DIP switch S3.



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- [1] DIP switch S3 for bus termination
[2] EMC cable gland

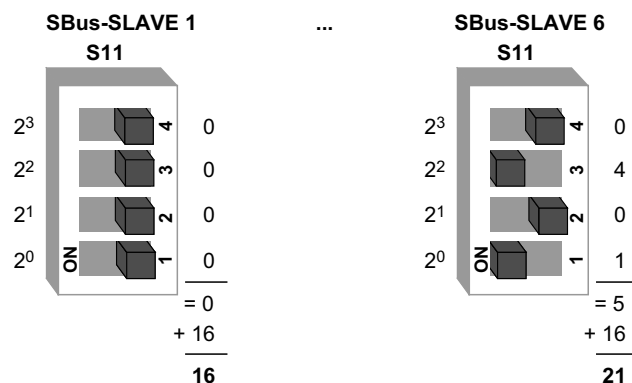


Installation Notes

Connecting an external SBus to MOVIFIT® slave units

- Set the SBus slave addresses via DIP switches S11/1 – S11/4 on the MOVIFIT® EB-OX.

The SBus slave addresses are a combination of the DIP switch S11 settings and a fixed offset of 16.



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Set the SBus slave addresses in ascending order starting with 16 for the first SBus slave node.

Please note:

- If possible, use a 2x2 core twisted and shielded copper cable (data transmission cable with braided copper shield). Connect the shield of the cable to the metal housing of the MOVIFIT® ABOX using an EMC cable gland. Additionally for a 2-core cable, connect the shield ends to the GND. The cable must meet the following specifications:
 - Cable cross section 0.25 mm² (AWG23) ... 0.75 mm² (AWG18)
 - Cable resistance 120 Ω at 1 MHz
 - Capacitance per unit length ≤ 40 pF/m at 1 kHz
 Suitable cables are e.g. CAN bus or DeviceNet cables.
- The permitted total cable length is 100 m at a fixed SBus baud rate of 500 kBaud.
- Point-to-point wiring is not permitted.



TIP

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



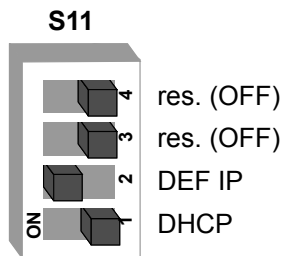
5.8 Setting the DIP switches in the ABOX



TIP

Before changing a DIP switch setting, disconnect the MOVIFIT® from power (supply voltage and 24 V backup operation). The DIP switch settings are adopted during initialization only.

The IP parameters are set with DIP switches S11/1 and S11/2.



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S11/1 "DHCP"	S11/2 "DEF IP"	Status
ON	OFF	The MOVIFIT® unit awaits the IP parameter being assigned by a DHCP server.
OFF	ON	The IP parameters are set to the following default values when the DC 24 V voltage is switched on: - IP address: 192.168.10.4 - Subnet mask: 255.255.255.0 - Default gateway: 1.0.0.0 with EtherNet/IP - DHCP / Startup Configuration: Saved IP parameters (DHCP is deactivated)
OFF	OFF	The IP parameters set in the parameter tree are used On delivery, the above-mentioned default values are set.

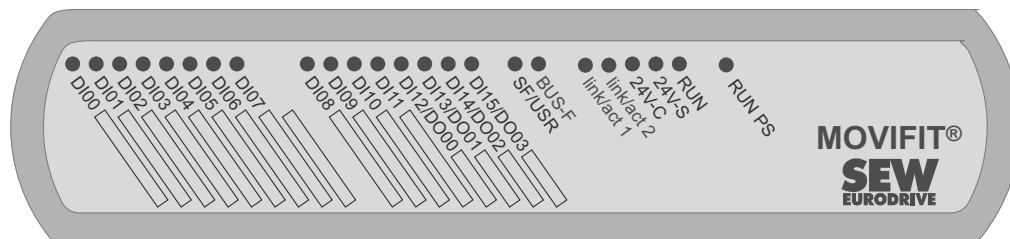
On delivery, DIP switches S11/1 and S11/2 are both set to "OFF".



5.9 Status LEDs of the MOVIFIT® function level "Technology"

5.9.1 General LEDs

The following figure shows the LEDs for MOVIFIT® function level "Technology" with PROFINET IO interface.



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LEDs "DI.." and
"DO.."

The following table shows the states of the LEDs "DI.." and "DO..":

LED	Status	Meaning
DI00 to DI15	Yel-low	Input signal present at binary input DI..
	Off	Input signal at binary input DI.. open or "0".
DI100 through DI103 ¹⁾	Yel-low	Input signal present at binary input DI..
	Off	Input signal at binary input DI.. open and "0".
DO00 to DO03	Yel-low	DO.. output switched.
	Off	DO.. output logical "0"

1) Only with MOVIFIT® in SBus slave design

LEDs "24V-C" and
"24V-S"

The following table shows the states of the "24V-C" and "24V-S" LEDs:

LED	Status	Meaning	Remedy
24V-C	Green	24V_C continuous voltage present at X20:2, 3.	-
	Off	24V_C continuous voltage not present at X20:2, 3.	Check 24_VC.
24V-S	Green	24V_S actor voltage present at X20:5, 6.	-
	Off	24V_S actor voltage X20:5, 6 not present.	Check 24_S voltage supply.



LED "SF/USR"

The following table shows the states of the "SF/USR" LED:

SF/USR	Meaning	Remedy
Off	IEC program is running.	-
Green	IEC program is running. The green LED is controlled by the IEC program.	Refer to the IEC program documentation for more information
Red	Boot project has not been started or has been cancelled due to a fault.	Log in via MOVITOOLS® / PLC-Editor / Remote-Tool and check the boot project.
	MOVIFIT® initialization fault Wrong EBOX/ABOX combination	Incorrect card ID. Check the type of the MOVIFIT® EBOX. Use the correct EBOX on the ABOX and perform a complete startup procedure.
Flashes Red	No IEC application program loaded.	Load an IEC application program and, if necessary, restart the integrated PLC.
Flash-ing yellow	The IEC application program has been loaded but is not executed (PLC = stop)	Check the IEC application program using MOVITOOLS® MotionStudio and, if necessary, restart the integrated PLC.
Flashes 1 x red and n x green	Fault status reported by the IEC program.	Refer to the IEC program documentation for more information on the statuses and the corresponding remedy

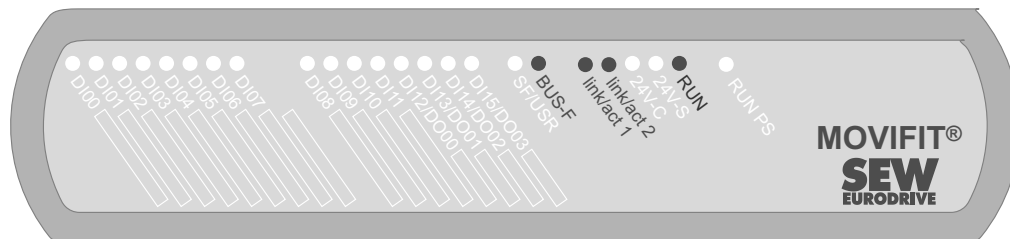


Installation Notes

Status LEDs of the MOVIFIT® function level "Technology"

5.9.2 Bus-specific LEDs for PROFINET

This section describes the bus-specific LEDs for PROFINET. In the following figure, the LEDs are shown as dark:



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"RUN" LED

The following table shows the states of the "RUN" LED:

RUN	BUS-F	Meaning	Remedy
Green	x	MOVIFIT® components hardware OK	-
Green	Off	- Correct MOVIFIT® operation - MOVIFIT® is currently exchanging data with the PROFINET master (data exchange) and all subordinate drive systems	-
Off	x	- MOVIFIT® not ready - No 24 V power supply	- Check DC 24 V supply. - Switch MOVIFIT® back on. Replace EBOX if problem occurs several times.
Red	x	Fault in the MOVIFIT® component hardware	Switch MOVIFIT® back on. Replace EBOX if problem occurs several times.
Flash-ing green	x	MOVIFIT® components hardware does not start.	Switch MOVIFIT® back on. Replace EBOX if problem occurs several times.
Flash-ing yellow	x	MOVIFIT® components hardware does not start.	Switch MOVIFIT® back on. Replace EBOX if problem occurs several times.
Yellow	x	MOVIFIT® components hardware does not start.	Switch MOVIFIT® back on. Replace EBOX if problem occurs several times.

X Any state



"BUS-F" LED

The following table shows the states of the "BUS-F" LED:

RUN	BUS-F	Meaning	Remedy
Green	Off	MOVIFIT® is currently exchanging data with the PROFINET master (data exchange)	-
Green	Flash- ing green, flash- ing green/ red	The flashing function in the PROFINET master configuration is activated to visually localize the stations.	-
Green	Red	• Connection to the PROFINET master has failed. • MOVIFIT® does not detect a link. • Bus interruption • PROFINET master not in operation.	• Check the PROFINET connection of the MOVIFIT® • Check the PROFINET master. • Check all cables in your PROFINET network.

**LEDs "link/act 1"
and "link/act 2"**

The following table lists the states of the "link/act 1" and "link/act 2" LEDs:

link/act 1 link/act 2	Meaning
Green	• Ethernet cable connects device with other Ethernet stations.
Flashing red	• "Localize" function, see chapter "Operating MOVITOOLS® MotionStudio (see page 97)"
Yellow	• Ethernet communication activated



5.9.3 LED "RUN PS"

The "RUN PS" LED indicates the operating status of the motor starter (for MOVIFIT®-SC) or the integrated frequency inverter (for MOVIFIT®-FC). MOVIFIT®-MC has no "RUN PS" LED.

LED color	LED status	MOVIFIT®		MOVIMOT® power section – operating state	Description
		-SC	-FC		
-	Off	X	X	not ready	No 24 V power supply
Green	Steady light	X	X	Unit enabled	Motor(s) in operation.
Green	Flashes steadily		X	Ready for operation	Standstill current function active
Green	Flashing evenly, fast	X	X	Current limit active	Drive operating at current limit.
Green	1x flashing, break	X		Unit enabled	Normal operation "enable" for dual-motor operation: - Motor starter ready for operation (24 V electronics power supply and supply voltage present) - Drive 1 enabled
Green	2x flashing, break	X		Unit enabled	Normal operation "enable" for dual-motor operation: - Motor starter ready for operation (24 V electronics power supply and supply voltage present) - Drive 2 enabled
Green/yellow	Flashing with alternating colors	X	X	Ready, but timeout	Faulty communication with cyclical data exchange
Yellow	Steady light	X	X	Ready, but unit inhibited	24 V power supply and supply voltage OK, but no enable signal
Yellow	Flashes steadily	X	X	not ready	Self-testing phase Or 24 V supply applied but supply voltage not OK
Yellow	Flashing evenly, fast	X	X	Ready for operation	Brake release without drive enable active
Red	Steady light	X		not ready	24V_C and 24V_P supply OK. Motor starter power section board defective
			X	not ready	Check 24V_C and 24V_P supply Make sure that there is a smoothed DC voltage with low ripple (residual ripple max. 13%) present
Red	Flashing evenly, slowly		X	Fault 08	Speed monitoring fault
			X	Fault 09	Faulty startup/parameterization (e.g. with MotionStudio)
			X	Fault 15	24 V supply voltage too low
			X	Fault 90	Assignment of motor – inverter incorrect
		X	X	Faults 17 to 24, 37	CPU fault
		X	X	Fault 25	EEPROM fault
		X	X	Fault 94	checksum error
		X	X	Fault 97	Copy error
Red	2x flashing, break		X	Error 07	DC link voltage too high.
Red	3x flashing, break	X		Fault 44	Ixt utilization
		X	X	Error 01	Overcurrent motor/output stage
		X	X	Fault 11	Overtemperature in output stage



LED color	LED status	MOVIFIT®		MOVIMOT® power section – operating state	Description
		-SC	-FC		
Red	4x flashing, break	X	X	Fault 84	Overload in motor
		X	X	Fault 31	TF has triggered
Red	5x flashing, break	X		Fault 89	Overtemperature in brake
			X	Fault 89	Overtemperature in brake Incorrect motor/inverter assignment
			X	Fault 4	Overcurrent in brake chopper
Red	6x flashing, break	X	X	Error 06	Mains phase failure
			X	Fault 81	Start condition ¹⁾
			X	Fault 82	Open output

1) only for hoist operation mode



6 PROFINET IO – Project Planning

6.1 Introduction

Classic fieldbus communication is enhanced by fast Ethernet technology as a physical transmission medium using PROFINET IO. Profinet supports real-time capable process communication as well as open communication via Ethernet TCP/IP. PROFINET distinguishes between 3 communication classes that differentiate in terms of efficiency and functionality.

6.1.1 3 communication classes

- **TCP/IP**

Open Ethernet TCP / IP communication without real-time requirements (e.g. Web technology)

- **RT (Real-Time)**

IO data exchange between automation units in real-time (>1 ms).

- **IRT (Isochronous Real-Time)**

Isochronous real-time communication for synchronized IO data exchange (e.g. for motion control applications).

MOVIFIT® function level "Technology" meets the requirements of the PROFINET RT class and provides open communication via TCP/IP or UDP/IP.

6.1.2 >3 unit types

PROFINET IO distinguishes 3 unit types:

- **IO controller**

The IO controller undertakes the master function for the cyclic IO data exchange with the decentralized field units and is usually implemented as a communication interface of a controller. It is similar to a PROFIBUS DP master class 1. A PROFINET IO system can have several IO controllers.

- **IO device**

All field units of PROFINET IO that are controlled by an IO controller are designated as IO devices, e.g. I/O, drives, valve terminals, etc. IO devices are comparable with PROFIBUS DP slave participants. The MOVIFIT® unit is a PROFINET I/O device.

- **IO supervisor**

Programming devices / PC with corresponding engineering / diagnostic tools are designated as IO supervisors. IO supervisors have access to process and parameter data as well as alarm and diagnostic information.



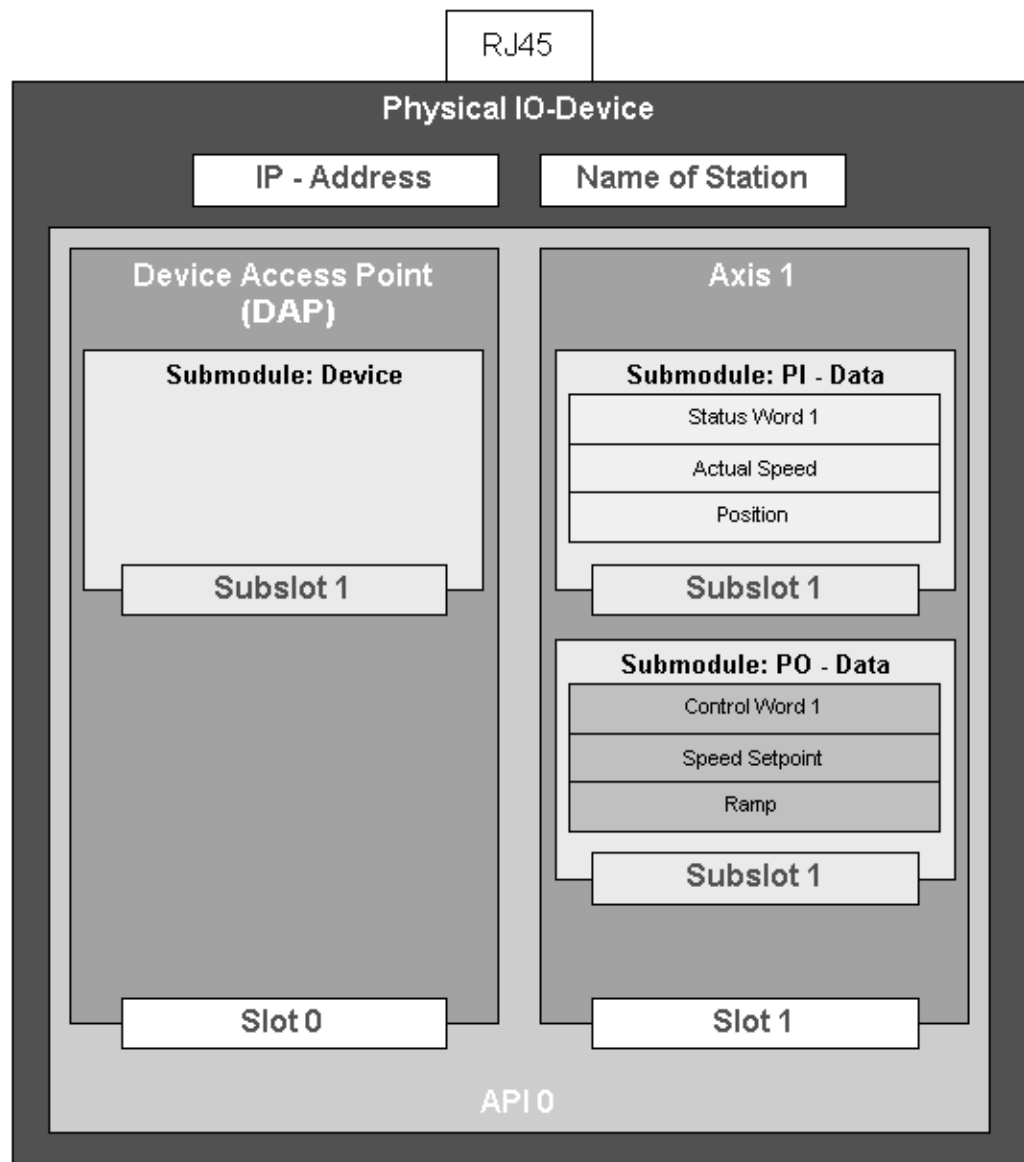
6.1.3 Communication model

The communication model of PROFINET IO is based on the many years of experience with PROFIBUS DP-V1. The master slave access procedure was mapped on a provider-consumer model.

Several communication channels are used for the data exchange between IO controller and IO devices. The cyclic IO data and the event-driven alarms are transferred via real-time channels. The standard channel based on UDP / IP is used for parameter settings, configuration and diagnostic information.

6.1.4 Unit model

The known decentralized periphery of PROFIBUS DP was enhanced for the device model. The device model is based on slot and subslot mechanisms where modular devices with slots can be implemented for modules and submodules. In this way, the slot and submodules are represented by subslots for the modules. These mechanisms also enable logical modularization, e.g. for a drive system (see following figure).



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A single drive axle is represented as a module under PROFINET IO. Several submodules can be plugged into this module. The submodules define the process data interface for the IO controller or data traffic partner. They have provider or consumer quality. The model provides the option to plug several modules into an IO device for multi-axis systems that have a common PROFINET IO interface. In this way, each module again represents a single axis. Slot 0 is used as a Device Access Point (DAP) and usually represents the IO device.



6.2 PROFINET IO controller – project planning

The following sections describe the project planning for MOVIFIT® units with PROFINET interface. The project planning will be explained using the example of the SIMATIC STEP 7 project planning software and a SIMATIC CPU 315F-2 PN/DP.

6.2.1 Installing the GSDML file



TIP

The latest GSDML file version is also available for download on the SEW website (www.sew-eurodrive.de) in the Software section.

Proceed as follows to install the GSD file:

1. Start STEP 7 HW Config and select the "Install new GSD file" menu item in the "Extras" menu.

A window is displayed.

2. Click on [Browse] and select the following file:

GSDML-V2.1-SEW-MTX-JJJJMMTT.xml (JJJJMMTT represents the date)

3. Confirm your selection by clicking [OK].

4. You can find the PROFINET IO connection for MOVIFIT® via "PROFINET IO" / "Other field devices" / "Drives" / "SEW" / "MOVIFIT" in the hardware catalog.

4 entries are available:

- MOVIFIT Classic V1.1
- MOVIFIT Technology V1.0
for controllers that support the PROFINET IO topology detection
- MOVIFIT Classic V1.0 **ALT**
- MOVIFIT Technology V1.0 **ALT**
for controllers that do **not** support the PROFINET IO topology detection

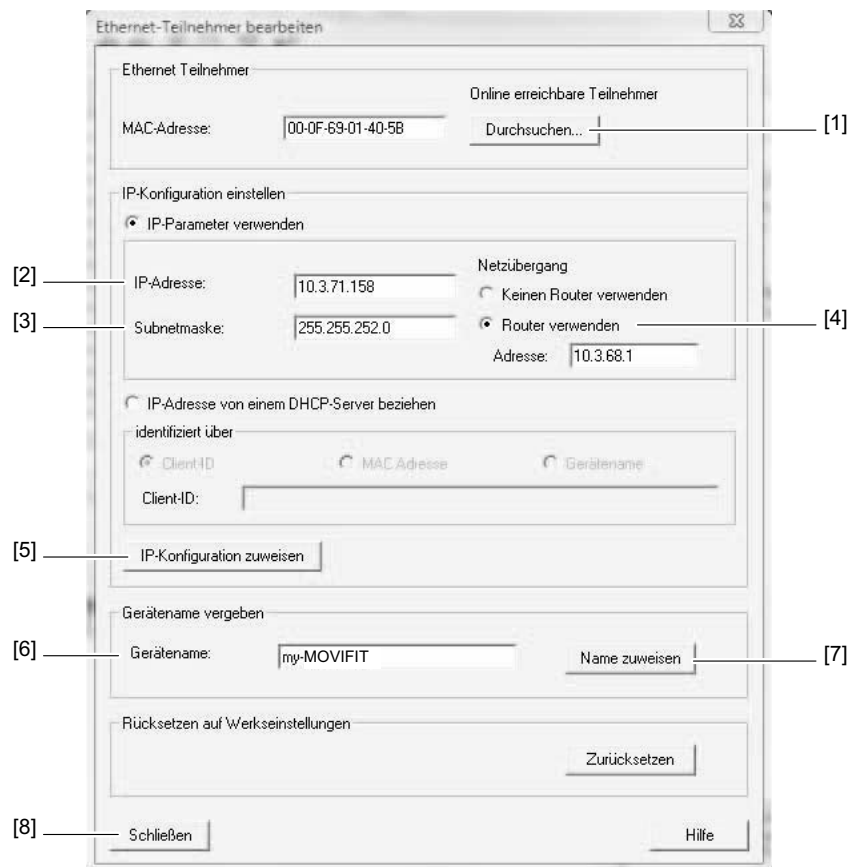


6.2.2 Assigning a PROFINET device name

Proceed as follows to assign the PROFINET device name:

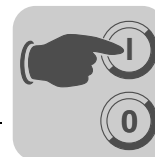
1. Select "ETHERNET"/"Edit ETHERNET station ..." from the "Target system" menu in STEP 7 HW Config.

The following window opens:



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- [1] [Browse] button
 - [2] "IP address" input field
 - [3] "Subnet mask" input field
 - [4] "Router address" input field
 - [5] "Assign IP configuration" button
 - [6] "Device name" input field
 - [7] "Assign name" button
 - [8] [Close] button
2. Click on the [Browse] [1] button in the "Ethernet stations" group. You receive an overview of all PROFINET IO stations that you can reach online with your project planning tool.



3. Choose the required station.

The SEW station appears under "Unit type". The default device name is "PNETDeviceName" and must be changed appropriately. Several MOVIFIT® units can be distinguished between by the MAC addresses displayed. The MAC address is affixed to the MOVIFIT® unit.

4. Enter the device name in the "Device name" input field [6] and click the [Assign name] button [7].

The device name can have up to 255 characters. The device name is transferred to and saved in the station.

You can reset the device name of the MOVIFIT® unit online using the [Reset] button. Then you will have to restart the MOVIFIT® unit.

5. Specify an IP address [2] and a subnet mask [3] as well as a router address [4] if required.

Click the [Assign IP configuration] button [5].

	TIP
	The IO controller must not yet be in a cyclic data transmission with the IO devices.

6. Check whether the settings have been applied by once again clicking the [Browse] button [1].
7. Click the [Close] button [8].



6.3 PROFINET interface for a MOVIFIT® unit – project planning

6.3.1 Creating a new project

Proceed as follows to create a new project:

1. Start the SIMATIC Manager and create a new project.

Select your control type and add the required modules. The following modules make sense:

- **OB82 module:** This module makes sure that the controller does not trigger "STOP" in the event of so-called diagnostic alarms.
- **OB86 module:** This module indicates the failure of decentralized peripherals.
- **OB122 module:** This module is addressed if the controller cannot access the data of a station of the decentralized periphery. This can occur when, for example, the MOVIFIT® unit is ready for operation later than the control system.

2. Start STEP 7 HW Config and select the PROFINET IO slot in the control rack.

3. Add a PROFINET IO system by right-clicking the context menu with your mouse.

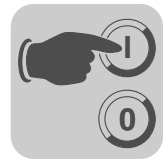
4. Specify an IP address for the PROFINET IO controller when doing this.

5. Add a new PROFINET subsystem using the [ETHERNET] button.

6. Open "PROFINET IO" / "Additional Field Devices" / "Drives" / "SEW" / "MOVIFIT" in the hardware catalog.

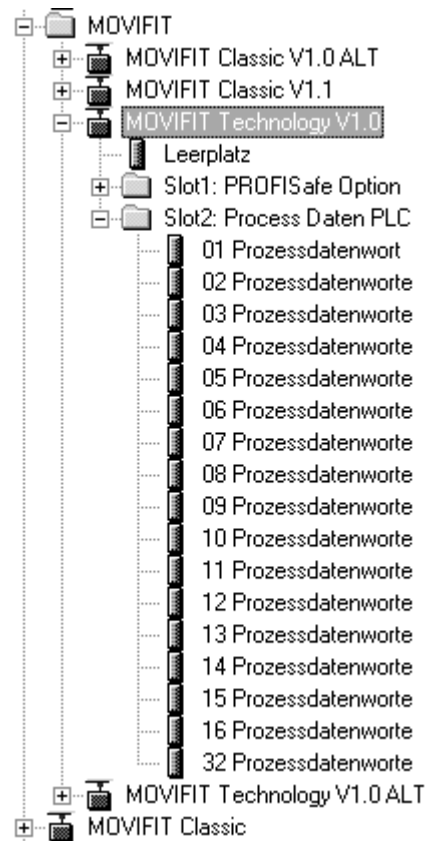
4 entries are available:

- MOVIFIT Classic V1.1
- MOVIFIT Technology V1.0
for controllers that support the PROFINET IO topology detection
- MOVIFIT Classic V1.0 **ALT**
- MOVIFIT Technology V1.0 **ALT**
for controllers that do **not** support the PROFINET IO topology detection



7. Move the entry "MOVIFIT Technology V1.0" to the PROFINET IO system with the mouse and assign a PROFINET station name. This name must correspond to the PROFINET device name specified in the MOVIFIT® unit.
8. Enter the IO and peripheral addresses in slot 2 and save the configuration.

The slot model is used for project planning with PROFINET. Each slot is assigned to a MOVIFIT® fieldbus interface. The following structure is used:



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Slot 1 is used for the PROFIsafe unit variant.

Slots 2 – 17 are assigned process data channels of the controller. Slot 2 is assigned 10 process data by default.

9. Extend your user program by data exchange with the new units. Process data transfer is consistent. SFC14 and SFC15 can be used to transfer process data.



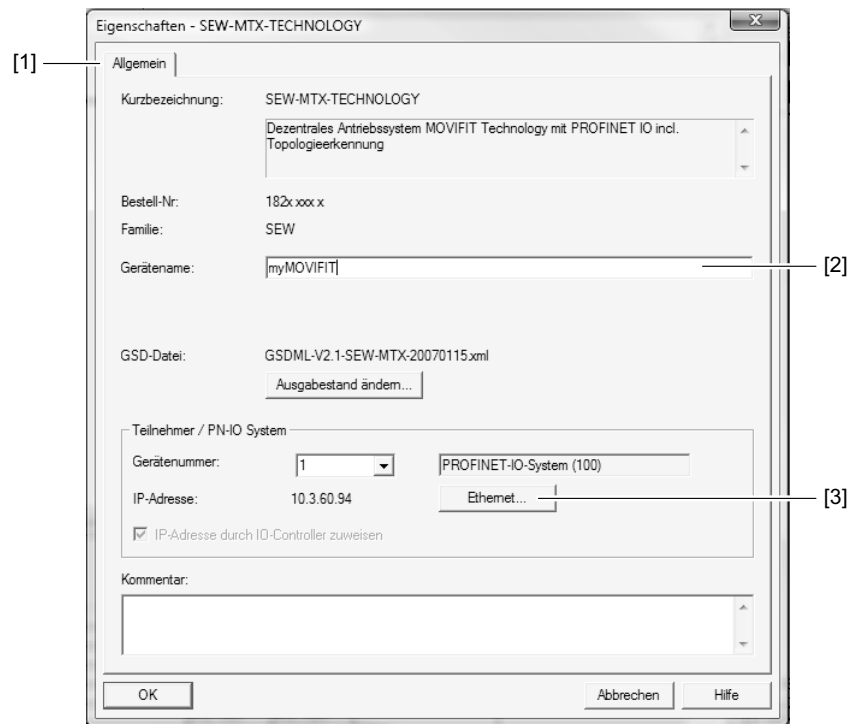
6.3.2 Configuring a station

When the individual slots are configured, the new station has to be configured with further settings.

Proceed as follows to configure a station:

1. Double-click on the unit symbol of the new station.

The following window opens:

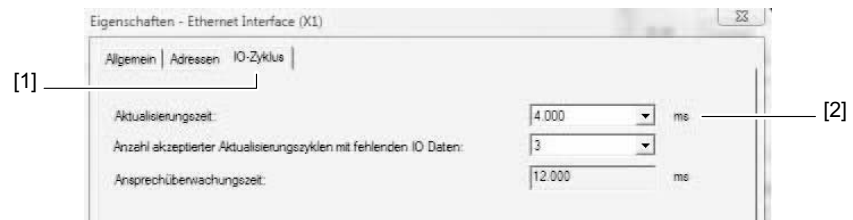


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- [1] "General" tab
 - [2] "Device name" input field
 - [3] [ETHERNET] button
2. Enter the device name mentioned above in the "Device name" input field [2] on the "General" tab.
Note that the name is case-sensitive.
 3. Click on [Ethernet] button in the "Station/PN IO system" group in order to enter the previously assigned IP address. [3].



4. Double-click on the "Ethernet interface" slot in order to set the station's update time.
The following window opens:



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- [1] "IO cycle" tab
[2] "Update time" selection field
5. On the "IO cycle" tab [1] set the update time [2] for the station to update its process data.

As a gateway, the MOVIFIT® unit supports a minimum update time of 4 ms.



6.4 *PROFINET configuration with topology detection*

6.4.1 Introduction

The PROFINET technology detection allows for projecting and monitoring the structure of the network with the PROFINET IO controller in addition to the PROFINET IO devices.

The so-called "Physical device (PHDEV)" is the starting point for the project planning. The PDEV is a model for the ETHERNET interface and can be found in slot 0 of the project planning with an "ETHERNET interface" subslot and one subslot for each ETHERNET port.

The visible ETHERNET ports can be connected to the project planning tool. The result is an image of the desired ETHERNET routing for the plant. This image is stored in the PROFINET IO controller.

In order to be able to determine the real plant topology, the PROFINET IO devices must support the so-called LLDP protocol. The PROFINET IO devices exchange information with the neighboring PROFINET IO devices via LLDP. Via LLDP, each PROFINET IO device cyclically sends information on its own PROFINET device name and port number. The neighboring unit receives and stores this information. Now a PROFINET IO controller can read the stored information from the PROFINET IO devices, thus determining the real plant topology.

By comparing the projected topology with the real topology, you can detect any missing or incorrectly wired PROFINET IO devices and localize them in the plant.

Apart from cabling you can still determine the transmission characteristics for the ports. For example, you can set an "Auto-negotiation" port to "100 Mbit full duplex". The settings will be monitored.

SNMP as a protocol for network diagnostics extends the topology detection with standard diagnostics mechanisms from the IT area.



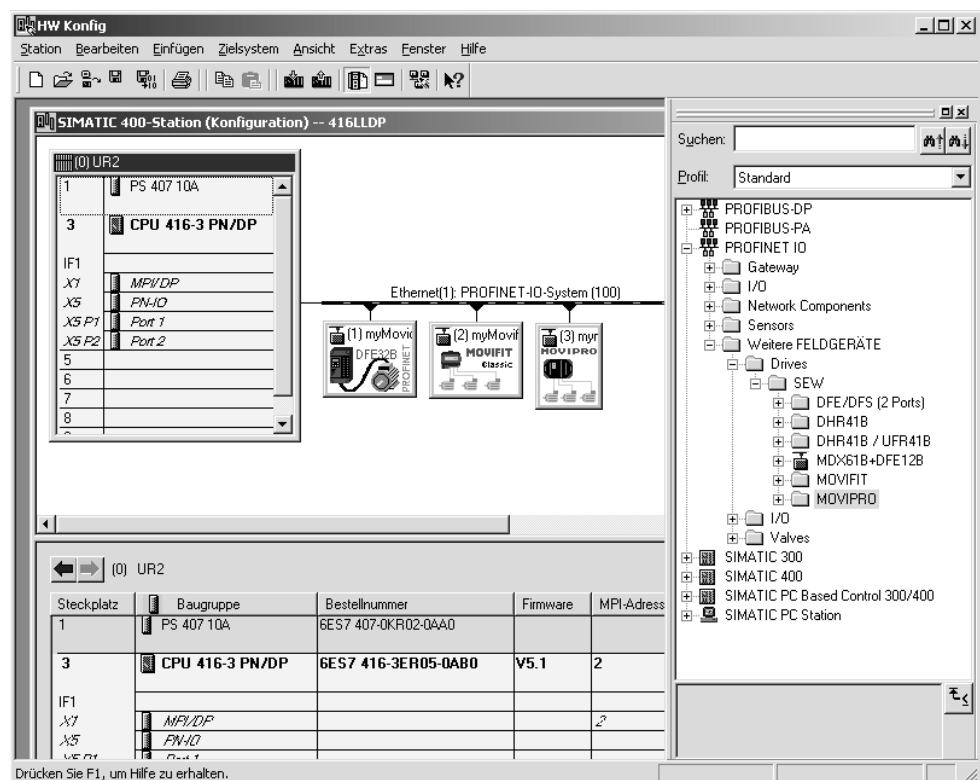
6.4.2 PROFINET topology – project planning

The project planning procedure for a PROFINET topology will be described using the example of SIMATIC STEP 7. There are various approaches for the project planning in SIMATIC STEP 7. This example will focus on one approach.

1. In STEP 7 HW Config, import the PROFINET devices from the hardware catalog into the PROFINET network as usual.

Make sure that the PROFINET IO controller supports the topology detection. The controller manufacturer will provide according information.

The hardware catalog contains several entries for each SEW interface marked as different versions. An entry marked with "ALT" does not support the PROFINET IO topology detection.



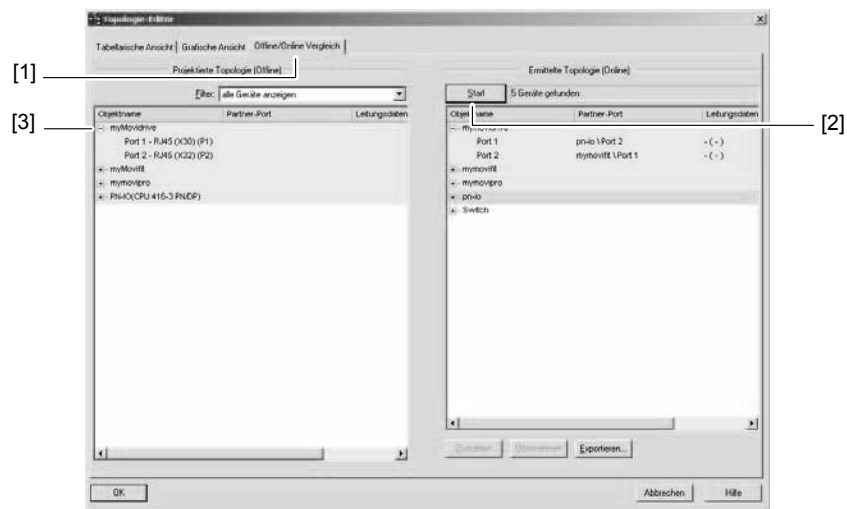
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2. Right-click on the "PROFINET IO system" and select "PROFINET IO topology" from the context menu.

The "Topology editor" window is displayed.



3. Select the "Offline/online comparison" tab [1].



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- [1] "Offline/online comparison" tab
- [2] [Start] button
- [3] Plus/minus symbol

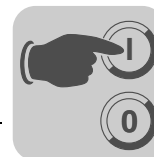
4. Determine the online topology by clicking [Start] [2].
5. Make sure that the determined topology complies with your requirements by clicking on the plus symbol [3] in the online topology and checking the partner port.

The following units are displayed in this example:

- 3 SEW units (MOVIDRIVE®, MOVIPRO® and MOVIFIT®)
- one controller
- one switch

The switch does not support topology and is highlighted white. The remaining PROFINET IO devices are not linked yet and are thus highlighted yellow.

6. In order to apply the determined online topology to the project planning port by port, right-click on a port. Select "Apply port interconnection". Repeat this procedure for all ports of the devices until the lists are green.



6.4.3 Changing port characteristics

The two ETHERNET ports of the PROFINET interface are set to "Automatic setup" by default. Observe the following for this default setup:

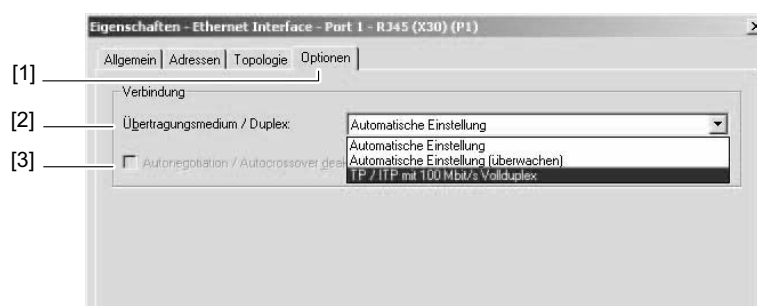
- Auto-negotiation and auto-crossover are activated in this setup.
- The baud rate and the duplex mode are configured automatically.
- The neighbor port must also be set to "Automatic setup".
- You can use patch or crossover cables.

You may set a port to "100 Mbit/s full duplex". Observe the following for this setup:

- This setting must also be made for the port of the neighbor unit, otherwise it would work with 100 Mbit/s half duplex.
- If auto-crossover is deactivated, you have to use cross cables.

Proceed as follows to set a port to "100 Mbit/s full duplex":

1. Select a unit in STEP 7 HW Config.
2. Select the desired port on slot 0.
3. Right-click on the port and select "Object properties" from the context menu.
A window is displayed.
4. Select the "Options" tab [1].



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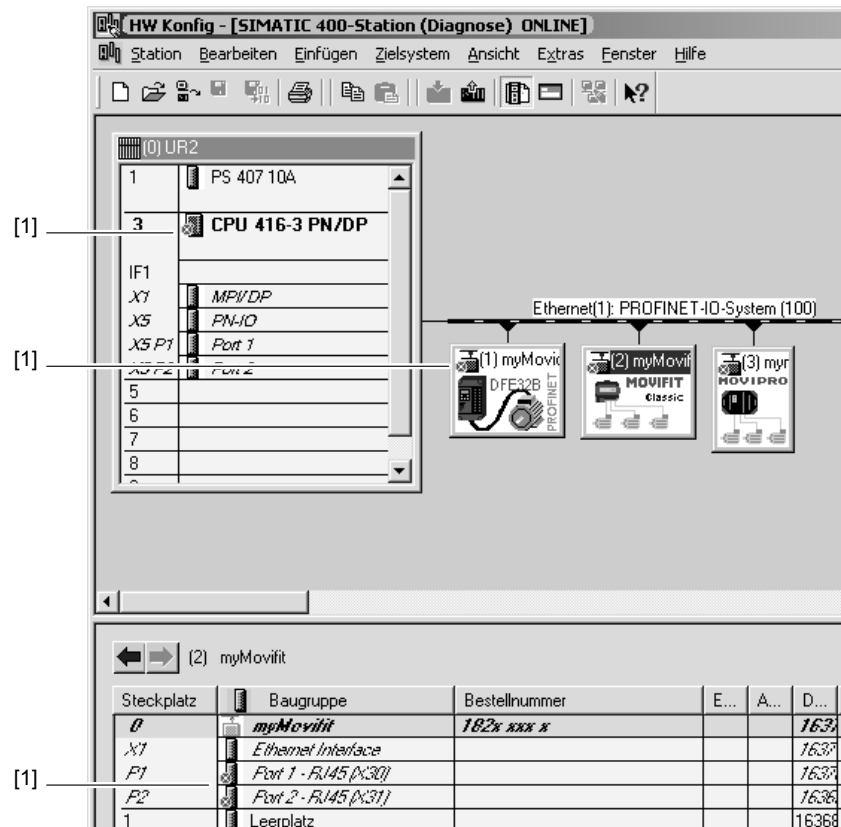
- [1] "Options" tab
- [2] "Transmission medium/duplex" selection list
- [3] "Auto-negotiation/auto-crossover" checkbox

5. From the "Transmission medium/duplex" [2] select "TP/ITP with 100 Mbit/s full duplex".
6. Deactivate the "Auto-negotiation/auto-crossover" checkbox [3].



6.4.4 Topology diagnostics

Topology errors are reported to the PROFINET IO controller as diagnostics alarms. In the event of an error, the "EXTF" LED of the PROFINET IO controller is lit. The error is also indicated by a red cross [1] in STEP 7 HW Config.



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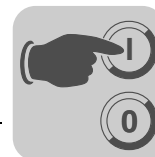
[1] "Red cross" – symbol for errors

Possible causes:

- ETHERNET ports mixed up
- Wrong port property settings
- Units cannot be addressed

Proceed as follows to display information on an error:

1. Select the unit or the respective slot.
2. Right-click and select "Module status" from the context menu.
A window is displayed.
3. Select the "Communication diagnostics" tab.



6.4.5 Port statistics

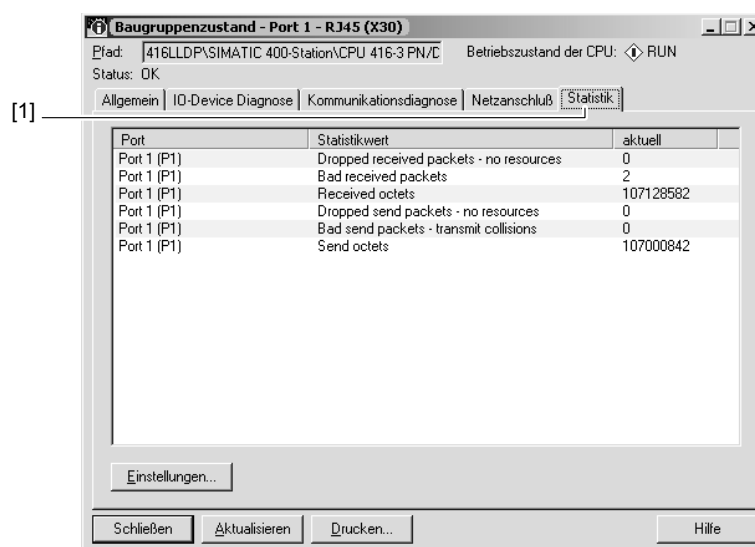
Proceed as follows to display the port statistics for an ETHERNET port in STEP 7 HW Config:

1. Click the "ONLINE ↔ OFFLINE", to switch to the "Online" communication mode.
2. Select a unit.
3. Select the desired port on slot 0.
4. Right-click and select "Module status" from the context menu.

A window is displayed.

Select the "Statistics" tab [1].

The following view is displayed:



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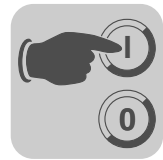
[1] "Statistics" tab

The following statistic values can be displayed:

- **Dropped received packets – no resources** indicates the number of valid ETHER-NET packets dropped on receipt. A large number of dropped valid packets suggests a high load on the bus system. In this case, try to reduce the utilization by especially reducing the number of broadcast and multicast telegrams and reducing the IO cycle or the number of PROFINET units in a line if required.



- **Bad received packets** indicates the number of faulty ETHERNET packets. A high number suggests a bus fault. In this case, check the cabling and shielding of the network.
- **Received octets** indicates the number of received packets.
- **Dropped sent packets – no resources** indicates the number of valid ETHERNET packets dropped on dispatch. A large number of dropped valid packets suggests a high load on the bus system. In this case, try to reduce the utilization by especially reducing the number of broadcast and multicast telegrams and reducing the IO cycle or the number of PROFINET units in a line if required.
- **Bad send packets – transmit collisions** indicates the number of ETHERNET packets dropped due to collisions. There should be no collisions in a switched network.
- **Sent Octets** indicates the number of sent packets.



6.5 PROFINET diagnostics alarms

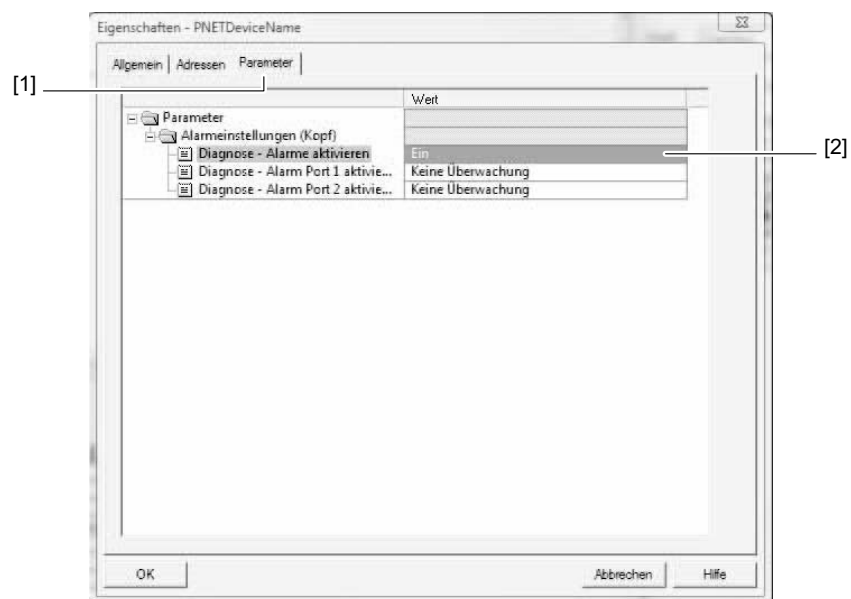
6.5.1 Activating the diagnostic alarms

The PROFINET interface supports diagnostic alarms in the event of a unit fault. These diagnostic alarms are deactivated by default. Proceed as follows to activate the diagnostics alarms in STEP 7 HW Config:

1. Mark a slot.
2. Right-click on the slot and select "Object properties" from the context menu.

A window is displayed.

3. Select the "Parameters" tab [1].
4. In "Activate diagnostics alarms" [2], set the alarms to "ON"



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- [1] "Parameters" tab
[2] "Activate diagnostics alarms" node



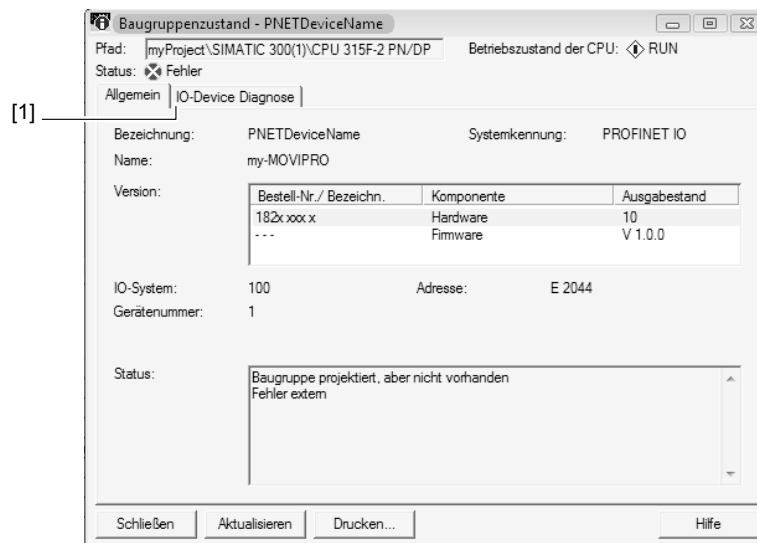
6.5.2 Troubleshooting

A fault in the function unit belonging to the plug-in module causes a diagnostic alarm to be sent to the controller as an "incoming event".

Proceed as follows to determine a fault in STEP 7 HW Config:

1. Click the "ONLINE ↔ OFFLINE", to switch to the "Online" communication mode.
2. Mark the symbol of the SEW PROFINET interface.
3. Right-click and select "Module status" from the context menu.

A window is displayed.

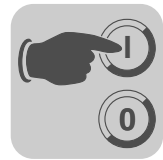


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[1] "IO device diagnostics" tab

4. Select the "IO device diagnostics" tab [1].
5. Click on [Display] to receive detailed information on the fault.

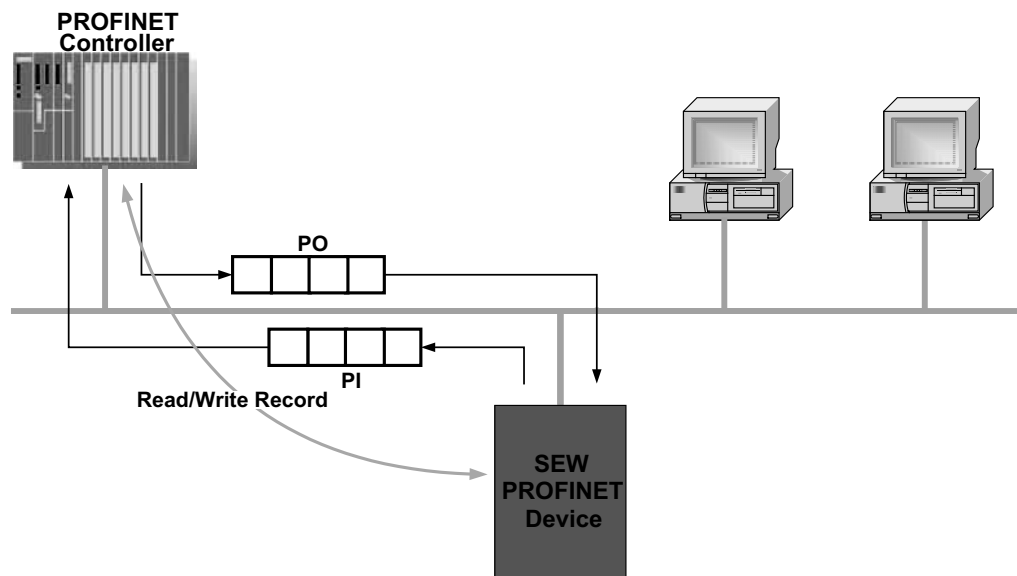
After resetting the fault, a so-called "ongoing event" is sent to the controller. The "SF" LED of the CPU goes out and no more faults are displayed in the module information.



7 Parameterization via PROFIdrive Dataset 47

7.1 PROFINET datasets – introduction

With "Read record" and "Write record", PROFINET offers acyclic services that can be used to transfer parameter data between the PROFINET controller (master) and a PROFINET device (slave). Via UDP (User Datagram Protocol), the priority of this data exchange is lower than the priority of the process data exchange.



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The user data transported via an acyclic PROFINET service is grouped in a dataset. Each dataset is clearly addressed by the following characteristics:

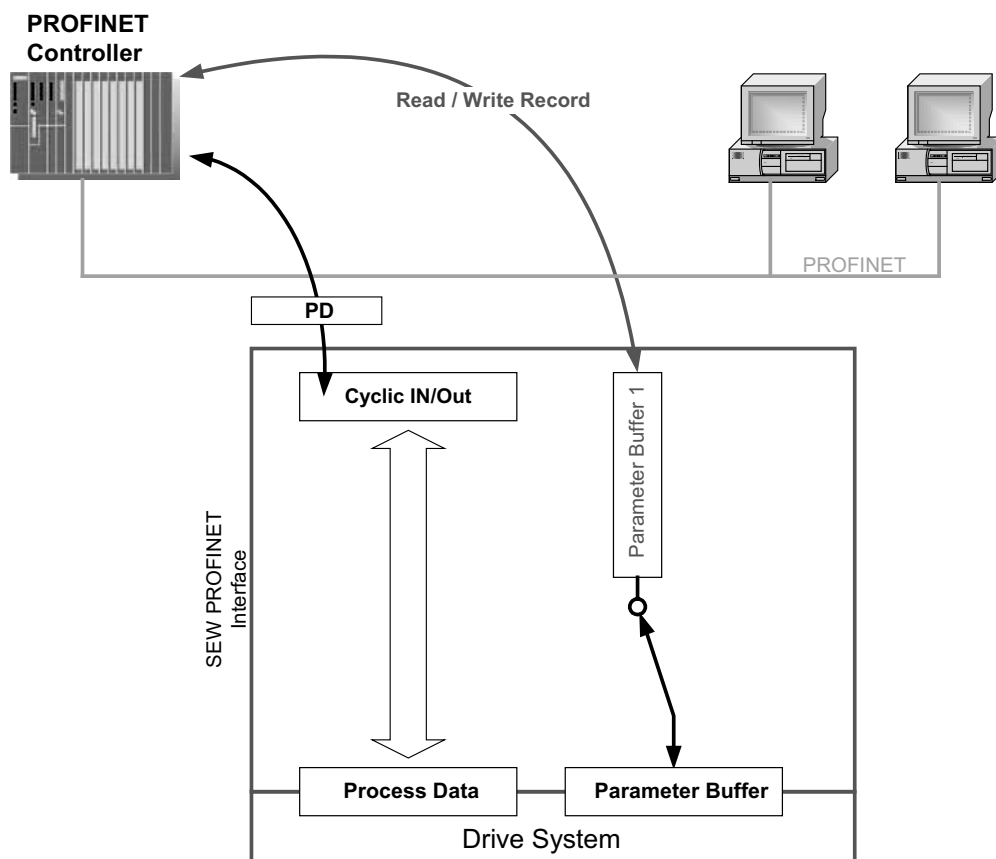
- API
- Slot number
- Subslot number
- Index

The structure of dataset 47 is used for the parameter exchange with SEW-EURODRIVE PROFINET units. The structure of dataset 47 is specified in the PROFIdrive profile drive technology of the PROFIBUS user organization as of V4.0 as PROFINET parameter channel. Different procedures for accessing parameter data of the SEW-EURODRIVE PROFINET unit are provided via this parameter channel.

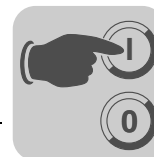


7.2 Characteristics of the SEW-EURODRIVE PROFINET units

The SEW-EURODRIVE PROFINET units that support acyclic Read Record and Write Record services all have the same communication characteristics. The units are basically controlled via a PROFINET controller with cyclic process data. Additionally, this controller (usually a PLC) can set the parameters for the SEW-EURODRIVE PROFINET unit via Read Record and Write Record.

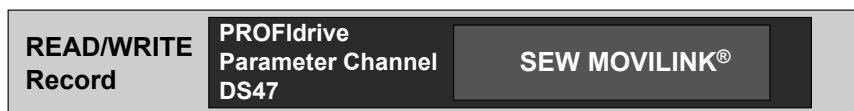


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7.3 Structure of the PROFINET parameter channel

Generally, the parameterization of the drives to the PROFIdrive-Base Mode Parameter Access of profile version 4.0 is implemented via dataset 47. The *Request ID* entry is used to distinguish between parameter access based on PROFIdrive profile or via SEW MOVILINK® services. The following table shows the possible codes of the individual elements. The dataset structure is the same for PROFIdrive and MOVILINK® access.



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The following MOVILINK® services are supported:

- 8-byte MOVILINK® parameter channel with all the services supported by the SEW device such as
 - READ parameter
 - WRITE parameter
 - WRITE parameter volatile
 - etc.



Parameterization via PROFIdrive Dataset 47

Structure of the PROFINET parameter channel

The following PROFIdrive services are supported:

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

Box	Data type	Values
Request reference	Unsigned8	0x00 reserved 0x01 – 0xFF
Request ID	Unsigned8	0x40 SEW MOVILINK® service 0x41 SEW data transport
Response ID	Unsigned8	<u>Response (+):</u> 0x00 reserved 0x40 SEW MOVILINK® service (+) 0x41 SEW data transport <u>Response (–):</u> 0xC0 SEW MOVILINK® service (–) 0x41 SEW data transport
Axis	Unsigned8	0x00 – 0xFF number of axes 0 – 255
No. of parameters	Unsigned8	0x01 – 0x13 1 – 19 DWORDs (240 data bytes)
Attribute	Unsigned8	For SEW MOVILINK® (Request ID = 0x40): 0x00 No service 0x10 READ parameter 0x20 WRITE parameter 0x40 Read minimum 0x50 Read maximum 0x60 Read default 0x80 Read attribute 0x90 Read EEPROM 0xA0 – 0xF0 reserved SEW data transport: 0x10 Value
No. of elements	Unsigned8	0x00 for parameters that are not indexed 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	0x0080 + MOVILINK® additional code low For SEW MOVILINK® 16 Bit error value

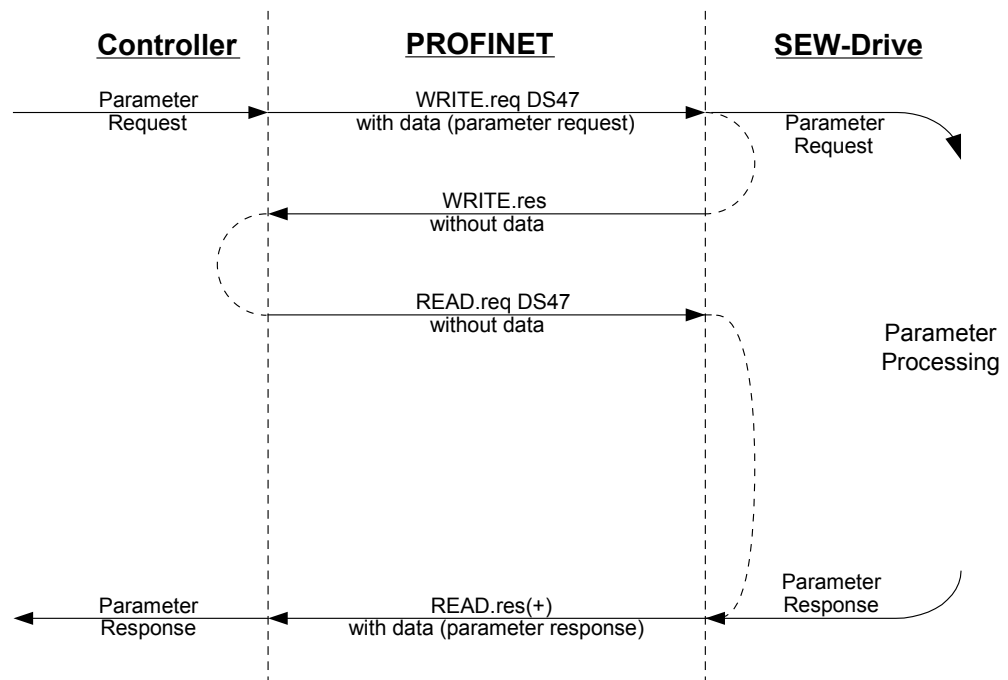


7.3.1 Parameterization procedure via dataset 47

Parameter access takes place with the combination of the WRITE RECORD and READ RECORD PROFINET services. The parameter setting order is transferred to the IO device using the WRITE.request. Then it is processed internally.

The controller now sends a READ.request to pick up the parameter setting response. The SEW device responds with a positive READ.response. The user data comprise the parameterization response of the parameterization request sent with WRITE.request sent before (see following figure). This mechanism applies to a PROFINET controller.

The following figure shows the telegram sequence for the parameter access via READ/ WRITE RECORD:

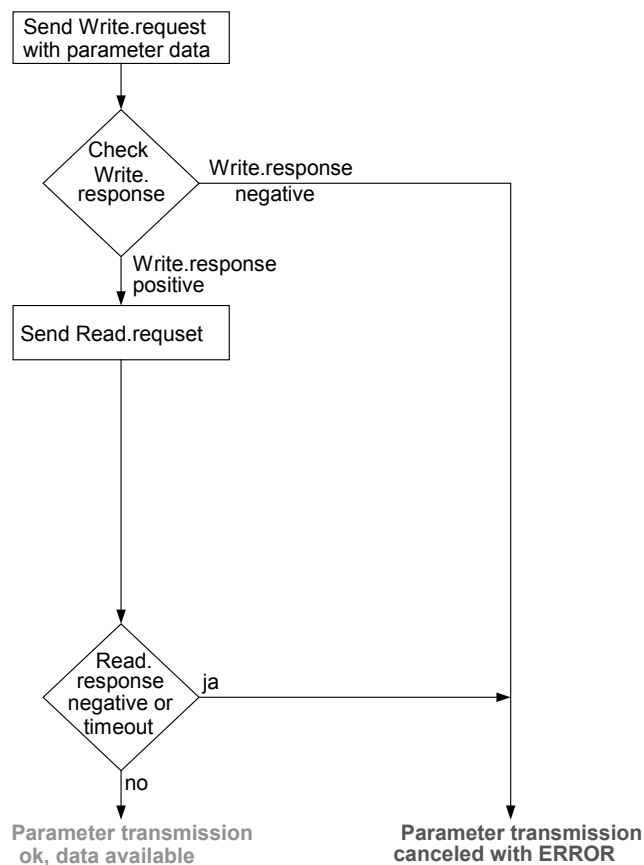


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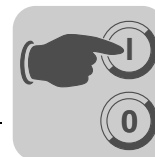


7.3.2 Processing sequence for the controller

If the bus cycles are very short, the request for the parameter response arrives before the SEW device has concluded the parameter access in the device. This means that the response data from the SEW device is not available yet. In this state, the SEW device delays the response to the READ RECORD Request.



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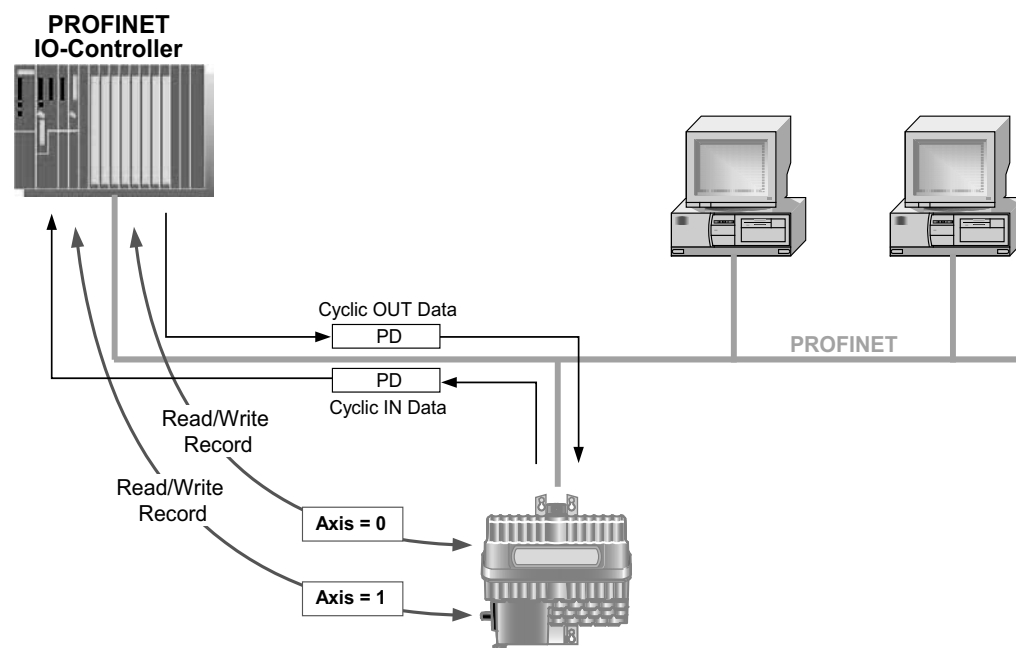
7.3.3 Addressing connected inverters

The structure of the DS47 dataset defines an *axis* element. This element is used to reach multi-axis drives that are operated via one PROFINET interface. The *axis* element addresses one of the units connected via the PROFINET interface.

Addressing a MOVIFIT® on PROFINET

With *Axis = 0*, the parameters of the MOVIFIT® control electronics can be accessed.

With *Axis = 1* the integrated power section of the MOVIFIT®-SC/FC is accessed.



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Axis = 0 => MOVIFIT® controller with fieldbus interface

Axis = 1 => MOVIFIT®-SC/FC power section

7.3.4 MOVILINK® parameter requests

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

Request ID: 0x40 SEW-MOVILINK® service

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



Parameterization via PROFIdrive Dataset 47

Structure of the PROFINET parameter channel

Reading a parameter via MOVILINK® – example

The following tables show an example of the structure of the *WRITE.request* and *READ.response* user data for reading an individual parameter via the MOVILINK® parameter channel. In this example, the firmware of the MOVIFIT® power section (SBus address 1) is read.

Sending a parameter request

The table shows the coding of the user data for the *WRITE.request* service. The *WRITE.request* service is used to transfer the parameter setting request to the inverter. The firmware version of the power section with the SBus address 1 is read.

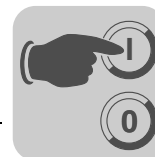
Service	WRITE. request	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	10	10 byte user data for parameter request

Byte	Box	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	SBus address of the MOVIFIT®-FC power section	0x01	Axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter
4	Attribute	0x10	MOVILINK® "READ Parameter" service
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 coding of the *READ.request* USER DATA including the PROFINET header.

Service	READ. request	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	240	Maximum length of response buffer in the master



Positive MOVILINK® parameter response

The table shows the READ.response USER DATA with the positive response data of the parameter setting request. The parameter value for index 8300 (firmware version) is returned as an example.

Service	READ. request	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	10	Maximum length of response buffer in the master

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



Writing a parameter via MOVILINK® – example

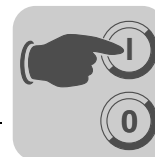
The following tables show the sequence of the *WRITE* and *READ* services for volatile writing of the value 1500 to parameter *P302 maximum speed* (Index 8517,0). The MOVILINK® *WRITE Parameter volatile* service is used for this purpose.

Send "WRITE parameter volatile" request

Service	WRITE. request	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	16	16-byte user data for order buffer

Byte	Box	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	0x01	Axis number 1 = SBus address of the MOVIFIT®-FC power section
3	No. of parameters	0x01	1 parameter
4	Attribute	0x30	MOVILINK® "Write parameter volatile" service
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter Number	0x2145	Parameter index 8517 = P302 maximum speed
8, 9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12, 13	Value High word	0x0000	Higher-order part of the parameter value
14, 15	Value Low word	0x0BB8	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 occurs. Otherwise, the status fault is located in Error_code_1.



Query parameter response

The following table shows the coding of the WRITE.request USER DATA including the PROFINET header.

Service	READ. request	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	240	Maximum length of response buffer in the master

Positive response to "WRITE parameter volatile"

Service	READ. response	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	4	4 byte user data in response buffer

Byte	Box	Value	Description
0	Response reference	0x01	Mirrored reference number from the parameter setting order
1	Response ID	0x40	Positive MOVILINK® response
2	Axis	0x01	Mirrored axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter

Negative parameter response

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

Service	WRITE.response	Description
API	0	Fixed setting = 0
Slot_Number	0	Random (is not evaluated)
Subslot_Number	1	Fixed setting = 1
Index	47	Index of the dataset for the parameter request; constant index 47
Length	8	8 byte user data in response buffer

Byte	Box	Value	Description
0	Response reference	0x01	Mirrored reference number from the parameter setting order
1	Response ID	0xC0	Negative MOVILINK® response
2	Axis	0x01	Mirrored axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Fault
5	No. of values	0x01	1 Error code
6, 7	Error value	0x0811	MOVILINK® return code e.g. Error class 0x08, Add. code 0x11 see section "MOVILINK® return codes of the PROFINET parameterization" (see page 66)



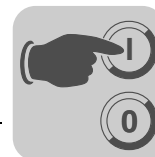
Parameterization via PROFIdrive Dataset 47

Structure of the PROFINET parameter channel

MOVILINK® return codes of the PROFINET parameterization

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

MOVILINK® Return code (hex)	Description
0x0810	Invalid index, parameter index does not exist in the unit
0x0811	Function/parameter not implemented
0x0812	Read access only
0x0813	Parameter lock activated
0x0814	Factory setting is active
0x0815	Value for parameter too large
0x0816	Value for parameter too small
0x0817	Required option card not installed
0x0818	Error in system software
0x0819	Parameter access via RS-485 process interface only
0x081A	Parameter access via RS-485 diagnostic interface only
0x081B	Parameter is access-protected
0x081C	Controller inhibit is required
0x081D	Invalid value for parameter
0x081E	Factory setting was activated
0x081F	Parameter was not saved in EEPROM
0x0820	Parameter cannot be changed with output stage enabled / reserved
0x0821	Reserved
0x0822	Reserved
0x0823	Parameter may only be changed at IPOS program stop
0x0824	Parameter may only be changed when auto setup is deactivated
0x0505	Incorrect coding of management and reserved byte
0x0602	Communication error between inverter system and fieldbus interface
0x0502	Timeout of secondary connection (e.g. during reset or with Sys-Fault)
0x0608	Incorrect coding of the format field



7.3.5 PROFIdrive parameter requests

The PROFIdrive parameter channel of SEW inverters is directly mapped in the structure of dataset 47. Parameter access with PROFIdrive services usually takes place according to the structure described below. The typical message sequence for dataset 47 is used. PROFIdrive only defines the two request IDs

Request ID: 0x01 request parameter (PROFIdrive)

Request ID: 0x02 change parameter (PROFIdrive)

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

	TIP
	The request ID = 0x02 = change parameter (PROFIdrive) results in remanent write access to the selected parameter. Consequently, the internal flash/EEPROM of the inverter is written with each write access. Use the MOVILINK® "WRITE Parameter volatile" service if parameters must be written cyclically at short intervals. With this service, you only alter the parameter values in the RAM of the inverter.

Reading a parameter via PROFIdrive – example

The following tables show an example of the structure of the WRITE.request and READ.response user data for reading an individual parameter via the MOVILINK® parameter channel.

Sending a parameter request

The table shows the coding of the user data for the WRITE.request service specifying the PROFINET header. The WRITE.request service is used to transfer the parameterization request to the inverter.

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

Byte	Box	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	0x01	Axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter
4	Attribute	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 coding of the READ.request USER DATA including the PROFINET header.

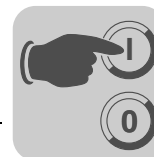
Service:	READ.request	Description
Slot_Number	0	Random, (is not evaluated)
Index	47	Index of the dataset; constant index 47
Length	240	Maximum length of response buffer in the PROFINET controller

Positive PROFIdrive parameter response

The table shows the READ.response user data with the positive response data of the parameter setting request. The parameter value for index 8300 (firmware version) is returned as an example.

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

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



Writing a parameter via PROFIdrive – example

The following tables show the structure of the *WRITE* and *READ* services for the **remanent** writing of parameter *P302 Maximum speed* (see section "Writing a parameter via MOVILINK® – example" (see page 64). The PROFIdrive *Change Parameter* service is used for this purpose.

Send "WRITE parameter" request

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

Byte	Box	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	0x01	Axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter
4	Attribute	0x10	Access to parameter value
5	No. of elements	0x00	0 = access to direct value, no subelement
6, 7	Parameter Number	0x2145	Parameter index 8517 = P302 maximum speed
8, 9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12, 13	Value High word	0x0000	Higher-order part of the parameter value
14, 15	Value Low word	0x0BB8	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 occurs. Otherwise, the status fault is located in Error_code_1.



Parameterization via PROFIdrive Dataset 47

Structure of the PROFINET parameter channel

Query parameter response

The following table shows the coding of the WRITE.request user data including the PROFINET header.

Service	Write.request	Description
Slot_Number	X	Random (is not evaluated)
Index	47	Index of the dataset
Length	240	Maximum length of response buffer in the PROFINET controller

Positive response to "WRITE parameter"

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

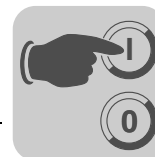
Byte	Box	Value	Description
0	Response reference	0x01	Mirrored reference number from the parameter setting order
1	Response ID	0x02	Positive PROFIdrive response
2	Axis	0x01	Mirrored axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter

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

Byte	Box	Value	Description
0	Response reference	0x01	Mirrored reference number from the parameter setting order
1	Response ID	0x810x82	Negative response for "Request Parameter" Negative response for "Change Parameter"
2	Axis	0x01	Mirrored axis number; 1 = SBus address 1
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Fault
5	No. of values	0x01	1 Error code
6, 7	Error value	0x0811	MOVILINK® return code e.g. Error class 0x08, Add. code 0x11 see section "MOVILINK® return codes for PROFINET" (see page 66)



PROFIdrive return codes for PROFINET

The following table shows the coding of the error number in the PROFIdrive 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 for
0x00	Invalid parameter number.	Access to non-existent parameters
0x01	Parameter value cannot be changed	An attempt was made to change a parameter value that cannot be changed
0x02	Minimum or maximum value exceeded	An attempt was made to change a value to one that is outside of the limit values
0x03	Incorrect subindex	Access to non-existent subindex
0x04	No assignment	Access with subindex to parameter that is not indexed
0x05	Incorrect data type	An attempt was made to change a replace a value with one that does not correspond to the data type of the parameter
0x06	Setting not permitted (can only be reset)	An attempt was made to set a value to one larger than 0 where this is not permitted
0x07	Description element cannot be changed	Access to description element that cannot be changed
0x08	Reserved	(PROFIdrive Profile V2: PPO write query for IR not available)
0x09	Description does not exist	Access to description that is not accessible (parameter value exists)
0x0A	Reserved	(PROFIdrive Profile V2: incorrect access group)
0x0B	No operation priority	An attempt was made to change a parameter without change rights
0x0C	Reserved	(PROFIdrive Profile V2: incorrect 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 assignment available	Access to text assignment that is not accessible (parameter value exists)
0x10	Reserved	(PROFIdrive Profile V2: no PPO write)
0x11	Request cannot be executed due to the operating mode	Access is currently not possible and the reason is not explained
0x12	Reserved	(PROFIdrive Profile V2: other error)
0x13	Reserved	(PROFIdrive Profile V2: data cannot be read in cyclic exchange)
0x14	Incorrect value	An attempt was made to change a value to one that is in the permitted range but is not permitted due to other long-term reasons (parameter with specified individual values)
0x15	Response is too long	The length of the current response exceeds the maximum transmittable length
0x16	Invalid parameter address	Invalid value or value that is not valid for this attribute, number of elements, parameter number, subindex or a combination of these factors.
0x17	Incorrect format	Write request: Invalid format or parameter data format that is not supported
0x18	Number of values is not consistent	Write request: Number of values of parameter data does not correspond to the number of elements in the parameter address
0x19	Axis does not exist	Access to an axis that does not exist
up to 0x64	Reserved	–
0x65–0xFF	Depends on the manufacturer	–



7.4 Reading/writing the parameterization via dataset 47

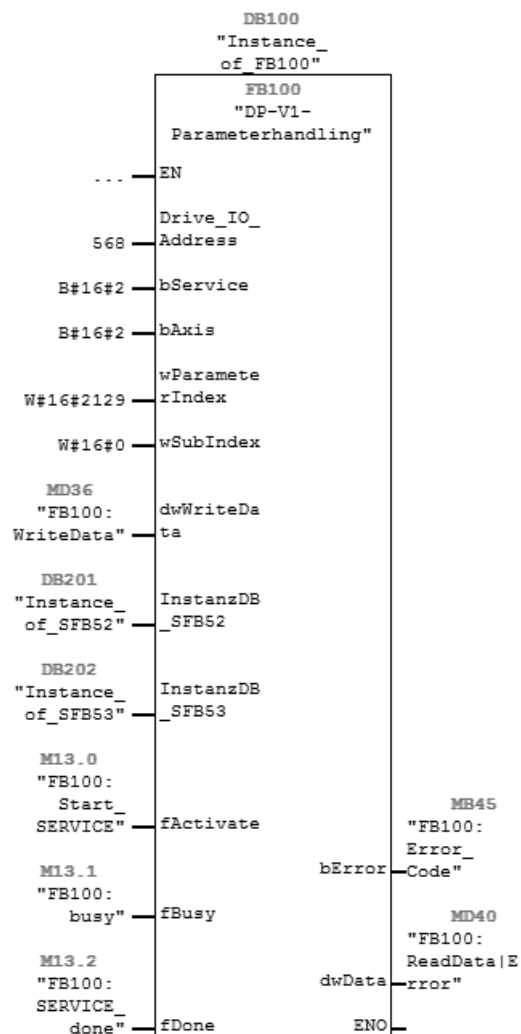
7.4.1 Example with the S7 "MOVILINK® parameter channel" function module



TIP

- The MOVILINK® parameter channel sample program is available via the SEW homepage (www.sew-eurodrive.de)
- This example is a special and free service that demonstrates only the basic approach to generating a PLC program. SEW is not liable for the contents of the sample program.

Calling the function module:



1747628683



Comment regarding the function module:

```
Write service: x2h, fixed setpoint: P160, index 8489d = 2129h

Wiring of FB:
"Drive_IO_Address": (INT) Input address of the process data =>Hardware config.
"bService":         (BYTE) Read: 01h; Write 02h, volatile writing 03h
"bAxis":            (BYTE) Sub address/SBUS address of lower-level MC07
"wParameterindex": (WORD) Parameter index => "MC07 Communication" manual
"wSubIndex":        (WORD) MOVILINK subindex = 0
"dwWriteData":      (DWORD) Parameter data for WRITE service
"InstanzDB_SFB52 (BLOCK_DB) Instance DB for the SFB52
"InstanzDB_SFB53 (BLOCK_DB) Instance DB for the SFB53
"fActivate"         (BOOL) Activation bit
"fBusy":            (BOOL) Parameter service is active
"fDone":            (BOOL) Parameter service was executed
"bError"            (BYTE) No error = 0; S7 error = 1; TimeOut = 2;
                     MOVILINK error = 3
"dwData":           (DWORD) bError = 0 => Parameter value after READ service
                     bError = 1 => S7 error code
```

1748164107

7.4.2 PROFINET for MOVIFIT® Funktionslevel "Technology" – technical data

GSD file for PROFINET:	GSDML-V2.1-SEW-MTX-JJJJMMTT.xml ¹⁾
Module name for project planning:	SEW-MTX-TECHNOLOGY
Supported dataset:	Index 47
Supported slot number:	Recommendation: 0
Manufacturer code:	10A hex (SEW-EURODRIVE)
Profile ID:	0
Max. length	240 bytes

1) JJJJMMTT represents the date



7.4.3 Error codes of the PROFINET services

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

Bit:	7	6	5	4	3	3	2	0
	Error_Class				Error_Code			

1663318411

Error_Class (from PROFINET specification)	Error_Code (from PROFINET specification)	PROFINET Parameter channel
0x0 – 0x9 hex = reserved		
0xA = application	0x0 = read error 0x1 = write error 0x2 = module failure 0x3 – 0x7 = reserved 0x8 = version conflict 0x9 = feature not supported 0xA – 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		



8 Error Diagnostics on PROFINET

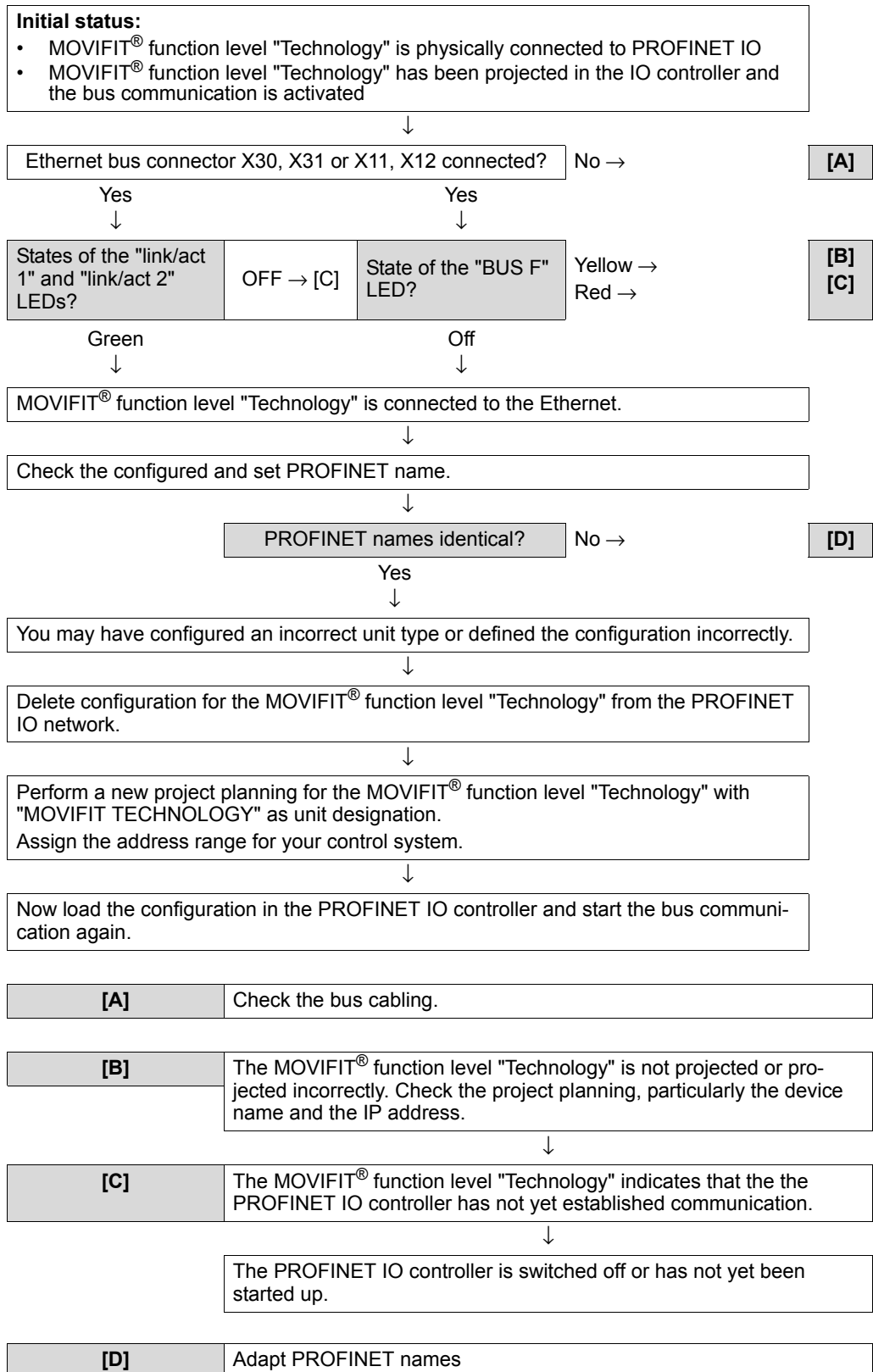
8.1 *Diagnostics procedures*

The diagnostic procedure described in the following section demonstrates the error analysis methods for the most frequent problems:

- MOVIFIT® function level "Technology" does not work on PROFINET IO



8.1.1 Diagnostic problem: MOVIFIT® function level "Technology" does not work on PROFINET IO





8.2 Fieldbus timeout

A fieldbus timeout can occur in MOVIFIT® when you switch off the fieldbus master or if there is a wire break in the fieldbus cabling. The "BUS-F" LED indicates that no new user data is being received. The process data for all units have been set to "0". This means that all drives connected to MOVIFIT® are stopped. In addition, the digital outputs are set to "0".

	! DANGER
	Risk of crushing if the drive starts up automatically. Severe or fatal injuries. • The "Fieldbus timeout" fault resets automatically. Thus, the drives receive the current process output data from the controller once the fieldbus communication has restarted. • If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.



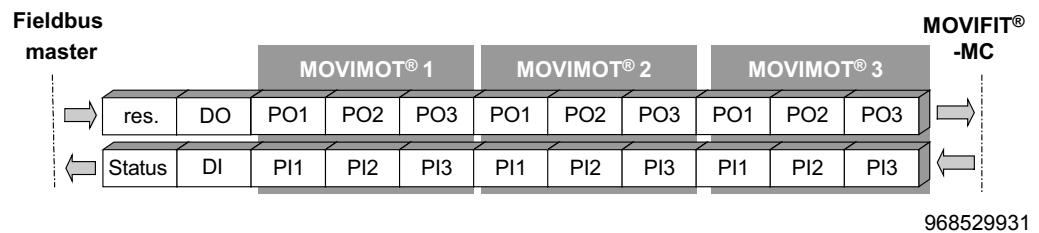
9 Process Data Description in Transparent Mode

9.1 Process image

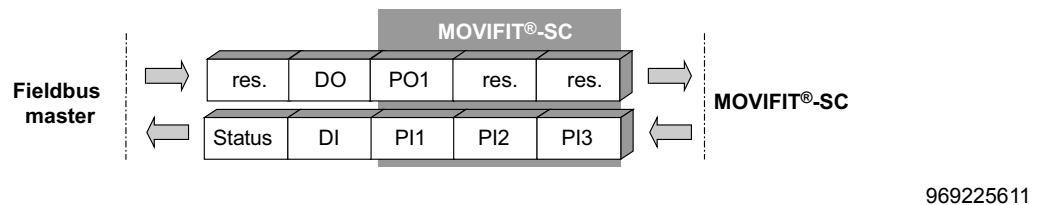
The process image that is exchanged between the fieldbus master and the MOVIFIT[®] unit depends on the MOVIFIT[®] unit type.

The following figures illustrate the process images between the fieldbus master and MOVIFIT[®].

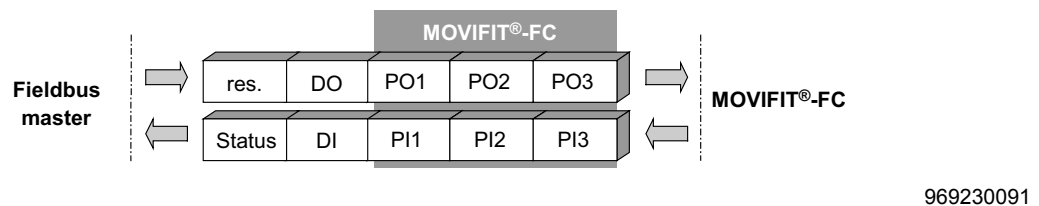
MOVIFIT[®]-MC:



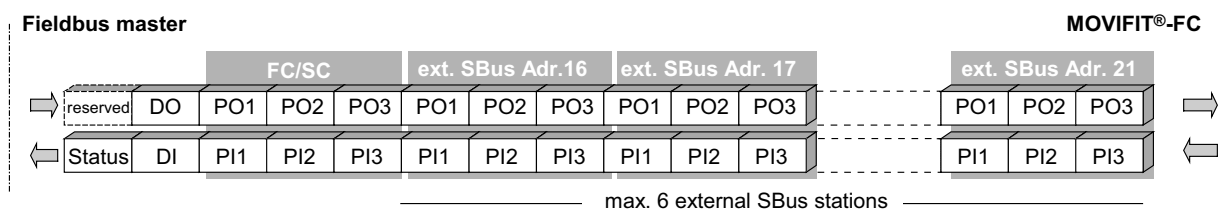
MOVIFIT[®]-SC:



MOVIFIT[®]-FC:



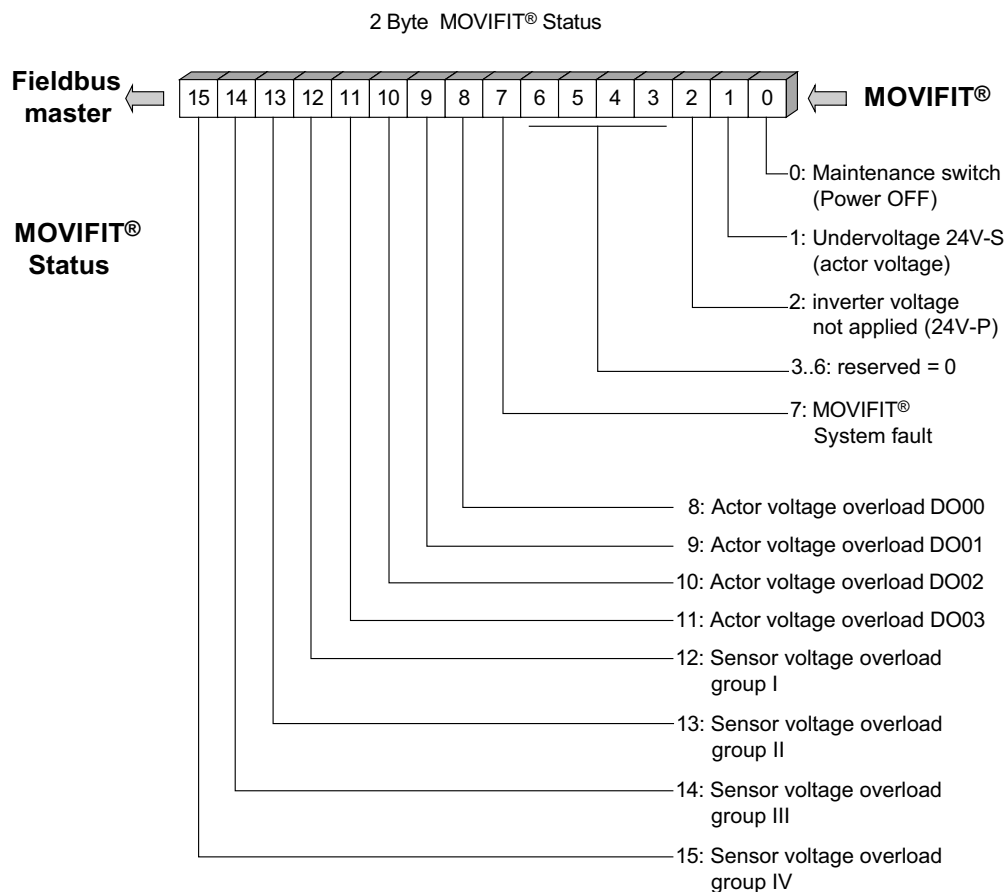
MOVIFIT[®]-SC/-FC with e.g. 6 MOVIFIT[®]-FC slave units:





9.2 MOVIFIT® status word

The following figure shows the assignment of the MOVIFIT® status word:



792963339



TIP

If the actor voltage 24V_S is not wired, bit 1 is set to "1".



The following table shows the diagnostics information of the MOVIFIT® that is processed in the higher-level PLC application. The signals are transferred to the controller via parameters and, if necessary, via the process data channel.

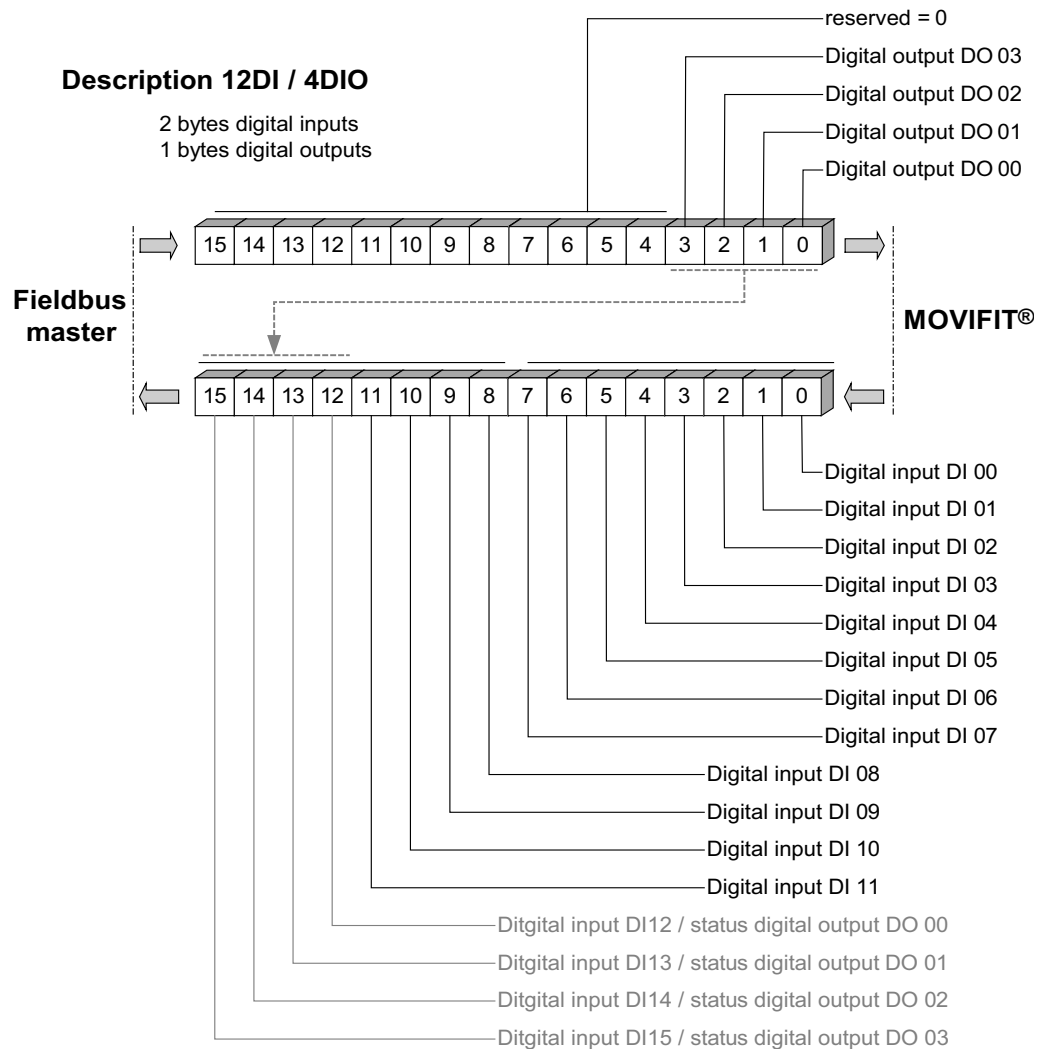
The logical communication status "0" signals the status OK for each signal to ensure that no asynchronous startup sequences from the bus master and the PLC can cause incorrect diagnostic messages when the systems are started up (bus startup with user data = 0).

MOVI-FIT® status bit	Diagnostic name via bus	Function and coding
0	Maintenance switch (mains OFF)	Maintenance switch (mains OFF) 1 = Maintenance switch activated (mains off) 0 = OK (not activated)
1	Undervoltage 24V-S	Value falls below the lower limit for the actuator voltage DO00 – 03 1 = Value falls below lower limit 0 = OK
2	No frequency voltage applied (24V-P)	Presence of 24V_P for integrated inverter (FC) or external MOVIMOT® 1 = 24V_P not present 0 = 24V_P OK
7	MOVIFIT® system fault	MOVIFIT® system fault 1 = MOVIFIT® system fault occurred 0 = OK For further information refer to status word (index 8310).
8	Overload actuator voltage DO00	Short circuit/overload of the actuator voltage for digital output DO00 1 = Short circuit/overload DO00 0 = OK
9	Overload actuator voltage DO01	Short circuit/overload of the actuator voltage for digital output DO01 1 = Short circuit/overload DO01 0 = OK
10	Overload actuator voltage DO02	Short circuit/overload of the actuator supply for digital output DO02 1 = Short circuit/overload DO02 0 = OK
11	Overload actuator voltage DO03	Short circuit/overload of the actuator supply for digital output DO03 1 = Short circuit/overload DO03 0 = OK
12	Overload sensor voltage group I	Short circuit/overload of the sensor supply group I (VO24-I) 1 = short circuit / overload sensor supply 0 = Sensor supply OK
13	Overload sensor voltage group II	Short circuit/overload of the sensor supply group II (VO24-II) 1 = short circuit / overload sensor supply 0 = Sensor supply OK
14	Overload sensor voltage group III	Short circuit/overload of the sensor supply group III (VO24-III) 1 = short circuit / overload sensor supply 0 = Sensor supply OK
15	Overload sensor voltage group IV	Short circuit/overload of the sensor supply group IV (VO24-IV) 1 = short circuit / overload sensor supply 0 = Sensor supply OK



9.3 Digital inputs/outputs

The following figure shows the structure of the MOVIFIT[®] input/output bytes for 12DI/4DO:

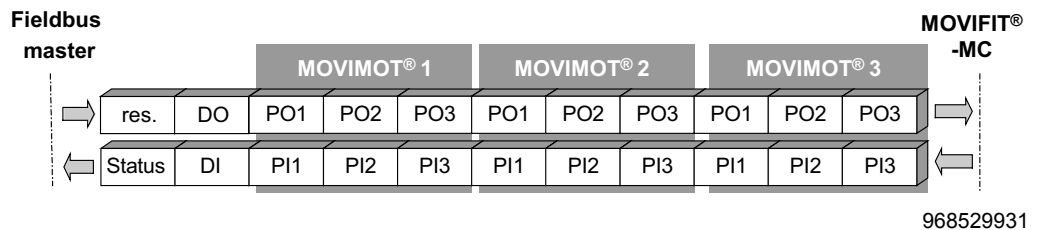


792940043



9.4 Process data between a MOVIMOT[®] inverter and MOVIFIT[®]-MC

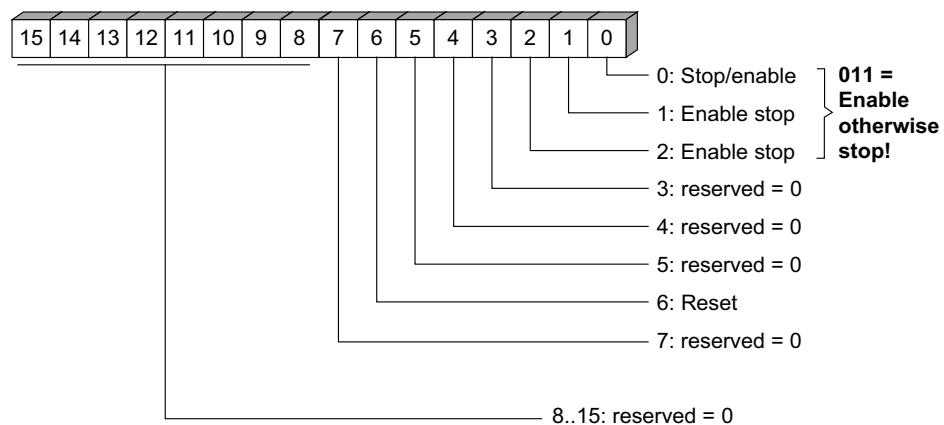
In transparent mode, 1 MOVIMOT[®] drive connected to MOVIFIT[®]-MC via RS485, is addressed with 3 process data words.



Process output data MOVIMOT [®] 1	Process input data MOVIMOT [®] 1
PO1: Control word	PI1: Status word 1
PO2: Speed [%]	PI2: Current
PO3: Ramp	PI3: Status word 2

9.4.1 Control word to MOVIMOT[®] – assignment

The following figure shows the assignment of the MOVIMOT[®] control word:



792886795



TIP

The assignment of the control word can change depending on the DIP switch setting of the additional MOVIMOT[®] functions. The bits 8 to 15 are then partially assigned. Refer to the "MOVIMOT[®] MM.."operating instructions for more information.



9.4.2 Coding of the speed [%] setpoint

The speed setpoint is given as a relative value in percentage and refers to maximum speed set using the MOVIMOT® setpoint potentiometer f1.

Coding: $C000_{\text{hex}} = -100\%$ (counterclockwise direction)
 $4000_{\text{hex}} = +100\%$ (CW rotation)
 1 digit = 0.0061 %

Example: 80 % n_{max} , CCW rotation

Calculation: $-80 \% / 0.0061 = -13115_{\text{dec}} = CCC5_{\text{hex}}$

9.4.3 Coding of the ramp

The current integrator ramp is transferred in process output data word PO3.

The transferred time value refers to a change in speed of 1500 rpm..

Coding: 1 digit = 1 ms

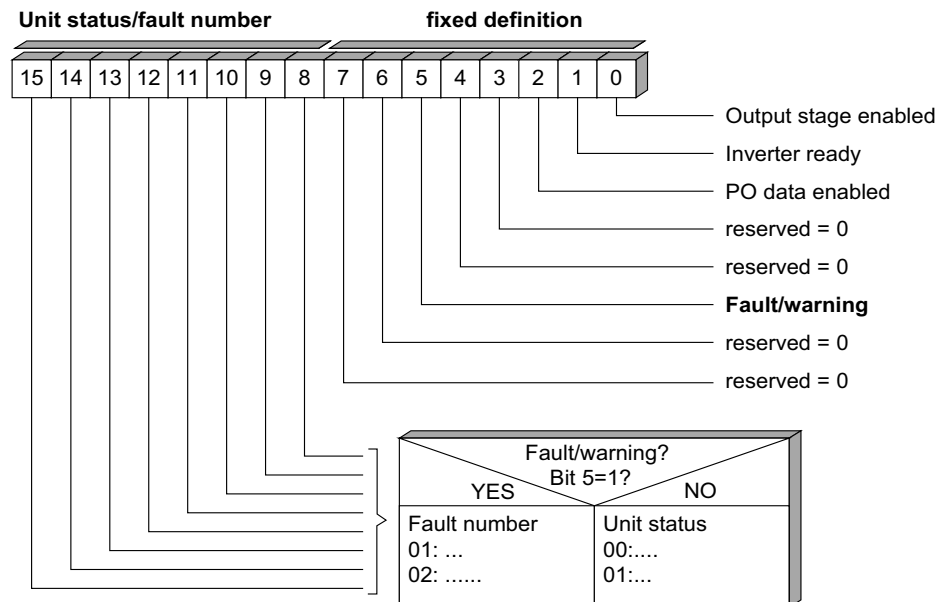
Range: 100 – 10000 ms

Example: 2.0 s = 2000 ms = $2000_{\text{dec}} = 07D0_{\text{hex}}$



9.4.4 Status word 1 of MOVIMOT[®] – assignment

The following figure shows the assignment of status word 1 for MOVIMOT[®]:



792888459

The following table shows the assignment of status word 1 for MOVIMOT[®]:

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIMOT [®] is enabled 0: MOVIMOT [®] is not enabled
1	Inverter ready	1: MOVIMOT [®] is ready 0: MOVIMOT [®] is not ready
2	PO data enabled	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	Fault/warning	Bit set: Fault/warning present Bit not set: No fault/warning
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8 – 15	Bit 5 = 0: Unit status 0: 24 V operation 2: No enable 4: Enable 18: Manual oper. active Bit 5 = 1: Fault number	If there is no fault/warning (bit 5 = 0), the operating/enable status of the inverter power section is displayed in this byte. If there is a fault/warning (bit 5 = 1), the fault number is displayed in this byte.

9.4.5 Coding of the current value for MOVIMOT[®]

When this setting is made, the control section returns the actual current value of the output current in the unit [% I_N] as a percentage, based on the rated unit current.

Coding: 1 digit = 0,1 % I_N

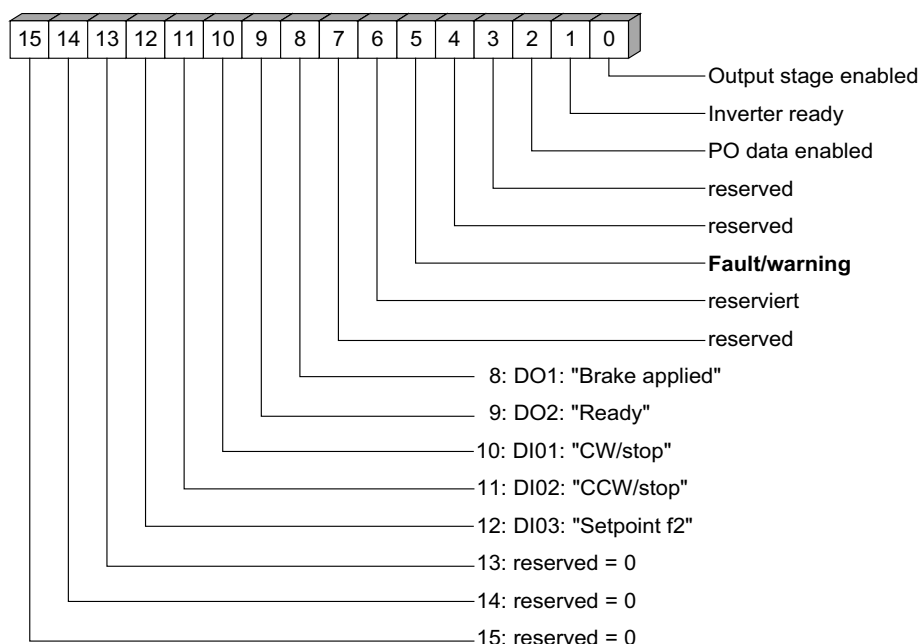
Range: Signed 16 bit integer

Example: 0320_{hex} = 800 x 0.1 % I_N = 80 % I_N



9.4.6 Status word 2 of MOVIMOT® – assignment

The following figure shows the assignment of status word 2 for MOVIMOT®:



792890123

The following table shows the assignment of status word 2 for MOVIMOT®:

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIMOT® is enabled 0: MOVIMOT® is not enabled
1	Inverter ready	1: MOVIMOT® is ready 0: MOVIMOT® is not ready
2	PO data enabled	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	Fault/warning	Bit set: Fault/warning present Bit not set: No fault/warning
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8	DO1 brake	1: Brake applied 0: Brake released
9	DO2 (ready)¹⁾	1: Input DO1 is set 0: Input DO1 is not set
10	DI1 (CW)	1: Input DI1 is set 0: Input DI1 is not set
11	DI2 (CCW)	1: Input DI2 is set 0: Input DI2 is not set
12	DI3 (setpoint f2)	1: Input DI3 is set 0: Input DI3 is not set
13 – 15	Reserved	Reserved = 0

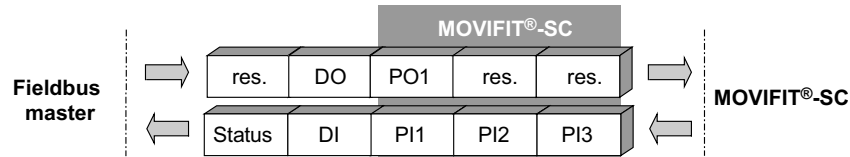
1) The functionality of the output can change depending on the additional function setting.



9.5 Process data between the integrated motor starter and MOVIFIT®-SC.

The motor starter can be used for single or dual-motor operation. The process data assignment is the same for both modes of operation.

In transparent mode, for SC single-motor operation or SC dual-motor operation, 1 process output data word and 3 process input data words:



969225611

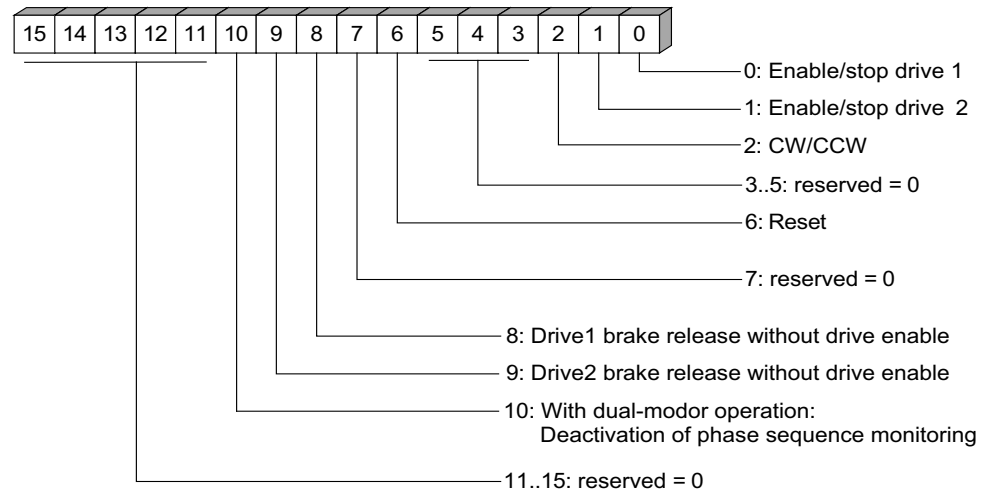
Process output data MOVIFIT®-SC	Process input data MOVIFIT®-SC
PO1: SC control word	PI1: Status word drive 1
	PI2: Status word drive 2
	PI3: Current drive 1 and 2



9.5.1 MOVIFIT®-SC control word – assignment

The MOVIFIT®-SC control word contains the control bit for single-motor operation with reversal of direction of rotation and dual-motor operation with one direction of rotation each.

The following figure shows the assignment of the MOVIFIT® control word:



792896779

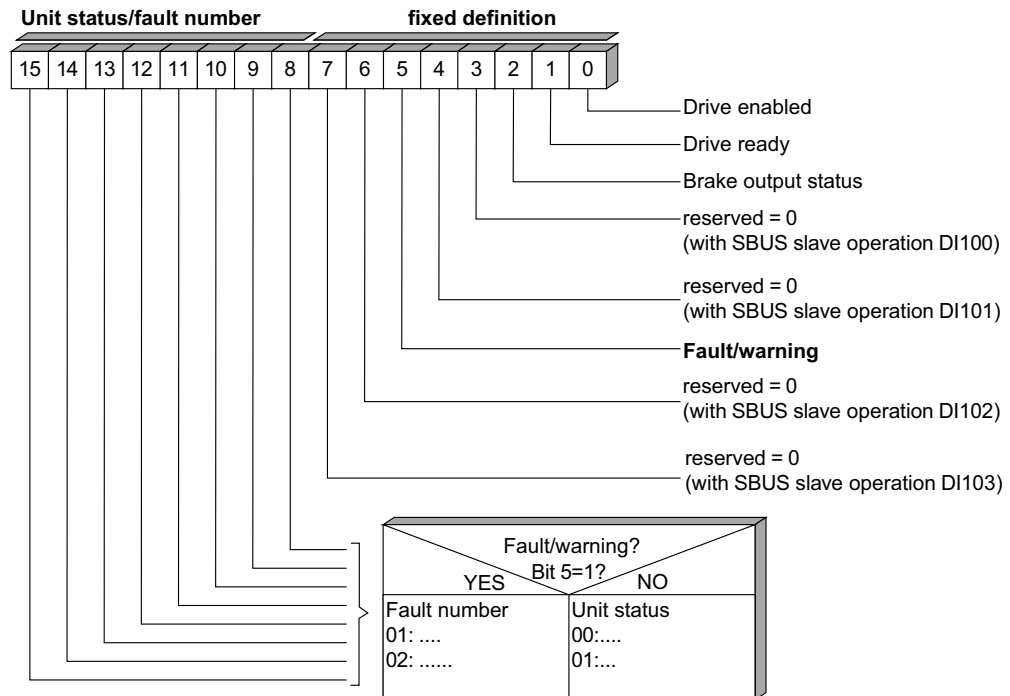
The following table shows functions of the of the status word bits for MOVIFIT®-SC:

Bit	Meaning	Explanation
0	Enable / stop drive 1	1: Enable drive 1 0: Inhibit drive 1
1	Enable / stop drive 2	Single-motor operation: Bit has no function Dual-motor operation: 1: Enable drive 2 0: Inhibit drive 2
2	CW/CCW operation	Single-motor operation: 1: Request "CCW" rotation 0: Request "CW" rotation Dual-motor operation: Bit has no function
3 – 5	Reserved	For reserved bits, the value 0 must be transferred for later use
6	Fault reset	If there is a unit fault, the fault can be reset by changing this bit from 0 to 1.
7	Reserved	For reserved bits, the value 0 must be transferred for later use
8	Brake release of drive 1 without drive enable	The functionality can be inhibited by setting a parameter. 1: Release brake of drive 1 without drive enable 0: Do not release brake of drive 1
9	Brake release of drive 2 without drive enable	The functionality can be inhibited by setting a parameter. Single-motor operation: Bit has no function Dual-motor operation: 1: Release brake of drive 2 without drive enable 0: Do not release brake of drive 2
10	Deactivating the phase monitoring	for dual-motor operation: 1: Deactivating the phase sequence monitoring 0: Phase deactivation not deactivated
11 – 15	Reserved	For reserved bits, the value 0 must be transferred for later use



9.5.2 MOVIFIT® status word – assignment

The MOVIFIT®-SC status word is available separately for each drive. This allows the individual drive channels to signal independent status messages in dual-motor operation.



792898443

The following table shows assignment of the of the status bits for MOVIFIT®-SC:

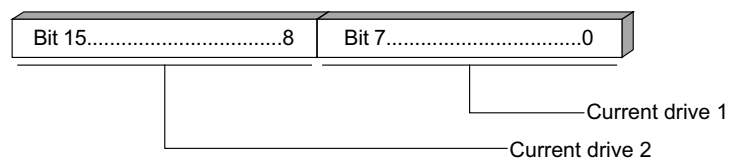
Bit	Meaning	Explanation
0	Drive enabled	Bit set: Drive enabled Bit not set: Drive is inhibited
1	Drive ready	Bit set: MOVIFIT® starter power section is ready Bit not set: MOVIFIT® starter power section is not ready
2	Status of brake output	Bit set: Brake output is set Bit not set: Brake output is not set
3	Reserved (input DI100)	Function only in operating mode as SBUS slave 1: Input DI100 is set 0: Input DI100 is not set
4	Reserved (input DI101)	Function only in operating mode as SBUS slave 1: Input DI101 is set 0: Input DI101 is not set
5	Fault/warning	1: Fault/warning present 0: OK
6	Reserved (input DI102)	Function only in operating mode as SBUS slave 1: Input DI102 is set 0: Input DI102 is not set
7	Reserved (input DI103)	Function only in operating mode as SBUS slave 1: Input DI103 is set 0: Input DI103 is not set
8 – 15	Bit 5 = 0: Unit status 0: Starter not ready 2: Drive not enabled 4: Drive enabled 18: Manual operation active Bit 5 = 1: Fault number	If there is no fault/warning (bit 5 = 0), the operating/enable status of the starter or drive is displayed in this byte. If there is a fault/warning (bit 5 = 1), the fault number is displayed in this byte.



9.5.3 Coding of the current values for MOVIFIT®-SC

MOVIFIT® returns the output current information for drive 1 and drive 2 via the third process input data word. In single-motor operation, the current value for drive 2 is set to 0.

The following figure shows the assignment of the process input data word regarding the current for MOVIFIT®-SC:



792900107

The following table shows the coding of the current values:

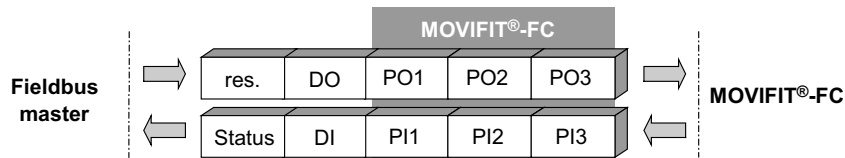
Current drive 2	Current drive 1
Coding with 8 bit: 0 – (2 ⁸ -1) corresponds to 0 – 200% I _{N,unit}	Coding with 8 bit: 0 – (2 ⁸ -1) corresponds to 0 – 200% I _{N,unit}



9.6 Process data between the integrated inverter and MOVIFIT[®]-FC

The integrated frequency inverter works with the same process data interface as MOVIMOT[®].

In transparent mode, 3 process output data words and 3 process input data words are exchanged between MOVIFIT[®]-FC and the integrated frequency inverter:



969230091

Process output data MOVIFIT [®] -FC	Process input data MOVIFIT [®] -FC
PO1: Control word	PI1: Status word 1
PO2: Speed [%]	PI2: Current
PO3: Ramp	PI3: Status word 2

 = Parameters can be set



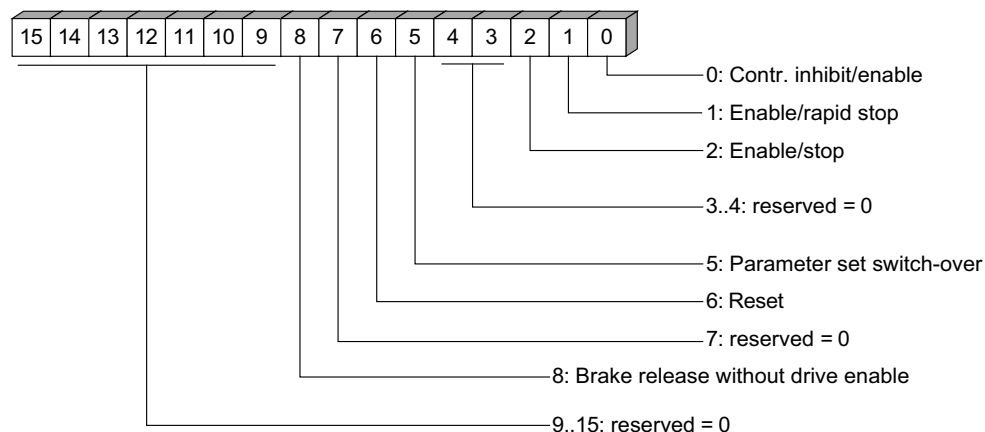
TIP

Parameters can be set for PO2 and PI2 in combination with MOVIFIT[®]-FC, see section "Parameter list for the MOVIFIT-FC power section (see page 147)". This section describes the structure of the process data with factory setting.



9.6.1 MOVIFIT®-FC control word – assignment

MOVIFIT®-FC is controlled via the control word. The following figure shows the assignment of the control word for MOVIFIT®-FC.



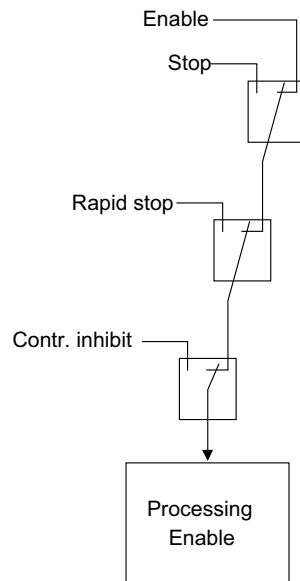
792905099

The following table shows the functions of the control word for MOVIFIT®-FC.

Bit	Meaning	Explanation
0	Controller inhibit/Enable	0: Enable 1: Inhibit controller, activate brake
1	Enable/rapid stop	0: Rapid stop 1: Enable
2	Enable/stop	0: Stop at normal ramp 1: Enable
3	Reserved	For reserved bits, the value 0 must be transferred for later use
4	Reserved	For reserved bits, the value 0 must be transferred for later use
5	Parameter set switch-over	0: Parameter set 1 1: Parameter set 2
6	Fault reset	If there is a fault in the inverter power section, an error reset is requested by changing this bit from 0 to 1.
7	Reserved	For reserved bits, the value 0 must be transferred for later use
8	Brake release without drive enable	This function is not active in Easy mode. The functionality is activated by setting an additional parameter. 1: Release brake without drive enable 0: Do not release brake
9 – 15	Reserved	For reserved bits, the value 0 must be transferred for later use



The following prioritization applies to the evaluation of bits used for the enable in the control word:



792936715

9.6.2 Coding of the speed [%] setpoint

The relative speed setpoint is indicated in percentage and refers to the preset maximum speed in parameter P302, index 8517 (parameter set 1) or parameter P312, index 8521 (parameter set 2).

In Easy mode, the maximum speed is set to 3000 rpm as a default.

Coding: $C000_{\text{hex}} = -100\%$ (counterclockwise direction)
 $4000_{\text{hex}} = +100\%$ (CW rotation)
 1 digit = 0,0061 %

Example: 80 % n_{max} , CCW rotation

Calculation: $-80 \% / 0,0061 = -13115_{\text{dec}} = \text{CCC}5_{\text{hex}}$

9.6.3 Coding of the ramp

The current integrator ramp is transferred in process output data word PO3. The transferred time value refers to a change in speed of 1500 rpm.. Presetting the ramp via process data will deactivate parameters P130/P140 and P131/P141.

Coding: 1 digit = 1 ms

Range: 100 ms – 65 s

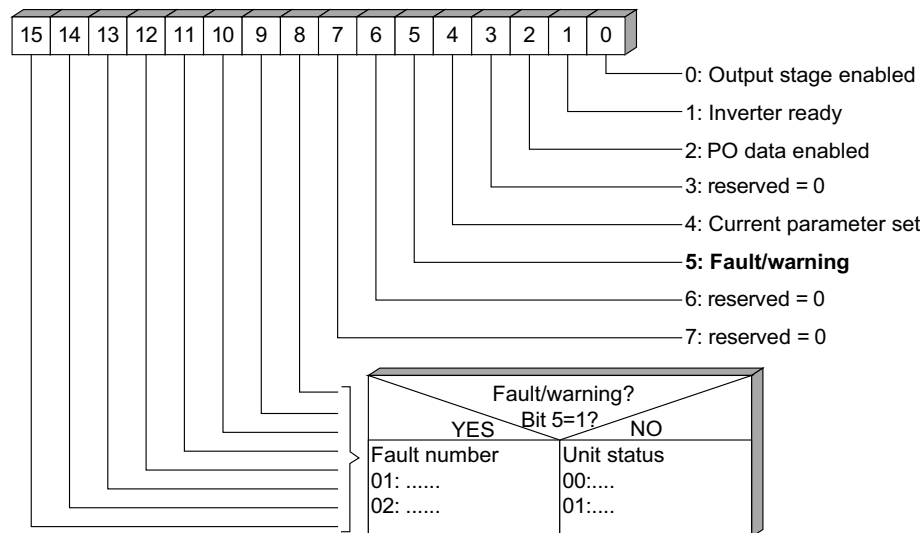
Example: 2.0 s = 2000 ms = $2000_{\text{dec}} = 07D0_{\text{hex}}$



9.6.4 MOVIFIT®-FC status word 1 – assignment

Status word 1 is used to display the unit status and, in case of a fault, the respective fault number.

The following figure shows the assignment of status word 1 for MOVIFIT®-FC:



792906763

The following table shows the assignment of status word 1 for MOVIFIT®-FC:

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIFIT® inverter output stage is enabled 0: MOVIFIT® inverter output stage is not enabled
1	Inverter ready	1: Inverter power section is ready for operation 0: Inverter power section is not ready for operation
2	PO data enabled	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	For reserved bits, the value 0 is transferred for later use
4	Current parameter set	0: Parameter set 1 1: Parameter set 2
5	Fault/warning	1: Fault/warning present 0: OK
6	Reserved	For reserved bits, the value 0 is transferred for later use
7	Reserved	For reserved bits, the value 0 is transferred for later use
8 – 15	Bit 5 = 0: Unit status 0: 24 V operation 1: Controller inhibit 2: No enable 3: Standstill current 4: Enable 18: Manual operation active Bit 5 = 1: Fault number	If there is no fault/warning (bit 5 = 0), the operating/enable status of the inverter power section is displayed in this byte. If there is a fault/warning (bit 5 = 1), the fault number is displayed in this byte.



9.6.5 Coding of the current value MOVIFIT[®]-FC

When this setting is made, the control section returns the actual current value of the output current in the unit [% I_N] as a percentage, based on the rated unit current.

Coding: 1 digit = 0,1 % I_N

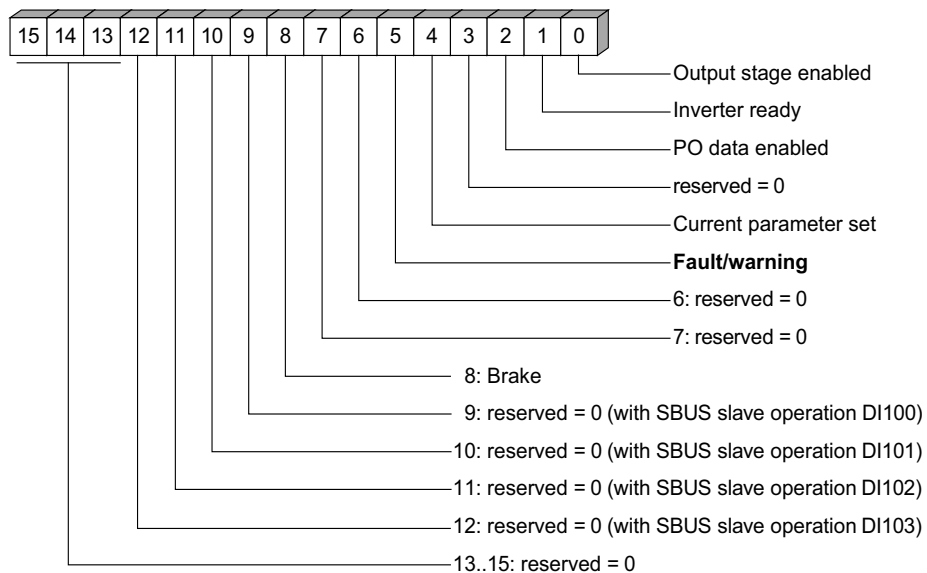
Range: Signed 16 bit integer

Example: $0320_{\text{hex}} = 800 \times 0.1 \% I_N = 80 \% I_N$

9.6.6 MOVIFIT[®]-FC status word 2 – assignment

The digital input terminals DI100 – 103 are only available with MOVIFIT[®] slave units that communicate via SBUS with a central MOVIFIT[®] unit with fieldbus connection.

The following figure shows the assignment of status word 2 for MOVIMOT[®]-FC:



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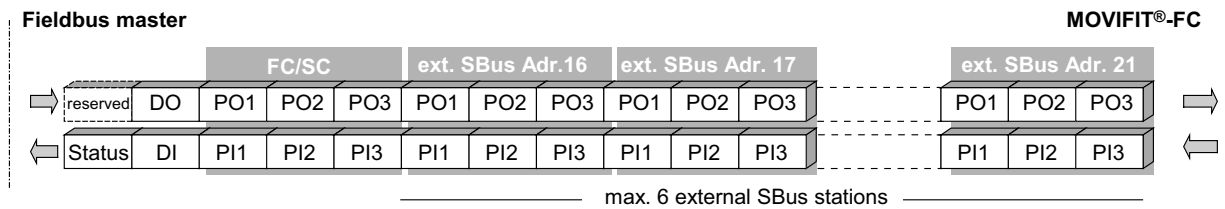


The following table shows the assignment of status word 2 for MOVIFIT®-FC

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIFIT® inverter output stage is enabled 0: MOVIFIT® inverter output stage is not enabled
1	Inverter ready	1: Inverter power section is ready for operation 0: Inverter power section is not ready for operation
2	PO data enabled	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Current parameter set	0: Parameter set 1 1: Parameter set 2
5	Fault/warning	1: Fault/warning present 0: OK
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8	Brake	1: Brake applied 0: Brake released
9	Reserved (input DI100)	Function only in operating mode as SBUS slave 1: Input DI100 is set 0: Input DI100 is not set
10	Reserved (input DI101)	Function only in operating mode as SBUS slave 1: Input DI101 is set 0: Input DI101 is not set
11	Reserved (input DI102)	Function only in operating mode as SBUS slave 1: Input DI102 is set 0: Input DI102 is not set
12	Reserved (input DI103)	Function only in operating mode as SBUS slave 1: Input DI103 is set 0: Input DI103 is not set
13 – 15	Reserved	Reserved = 0



9.7 Process data 1 MOVIFIT[®] slave unit and MOVIFIT[®]-SC/-FC



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TIPS

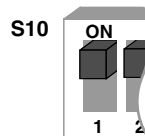
- The process data image of MOVIFIT[®]-SC slave units corresponds to the process image of MOVIFIT[®]-SC.
For further information refer to section "Process data between the integrated motor starter and MOVIFIT-SC (see page 86)".
- The process data image of MOVIFIT[®]-FC slave units corresponds to the process image of MOVIFIT[®]-FC.
For further information refer to section "Process data between the integrated inverter and MOVIFIT-FC (see page 90)".



10 MOVITOOLS® MotionStudio – Operation

10.1 Preparations on MOVIFIT®

1. Always follow the safety and warning instructions in the relevant operating instructions when working on **MOVIFIT®**.
2. Install the current software version of the MOVITOOLS® MotionStudio on your PC.
3. For MOVIFIT®-SC and MOVIFIT®-FC: Set DIP switch S10/1 to "ON" (activate "Expert mode")



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TIP

You only have to activate the "Expert mode" if you want to change parameters. You do not have to activate the Expert mode to read parameters.

If DIP switches S10/2 – S10/6 are set correctly for the application when activating the expert mode (DIP switch S10/1 = OFF => ON), you do not have to perform a motor/ brake startup with MOVITOOLS® MotionStudio.



10.2 About MOVITOOLS® MotionStudio

10.2.1 Tasks

The software package enables you to perform the following tasks with consistency:

- Establishing communication with units
- Executing functions with the units

10.2.2 Establishing communication with other units

The SEW Communication Server is integrated into the MOVITOOLS® MotionStudio software package for establishing communication with the units.

The SEW Communication Server allows you to create **communication channels**. Once the channels are established, the units communicate via these communication channels using their communication options. You can operate up to four communication channels at the same time.

MOVITOOLS® MotionStudio supports the following types of communication channels:

- Serial (RS-485) via interface adapters
- System bus (SBus) via interface adapters
- Ethernet
- EtherCAT
- Fieldbus
 - PROFIBUS DP/DP-V1
- S7-MPI

Depending on the unit and its communication options, the available channels can vary.

10.2.3 Executing functions with the units

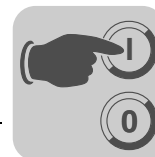
The software package offer uniformity in executing the following functions:

- Parameterization (in the parameter tree of the unit)
- Startup
- Visualization and diagnostics
- Programming

The following basic components are integrated into the MOVITOOLS® MotionStudio software package, allowing you to use the units to execute functions:

- MotionStudio
- MOVITOOLS®

All functions communicate using **tools**. MOVITOOLS® MotionStudio provides the right tools for every unit type.



10.3 First steps

10.3.1 Starting the software and creating a project

Proceed as follows to start MOVITOOLS® MotionStudio and create a project:

1. Start the MOVITOOLS® MotionStudio from the Windows start menu via:
[Start]/[Programs]/[SEW]/[MOVITOOLS-MotionStudio]/[MOVITOOLS-MotionStudio]
2. Create a project with name and storage location.

10.3.2 Establishing communication and scanning the network

Proceed as follows to establish a communication with MOVITOOLS® MotionStudio and scan your network:

1. Set up a communication channel to communicate with your units.
Refer to the section dealing with the respective type of communication for detailed information.
2. Scan your network (unit scan). Press the [Start network scan] button [1] in the toolbar.



[1]

3. Select the unit you want to configure.
4. Right-click to open the context menu.
As a result you will see a number of unit-specific tools to execute various functions with the units.



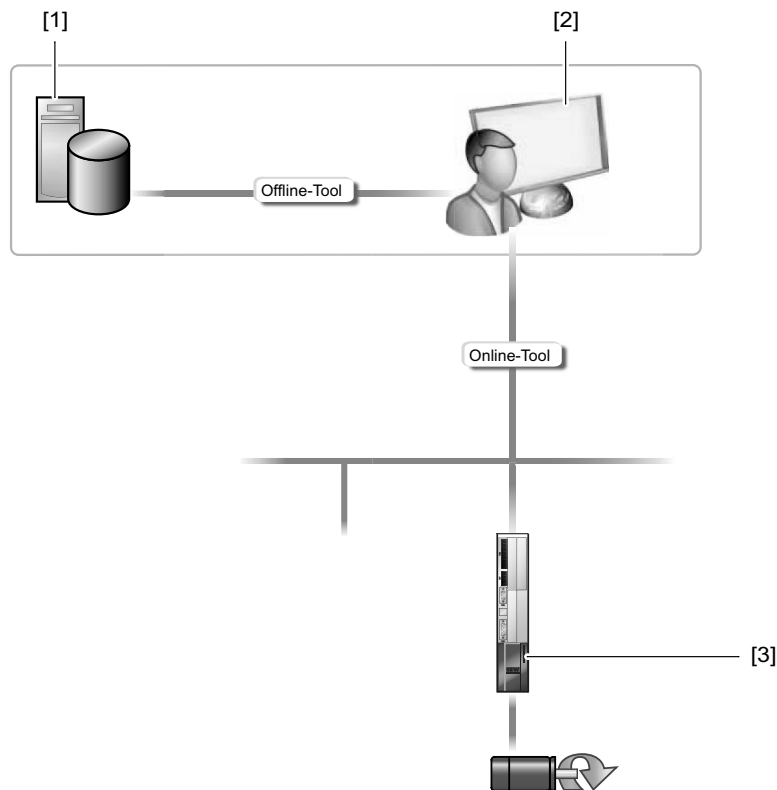
10.4 Connection mode

10.4.1 Overview

MOVITOOLS® MotionStudio differentiates between the "online" and "offline" communication mode.

You can select the communication mode yourself. Depending on the selected communication mode, you can choose offline or online tools specific to your unit.

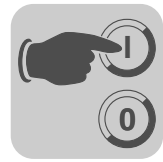
The following figure illustrates the two types of tools:



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- [1] Hard drive of the engineering PC
- [2] RAM of the engineering PC
- [3] Unit

Tools	Description
Offline tools	Changes made using offline tools affect "ONLY" the RAM [2]. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC. • Perform the "Download (PC->unit)" function if you want to transfer the changes to your unit [3] as well.
Online tools	Changes made using online tools affect "ONLY" the unit [3]. • Perform the "Upload (unit->PC)" function if you want to transfer the changes to your RAM. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC.



	TIP The "online" communication mode is NOT a response message which informs you that you are currently connected to the unit or that your unit is ready for communication. Should you require this feedback, observe section "Setting the cyclical accessibility test" in the online help (or the manual) of MOVITOOLS® MotionStudio.
	TIP - Project management commands (such as download and upload), the online unit status, and the unit scan work independent of the set communication mode. - MOVITOOLS® MotionStudio starts up in the communication mode that you set before you closed down.

10.4.2 Selecting communication mode (online or offline)

Proceed as follows to select a communication mode:

1. Select the communication mode:

- "switch to online mode" [1] for functions (online tools) that should directly influence the unit
- "switch to offline mode" [2] for functions (offline tools) that should influence your project



1134457227

- [1] "Switch to online mode" symbol
[2] "Switch to offline mode" symbol

2. Select the unit node.

3. Right-click to open the context menu and display the tools for configuring the unit.



10.5 Serial (RS-485) communication via interface adapters

10.5.1 Engineering via interface adapters (serial)

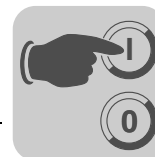
As your unit supports "Serial" communication, you can use a suitable interface adapter for engineering.

The interface adapter is an additional hardware component available from SEW-EURODRIVE. You can use it to connect your engineering PC to the corresponding communication option of the unit.

The following table shows you the different types of interface adapters available, and for which units they are suitable.

Type of interface adapter (option)	Order no.	Scope of delivery	Units
USB11A (USB to RS-485)	08248311	2 connection cables: - TAE connection cable with 2 RJ10 plugs - USB connection cable with USB-A plug and USB-B plug	- MOVIDRIVE® B - MOVITRAC® 07A - MOVITRAC® B - MOVIFIT® MC/FC/SC - MOVIGEAR® - UFx11A fieldbus gateways - DFx fieldbus gateways - DHx MOVI-PLC® controller - MFx/MQx fieldbus interfaces for MOVIMOT®
UWS21B (RS-232 to RS-485)	18204562	2 connection cables: - TAE connection cable with 2 RJ10 plugs - Connection cable with 9-pin D sub plug	
UWS11A (RS-232 to RS-485) for mounting rail	822689X	none	

As the majority of PCs come equipped with USB interfaces instead of RS-232 interfaces, the following section only focuses on the USB11A interface.



10.5.2 Starting up the USB11A interface adapter

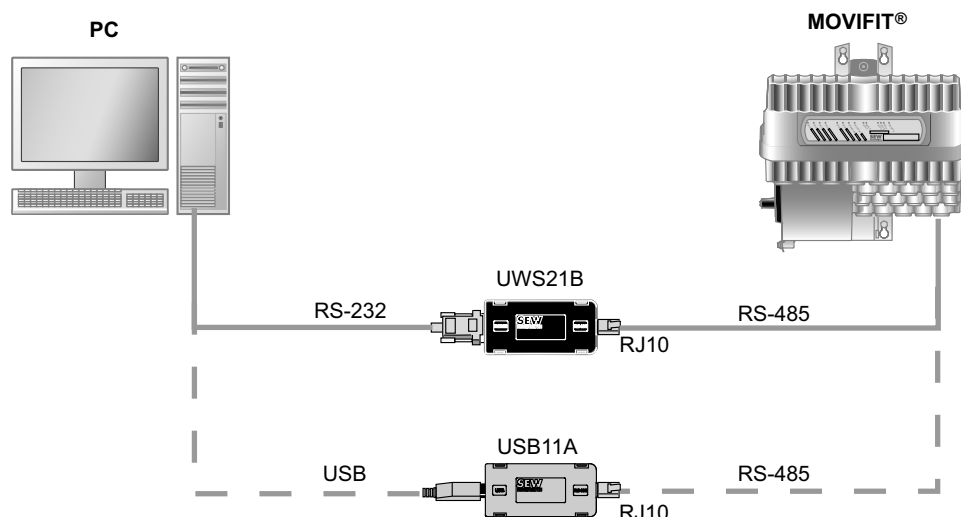
Overview

The USB11A interface adapter uses a COM redirector. It assigns the interface adapter to the first free COM port.

The following section describes how to connect the USB11A interface adapter and, if required, install the respective drivers.

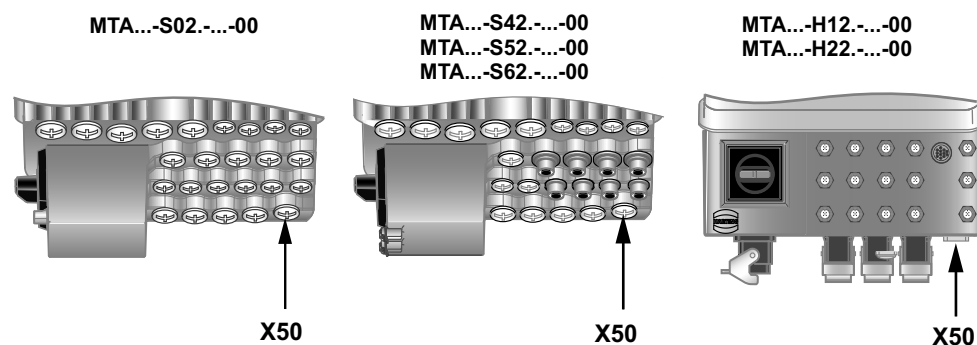
Connecting MOVIFIT® to the PC or the Laptop

Connect MOVIFIT® to PC or laptop using option USB11A or UWS21B:



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Option USB11A or UWS21B can be connected to MOVIFIT® using the diagnostics socket X50. Depending on the type of connection box, the diagnostics socket is located under the cable gland shown in the following illustration:



792941707



Installing the driver

The drivers for the USB11A interface adapter are copied to your PC together with MOVITOOLS® MotionStudio.

If you need to install the drivers manually, you can do so via the MOVITOOLS® MotionStudio installation path.

Proceed as follows to **manually** install the driver for the USB11A interface adapter:

1. Make sure that you have local administrator rights on your PC.
2. Connect the USB11A interface adapter to a free USB port on your PC.
Your PC will detect the new hardware and launch the hardware wizard.
The further procedure depends on the MOVITOOLS® MotionStudio version you are using.
 - As of **version 5.60**, the drivers are installed automatically and the interface adapter is ready for operation.
 - For **version 5.50** or earlier versions, proceed with step 3.
3. Follow the instructions of the hardware wizard.
4. Click on [Browse] and go to the MOVITOOLS® MotionStudio installation folder.
5. Enter the following path:
`"..\Program Files\SEW\MotionStudio\Driver\FTDI_V2_XXYY"`
6. One click on [Next] installs the drivers and assigns the interface adapter to the first free COM port of the PC.

Checking the COM port of the USB11A on the PC

Proceed as follows to check which virtual COM port has been assigned to the USB11A:

1. Select the following item from the Windows start menu:
 [Start]/[Setup]/[Control panel]/[System]
2. Open the "Hardware" tab.
3. Click on the [Device manager] button.
4. Open the "Connections (COM and LPT)" folder.

You will see which virtual COM port has been assigned to the interface adapter, e.g.: "USB Serial Port (COM3)".



TIP

Change the COM port of the USB11A in order to prevent a conflict with another COM port.

It is possible that another device (e.g. an internal modem) uses the same COM port as the USB11A interface adapter.

- Select the COM port of the USB11A in the device manager.
- Select [Properties] from the context menu and assign the USB11A to a different COM port.
- Restart your system in order for the changes to become effective.



10.5.3 Configuring the serial communication

You must have a serial connection between your PC and the units you want to configure. You can establish one, for example, using the USB11A interface adapter.

Proceed as follows to configure serial communication:

1. Click on "Configure communication plugs" [1] in the toolbar.

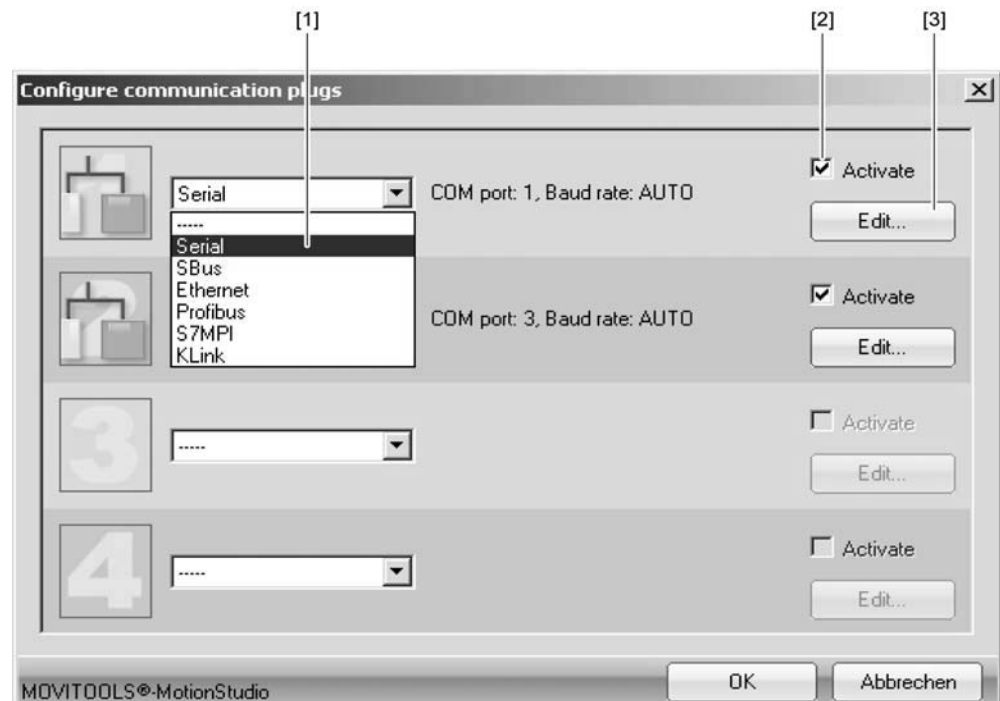


[1]

1133341835

[1] "Configure communication plugs" symbol

This will open the "Configure communication plugs" window.



946942987

- [1] "Type of communication" selection list
- [2] "Activate" checkbox
- [3] [Edit] button



2. From the list [1], select "Serial" as the communication type.

In the example, "Serial" is activated as the communication type for the first communication channel [2].

3. Press the [Edit] button [3] on the right side of the "Configure communication plugs" window.

This will display the settings for the "serial" communication type.



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4. It might be necessary to change the preset communication parameters on the tab pages [Basic settings] and [Extended settings]. When doing so, refer to the detailed description of the communication parameters (see page 107).



10.5.4 Communication parameters, serial (RS-485)

The following table describes the [basic setting] for the serial (RS-485) communication channel:

Communication parameters	Description	Note
COM port	Serial port connected to the interface adapter	- If there is no value entered here, the SEW Communication Server uses the first available port. - A USB interface adapter is indicated by the addition of "(USB)".
Baud rate	Transmission speed with which the connected PC communicates with the unit in the network via the communication channel	- Possible values: 9.6 kBit/s 57.6 kBit/s - AUTO (default setting) - Find the correct value for the connected unit in the documentation. - If you set "AUTO", the units are scanned with both baud rates in succession. - Set the starting value for automatic baud rate detection under [Settings] / [Options] / [Communication].

The following table describes the [extended setting] for the serial (RS-485) communication channel:

Communication parameters	Description	Note
Parameter telegrams	Telegram with a single parameter	Used for transferring a single parameter of a unit.
Multibyte telegrams	Telegram with several parameters	Used for transferring the complete parameter set of a unit.
Timeout	Waiting time in [ms] that the master waits for a reply from a slave after it has sent a request.	- Default setting: 100 ms (parameter telegram) 350 ms (multibyte telegram) - Increase the value if not all units are detected during a network scan.
Retries	Number of request retries after the timeout is exceeded	Default setting: 3

10.5.5 Setting the serial interface for MOVIFIT®-MC

If not all the MOVIMOT® drives are detected in connection with MOVIFIT®-MC, SEW-EURODRIVE recommends the following communication parameters for the serial interface:

Parameter telegrams	Timeout:	350 ms
	Number of attempts:	3
Multibyte telegrams	Timeout:	3500 ms
	Number of attempts:	1

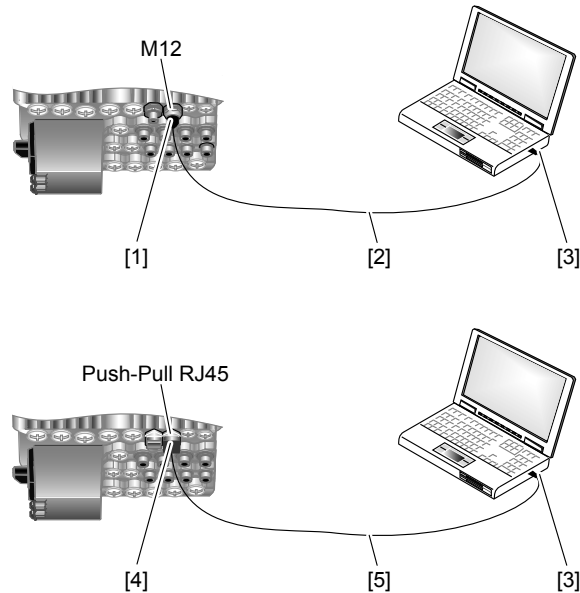


10.6 Communication via Ethernet

10.6.1 Connecting the unit to the PC via Ethernet

Connecting the Ethernet interface of the unit to the PC

The following figure shows the connection between the PC/laptop and the MOVIFIT® unit:



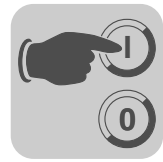
1654212363

- | | |
|--|---|
| [1] Interface (M12) of the MOVIFIT® unit | [4] Interface (push-pull RJ45) of the MOVIFIT® unit |
| [2] conventional Ethernet cable | [5] Ethernet cable with push-pull RJ45 plug |
| [3] Ethernet interface of the PC/laptop | |



NOTICE

Do not use push-pull RJ45 sockets without the mating push-pull RJ45 connector according to IEC PAS 61076-3-117. Conventional RJ45 patch cables without push-pull connector housing do not latch when plugged. This may damage the socket.



10.6.2 Address Editor

Overview

The Address Editor is a freeware tool by SEW-EURODRIVE GmbH & Co KG.

It is available once the "MOVITOOLS® MotionStudio" engineering software is installed. However, it is used separately.

You can use the Address Editor to establish a communication for your units via ETHERNET and to address the units.

If you connect the ETHERNET interface of your engineering PC to ETHERNET via a patch cable, the Address Editor detects all ETHERNET stations in the connected network segment (local network).

Unlike with "MOVITOOLS® MotionStudio", you will **not** have to adjust the IP address of the engineering PC to the local network.

Thus the Address Editor is a reasonable addendum to "MOVITOOLS® MotionStudio".

Proceed as follows if you have added other ETHERNET stations to an existing network:

- Starting the Address Editor
- Searching for Ethernet stations

Once you have found the other ETHERNET stations, you have two options:

- Adjust detected ETHERNET stations to the network (address)
- Adjust engineering PC to the network (address)

Starting the Address Editor

You can use the Address Editor once MOVITOOLS® MotionStudio has been installed.

Proceed as follows to start the Address Editor:

1. Close MOVITOOLS® MotionStudio.
2. Start the Address Editor from the Windows start menu via:
[Start] / [Programs] / [SEW] / MOVITOOLS MotionStudio] / [Address Editor (Address Tool)]



Searching for Ethernet stations

You can use the Address Editor to search a network for ETHERNET stations. You can also specifically search recently added ETHERNET stations. Moreover, the Address Editor helps you to localize the ETHERNET interface of the detected ETHERNET stations.

Proceed as follows to search for ETHERNET stations and localize the hardware:

1. Select "ETHERNET" as the interface for PC and unit. To do so, click on the corresponding option field in the lower part of the window.
2. Click on [Continue] to confirm your selection and proceed to the next dialog.
3. Wait for the network scan to start **automatically**. The default setting for the waiting time (scan timeout) is 3 s [2]

Note: If you are unable to find any units after the network scan, the wiring might be inadequate, or you have several network cards installed (activated) in your PC.

In this case, proceed as follows:

- Select the desired card. To do so, click "Select network card" [3] in the toolbar.
- Start the network scan **manually**. To do so, click "Start network scan" [1] in the toolbar.



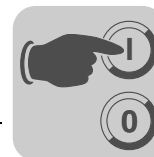
1513526795

- [1] "Start network scan" symbol
- [2] "Scan timeout" input field
- [3] "Select network card" symbol
- [4] "Localize" checkbox

As a result, the current addresses of all ETHERNET stations in the connected network will be displayed.

4. Mark the "Localize" checkbox [4] to localize an ETHERNET station.

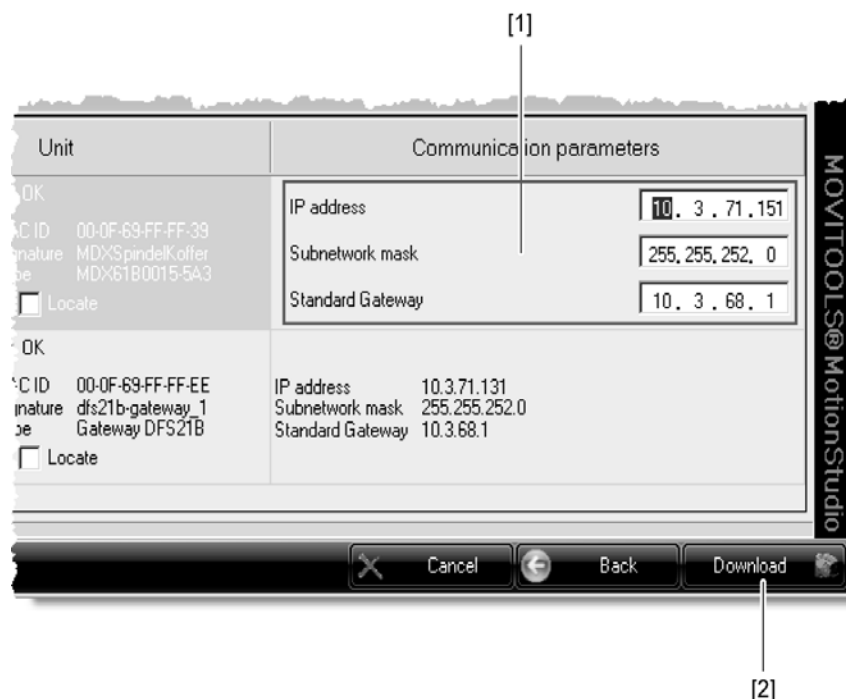
The link/act LED of the first ETHERNET interface of the respective ETHERNET station will blink green.



*Adjust detected
ETHERNET sta-
tions to the net-
work (address)*

Proceed as follows to adjust (address) the localized ETHERNET stations to the network:

1. Double-click on the "Communication parameters" window of the respective unit [1] to adjust the IP parameters of an ETHERNET station to the network.



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- [1] "Communication parameters" window
[2] "Download" button

The following fields can be edited:

- IP address of the ETHERNET station
 - IP address of the subnet mask
 - IP address of the standard gateway
 - DHCP startup configuration (if supported by the unit)
2. Transmit the address changes to the ETHERNET station. Click on [Download] [2].
 3. Switch the unit off and on again in order to apply the changes.



*Adjust engineering
PC to the network
(address)*

Proceed as follows to adjust (address) the engineering PC to the network:

1. Select the following item from the Windows start menu:
[Start] / [Setup] / [Network connections]
2. Select the corresponding PC interface.
3. Select "Properties" from the context menu.
4. Activate the checkbox with the following entry "Internet protocol (TCP/IP)".
5. Click on "Properties".
6. Activate the "Use the following IP address" checkbox.
7. Enter the same IP addresses for the subnet mask and the standard gateway as for the other ETHERNET stations in this local network.
8. For the engineering PC, enter an IP address that meets the following conditions:
 - In the blocks that define the **network**, the address segment for the engineering PC must correspond to the other ETHERNET stations.
 - In the blocks that define the **station**, the address segment for the engineering PC must differ from the other stations.
 - The last block must not contain "0", "4", "127" or "255".



TIP

In the IP address of the subnet mask (e.g. 255.255.255.0) the values in the blocks have the following meaning:

- "255", defines the address of the network where the stations are located.
- "0", defines the address of the actual station to distinguish it from other stations.



10.6.3 Configuring the communication channel via Ethernet

Proceed as follows to configure a communication channel for ETHERNET:

1. Click on "Configure communication plugs" [1] in the toolbar.

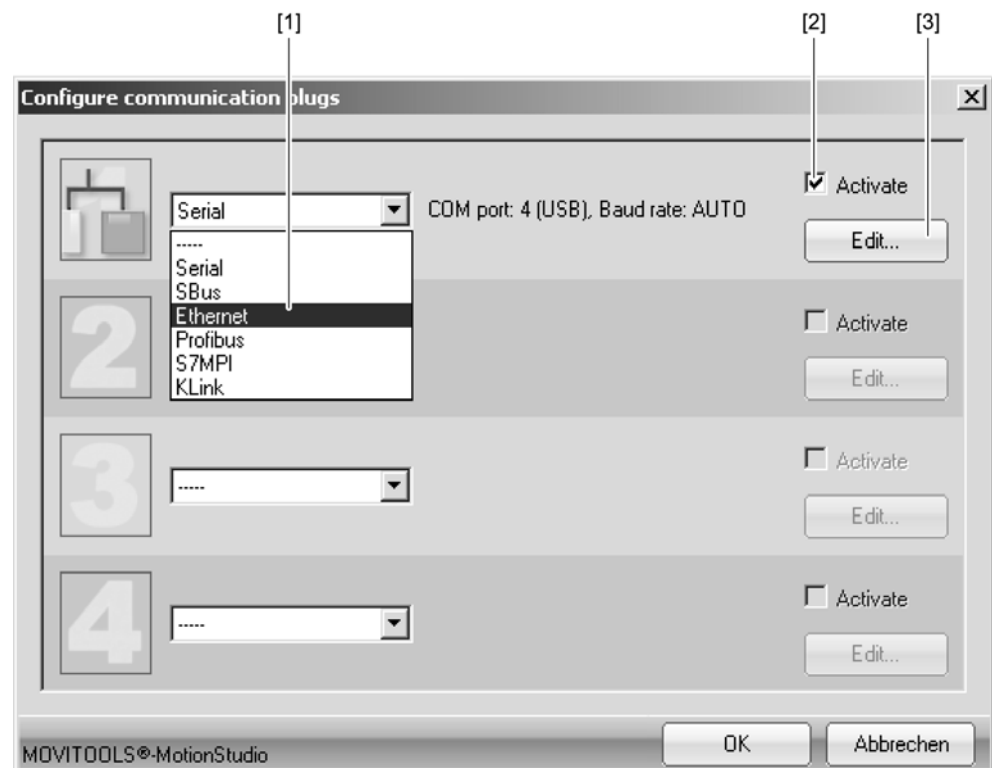


[1]

1133341835

[1] "Configure communication plugs" symbol

This will open the "Configure communication plugs" window.



1144381323

[1] "Type of communication" selection list

[2] "Activate" checkbox

[3] [Edit] button



2. From the list [1], select "Ethernet" as the communication type.
In the example, "ETHERNET" is activated as the communication type for the first communication channel [2].
3. Click [Edit] [3] in the right section of the window.
This will display the settings for the "ETHERNET" communication type.
4. Set up the SMLP protocol. Select the "SMLP settings" tab
5. Set the parameters. Follow the instructions described in the section "Setting parameters for SMLP".


TIP

SMLP stands for **S**imple **MOVILINK®** **P**rotocol. It is the SEW-EURODRIVE unit protocol and is transmitted directly via TCP/IP.



10.6.4 Setting communication parameters for SMLP

Proceed as follows to set the communication parameters for communicating via ETHERNET:

1. Change the communication parameters if necessary. Refer to the detailed description of the communication parameters for SMLP.

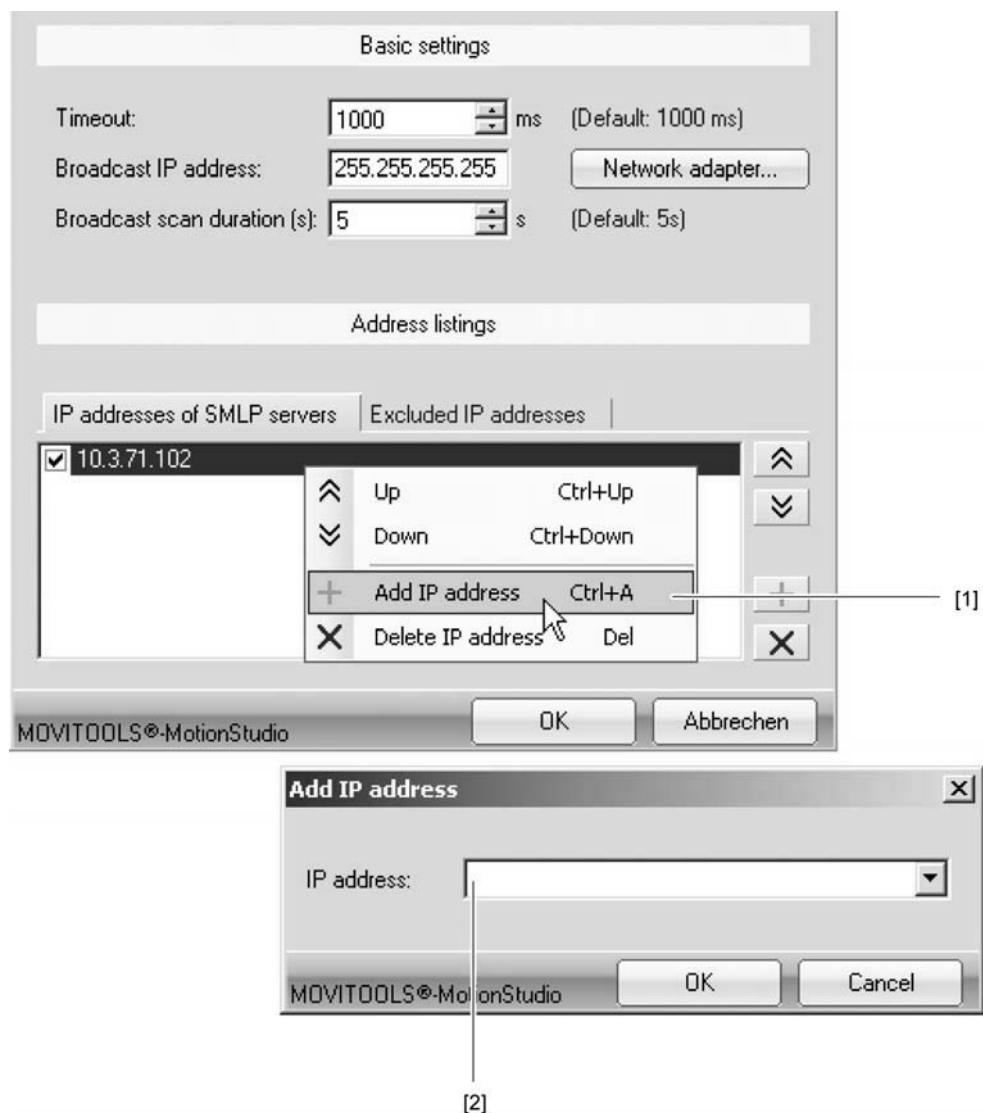


TIP

During a unit scan, the system recognizes only units that are in the same (local) network segment as the PC that is running MOVITOOLS® MotionStudio.

- If you have units that are **OUTSIDE** the local network segment, add the IP addresses of these units to the list of SMLP servers.

2. Add an IP address by opening the context menu and selecting [Add IP address] [1].



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[1] [Add IP address] button

[2] "IP address" input field

3. Add the IP address in the input field [2].



10.6.5 Communication parameters for SMLP

The following table describes the communication parameters for SMLP:

Communication parameters	Description	Note
Timeout	Waiting time in [ms] that the client waits for a reply from the server after it has made a request.	• Default setting: 1000 ms • Increase the value as required if a delay in communication is causing malfunctions.
Broadcast IP address	IP addresses of the local network segment within which the unit scan is carried out	In the default setting, the unit scan retrieves units that are in the local network segment only.
IP addresses SMLP server	IP address of the SMLP server or of other units that are to be included in the unit scan but are outside the local network segment	• Enter the IP address of units that are to be included in the unit scan but are outside the local network segment. • Enter the IP address of the SIMATIC S7 control, if you are operating an indirect ETHERNET to PROFIBUS communication via SIMATIC S7.
Excluded IP address	IP addresses of units that should not be included in the unit scan	Enter IP addresses of units that should not be included in the unit scan. This can be units that are not ready for communication (for example as they have not been started up yet)

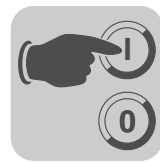
10.7 Executing functions with the units

10.7.1 Parameterizing units in the parameter tree

Parameterize units in the parameter tree.

The parameter tree displays all unit parameters arranged in folders.

You can manage the unit parameters via the context menu or the toolbar. The following steps illustrate how to read/edit unit parameters.



10.7.2 Reading/editing unit parameters

Proceed as follows to read/edit unit parameters:

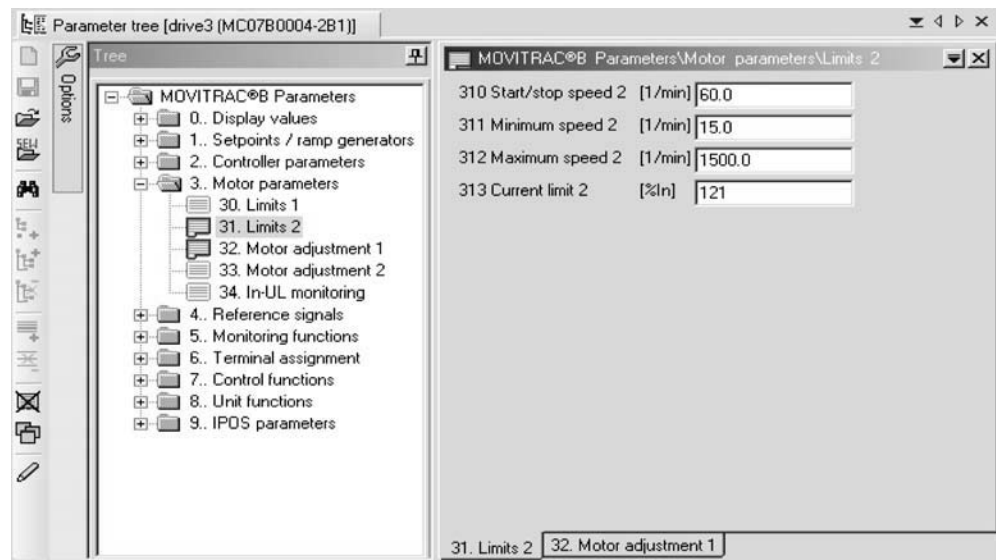
1. Switch to a view (project view or network view).
2. Select the communication mode:
 - Press the [Switch to online mode] button [1] if you would like to read or change parameters directly on the **unit**.
 - Press the [Switch to offline mode] button [2] if you would like to read or change parameters in the **project**.



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- [1] "Switch to online mode" symbol
[2] "Switch to offline mode" symbol

3. Select the unit you want to configure.
4. Open the context menu and select the [Parameter tree] command.
Then, the "Parameter tree" view opens on the right section of the screen.
5. Expand the "Parameter tree" up to the node you require.



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6. Double click to display a particular group of unit parameters.
7. Press the enter key to finalize any changes you make to numerical values in the input fields.



10.7.3 Starting up units (online)

Proceed as follows to start up the units (online):

1. Switch to the network view.
2. Click on "Switch to online mode" [1] in the toolbar.



[1]

1184030219

[1] "Switch to online mode" symbol

3. Select the unit you want to startup.
4. Open the context menu and select the following command:
[Startup]/[Startup]
Then, the Startup wizard opens.
5. Follow the instructions of the startup wizard and then load the startup data onto your unit.



TIP

- Refer to the parameter list in the unit documentation for detailed information on the unit parameters.
- For detailed information on the startup wizard, refer to the MOVITOOLS® MotionStudio online help.

10.7.4 Configuration and diagnostics in transparent mode

There are plug-ins for configuration and diagnostics for the SEW-EURODRIVE application modules, see section "Configuration in transparent mode (see page 162)".



11 Power Section – Parameterization

11.1 Motor/brake startup with MOVIFIT®-SC

	TIP • You only have to perform the following motor/brake startup when "Expert mode" is activated (=> DIP switch S10/1 = ON). • For information on startup in "Easy mode" using DIP switches, see the MOVIFIT®-SC operating instructions.
--	--

You can adjust the parameters for MOVIFIT®-SC. At least the parameters described in this section must be set when Expert mode is active to ensure successful startup.

All other parameters are described in detail in section "Parameter list for the MOVIFIT-SC power section (see page 135)" section and in section "Parameter description for MOVIFIT-SC (see page 138)" section..

11.1.1 Parameter 200

Rated mains voltage

This parameter must be used to adjust the unit to the rated input voltage of the supply system.

- Choose the setting 400 V when the mains supply a voltage of 3 x AC 380 V, 3 x AC 400 V or 3 x AC 415 V.
- Choose the setting 500 V when the mains supply a voltage of 3 x AC 460 V, 3 x AC 480 V or 3 x AC 500 V.



11.1.2 Parameter 700

Starter operating mode

The unit offers you the option of controlling up to 2 drives separately. If these drives are equipped with an SEW three-wire brake, brake control can also be performed independently using MOVIFIT®.

SINGLE MOTOR OPERATION:

In the "SINGLE-MOTOR OPERATION" starter operating mode, the motor connected at terminal X8 can be run "CLOCKWISE" and "COUNTERCLOCKWISE". If a brake motor with an SEW three-wire brake is used, the brake must be connected at X8.

DUAL MOTOR OPERATION:

In the "DUAL-MOTOR OPERATION" operating mode, drive 1 connected at X8 and drive 2 connected at X9 can be run independently of one another in one direction of rotation.

If a brake motor with an SEW three-wire brake is used, the brake of drive 1 must be connected at X8.

The brake of drive 2 must be connected at X9.

**! DANGER**

For operation with only one motor, use X8 and X81 terminals or the X8 plug connector. Severe or fatal injuries.

- Do not connect the X9 and X91 terminals or the X9 connector in this situation.

**! DANGER**

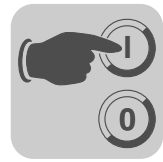
Incorrect connection will cause incorrect motor rotation and/or uncontrolled motor startup.

Severe or fatal injury.

- Check the wiring with the operating manual before starting the motor.

**TIP**

If the current measured at the output for drive 2 in the "SINGLE-MOTOR OPERATION" starter operating mode exceeds a value of 10% $I_{N,unit}$, the unit switches off with a fault message and the unit locks.



11.1.3 Parameter 736

Rated brake voltage brake 1

- This parameter must be used to adjust the unit to the rated voltage of the brake installed in drive 1 if an SEW three-wire brake is connected at X8.
- **The rated brake voltage must match the rated mains voltage. Take this into account when ordering the motor/brake.**

11.1.4 Parameter 737

Rated brake voltage brake 2

- This parameter must be used to adjust the unit to the rated voltage of the brake installed in drive 2 if an SEW three-wire brake is connected at X9.
- **The rated brake voltage must match the rated mains voltage. Take this into account when ordering the motor/brake.**

11.1.5 Parameter 620/621

Binary outputs DB00 and DB01

	 DANGER
	If binary outputs DB00 or DB01 are used to control the brake, do not change the parameters of the functions of the binary outputs. Severe or fatal injuries. • Check the parameter settings before using the binary outputs to control the brake.



11.2 Motor/brake startup with MOVIFIT®-FC



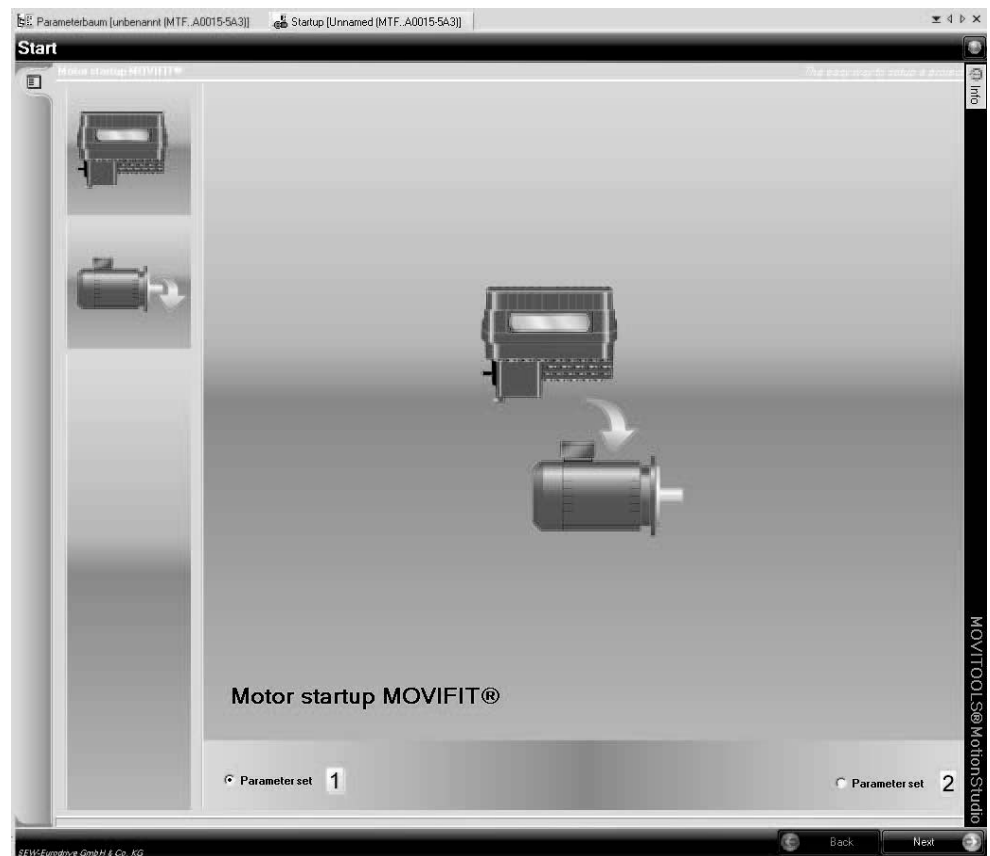
TIP

- You only have to perform the following motor/brake startup when "Expert mode" is activated.
- For information on startup in "Easy mode" using DIP switches, see the MOVIFIT®-FC operating instructions.

11.2.1 Startup procedure

1. Once the startup tool has been selected in MOVITOOLS® MotionStudio, the parameter set selection window is displayed.

In this window, select the required parameter set.

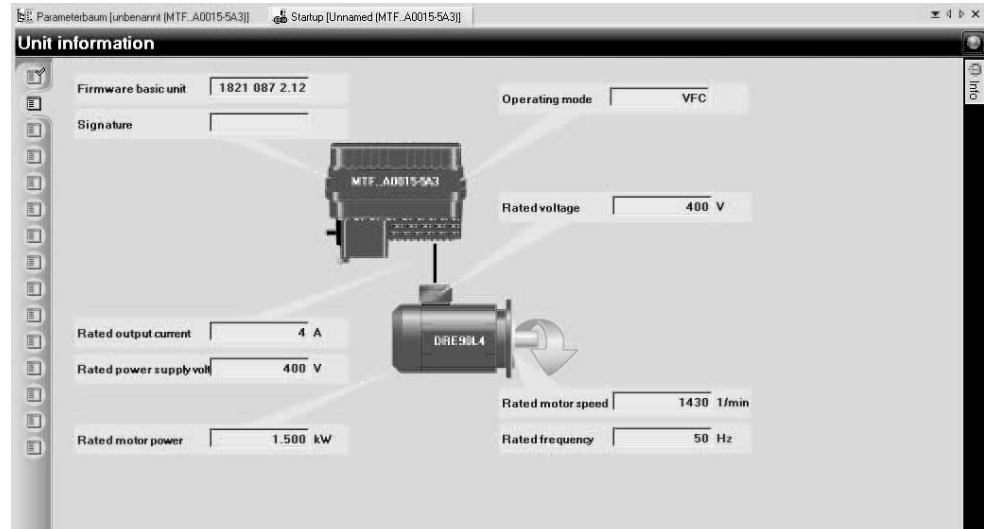


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Use the [back] and [next] buttons to switch between the pages.



- Once the parameter set has been selected, the current unit information is displayed (only display values):



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- Select the configuration for the motor output:
 - The fixed connection of the motors to MOVIFIT®-FC is the default setting.
 - The switchable connection of the motors to MOVIFIT®-FC is only available for the special designs with dual motor operation.

For more information on the MOVIFIT® special design for dual motor operation, refer to the "MOVIFIT®-FC special design for dual motor operation" operating instructions.



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Power Section – Parameterization

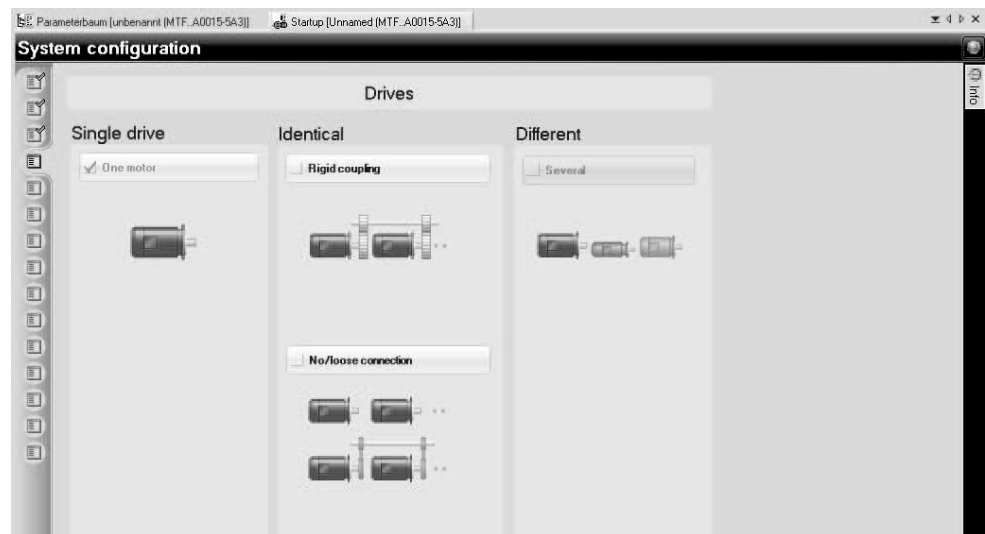
Motor/brake startup with MOVIFIT®-FC

4. Select the system configuration:

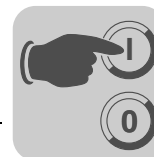
- With "one motor", MOVIFIT®-FC controls a single motor.
- With "rigid coupling", MOVIFIT®-FC controls several motors that are rigidly coupled via the axes.
- With "no/loose coupling", MOVIFIT®-FC controls several motors that are not or loosely coupled via the axes.

With "rigid coupling" or "no/loose coupling", you will have to select the alternative brake control "Via constant voltage" in the "Brake" menu.

"Multiple" is not possible for MOVIFIT® units.

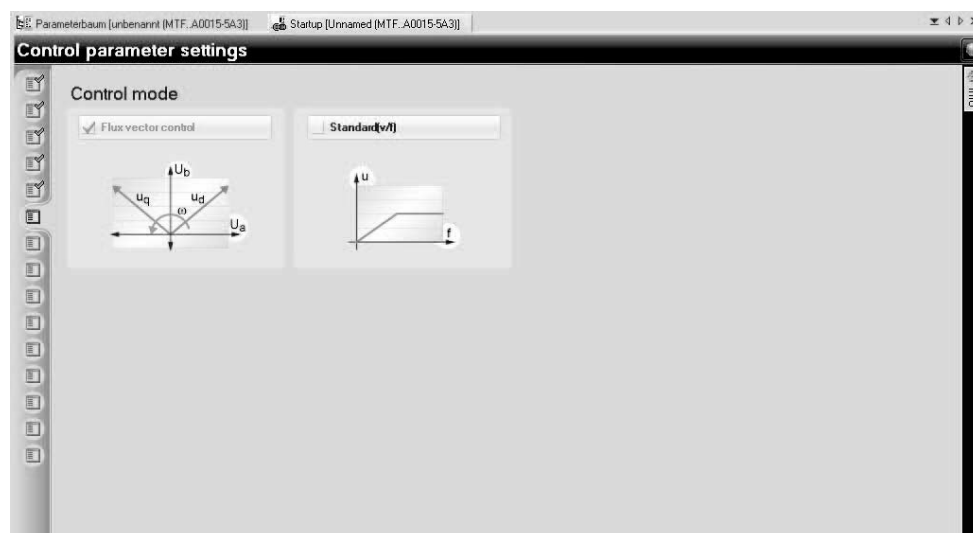


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5. Select the control mode:

- The vector-controlled operating mode (VFC) is adapted for use with SEW motors.
- For non-SEW motors, select the operating mode V/f characteristic curve when the VFC operating mode does not produce a satisfactory result.



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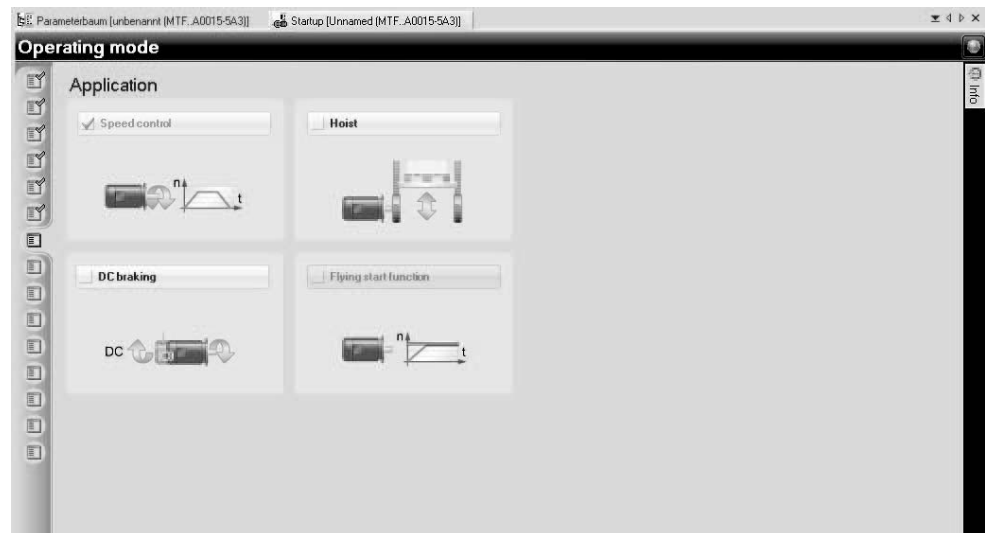
Power Section – Parameterization

Motor/brake startup with MOVIFIT®-FC

6. Choose one of the following operating modes:

- Speed control
- DC brake
- Hoist (only with VFC mode)

"Flying start" is not possible with MOVIFIT®.



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DANGER

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- You must choose the "Hoist" operating method for hoist applications.



TIP

The operating mode "DC braking" is used to slow a drive without giving off regenerative energy to a connected SEW three-wire brake coil or a braking resistor. In this mode, the energy released during the braking process is converted to heat losses in the motor.



7. Select the type of the connected motor.



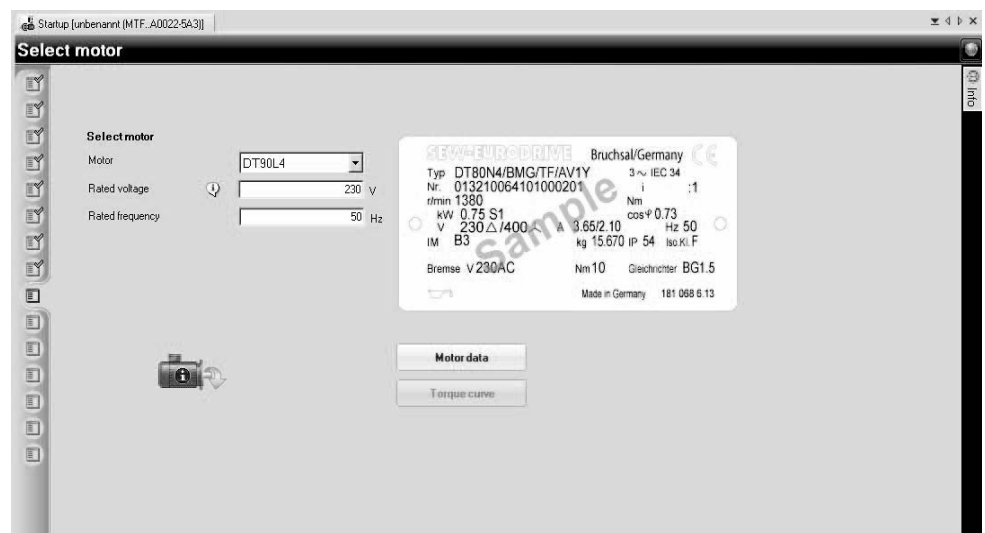
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Standard motors:

When selecting an SEW standard motor, select:

- the motor type
- the rated motor voltage (corresponding to the respective type of connection, "Star" or "Delta")
- and the rated motor frequency

Refer to the motor nameplate of the motor.



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Power Section – Parameterization

Motor/brake startup with MOVIFIT®-FC

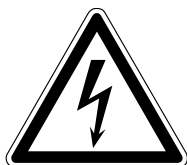
Non-SEW motors:

With non-SEW motors, you have to provide nameplate additional data.

Start a calibration process via [Start calibration] to determine additional motor parameters.

Before you start make sure that:

- the motor is connected,
- the mains voltage is present
- and the unit is ready for operation

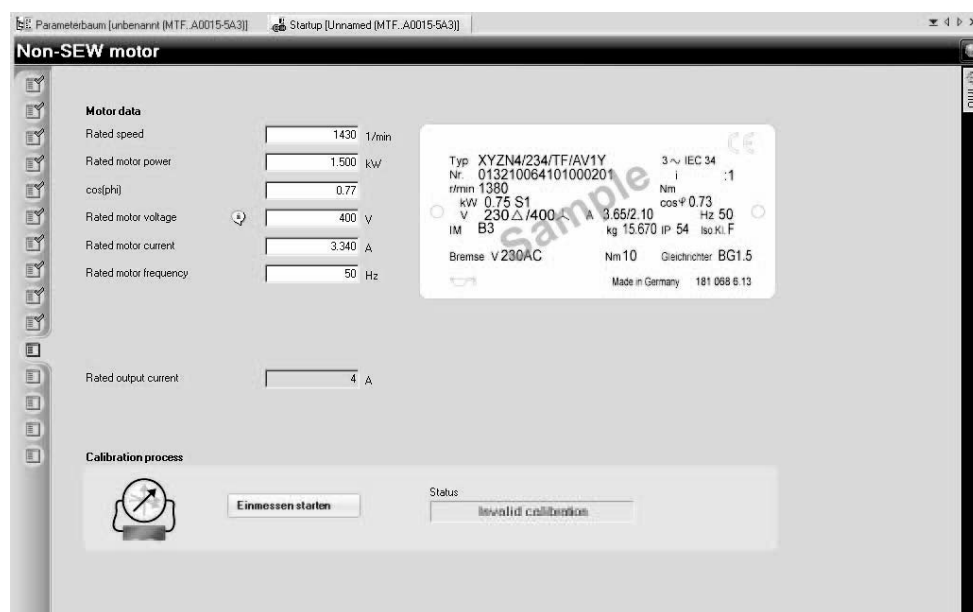


! DANGER

The connected motor is energized during the calibration procedure.

Severe or fatal injuries from electric shock.

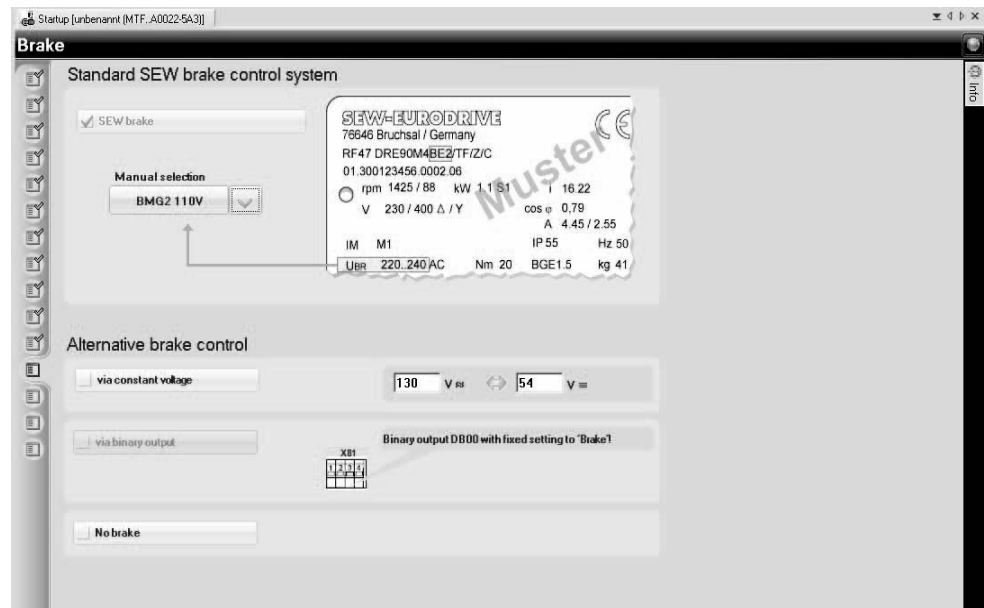
- The terminal box of the drive that has been connected must be closed during the calibration process.



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8. For brakemotors, select the connected brake after the motor startup:



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Standard SEW brake control:

- If the motor is equipped with the brake with the brake intended for the MOVIFIT® drive (see table on following pages),
 - activate the "SEW brake" checkbox
 - and select "manual selection" to select the brake according to the nameplate data.

With the SEW standard brake control, the brake is directly supplied from the DC link thus using regenerative energy. The brake temperature is monitored.



Alternative brake control

	NOTICE
	When selecting an alternative brake control, the drive must already be equipped with an internal or external braking resistor. During the brake process, the braking resistor stores regenerative power.

The alternative brake control is intended for the case

- that the motor is equipped with a brake different from the one intended for the MOVIFIT® drive (see table on the next page)
- or that several motors/brakes are operated with one MOVIFIT® in parallel. I.e. you have selected "no/loose coupling" in the "System configuration" window (step 4).

The following control methods are available:

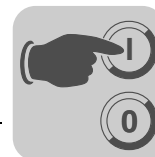
- Brake control via constant voltage
 - Activate the "via constant voltage" checkbox
 - Enter the brake supply voltage either as AC or DC voltage

Brake control via binary output

- Activate the "via binary output" checkbox

For the brake control via the binary output a brake rectifier is required that releases the brake when the binary output signal is set.

If the motor is not equipped with a brake, activate the "no brake" checkbox.



The following table shows the permitted brakes for the MOVIFIT® drive:

Motor	Permitted brakes
DR63M4	BR03
DR63L4	BR03
DT71D4	BMG05, BMG1
DT80K4	BMG05, BMG1
DT80N4	BMG05, BMG1
DT90S4	BMG2, BMG4
DT90L4	BMG2, BMG4
DV100M4	BMG2, BMG4
DV100L4	BMG2, BMG4
DAS80K4	BR1
DAS80N4	BR1
DAS90S4	BR2
DAS90L4	BR2
DAS100M4	BR2
DAS100L4	BR2
DR63M4	BR03
DR63L4	BR03
DRS71S4	BE05, BE1
DRS71M4	BE05, BE1
DRS80S4	BE05, BE1, BE2
DRS80M4	BE05, BE1, BE2
DRS90M4	BE1, BE2, BE5
DRS90L4	BE1, BE2, BE5
DRS100M4	BE2, BE5
DRS100L4	BE2, BE5
DRS100LC4	BE2, BE5
DRE80S4	BE05, BE1, BE2
DRE80M4	BE05, BE1, BE2
DRE90M4	BE1, BE2, BE5
DRE90L4	BE1, BE2, BE5
DRE100M4	BE2, BE5
DRE100L4	BE2, BE5
DRE100LC4	BE2, BE5
DRE132S4	BE5, BE11
DRP80M4	BE05, BE1, BE2
DRP90M4	BE1, BE2, BE5
DRP90L4	BE1, BE2, BE5
DRP100M4	BE2, BE5
DRP100L4	BE2, BE5
DRP112M4	BE5, BE11
DRP132M4	BE5, BE11



TIP

Possible brake voltages:

BR1: 230 V
 BR2: 230 V / 400 V
 BR03, BMG05...BMG4, BE1...BE11: 110 V / 230 V / 400 V



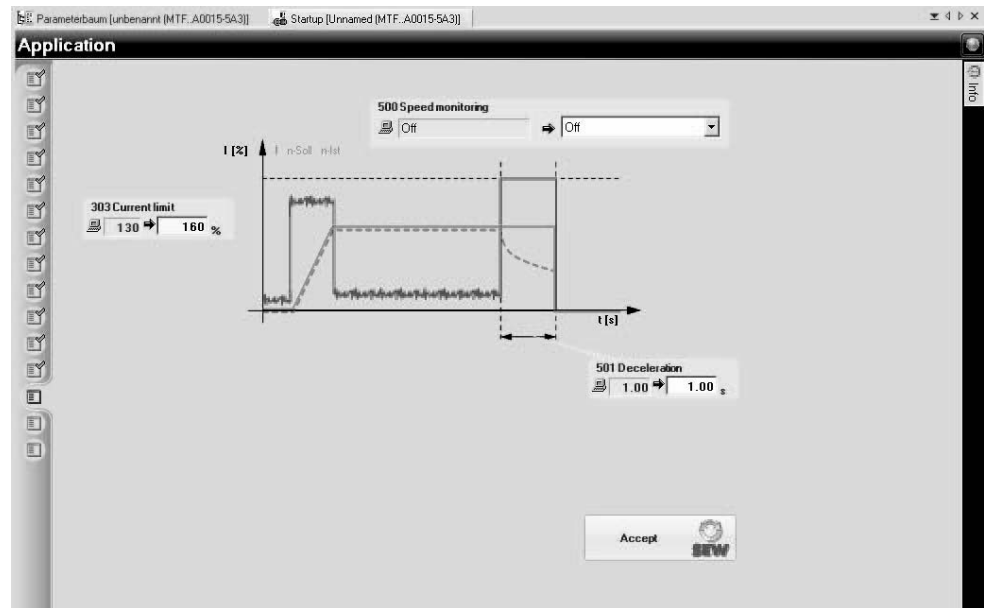
Power Section – Parameterization

Motor/brake startup with MOVIFIT®-FC

9. In the next step "Application" you can activate the "Speed monitoring" function and set the current limit.

In hoist mode, speed monitoring is activated as standard. When speed monitoring is active, a fault is triggered after the specified deceleration time when the output current reaches the set current limit continuously.

The percentage current level is based on the rated unit current. The output frequency is reduced to protect the motor from stalling when the current limit is reached. To ensure stall protection, accept the default value for the current limit.



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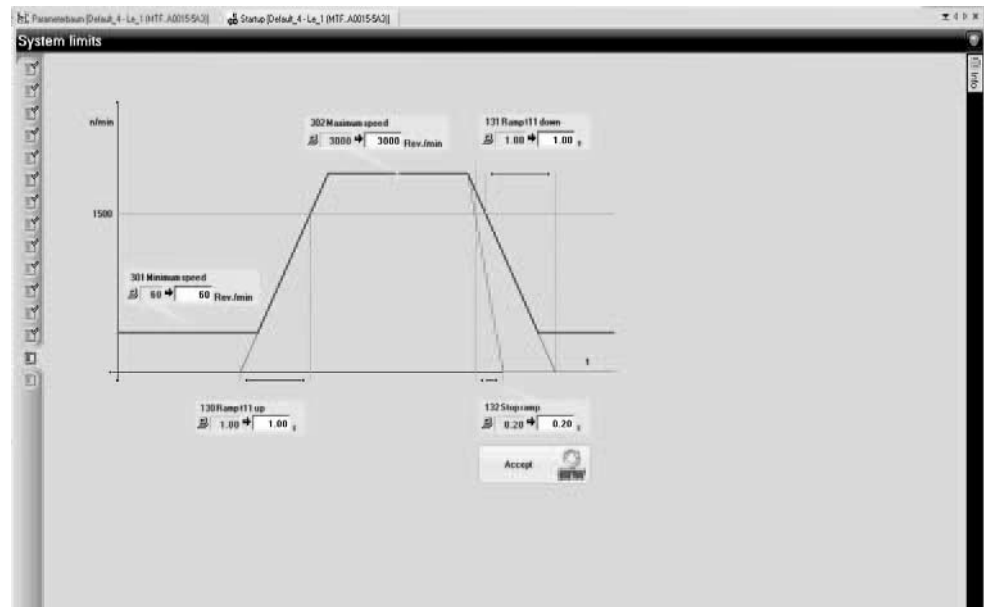
The suggested values can be adopted by clicking on the black arrows. Click the right mouse button in the input field to display additional input options.

You can accept each default value individually, or you can accept all default values by clicking the [Accept SEW suggestion] button.



10. In the next step, parameters are set for the speed limits and ramp times.

The ramp times are always based on a change in the output speed of 1500 rpm. The ramp times apply when a ramp time has not been specified via the process data and an enable/revoke enable occurs. The stop ramp is active when a "Rapid stop" is requested or when specific faults occur.



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The suggested values can be adopted by clicking on the black arrows. Click the right mouse button in the input field to display additional input options.

You can accept each default value individually, or you can accept all default values by clicking the [Accept SEW suggestion] button.

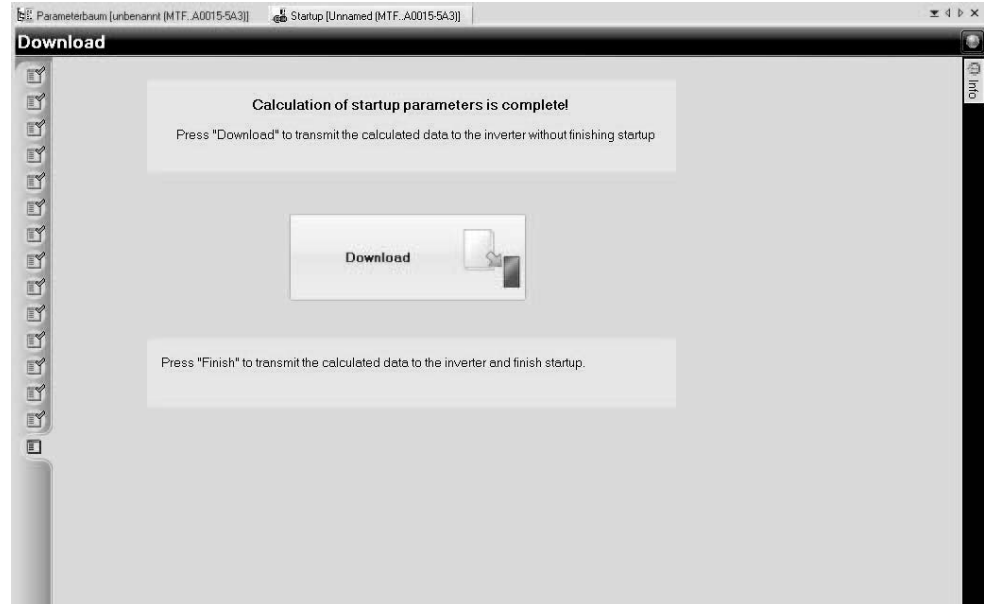


Power Section – Parameterization

Starting up a hoist with MOVIFIT®-FC in "Expert mode"

11. Use the "Download" button to transfer all the parameters to the MOVIFIT® unit.

Use the "Finish" button to transfer the parameters to the MOVIFIT® unit and finish the startup.



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Before the transmission, you can use the [back] and [next] buttons to switch between the pages. The settings are not lost.

11.3 Starting up a hoist with MOVIFIT®-FC in "Expert mode"

You must always set the operating mode to "Hoist" (only available with the VFC operating mode) when using hoist applications during motor startup or brake startup (see section "Startup procedure (see page 122)").

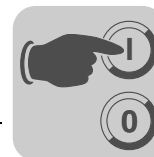


DANGER

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- MOVIFIT® may not be used as a safety device in hoist applications. Use monitoring systems or mechanical protection devices to ensure safety.



11.4 Parameter list for the MOVIFIT®-SC power section

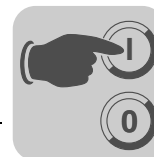
No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® Motion-Studio
0_	Display values				
00_	Process values				
000	10096	11	Output current drive 1	[%]	
001	10096	12	Output current drive 2	[%]	
002	10096	13	Rated mains frequency	[Text]	
003	10096	14	Mains phase sequence	[Text]	
01_	Status displays				
010	8310	0	Starter status	[Text]	
011	8310	0	Operating state	[Text]	
012	8310	0	Fault status	[Text]	
014	8327	0	Heat sink temperature	[°C]	
015	10096	10	DIP switch setting S10 switch	[Bit field]	
03_	Binary inputs (only in "SBus slave" operating mode)				
031	8334 Bit 1	0	Position binary input DI100	[Bit field]	
	8335	0	Binary input DI100 assignment	NO FUNCTION (factory setting)	
032	8334 Bit 2	0	Position binary input DI101	[Bit field]	
	8336	0	Binary input DI101 assignment	NO FUNCTION (factory setting)	
033	8334 Bit 3	0	Position binary input DI102	[Bit field]	
	8337	0	Binary input DI102 assignment	NO FUNCTION (factory setting)	
034	8334 Bit 4	0	Position binary input DI103	[Bit field]	
	8338	0	Binary input DI103 assignment	NO FUNCTION (factory setting)	
05_	Binary outputs				
050	8349 Bit 0	0	Position binary output DB00	[Bit field]	
	8350	0	Binary output DB00 assignment	BRAKE RELEASED (factory setting)	
051	8349 Bit 1	0	Position binary output DB01	[Bit field]	
	8351	0	Binary output DB01 assignment	BRAKE RELEASED (factory setting)	
07_	Unit data				
070	8301	0	Unit type	[Text]	
071	8361	0	Rated output current	[A]	
076	8300	0	Firmware power section	[Part number and version]	
	8314-8317	0	Signature	[Text]	
08_	Fault memory				
080			Fault t-0	Fault code	Background information for errors that occurred in the past when t-0
09_	Bus diagnostics				
094	8455	0	PO1 setpoint	[hex]	
095	8456	0	PO2 setpoint	[hex]	
096	8457	0	PO3 setpoint	[hex]	
097	8458	0	PI1 actual value	[hex]	
098	8459	0	PI2 actual value	[hex]	
099	8460	0	PI3 actual value	[hex]	



Power Section – Parameterization

Parameter list for the MOVIFIT®-SC power section

No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® Motion-Studio
1__ Setpoints/ramp generators					
13_ Soft startup time 1					
130	10096	1	Soft startup time drive 1	0... 0.2 ...1 [s]	
131	10096	2	Soft startup time drive 2	0... 0.2 ...1 [s]	
14_ Change in direction of rotation					
140	10096	20	Reversing time	0.05... 0.2 ...0.10 [s]	
2__ Power supply					
200	10096	19	Rated mains voltage	0: 400 V 1: 500 V	
201	8927	0	Enable "Deactivation of mains phase sequence monitoring"	OFF ON	OFF ON
3__ Motor parameters					
30_ Limits drive 1					
300	10096	6	Switch-off current drive 1	1... 150 [%]	
301	10096	8	Deceleration time monitoring drive 1	0... 2 ...0.10 [s]	
31_ Limits drive 2					
310	10096	7	Switch-off current drive 2	1... 150 [%]	
311	10096	9	Deceleration time monitoring drive 2	0... 2 ...0.10 [s]	
34_ Motor protection					
340	8533	0	Motor protection drive 1	0: OFF 1: ON	
341	9114	0	Rated current drive 1	0 ... 10 [A]	
342	8535	0	Motor protection drive 2	0: OFF 1: ON	
343	9115	0	Rated current drive 2	0 ... 10 [A]	
6__ Terminal assignment in the power section					
60_ Binary inputs (only in "SBus slave" operating mode)					
600	8335	0	Binary input DI100	0: No function 11: External fault 0 active 12: Fault reset	
601	8336	0	Binary input DI101		
602	8337	0	Binary input DI102		
603	8338	0	Binary input DI103		
62_ Binary outputs					
620	8350	0	Binary output DB00	0: No function 1: Fault drive 1 2: Fault drive 2 3: Ready for operation 4: Drive 1 ON 5: Drive 2 ON 6: Brake 1 released 7: Brake 2 released	
621	8351	0	Binary output DB01	0: No function 1: Fault drive 1 2: Fault drive 2 3: Ready for operation 4: Drive 1 ON 5: Drive 2 ON 6: Brake 1 released 7: Brake 2 released	



No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® Motion-Studio
7_	Control functions				
70_	Operating modes				
700	10096	3	Operating mode	0: Single-motor operation 1: Dual-motor operation	
73_	Brake function				
731	10096	4	Brake application time drive 1	0..0.10 [s]	
734	10096	5	Brake application time drive 2	0..0.10 [s]	
736	9400	0	Rated brake voltage drive 1	2: 400 V 3: 500 V	
737	9401	0	Rated brake voltage drive 2	2: 400 V 3: 500 V	
738	8893	0	Activate "Brake release without drive enable"	OFF ON	OFF ON
8_	Unit functions				
80_	Setup				
802	8594	0	Factory setting	0: No factory setting 1: Basic initialization 2: Delivery state	
803	8595	0	Parameter lock	0: OFF 1: ON	OFF ON
81_	Serial communication				
813	8600	0	SBus address (display values)	Master unit: 1 Slave unit: 16..31	
816	8603	0	SBus baud rate (display values)	2: 500 kBaud	
83_	Fault responses				
830	8609	0	Response external fault	0: No response 2: Immediate stop / Locking 5: Immediate stop / warning	
835	8616	0	TF signal response	0: No response 2: Immediate stop / Locking	
836	8615	0	Response SBus timeout	2: Immediate stop / Locking 5: Immediate stop / warning	
839	10454	1	Fault response output open	0: No response 2: Immediate stop / Locking	
84_	Reset behavior				
840	8617	0	Manual reset	0: No 1: Yes	
87_	Process data assignment (display values)				
870	8304	0	Setpoint description PO1	[Text]	
871	8305	0	Setpoint description PO2	[Text]	
872	8306	0	Setpoint description PO3	[Text]	
873	8307	0	Actual value description PI1	[Text]	
874	8308	0	Actual value description PI2	[Text]	
875	8309	0	Actual value description PI3	[Text]	



11.5 Parameter description for MOVIFIT®-SC

11.5.1 Display values

<i>Parameter 000</i>	Output current of drive 1 Apparent motor current of drive 1 in range 0...200% of the rated unit current
<i>Parameter 001</i>	Output current of drive 2 Apparent motor current of drive 2 in range 0...200% of the rated unit current
<i>Parameter 002</i>	Rated mains frequency Display of the automatically determined mains frequency
<i>Parameter 003</i>	Mains phase sequence Display of the automatically determined connection sequence of the supply system input phases It distinguishes between a clockwise rotating field and a counterclockwise rotating field. In the "Dual-motor operation" operating mode, mains phases L1, L2, and L3 must be connected as a clockwise rotating field at the terminals in the unit. If you do not follow this sequence, the unit generates the error message "Startup, no. 9, internal error 3" when the power is connected. In this case, the power section will not be enabled. You can deactivate monitoring using parameter 201.

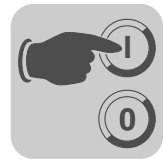


DANGER

An incorrect connection will cause the motor to rotate in the wrong direction.
 Severe or fatal injuries.

- Check the wiring before starting the motor.

<i>Parameter 010</i>	Starter status Statuses of the unit output stage: • INHIBITED • ENABLED
<i>Parameter 011</i>	Operating state The following operating statuses are possible: • 24 V OPERATION • NO ENABLE • ENABLE • FACTORY SETTING • FAULT
<i>Parameter 012</i>	Fault status Fault status of the starter power section



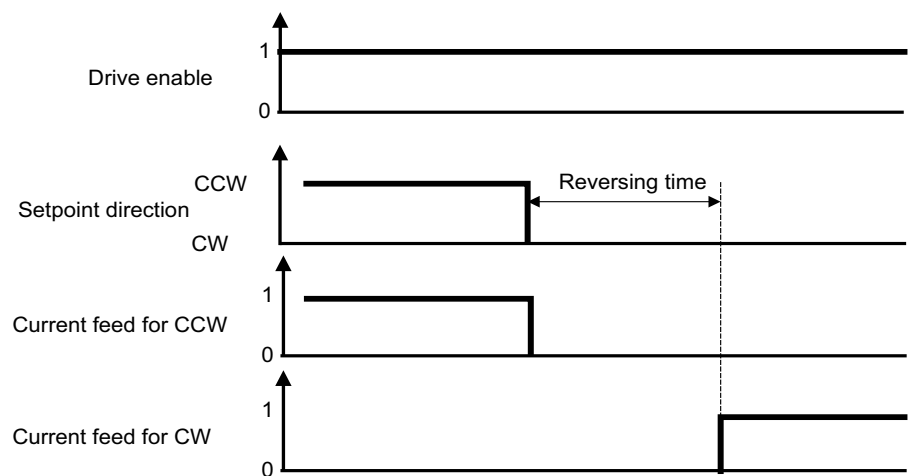
<i>Parameter 014</i>	Heat sink temperature Heat sink temperature of the starter
<i>Parameter 015</i>	DIP switch setting S10 Display of DIP switch setting S10
<i>Parameter 031</i>	Setting/assignment of binary input DI100 Displays the status of binary input DI100 (only in "SBus slave" operating mode).
<i>Parameter 032</i>	Setting/assignment of binary input DI101 Displays the status of binary input DI101 (only in "SBus slave" operating mode).
<i>Parameter 033</i>	Setting/assignment of binary input DI102 Displays the status of binary input DI102 (only in "SBus slave" operating mode).
<i>Parameter 034</i>	Setting/assignment of binary input DI103 Displays the status of binary input DI103 (only in "SBus slave" operating mode).
<i>Parameter 050</i>	Setting/assignment binary output DB00 Display of the status of binary output DB00
<i>Parameter 051</i>	Setting/assignment binary output DB01 Display of the status of binary output DB01
<i>Parameter 070</i>	Unit type Device type is displayed
<i>Parameter 071</i>	Rated output current The rated unit current is displayed in [A]
<i>Parameter 076</i>	Firmware power section Display of the part number and version of the firmware of the power section
<i>Parameter 080</i>	Fault t-0 The unit saves the diagnostic data when a fault occurs. The last error is displayed in the error memory.
<i>Parameter 094</i>	PO1 setpoint Process data output word 1
<i>Parameter 095</i>	PO2 setpoint Process data output word 2
<i>Parameter 096</i>	PO3 setpoint Process data output word 3



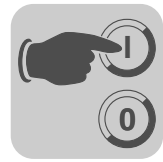
<i>Parameter 097</i>	PI1 actual value Process data input word 1
<i>Parameter 098</i>	PI2 actual value Process data input word 2
<i>Parameter 099</i>	PI3 actual value Process data input word 3

11.5.2 Setpoint/ramp generators

<i>Parameter 130</i>	Soft startup time drive 1 You can configure a soft startup time to limit the starting current for drive 1. A phase angle takes place after enable in the time period defined in this parameter.
<i>Parameter 131</i>	Soft startup time drive 2 You can configure a soft startup time to limit the starting current for drive 2. A phase angle takes place after enable in the time period defined in this parameter.
<i>Parameter 140</i>	Reversing time This parameter defines the time for which the power of drive 1 is switched off in the "Single-motor operation" operating mode during a change in the direction of rotation before power is supplied again for the new direction of rotation.



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11.5.3 Mains supply parameters

Parameter 200

Rated mains voltage

This parameter must be used to adjust the unit to the rated input voltage of the supply system.

Choose the setting 400 V when the mains supply a voltage of 3 x AC 380 V, 3 x AC 400 V or 3 x AC 415 V.

Choose the setting 500 V when the mains supply a voltage of 3 x AC 460 V, 3 x AC 480 V or 3 x AC 500 V.

Parameter 201

Enable "Deactivation of mains phase sequence monitoring"

If this parameter is set to ON, you can deactivate mains phase sequence monitoring for dual-motor operation by setting the corresponding bit in process output data word PO1.

Deactivation for dual-motor operation must occur before the mains voltage supply is switched on with a counterclockwise rotating field.

11.5.4 Motor parameters

*Parameter 300 and
parameter 301*

Switch-off current drive 1

Deceleration time monitoring drive 1

The parameter *Switch-off current drive 1* is used to set a switch-off limit for drive 1. The parameter *Delay time monitoring drive 1* specifies how long this switch-off current can be exceeded without the unit switching off with the error message "Overtemperature motor".

*Parameter 310 and
parameter 311*

Switch-off current drive 2

Deceleration time monitoring drive 2

The parameter *Switch-off current drive 2* is used to set a switch-off limit for drive 2. The parameter *Delay time monitoring drive 2* specifies how long this switch-off current can be exceeded without the unit switching off with the error message "Overtemperature motor".

Parameter 340

Motor protection drive 1

Activation/deactivation of the thermal protection model for drive 1.

If this function is activated, MOVIFIT® electronically takes over the thermal protection of drive 1. The motor utilization is determined via the inverter output current, the rated current from *P341* and the time.

Parameter 341

Rated current drive 1

The rated current of the connected drive must be known in order to calculate the thermal protection model for drive 1.

The rated current can be found on the nameplate of the motor.

Parameter 342

Motor protection drive 2

Activation/deactivation of the thermal protection model for drive 2.

If this function is activated, MOVIFIT® electronically takes over the thermal protection of drive 2. The motor utilization is determined via the inverter output current, the rated current from *P343* and the time.



Parameter 343

Rated current drive 2

The rated current of the connected drive must be known in order to calculate the thermal protection model for drive 2.

The rated current can be found on the nameplate of the motor.

11.5.5 Terminal assignment

Parameters 600 – 603

Binary inputs DI100 – DI103 (only in "SBus slave" operating mode)

Effect when	"0" signal	"1" signal
0: No function	-	-
11: External fault	External fault	-
12: Fault reset	Resets from 0 to 1 on positive edge	Resets from 0 to 1 on positive edge

Parameters 620/ 621

Binary outputs DB00 and DB01

Effect when	"0" signal	"1" signal
0: No function	-	-
1: Fault drive 1	No malfunction	Fault drive 1
2: Fault drive 2	No malfunction	Fault drive 2
3: Ready for operation	not ready	Ready for operation
4: Drive 1 ON	Drive 1 not enabled	Drive 1 enabled
5: Drive 2 ON	Drive 2 not enabled	Drive 2 enabled
6: Brake 1 released	Brake drive 1 applied	Brake drive 1 released
7: Brake 2 released	Brake drive 2 applied	Brake drive 2 released

**! DANGER**

If binary outputs DB00 and DB01 are used to control the brake, do not change the parameters of the functions of the binary outputs.

Severe or fatal injuries.

- Check the parameter settings before using the binary outputs to control the brake.



11.5.6 Control functions

Parameter 700

Starter operating mode

The unit offers you the option of controlling up to 2 drives separately. If these drives are equipped with an SEW three-wire brake, brake control can also be performed independently using MOVIFIT®.

SINGLE MOTOR OPERATION:

In the "SINGLE-MOTOR OPERATION" starter operating mode, the motor connected at terminal X8 can be run "CLOCKWISE" and "COUNTERCLOCKWISE".

If a brake motor with an SEW three-wire brake is used, the brake must be connected at X8.

DUAL MOTOR OPERATION:

In the "DUAL-MOTOR OPERATION" operating mode, drive 1 connected at X8 and drive 2 connected at X9 can be run independently of one another in one direction of rotation.

If a brake motor with an SEW three-wire brake is used, the brake of drive 1 must be connected at X8.

The brake of drive 2 must be connected at X9.



! DANGER

For operation with only one motor, use X8 and X81 terminals or the X8 plug connector. Severe or fatal injuries.

- Do not connect the X9 and X91 terminals or the X9 connector in this situation.



! DANGER

Incorrect connection will cause incorrect motor rotation and/or uncontrolled motor startup. Severe or fatal injury.

- Check the wiring with the operating manual before starting the motor.



TIP

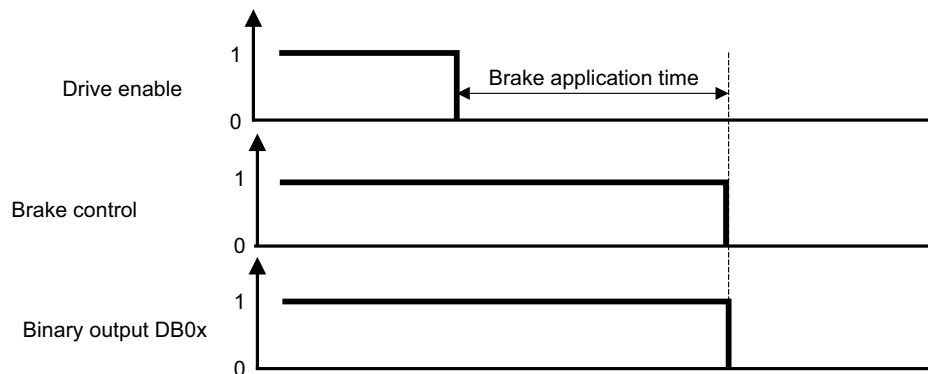
If the current measured at the output for drive 2 in the "SINGLE-MOTOR OPERATION" starter operating mode exceeds a value of 10% $I_{N,unit}$, the unit switches off with a fault message and the unit locks.

**Parameter 731****Brake application time starter brake 1**

This parameter is used to specify a delay between the time when the drive enable is revoked for drive 1 and when the brake is applied. This delay time affects the SEW three-wire brake connected at X8 and the binary output set to "BRAKE 1 RELEASED".

Parameter 734**Brake application time starter brake 2**

This parameter is used to specify a delay between the time when the drive enable is revoked for drive 2 and when the brake is applied. This delay time affects the SEW three-wire brake connected at X9 and the binary output set to "BRAKE 2 RELEASED".



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Parameter 736**Rated brake voltage brake 1**

This parameter must be used to adjust the unit to the rated voltage of the brake installed in drive 1 if an SEW three-wire brake is connected at X8.

The rated brake voltage must match the rated mains voltage. Take this into account when ordering the motor/brake.

Parameter 737**Rated brake voltage brake 2**

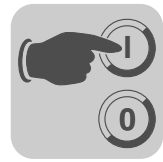
This parameter must be used to adjust the unit to the rated voltage of the brake installed in drive 2 if an SEW three-wire brake is connected at X9.

The rated brake voltage must match the rated mains voltage. Take this into account when ordering the motor/brake.

Parameter 738**Activation of brake release without drive enable**

If this parameter is set to "ON", the brake on drive 1 and the brake on drive 2 (only for dual-motor operation) can be released independently of each other without the drive being enabled by setting the corresponding bit in the process output data word PO1.

The brake is applied when the unit is not ready for operation.



11.5.7 Unit functions

Parameter 802

Factory setting

Choose "Delivery condition" to reset the unit parameters that have a factory setting, and which cannot be set via DIP switch S10, to the factory setting value.

For the parameters

- Starter operating mode
- Rated mains voltage
- Rated brake voltage brake drive 1
- Rated brake voltage brake drive 2

that can be set in Easy mode using DIP switch S10, the DIP switch setting is activated when the factory setting "Delivery condition" is selected.

Parameter 803

Parameter lock

If this parameter is set to "ON", you cannot change any of the parameters except the parameter lock. This setting makes sense once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when this parameter is set to "OFF".

Parameter 813

SBus address

Displays the SBus unit address of the starter power section.

Parameter 816

SBus baud rate

Displays the baud rate of SBus communication with the starter power section.

Parameter 830

Response external fault

This parameter programs the fault response that is triggered by an input terminal programmed to "/EXT. FAULT" (only in "SBus slave" operating mode).

Parameter 835

TF signal response

This parameter is used to program the fault response triggered by the temperature sensor monitoring of a TF that may be incorporated in the motor winding.

Parameter 836

Response SBus timeout

This parameter programs the fault response that is triggered by SBus timeout monitoring.

Parameter 839

Response output open

This parameter programs the fault response that the starter executes when the "Output open" fault is detected.

**Parameter 840****Reset**

If a fault is present at the power section, you can acknowledge it by setting this parameter to "ON". Once the fault has been reset, the parameter is set automatically to "OFF" again. If the power section does not indicate an error, setting the parameter to "ON" has no effect.

Parameter 870**Setpoint description PO1**

Displays the assignment of the process output data word PO1

Parameter 871**Setpoint description PO2**

Displays the assignment of the process output data word PO2

Parameter 872**Setpoint description PO3**

Displays the assignment of the process output data word PO3

Parameter 873**Actual value description PI1**

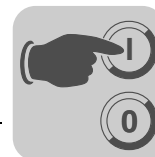
Displays the assignment of the process input data word PI1

Parameter 874**Actual value description PI2**

Displays the assignment of the process input data word PI2

Parameter 875**Actual value description PI3**

Displays the assignment of the process input data word PI3

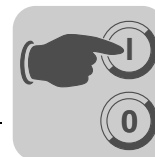


11.6 Parameter list for the MOVIFIT®-FC power section

No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® MotionStudio
0__	Display values				
00_	Process values				
000	8318	0	Speed (signed)	[rpm]	
002	8319	0	Frequency (signed)	[Hz]	
004	8321	0	Output current (amount)	[% I _N]	
005	8322	0	Active current (signed)	[% I _N]	
008	8325	0	DC link voltage	[V]	
009	8326	0	Output current	[A]	
01_	Status displays				
010	8310	0	Inverter status	[Text]	
011	8310	0	Operating state	[Text]	
012	8310	0	Fault status	[Text]	
013	8310 Bit 4		Current parameter set	Parameter set 1 or 2	
014	8327	0	Heat sink temperature	[°C]	
015	10087	135	DIP switch setting S10	[Bit field]	
03_	Binary inputs (only in "SBus slave" operating mode)				
031	8334 Bit 1	0	Position binary input DI100	[Bit field]	
	8335	0	Binary input DI100 assignment	NO FUNCTION (factory setting)	
032	8334 Bit 2	0	Position binary input DI101	[Bit field]	
	8336	0	Binary input DI101 assignment	NO FUNCTION (factory setting)	
033	8334 Bit 3	0	Position binary input DI102	[Bit field]	
	8337	0	Binary input DI102 assignment	NO FUNCTION (factory setting)	
034	8334 Bit 4	0	Position binary input DI103	[Bit field]	
	8338	0	Binary input DI103 assignment	NO FUNCTION (factory setting)	
05_	Binary outputs				
050	8349 Bit 0	0	Position binary output DB00	[Bit field]	
	8350	0	Binary input DB00 assignment	BRAKE RELEASED (factory setting)	
07_	Unit data				
070	8301	0	Unit type	[Text]	
071	8361	0	Rated output current	[A]	
076	8300	0	Firmware power section	[Part number and version]	
100	8461	0	Setpoint source	10: SBus (display value)	
101	8462	0	Control signal source	3: SBus (display value)	
700	8574	0	Operating mode	[Text]	
08_	Fault memory				
080			Fault t-0	Fault code	Background information for errors that occurred in the past when t-0
081			Fault t-1	Fault code	Background information for errors that occurred in the past when t-1



No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® MotionStudio
082			Fault t-2	Fault code	Background information for errors that occurred in the past when t-2
083			Fault t-3	Fault code	Background information for errors that occurred in the past when t-3
084			Fault t-4	Fault code	Background information for errors that occurred in the past when t-4
09_	Bus diagnostics				
094	8455	0	PO1 setpoint	[hex]	
095	8456	0	PO2 setpoint	[hex]	
096	8457	0	PO3 setpoint	[hex]	
097	8458	0	PI1 actual value	[hex]	
098	8459	0	PI2 actual value	[hex]	
099	8460	0	PI3 actual value	[hex]	
1_	Setpoints/ramp generators				
13_/14_	Speed ramps 1 / 2				
130/140	8807/9264	0	Ramp t11/t21 up	0.1...1...2000 [s]	
131/141	8808/9265	0	Ramp t11 / t21 down	0.1...1...2000 [s]	
134/144	8474/8482	0	Ramp t12/t22 up = down	0.1...10...2000 [s]	
135/145	8475/8483	0	S pattern t12 / t22	0: OFF 1: Level 1 2: Level 2 3: Level 3	
136/146	8476/8484	0	Stop ramp t13/t23	0.1...0.2...1 [s]	
3_	Motor parameters				
30_/31_	Limits 1 / 2				
300/310	8515/8519	0	Start/stop speed 1 / 2	0...150 [rpm]	
301/311	8516/8520	0	Minimum speed 1 / 2	0...60 – 6000 [rpm]	
302/312	8517/8521	0	Maximum speed 1 / 2	0...3000 – 6000 [rpm]	
303/313	8518/8522	0	Current limit 1 / 2	0...160 [% I _N]	
32_/33_	Motor adjustment 1 / 2				
320/330	8523/8528	0	Automatic adjustment 1/2	OFF ON	OFF ON
321/331	8524/8529	0	Boost 1/2	0...100 [%]	
322/332	8525/8530	0	IxR compensation 1/2	0...100 [%]	
323/333	8526/8531	0	Pre-magnetization 1 / 2	0... 2000 [ms]	
324/334	8527/8532	0	Slip compensation 1 / 2	0...500 [rpm]	
325	8834	0	No-load vibration damping	OFF ON	OFF ON



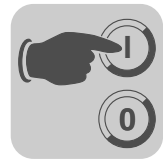
No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® MotionStudio	
34_	Motor protection					
340	8533	0	Motor protection	OFF ON	OFF ON	
5_	Monitoring functions					
50_	Speed monitoring					
500/502	8557/8559	0	Speed monitoring 1 / 2	0: OFF 3: MOT. & REGEN.MODE	OFF MOT. & REGEN.MODE	
501/503	8558/8560	0	Deceleration time 1/2	0.1...1...10 [s]		
52_	Mains OFF monitoring					
522	8927	0	Mains phase failure check Deactivating the mains phase failure check in unfavorable operating conditions can damage the unit.	OFF ON	OFF ON	
6_	Terminal assignment					
60_	Binary inputs (only in "SBus slave" operating mode)					
600	8335	0	Binary input DI100	0: No function 11: External fault 0 active 12: Error reset		
601	8336	0	Binary input DI101			
602	8337	0	Binary input DI102			
603	8338	0	Binary input DI103			
62_	Binary outputs					
620	8350	0	Binary output DB00	0: No function 2: Ready for operation 3: Output stage on 4: Rotating field on 5: Brake released 6: Brake applied 8: Parameter set 2		
7_	Control functions					
70_	Operating modes					
700/701	8574/8575	0	Operating mode 1 / 2	0: VFC 2: VFC hoist 3: VFC DC braking 21: V/f characteristic curve 22: V/f + DC braking		
71_	Standstill current					
710/711	8576/8577	0	Standstill current 1 / 2	0 – 50% I _{mot}		
72_	Setpoint stop function					
720/723	8578/8581	0	Setpoint stop function 1 / 2	OFF ON	OFF ON	
721/724	8579/8582	0	Stop setpoint 1 / 2	0...30 – 500 [rpm]		
722/725	8580/8583	0	Start offset 1 / 2	0...30 – 500 [rpm]		
73_	Brake function					
731/734	8749/8750	0	Brake release time 1 / 2	0...2000 [ms]		
732/735	8585/8587	0	Brake application time 1 / 2	0...100...2000 [ms]		



Power Section – Parameterization

Parameter list for the MOVIFIT®-FC power section

No.	Index dec.	Subindex dec.	Name	Range / factory setting	MOVITOOLS® MotionStudio
738	8893	0	Activation of brake release without drive enable	OFF ON	OFF ON
	10076	17/117	Brake option 1/2 (only for MOVIFIT®-FC with constant voltage brake)	0: SEW brake 1: Non-SEW brake (binary 24 V control signal) 2: no brake 3: Non-SEW brake const. Voltage	
	10076	10/110	constant DC voltage 1/2 (only for MOVIFIT®-FC with constant voltage brake)	40...250 [V DC]	
77_	Energy-saving function				
770	8925	0	Energy-saving function	0: OFF 1: ON	OFF ON
8_	Unit functions				
80_	Setup				
802	8594	0	Factory setting	0: No factory setting 1: Basic initialization 2: Delivery state	
803	8595	0	Parameter lock	0: OFF 1: ON	OFF ON
81_	Serial communication				
813	8600	0	SBus address (display value)		
816	8603	0	SBus baud rate (display value)	2: 500 kBaud	
83_	Error responses				
830	8609	0	Response to external fault	0: No response 2: Immediate stop / Locking 5: Immediate stop / warning	
835	8616	0	TF signal response	0: No response 2: Immediate stop / Locking	
836	8615	0	Response SBus timeout	2: Immediate stop / Locking 5: Immediate stop / warning	
84_	Reset behavior				
840	8617	0	Manual reset	No Yes	
86_	Modulation				
860/861	8620/8621	0	PWM frequency 1 / 2	0: 4 kHz 1: 8 kHz 3: 16 kHz	
87_	Process data assignment				
870	8304	0	Setpoint description PO1	10: Control word	
871	8305	0	Setpoint description PO2	1: Setpoint speed [rpm] 11: Setpoint speed [%]	
872	8306	0	Setpoint description PO3	8: Ramp	
873	8307	0	Actual value description PI1	6: Status word 1	
874	8308	0	Actual value description PI2	1: Actual speed [rpm] 2: Output current 3: Active current 8: Actual speed [%]	
875	8309	0	Actual value description PI3	7: Status word 2	



11.7 Parameter description for MOVIFIT®-FC

11.7.1 Display values

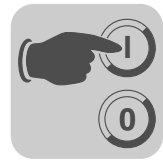
Parameter 000	Speed (signed) The displayed speed is the calculated actual speed.															
Parameter 002	Frequency (signed) Output frequency of the inverter															
Parameter 004	Output current (amount) Apparent current in range 0...200% of the rated unit current															
Parameter 005	Active current (signed) Active current in range -200 % ... +200% of the rated unit current The sign of the active current depends on the direction of rotation and the type of load: <table><tr><th>Direction of rotation</th><th>Speed</th><th>Active current</th></tr><tr><td>Clockwise rotation motor</td><td>Positive (n > 0)</td><td>Positive (I_W > 0)</td></tr><tr><td>Counterclockwise motor rotation</td><td>Negative (n < 0)</td><td>Negative (I_W < 0)</td></tr><tr><td>Clockwise rotation regenerative</td><td>Positive (n > 0)</td><td>Negative (I_W < 0)</td></tr><tr><td>Counterclockwise regenerative rotation</td><td>Negative (n < 0)</td><td>Positive (I_W > 0)</td></tr></table>	Direction of rotation	Speed	Active current	Clockwise rotation motor	Positive (n > 0)	Positive (I _W > 0)	Counterclockwise motor rotation	Negative (n < 0)	Negative (I _W < 0)	Clockwise rotation regenerative	Positive (n > 0)	Negative (I _W < 0)	Counterclockwise regenerative rotation	Negative (n < 0)	Positive (I _W > 0)
Direction of rotation	Speed	Active current														
Clockwise rotation motor	Positive (n > 0)	Positive (I _W > 0)														
Counterclockwise motor rotation	Negative (n < 0)	Negative (I _W < 0)														
Clockwise rotation regenerative	Positive (n > 0)	Negative (I _W < 0)														
Counterclockwise regenerative rotation	Negative (n < 0)	Positive (I _W > 0)														
Parameter 008	DC link voltage Voltage in [V] measure in the DC link															
Parameter 009	Output current Apparent current in [A]															
Parameter 010	Inverter status States of the unit output stage: • INHIBITED • ENABLED															
Parameter 011	Operating state The following operating statuses are possible: • 24 V OPERATION • CONTROLLER INHIBIT • NO ENABLE • STANDSTILL CURRENT • ENABLE • FACTORY SETTING • FAULT															



Power Section – Parameterization

Parameter description for MOVIFIT®-FC

<i>Parameter 012</i>	Fault status Fault status in text form
<i>Parameter 013</i>	Current parameter set Displays parameter set 1 or 2
<i>Parameter 014</i>	Heat sink temperature Heat sink temperature of the inverter
<i>Parameter 015</i>	DIP switch setting S10 Display of DIP switch setting S10
<i>Parameter 031</i>	Setting/assignment of binary input DI100 Displays the status of binary input DI100 (only in "SBus slave" operating mode).
<i>Parameter 032</i>	Setting/assignment of binary input DI101 Displays the status of binary input DI101 (only in "SBus slave" operating mode).
<i>Parameter 033</i>	Setting/assignment of binary input DI102 Displays the status of binary input DI102 (only in "SBus slave" operating mode).
<i>Parameter 034</i>	Setting/assignment of binary input DI103 Displays the status of binary input DI103 (only in "SBus slave" operating mode).
<i>Parameter 050</i>	Setting/assignment binary output DB00 Display of the status of binary output DB00
<i>Parameter 070</i>	Unit type Device type is displayed
<i>Parameter 071</i>	Rated output current The rated unit current is displayed in [A]
<i>Parameter 076</i>	Firmware power section Display of the part number and version of the firmware of the power section
<i>Parameter 700</i>	Operating mode The selected operating mode is displayed
<i>Parameters 080 – 084</i>	Fault code The unit saves the diagnostic data when a fault occurs. The last five errors are displayed in the error memory.



<i>Parameter 094</i>	PO1 setpoint (display value) Process data output word 1
<i>Parameter 095</i>	PO2 setpoint (display value) Process data output word 2
<i>Parameter 096</i>	PO3 setpoint (display value) Process data output word 3
<i>Parameter 097</i>	PI1 Actual value (display value) Process data input word 1
<i>Parameter 098</i>	PI2 Actual value (display value) Process data input word 2
<i>Parameter 099</i>	PI3 Actual value (display value) Process data input word 3
<i>Parameter 100</i>	Setpoint source Display of the setpoint source of the power section
<i>Parameter 101</i>	Control signal source Display of the control signal source source of the power section

11.7.2 Setpoints/ramp generators

<i>Parameters 130/ 140</i>	Ramp t11/t21 up Acceleration ramp (The ramp times are based on a setpoint step change of 50 Hz)
<i>Parameters 131/ 141</i>	Ramp t11 / t21 down Deceleration ramp (The ramp times are based on a setpoint step change of 50 Hz)
<i>Parameters 134/ 144</i>	Ramp t12/t22 up = down Acceleration and deceleration ramp at S pattern (The ramp times are based on a setpoint step change of 50 Hz) The ramp time sets the acceleration and deceleration if the <i>S pattern t12/t22</i> parameter has been set to grade 1, grade 2 or grade 3.



TIP

In preparation

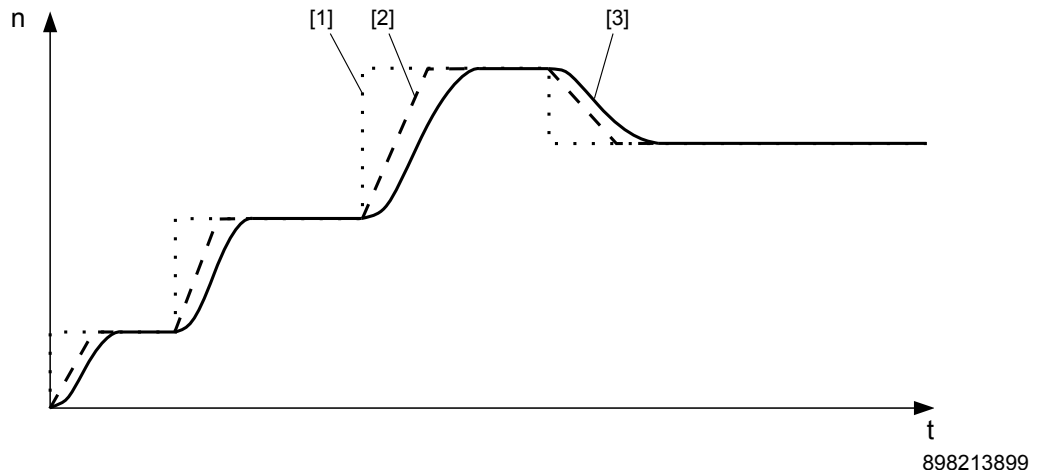
It is not possible to determine a setpoint via process data when parameter *P135/145 S pattern t12/t22* is activated.



Parameters 135/
145

S pattern t12/t22 (in preparation)

This parameter determines the pattern grade (1 = low, 2 = medium, 3 = high) of the ramp. The S pattern is used for rounding off the ramp and allows for a soft acceleration of the drive in the event of a setpoint change. The following figure shows the effect of the S pattern:



- [1] Setpoint selection
- [2] Speed without S pattern
- [3] Speed with S pattern

Parameters 136/
146

Stop ramp t13/t23

The stop ramp is activated

- for faults that are set to stop at the stop ramp when an error occurs
- when the stop ramp is selected using the corresponding bit in the process data

(The ramp times are based on a setpoint step change of 50 Hz)

11.7.3 Motor parameters

Parameters 300/
310

Start/stop speed 1/2

This parameter defines the smallest speed request which the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint selection is made using the active acceleration ramp.

Parameters 301/
311

Minimum speed 1/2

This parameter defines the minimum speed $n_{\min}$ of the drive.

The drive does not fall below this speed value even with the setpoint specification, which is slower than the minimum speed.

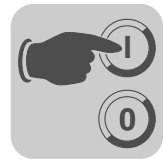
Parameters 302/
312

Maximum speed 1/2

This parameter defines the maximum speed $n_{\max}$ of the drive.

The drive does not exceed this speed value even when the setpoint specification is higher than the maximum speed.

If you set $n_{\min} > n_{\max}$, then the value set in $n_{\min}$ applies to the minimum speed and the maximum speed.



Parameters 303/ 313	Current limit 1/2 The internal current limitation is based on the apparent current. The inverter automatically decreases the current limit internally in the field weakening range to implement stall protection for the connected motor.
Parameters 320/ 330	Automatic adjustment 1/2 When the parameter is activated, the motor is calibrated each time the operating status changes to ENABLE.
Parameters 321/ 331	Boost 1/2 If parameter <i>P320/P330 Automatic adjustment 1/2</i> = "ON", the inverter sets parameter <i>P321/P331 Boost 1/2</i> automatically. This parameter does not usually have to be set manually. In exceptional cases, manual setting may be necessary to increase the breakaway torque.
Parameters 322/ 332	IxR compensation 1/2 If parameter <i>P320/P330 Automatic adjustment 1/2</i> = "ON", the inverter sets parameter <i>P322/P332 IxR compensation 1/2</i> automatically. Only specialists are permitted to change this parameter manually to optimize the settings.
Parameters 323/ 333	Pre-magnetization 1/2 The pre-magnetization time allows for a magnetic field is built up in the motor when the inverter is enabled.
Parameters 324/ 334	Slip compensation 1/2 Slip compensation increases the speed accuracy of the motor. Enter the rated slip of the connected motor as a manual entry. The slip compensation is designed for a ratio smaller than 10 for load moment of inertia to motor moment of inertia. If control starts oscillating, you must reduce the slip compensation or set it to 0, if required.
Parameter 325	No-load vibration damping No-load vibration damping can be activated when the motor tends to be unstable under no load conditions.
Parameter 340	Motor protection You can use this parameter to activate the TF monitoring function of the motor.

11.7.4 Monitoring functions

Parameters 500/ 502	Speed monitoring 1/2 With MOVIFIT®, speed monitoring is performed by evaluating operation at the current limit. Speed monitoring is triggered when the current limit is maintained for the duration of the set deceleration time.
------------------------	---



Parameters 501/
503

Deceleration time 1/2

The set current limit can be reached during acceleration, deceleration, or load peaks.

You can prevent the speed monitoring from responding too sensitively by setting the deceleration time. The current limit must be maintained for the duration of the set deceleration time before monitoring responds.

Parameter 522

Mains phase failure check

Deactivate this monitoring function to prevent the mains phase failure check from triggering with unsymmetrical supply systems.



NOTICE

Deactivating the mains phase failure check in unfavorable operating conditions can damage the unit.

- Do not deactivate the mains phase failure monitoring.

11.7.5 Terminal assignment

Parameters 600 –
603

Binary inputs DI100-DI103 (only in "SBus slave" operating mode)

Effect when	0 signal	1 signal
0: No function	-	-
11: External fault	External fault	-
12: Fault reset	Resets from 0 to 1 on positive edge	Resets from 0 to 1 on positive edge

Parameter 620

Binary output DB00

Effect when	0 signal	1 signal
0: No function	-	-
2: Ready for operation	not ready	Ready for operation
3: Output stage on	Unit inhibited	Unit enabled, motor energized
4: Rotating field on	No rotating field Important: MOVIFIT® and/or the connected drives could still contain supply voltage.	Rotating field
5: Brake released	Brake applied	Brake released
6: Brake applied	Brake released	Brake applied
8: Parameter set 2	Parameter set 1 active	Parameter set 2 active



! DANGER

If binary output DB00 is used to control the brake, do not change the parameters of the binary output functions.

Severe or fatal injuries.

- Check the parameter settings before using the binary output to control the brake.



11.7.6 Control functions

Parameter 700/
701

Operating mode 1/2

This parameter is used to set the basic operating mode of the inverter.

VFC / V/f characteristic curve:

Default setting for asynchronous motors. This setting is suitable for general applications such as conveyor belts, trolleys, etc.

VFC hoist:

The hoist function automatically provides all functions necessary for operating a simple hoist application. For the hoist function to be performed correctly, the motor brake must be controlled using the inverter.

VFC DC braking / V/f DC braking:

This setting means the asynchronous motor brakes by using current injection. The motor brakes without braking resistor on the inverter.



DANGER

With DC braking, guided stops are not possible and certain ramp values cannot be observed.

Severe or fatal injuries.

- Use a different operating mode.



Parameters 710/
711

Standstill current 1/2

When the standstill current function is activated, the inverter injects a current in the motor at standstill.

The standstill current fulfills the following functions:

- When the ambient temperature of the motor is low, the standstill current prevents the risk of condensation and freezing of the brake. Set the current level in such a way that the motor will not overheat.
- If you have activated the standstill current, you can enable the motor without pre-magnetization.

When the standstill current function is activated, the output stage remains enabled to inject the motor standstill current even in "NO ENABLE" status; a parameter set change-over is impossible.

In case of error, the motor is no longer energized.



! DANGER

A communication timeout does not interrupt the standstill current.

Severe or fatal injuries from electric shock.

- Disconnect the MOVIFIT® from the mains using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.
- Then wait at least one minute before opening the wiring space of MOVIFIT® or the connected drive, or touching the plug connector contacts.

Parameters 720/
723, 721/724, 722/
725

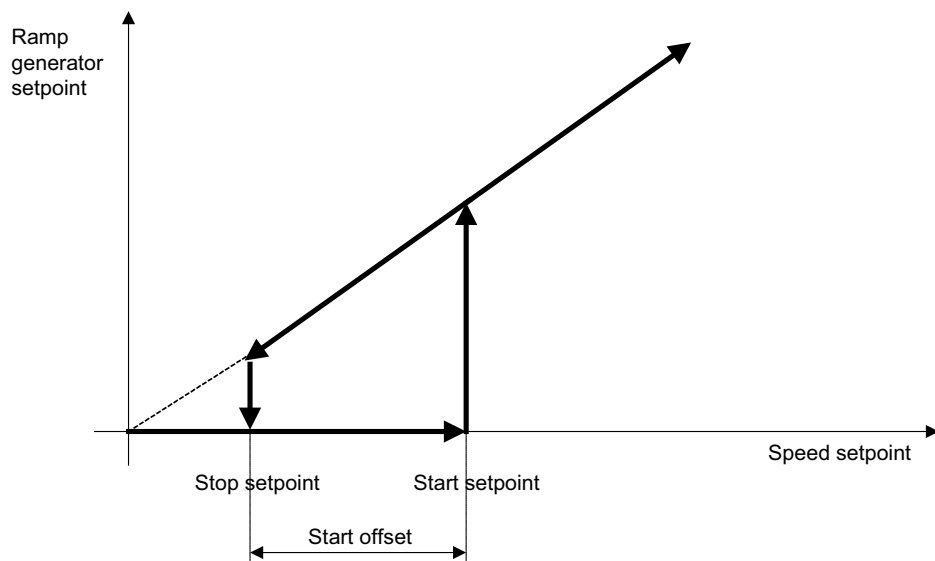
Setpoint stop function 1/2

Stop setpoint 1/2

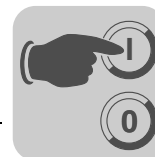
Start offset 1/2

If the setpoint stop function is activated, the inverter is enabled when the speed setpoint is $> (\text{stop setpoint} + \text{start offset})$.

Inverter enable is revoked when the speed setpoint falls below the stop setpoint.



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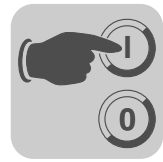
- Parameters 731/734** **Brake release time 1/2**
This parameter is used for defining how long the motor is to run at minimum speed after pre-magnetization ends. This time is necessary for opening the brake completely.
- Parameters 732/735** **Brake application time 1/2**
You can use this parameter to set the time required for the mechanical brake to apply.
- Parameter 738** **Activation of brake release without drive enable**
If this parameter is set to the value "ON", the brake can be released even if the drive is not enabled.
This functionality is only available when the motor brake is controlled via the inverter.
The brake is always applied when the unit is not ready for operation.
The brake cannot be released when the drive is not enabled in conjunction with the hoisting function.
- Parameter 770** **Energy efficiency function (In preparation)**
If this parameter is set to "OFF", the inverter reduces the no-load current.

11.7.7 Unit functions

- Parameter 802** **Factory setting**
Choose "Delivery condition" to reset the unit parameters that have a factory setting, and which cannot be set via DIP switch S10, to the factory setting value.
For the parameters
- Operating mode
 - Motor type
 - Motor connection type
 - Motor power rating
- that can be set in Easy mode using DIP switch S10, the DIP switch setting is activated when the factory setting "Delivery condition" is selected.
- Parameter 803** **Parameter lock**
If this parameter is set to "ON", you cannot change any of the parameters except the parameter lock. This setting makes sense once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when this parameter is set to "OFF".
- Parameter 813** **SBus address**
Displays the SBus unit address of the inverter power section.
- Parameter 816** **SBus baud rate**
Displays the baud rate of SBus communication with the inverter power section.
- Parameter 830** **Response external fault**
This parameter determines the fault response that is triggered by an input terminal programmed to "/EXT. FAULT" (only in "SBus slave" operating mode).



<i>Parameter 835</i>	TF signal response This parameter is used to determine the fault response triggered by the temperature sensor monitoring of a TF that may be incorporated in the motor winding.
<i>Parameter 836</i>	Response SBus timeout This parameter programs the fault response that is triggered by SBus timeout monitoring.
<i>Parameter 840</i>	Manual reset If a fault is present at the inverter power section, you can acknowledge it by setting this parameter to "ON". Once the fault has been reset, the parameter is set automatically to "OFF" again. If the power section does not indicate an error, setting the parameter to "ON" has no effect.
<i>Parameters 860/ 861</i>	PWM frequency 1/2 You can use this parameter to set the nominal cycle frequency at the inverter output. The cycle frequency can change automatically depending on the unit utilization.
<i>Parameter 870</i>	Setpoint description PO1 Displays the assignment of the process output data word PO1
<i>Parameter 871</i>	Setpoint description PO2 Displays the assignment of the process output data word PO2
<i>Parameter 872</i>	Setpoint description PO3 Displays the assignment of the process output data word PO3
<i>Parameter 873</i>	Actual value description PI1 Displays the assignment of the process input data word PI1
<i>Parameter 874</i>	Actual value description PI2 Displays the assignment of the process input data word PI2
<i>Parameter 875</i>	Actual value description PI3 Displays the assignment of the process input data word PI3



11.7.8 Parameters for constant voltage brake

	TIP
	The following parameter indexes can only be changed if the output stage of the MOVIFIT®-FC inverter is <u>not</u> enabled.

Parameter indexes
10076.17/
10076.117

Brake option 1/2

Activating the functionality of the brake for parameter set 1/2.

Setting	Meaning
0: SEW brake	MOVIFIT®-FC controls an SEW brake.
1: Non-SEW brake	MOVIFIT®-FC controls a brake via the binary output DB00 (DC 24 V). Parameter <i>P620</i> binary output DB00 is set to "5: brake released".
2: No brake	MOVIFIT®-FC controls no SEW brake.
3: Non-SEW brake const. Voltage	MOVIFIT®-FC controls a brake with a constant voltage.

If this parameter index is not set to "3: non-SEW brake const. voltage", the constant voltage brake is not controlled (default value = DC 0 V).

Parameter indexes
10076.10/
10076.110

Constant DC voltage 1/2

Parameter index 10076.10/10076.110 determines the constant voltage for controlling the constant-voltage brake for parameter set 1/2.

Permitted value range: DC 40..0.250 V



12 Configuration in Transparent Mode

12.1 Default configuration

The default configuration of the transparent mode presumes the following constellations:

- MOVIFIT®-FC 5 process data words
Gateway + integrated power section
- MOVIFIT®-SC 5 process data words
Gateway + integrated power section
- MOVIFIT®-MC 11 process data words
Gateway + 3 MOVIMOT®

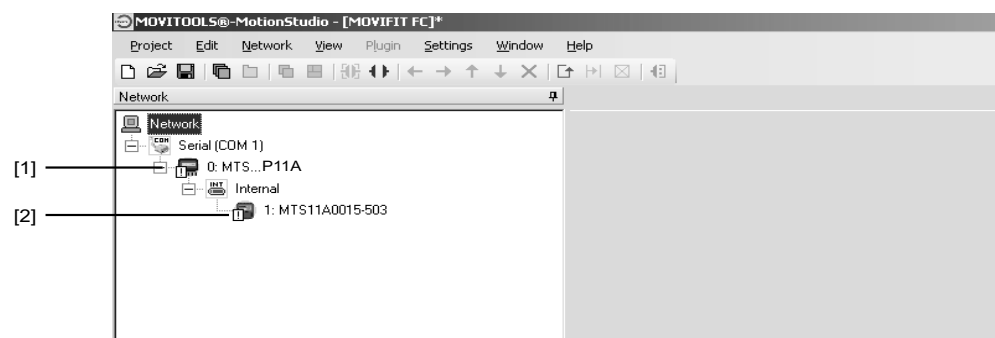
In the event of other constellation and in order to activate the replacement function, you have to observe the following sections when configuring the transparent mode.

12.2 Autosetup

	TIPS
	Prerequisite: • Set the addresses of all units on the external CAN bus (slave-units) one after another in ascending order starting with address 16. • For every replacement make sure that the new EBOX is assigned the same address as the EBOX you are replacing.

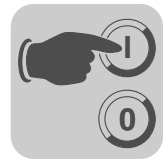
Proceed as follows to configure the transparent mode:

1. Connect your PC or laptop with the MOVIFIT® function level "Technology".
See section "Connecting MOVIFIT® to the PC or the laptop (see page 103)".
Perform an online scan.
See section "MOVITOOLS® MotionStudio – operation"/"Initial steps"



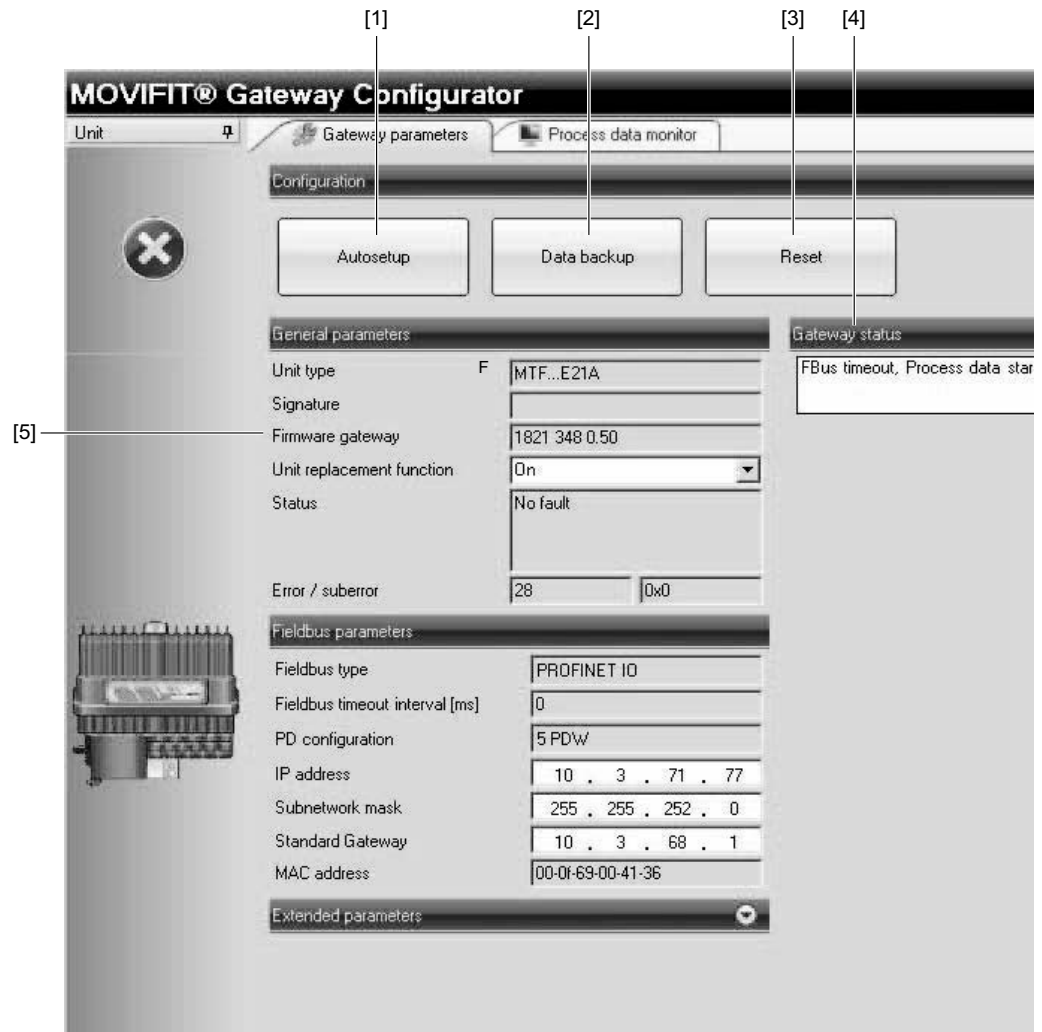
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- [1] Communication unit
[2] Power section



2. Right-click on the communication unit [1] and select "Startup"/"MOVIFIT® Gateway Configurator".

The following window is displayed:



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3. Click [Autosetup] [1].

The software scans the interfaces and options

- internal power section (with MOVIFIT®-FC/-SC) or RS-485 (with MOVIFIT®-MC)
- external CAN bus

and saves the connected units in the internal unit list.

On completion, the "Gateway status" field [4] displays "Process data started". MOVIFIT® function level "Technology" is now ready for operation.

Click [Reset] [3] to reset the fault messages of the transparent mode.



12.3 Replacement

12.3.1 Replacing MOVIFIT® "Technology" with MOVIFIT® "Technology" (same devices)

A monitoring function is available for MOVIFIT® function level "Technology". After a re-start or a slave timeout, this function checks whether the EBOX of the MOVIFIT®-FC/-SC function level "Technology" or another unit on the external CAN bus has been replaced.

If the EBOX has been replaced, the software transfers the stored data set from the ABOX of the MOVIFIT® function level "Technology" to the new EBOX.



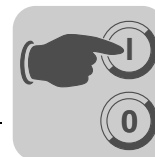
TIPS

Prior to a replacement, make sure that:

- You only replace a unit of the same type and with the same power rating (MOVIFIT®-FC/-SC)
- You only replace a unit with the same application module, see nameplate data.

The following table shows the designations of the application modules on the EBOX nameplate:

Labeling	Application module installed on delivery
"MSA1001A"	Cam positioning
"MSA1002A"	Binary control
"MSA1003A"	Bus positioning (Basic)
–	Transparent mode If the field on the EBOX nameplate is empty, the transparent mode application module is installed as a standard.



Preparation:

Proceed as follows to activate the replacement function:

1. Configure the transparent mode according to section "Autosetup (see page 162)".
2. Set parameter "Replacement function" [5] to "ON".
3. Click [Data backup] [2].

The data sets of the following units are stored in the MOVIFIT® ABOX.

- integrated power section (only MOVIFIT®-SC and MOVIFIT®-FC)
- Slave units on the external CAN bus
- Configuration parameters and identification of the PLC program "Transparent mode"

The following data is not stored on the MOVIFIT® ABOX:

- the actual PLC program "Transparent mode"

It is installed as a standard.

- the parameters of the connected MOVIMOT® inverters, as they do not have parameters or are equipped with an extra parameter module

On completion, the "Gateway status" field [4] displays "System projected".

Observe the following when replacing a unit:

- For **MOVIFIT® Technology units**, for activating DHCP or default IP parameters, the DIP switches S11 of the new EBOX must be set like in the EBOX to be replaced.
- For **MOVIFIT® slave units**, the DIP switches S11 of the new EBOX must have the same SBus address as in the EBOX to be replaced.



TIPS

- If you use the wrong type of EBOX, the EBOX will display an "Update fault", see section "Diagnostics (see page 168)".
- For further information on the replacement function for other application modules, refer to the respective manual.

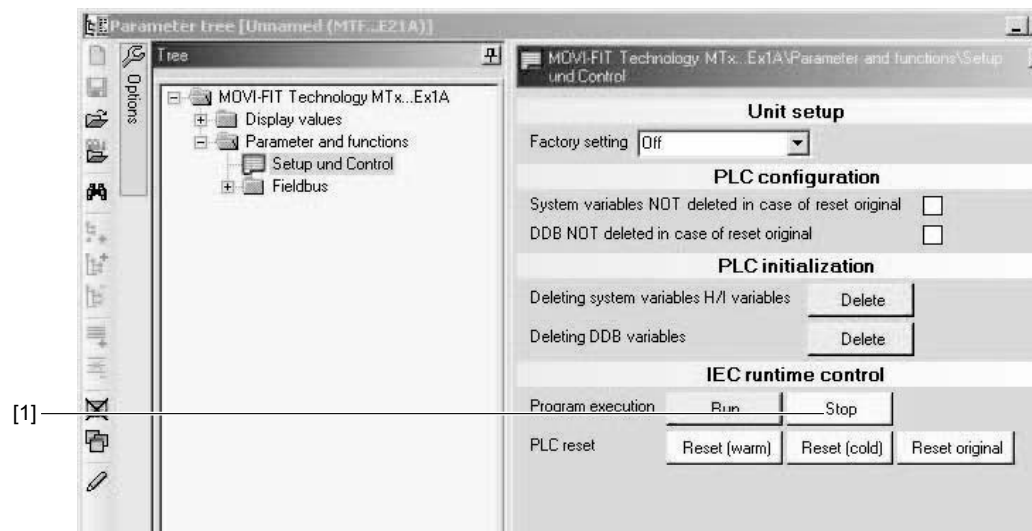


12.3.2 Replacing MOVIFIT® "Classic" with MOVIFIT® "Technology"

The MOVIFIT® unit performs a plausibility check. The MOVIFIT® unit will generate a fault when replacing a MOVIFIT® function level "Classic" with a MOVIFIT® function level "Technology". The "RUN" LED is lit up red.

Proceed as follow if you intend to replace the MOVIFIT® function level "Classic" with a MOVIFIT® function level "Technology":

1. replace the MOVIFIT® function level "Classic" with a MOVIFIT® of the same type and with function level "Technology".
2. Connect your PC or laptop with the MOVIFIT® function level "Technology".
Perform an online scan, see section "MOVITOOLS® MotionStudio – Operation (see page 97)".
3. Make sure the PLC editor is logged off.
4. Open the parameter tree of the communication unit and select the "Setup and control" group under "Parameters and functions".



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Click [Stop] [1].



WARNING

Stopping the IEC program via [Stop] or a reset via [Reset warm] does not stop the process data. A drive that has been enabled will keep on running.

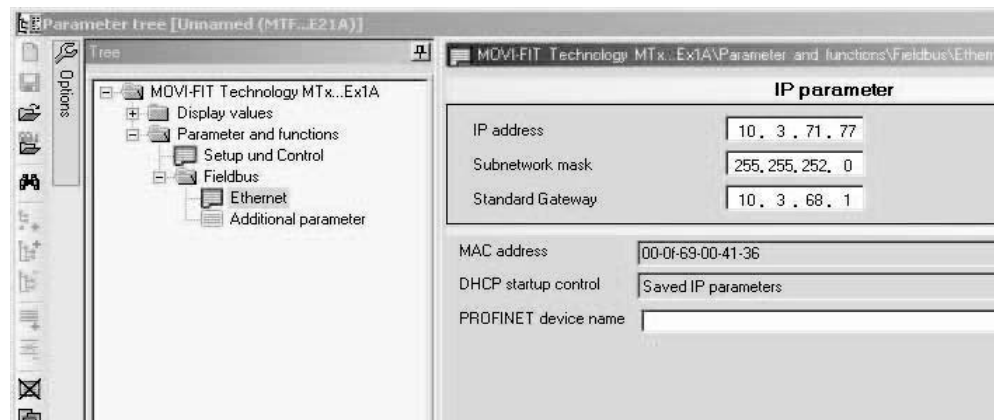
Severe or fatal injuries due to crushing or moving parts.

- Do not enter or access moving parts of the plant.

5. Set parameter "Factory setting" to "Delivery condition". Wait until the MOVIFIT® "Technology" has performed a reboot.



6. Switch to "Unit functions"/"Setup"/"Ethernet".



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Set the parameters according to your plant network:

7. Switch the 24 V supply of the MOVIFIT® off and back on (24 V reset).



12.4 Diagnostics

In the event of communication faults to lower-level devices, system fault "F111: station not available" is triggered: The internal or external system bus communication is interrupted (timeout). Both the digital inputs/outputs and the drives, which still contain their process data, can still be controlled.

If the system fault "111" occurs, the fault code 111 "Station communication interrupted" is displayed in the process input data word PI1 of the interrupted drive in status word 1.

With MOVIFIT®-SC, this error code is displayed in both status words (PI1 and PI2). In this way, a function module in the application program, which operates the lower-level drives and monitors their status or fault status, can detect fault "111" using the same mechanisms.

MOVIMOT® drives, whose RS485 communication with MOVIFIT®-MC is interrupted and do not receive any data, stop automatically after 1 second until new valid process data is received.

In the event of system fault "111", a MOVIFIT®-FC or -SC drive stops within 100 ms. **For safety reasons, the factory setting of 100 ms must not be changed.**

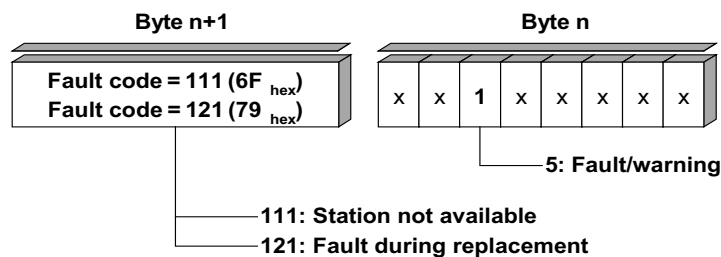
! DANGER

Risk of crushing if the drive starts up automatically.

Severe or fatal injuries.

- System fault "111" resets automatically as soon as communication with the lower-level drive system is reestablished. Once system communication has been started, the drives are assigned the current process data again automatically.
- If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.

The following figure shows the two system faults, 111 "Station not available" and 121 "Fault during replacement" displayed in the status word:



x = Statuses of the last lower-level PD exchange

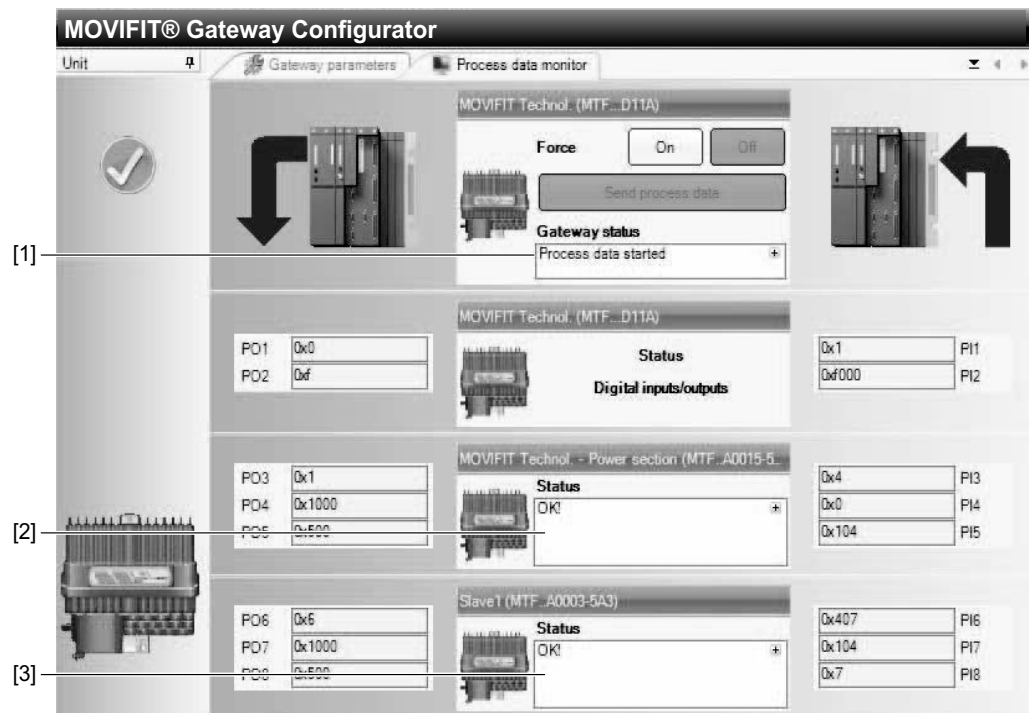
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Unit	Process input word	Meaning
MOVIMOT®	PI1: Status word 1	Fault code 111 (6F_{hex}), Bit 5 (malfunction) = "1", all other status information remains unchanged
MOVIFIT®-FC	PI1: Status word 1	- Fault code 111 (6F_{hex}), Bit 5 (malfunction) = "1", all other status information remains unchanged - Fault code 121 (79_{hex}), Bit 5 (malfunction) = "1", all other status information remains unchanged



Unit	Process input word	Meaning
MOVIFIT®-SC	PI1: Status word SC/status word SC motor 1	- Fault code 111 (6F_{hex}), Bit 5 (malfunction) = "1", all other status information remains unchanged - Fault code 121 (79_{hex}), Bit 5 (malfunction) = "1", all other status information remains unchanged

Apart from the process data that is exchanged between the controller and all the configured units, the "Process data monitor" also contains the status information on the transparent mode:



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The "Process data monitor" tab comprises the following functions:

- Diagnostics for the process data exchange during startup
- Setpoint selection for the units (force)
- "Gateway status" [1] and "Status" [2], [3] show the operating status in plain text.

If you click on [+] in the upper right corner of the respective field, you will receive further information on the status.



13 Parameterization and Manual Operation with the DBG Keypad

13.1 DBG keypad – description:

13.1.1 Function

You can use the DBG keypad for parameterization and manual operation of MOVIFIT® units. In addition to that, the keypad displays important information about the state of the MOVIFIT® unit.

13.1.2 Features

- Illuminated plain text display, up to 7 languages can be set
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)
- Degree of protection IP 40 (EN 60529)

13.1.3 Overview

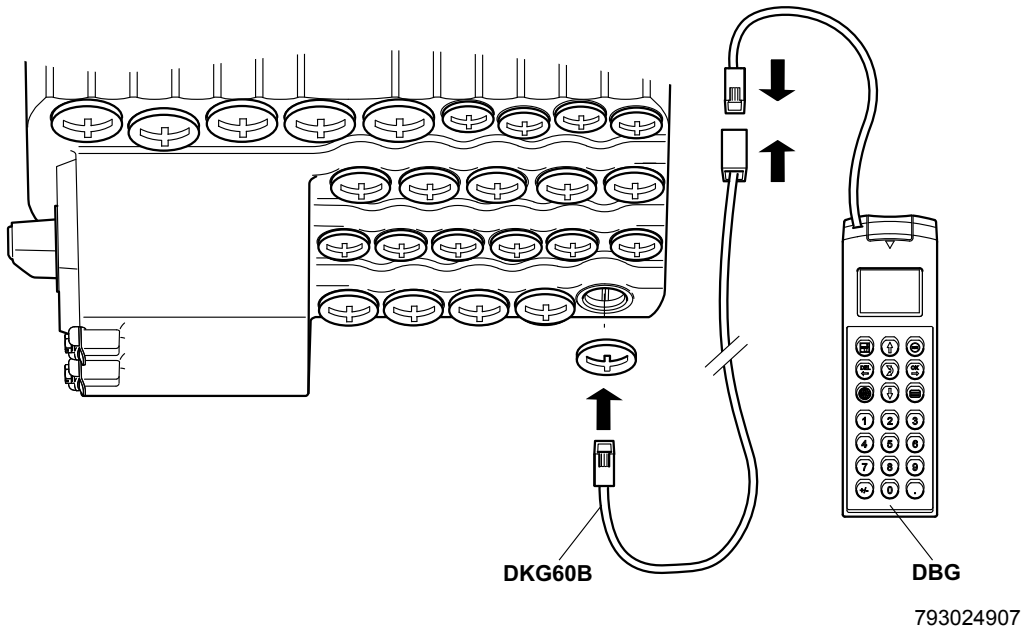
Keypad	Language	Part number
 792875147	DBG60B-01 DE / EN / FR / IT / ES / PT / NL (German / English / French / Italian / Spanish / Portuguese / Dutch)	1 820 403 1
	DBG60B-02 DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish)	1 820 405 8
	DBG60B-03 DE / EN / FR / RU / PL / CS (German / English / French / Russian / Polish / Czech)	1 820 406 6



13.1.4 Connecting the DBG keypad

MOVIFIT® units are equipped with an X50 diagnostics interface (RJ10 plug connector) for parameterization and manual operation.

The X50 diagnostics interface is at the bottom of the ABOX.



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WARNING

The surfaces of the MOVIFIT® and the external options, for example, the braking resistor, can reach high temperatures during operation.

Danger of burns.

- Do not touch the MOVIFIT® and external options until they have cooled down sufficiently.

You can also connect the DBG keypad to the MOVIFIT® using option DKG60B (5 m extension cable).

Extension cable	Description (= scope of delivery)	Part number
DKG60B	• Length 5 m • 4-core, shielded cable (AWG26)	0 817 583 7



NOTICE

The degree of protection specified in section Technical Data only applies if the screw plug of the diagnostic interface is mounted correctly.

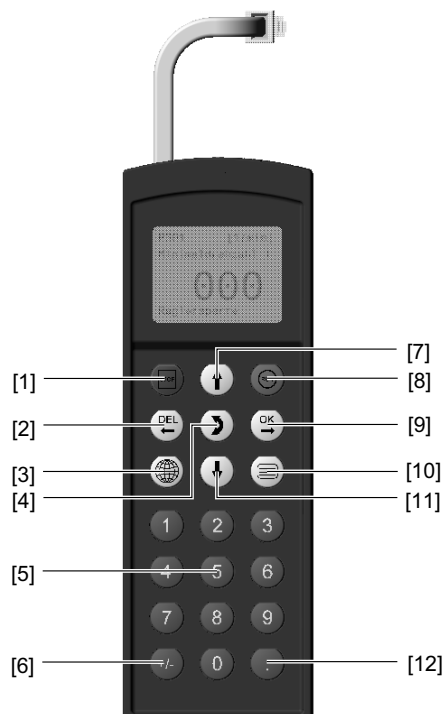
A missing or incorrectly installed screw plug can cause damage to the MOVIFIT®.

- Screw the screw plug back on with the seal after performing parameter setting, diagnostics or manual operation.



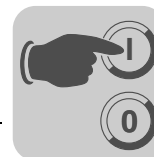
13.1.5 DBG – key assignment

The following figure shows the key assignment of the DBG keypad:



792878475

- | | | |
|------|-------------|--|
| [1] | Key | Stop |
| [2] | Key | Delete previous entry |
| [3] | Key | Select language |
| [4] | Key | Change menu |
| [5] | Key <0>-<9> | Digits 0-9 |
| [6] | Key | Sign reversal |
| [7] | Key | Up arrow, moves up to the next menu item |
| [8] | Key | Start |
| [9] | Key | OK, confirms the entry |
| [10] | Key | Activate the context menu |
| [11] | Key | Down arrow, moves down to the next menu item |
| [12] | Key | Decimal point |



13.2 Operating MOVIFIT®-SC with the DBG keypad

13.2.1 Selecting a language

1. The following text appears on the display for a few sections when the DBG keypad is switched on for the first time or after activating the delivery status:



1214344843

The symbol for language selection then appears on the display.



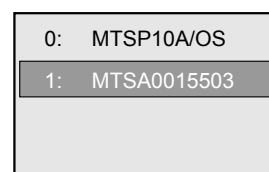
1214353419

2. Press the  key until the desired language appears.
Confirm your entry using the  key.
The DBG keypad searches for the connected units and displays them in the unit selection list.



1214465035

3. Use the  key or the  key to select the power section (SBus address 1) of the MOVIFIT®-SC.
Confirm your entry using the  key.
The "BASIC DISPLAY" menu is displayed.

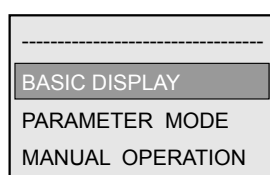


1214500747

13.2.2 DBG context menu for MOVIFIT®-SC

You can use the  key to go to the context menu.

For the MOVIFIT®-SC power section, the following menu items are available in the context menu of the DBG keypad:



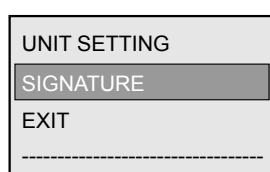
804071051

- "BASIC VIEW"
- "PARAMETER MODE"
- "MANUAL MODE"



1212582411

- "COPY TO DBG"
- "COPY IN FIT"
- "DBG DELIVERY ST."



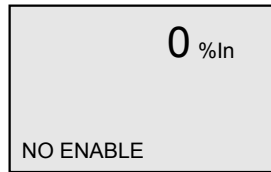
1212683403

- "UNIT SETTINGS"
- "SIGNATURE"
- "EXIT"



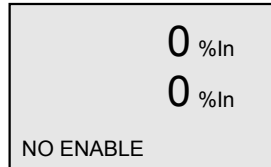
13.2.3 Basic display

The menu "BASIC DISPLAY" represents important characteristic values.



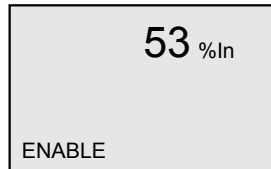
792986635

Display if starter is not enabled
in single-motor operation operating mode



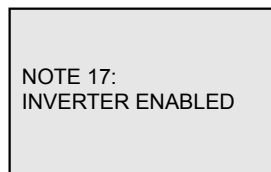
792988299

Display if starter is not enabled
in dual-motor operation operating mode



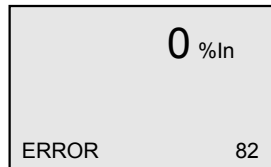
792989963

Display for enabled starter



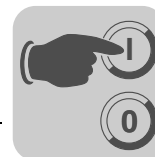
792991627

Information message



792993291

Fault display



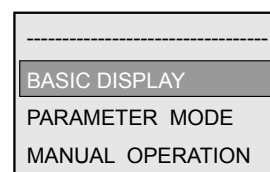
13.2.4 Parameter mode

In the menu "PARAMETER MODE", you can check and change parameter settings.

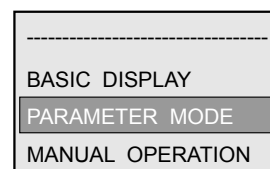
	TIP
	Parameterization in expert mode only.

To change parameters in the parameter mode, proceed as follows:

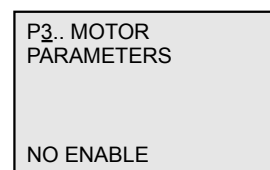
1. Use the key to go to the context menu.
2. Use the key to select the "PARAMETER MODE" menu item.
3. Use the key. The first display parameter P000 "OUTPUT CURRENT" appears.
Use the key or the key to select the main parameter groups 0 to 9.
4. Use the key to activate the selection of the parameter sub group in the desired parameter main group. The flashing cursor moves one position to the right.
5. Use the key or the key to select the required parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.
6. Use the key to activate the parameter selection in the desired parameter subgroup. The flashing cursor moves one position to the right.



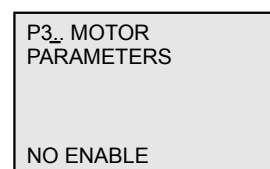
804071051



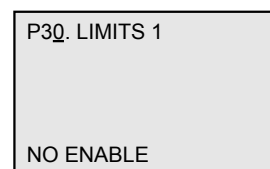
792996619



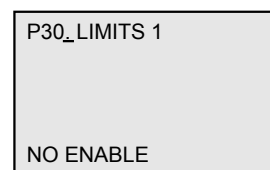
792998283



792999947



793001611



793003275



Parameterization and Manual Operation with the DBG Keypad

Operating MOVIFIT®-SC with the DBG keypad

7. Use the  key or the  key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.

```
P300          %
SWITCH-OFF CURR 1
                150

NO ENABLE
```

8. Use the  key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.

793004939

```
P300          %
SWITCH-OFF CURR. 1
                150 _

NO ENABLE
```

9. Use the  key or the  key to select the desired parameter value.

793006603

```
P300          %
SWITCH-OFF CURR 1
                135 _

NO ENABLE
```

10. Confirm the setting by using the  key. Exit the setting mode by pressing the  key. The flashing cursor is positioned under the third digit of the parameter number again.

793008267

```
P300          %
SWITCH-OFF CURR 1
                135

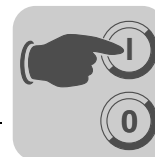
NO ENABLE
```

793009931

11. Use the  key or the  key to select another parameter or go back to the parameter subgroup menu using the  key.

12. Use the  key or the  key to select another parameter subgroup or go back to the main parameter group menu using the  key.

13. Use the  key to return to the context menu.



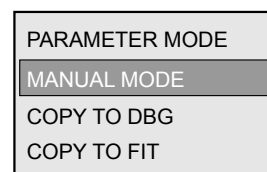
13.2.5 Manual operation

Activation

	DANGER
	The process data of the master take effect when the manual mode is deactivated. If the enable signal is present via the process data, the drive connected to MOVIFIT® can start up unintentionally when deactivating manual operation. Severe or fatal injuries from crushing. • Before deactivating the manual mode, set the process data in such way that the drive connected to MOVIFIT® is not enabled. • Change the process data only after deactivating manual operation.

Proceed as follows to change to manual mode:

1. Use the key to go to the context menu.
 2. Use the key or the key to select the "MANUAL MODE" menu item.
- Confirm your entry using the key.



1328112523

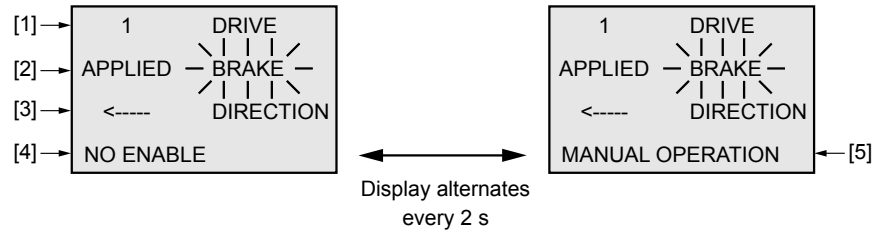
The keypad is now in manual operation mode.

	TIP
	If the drive is enabled or the brake is released, you cannot change to manual mode. In this case, the message "NOTE 17: INV. ENABLED" appears for 2 seconds and the DBG keypad returns to the context menu.



Single-motor operation

Manual operation display



793011595

- [1] Drive
- [2] Brake status
- [3] Direction of rotation ("<----" = CCW, "---->" = CW)
- [4] Drive status
- [5] Manual operation display

Operation

In single-motor operation, you can execute the following functions via the "MANUAL OPERATION" menu:

Setting the direction of rotation Use the key to select "DIRECTION".

"DIRECTION" is flashing.

Confirm your entry using the key. The DBG highlights "DIRECTION".

Use the key or the key to select the required direction of rotation.

Confirm your entry using the key.

Starting the drive You can use the key to start the drive.

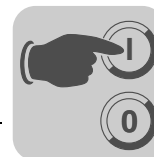
During operation, the keypad displays the current motor current in [%] of the rated motor current I_N .

Stopping the drive You can use the key to stop the drive.

Releasing the brake without drive enable Use the key to select "BRAKE".

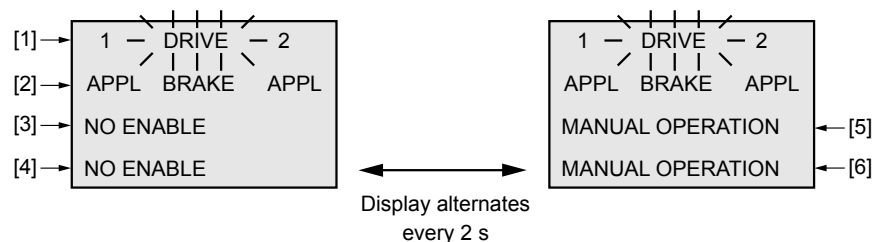
"BRAKE" is flashing.

You can use the key or the key to release or apply the brake without drive enable



Dual-motor operation

Manual operation display



793011595

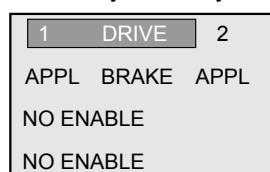
- [1] Drive
- [2] Brake status
- [3] Status drive 1
- [4] Status drive 2
- [5] Display – manual operation drive 1
- [6] Display – manual operation drive 2

Operation

In dual-motor operation, you can execute the following functions via the "MANUAL OPERATION" menu:

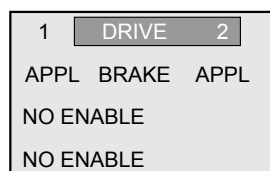
- Selecting the drive Use the key to select "DRIVE". "DRIVE" is flashing.
Confirm your entry using the key.
Use the key or the key to determine whether MOVIFIT®
- controls drive 1,
 - drive 2,
 - or both drives
- in manual operation.

Confirm your entry using the key.



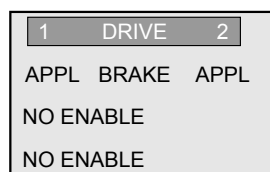
Display – control drive 1

793014923



Display – control drive 2

793016587



Display – control drive 1 and 2

793018251

Starting the drive You can use the key to start the drive(s).

Stopping the drive You can use the key to stop the drive(s).



Parameterization and Manual Operation with the DBG Keypad

Operating MOVIFIT®-SC with the DBG keypad

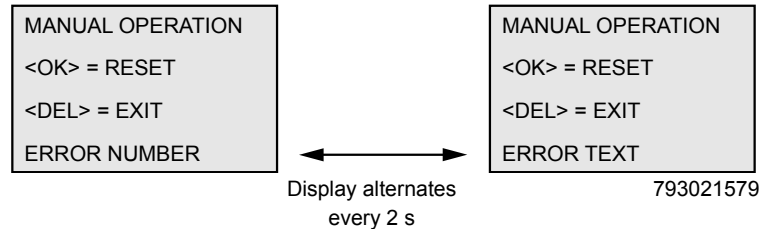
Releasing the brake without drive enable Use the key to select "BRAKE". "BRAKE" is flashing. You can use the key or the key to release or apply the brake(s) without drive enable.

Confirm your entry using the key.

If MOVIFIT® controls both drives in manual operation, MOVIFIT® releases or applies the brakes of both drives.

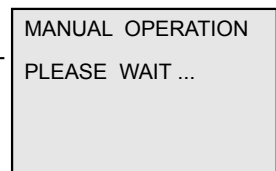
Resetting faults

If an error occurs during manual operation, the display shows the following message:



Press the key, the DBG keypad resets the error.

The following message is displayed during the fault reset:

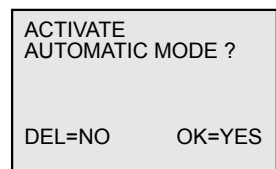


793023243

After the fault reset, manual operation remains active. The display shows the manual mode display again.

Deactivating manual operation Use the key or the key to deactivate the manual mode.

The following query appears:



793019915

- Press the key, to return to manual mode.
- Press the key, you will deactivate manual mode. The context menu appears.

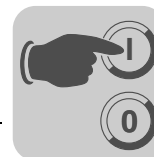


DANGER

The process data of the master take effect when the manual mode is deactivated. If the enable signal is present via the process data, the drive connected to MOVIFIT® can start up unintentionally.

Severe or fatal injuries from crushing.

- Before activating the manual mode, set the process data in such way that the drive connected to MOVIFIT® is not enabled.
- Change the process data only after deactivating manual operation.



13.3 Operating MOVIFIT®-FC with the DBG keypad

13.3.1 Selecting a language

1. The following text appears on the display for a few sections when the DBG keypad is switched on for the first time or after activating the delivery status:



1214344843

The symbol for language selection then appears on the display.



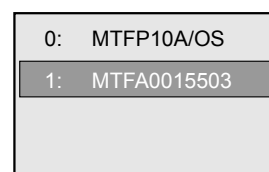
1214353419

2. Press the  key until the desired language appears.
Confirm your entry using the  key.
The DBG keypad searches for the connected units and displays them in the unit selection list.



1214465035

3. Use the  key or the  key to select the power section (SBus address 1) of the MOVIFIT®-FC.
Confirm your entry using the  key.
The "BASIC DISPLAY" menu is displayed.

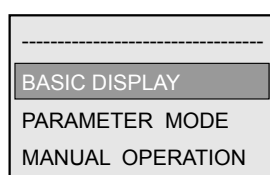


1214511627

13.3.2 DBG context menu for MOVIFIT®-FC

You can use the  key to go to the context menu.

For the MOVIFIT®-FC power section, the following menu items are available in the context menu of the DBG keypad:



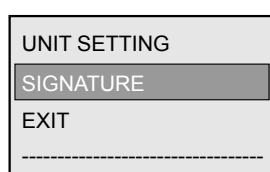
804071051

- "BASIC VIEW"
- "PARAMETER MODE"
- "MANUAL MODE"



1212582411

- "COPY TO DBG"
- "COPY IN FIT"
- "DBG DELIVERY ST."



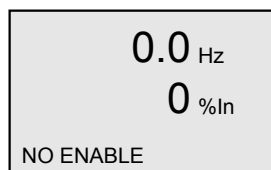
1212683403

- "UNIT SETTINGS"
- "SIGNATURE"
- "EXIT"



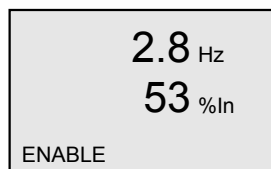
13.3.3 Basic display

The menu "BASIC DISPLAY" represents important characteristic values.



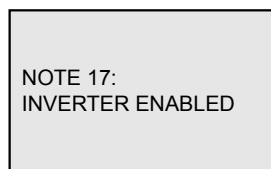
793026571

Display for inhibited inverter



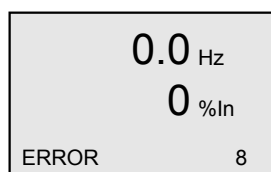
793028235

Display for enabled inverter



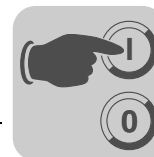
792991627

Information message



793029899

Fault display



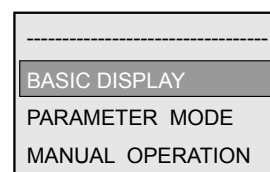
13.3.4 Parameter mode

In the menu "PARAMETER MODE", you can check and change parameter settings

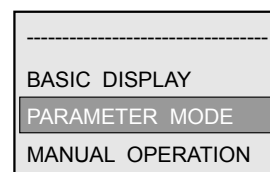
	TIP
	Parameterization in expert mode only.

To change parameters in the parameter mode, proceed as follows:

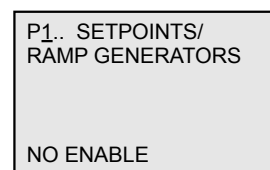
1. Use the key to go to the context menu.
2. Use the key to select the "PARAMETER MODE" menu item.
3. Use the key. The first display parameter P000 "SPEED" appears.
Use the key or the key to select the main parameter groups 0 to 9.
4. Use the key to activate the selection of the parameter sub group in the desired parameter main group. The flashing cursor moves one position to the right.
5. Use the key or the key to select the required parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.
6. Use the key to activate the parameter selection in the desired parameter subgroup. The flashing cursor moves one position to the right.



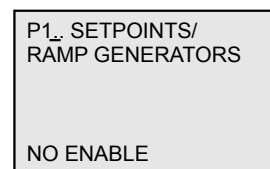
804071051



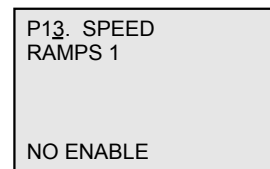
792996619



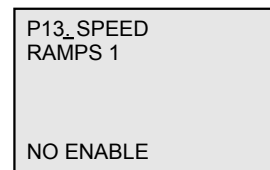
793031563



793033227



793034891



793036555



7. Use the key or the key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.

```
P131      s
RAMP T11 DOWN
          1.0

NO ENABLE
```

793038219

8. Use the key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.

```
P131      s
RAMP T11 DOWN
          1.0_

NO ENABLE
```

793039883

9. Use the key or the key to select the desired parameter value.

```
P131      s
RAMP T11 DOWN
          1.3_

NO ENABLE
```

793041547

10. Confirm the setting by using the key. Exit the setting mode by pressing the key. The flashing cursor is positioned under the third digit of the parameter number again.

```
P131      s
RAMP T11 DOWN
          1.3

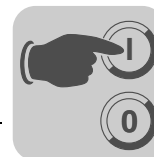
NO ENABLE
```

793043211

11. Use the key or the key to select another parameter or go back to the parameter subgroup menu using the key.

12. Use the key or the key to select another parameter subgroup or go back to the main parameter group menu using the key.

13. Use the key to return to the context menu.



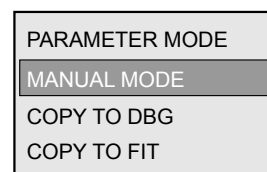
13.3.5 Manual operation

Activation

	DANGER
	The process data of the master take effect when the manual mode is deactivated. If the enable signal is present via the process data, the drive connected to MOVIFIT® can start up unintentionally when deactivating manual operation. Severe or fatal injuries from crushing. - Before deactivating the manual mode, set the process data in such way that the drive connected to MOVIFIT® is not enabled. - Change the process data only after deactivating manual operation.

Proceed as follows to change to manual mode:

- Use the key to go to the context menu.
- Use the key or the key to select the "MANUAL MODE" menu item.
Confirm your entry using the key.

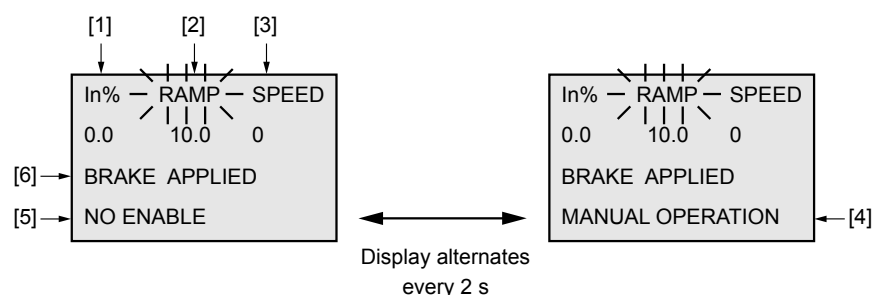


1328112523

The keypad is now in manual operation mode.

	TIP
	If the drive is enabled or the brake is released, you cannot change to manual mode. In this case, the message "NOTE 17: INV. ENABLED" appears for 2 seconds and the DBG keypad returns to the context menu.

Manual operation display



792873483

- [1] Output current in [%] of I_N
- [2] Acceleration (speed ramps in [s] in relation to a setpoint step change of 50 Hz)
- [3] Speed in [rpm]
- [4] Manual operation display
- [5] Inverter status
- [6] Brake status



Operation

The following functions can be executed in the "MANUAL OPERATION" menu:

Setting the ramp time Press the  key.

Use the  key or the  key to set the desired ramp time.

Confirm the entry with the  key.

Changing parameters You can use the  key to switch between parameters "RAMP", "SPEED" and "BRAKE".

Go to the "SPEED" parameter.

The keypad shows the currently set "SPEED" parameter as flashing.

Confirm the entry with the  key.

Enter speed

Enter the desired speed for manual operation using the digit keys <0> – <9>. Alternatively you can change the speed via the  key or the  key.

The sign determines the direction of rotation of the motor connected to the MOVIFIT®.

Confirm the entry with the  key.

Starting the drive

You can use the  key to start the drive.

During operation, the keypad displays the current motor current in [%] of the rated motor current I_N .

Stopping the drive

You can use the  key to stop the drive.

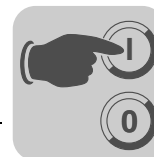
Releasing the brake without

Use the  key to select "BRAKE". "BRAKE" is flashing.

drive enable

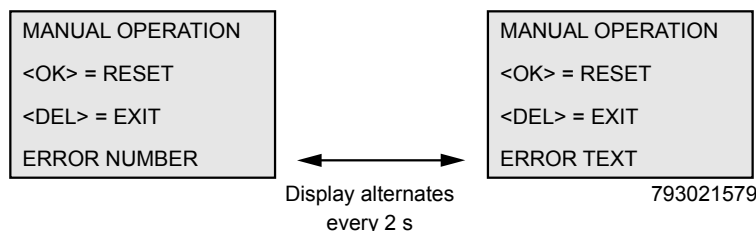
You can use the  key or the  key to release or apply the brake without drive enable

Confirm your entry using the  key.



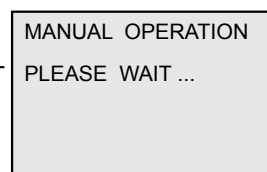
Resetting faults

If an error occurs during manual operation, the display shows the following message:



Press the  key, the DBG keypad resets the error.

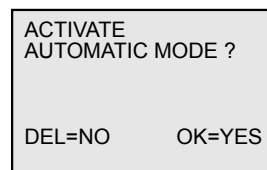
The following message is displayed during the fault reset:



After the fault reset, manual operation remains active. The display shows the manual mode display again.

Deactivating manual operation Use the  key or the  key to deactivate the manual mode.

The following query appears:



- Press the  key, to return to manual mode.
- Press the  key, you will deactivate manual mode. The context menu appears.



DANGER

The process data of the master take effect when the manual mode is deactivated. If the enable signal is present via the process data, the drive connected to MOVIFIT® can start up unintentionally.

Severe or fatal injuries from crushing.

- Before activating the manual mode, set the process data in such way that the drive connected to MOVIFIT® is not enabled.
- Change the process data only after deactivating manual operation.



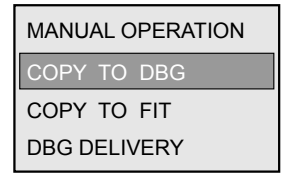
13.4 Copy function of the DBG keypad

You can use the DBG to copy the entire parameter set of the integrated power section of a MOVIFIT® to another MOVIFIT® of the same type as follows:

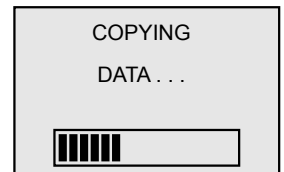
1. In the context menu, select the menu item "COPY TO DBG".

Confirm your entry using the  key.

The data is copied from the MOVIFIT® to the DBG keypad.



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2. After the copying process, connect the DBG keypad to another MOVIFIT® of the same type.

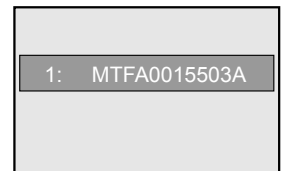
3. In the context menu, select the menu item "COPY TO FIT".

Confirm your entry using the  key.

The following display appears:



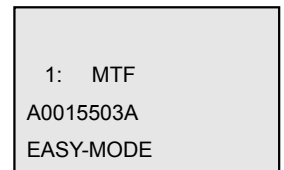
1212582411



1212589195

4. Press the  key.

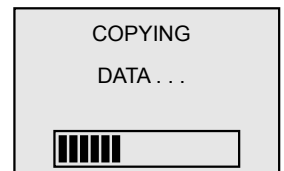
An overview of the MOVIFIT® type is displayed:



1212595979

5. Press the  key.

The data is copied from the DBG to the MOVIFIT®.



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14 Service

	NOTICE
	Improper handling of the MOVIFIT® may lead to damages. Potential damage to property. - Any repair work on SEW drives may be performed by qualified personnel only. - Consult the SEW-EURODRIVE if you encounter problems.

The faults listed in the following tables are displayed

- in the status word of the power section (see section "Process data description in transparent mode (see page 78)")
(MOVIFIT®-FC/-SC, MOVIMOT®)
- in the online unit status of the power section in MOVITOOLS® MotionStudio
- in the MOVIFIT® gateway configurator
(in conjunction with the "Transparent mode" application module)
- in the parameter tree of the power section under the following parameters:
 - P012 Error status*
 - P080 – P084 fault memory 0 – 4*

14.1 Fault list MOVIFIT®-MC

	TIP
	The faults related to MOVIFIT®-MC occur in the connected MOVIMOT® inverter. For the MOVIMOT® fault list, refer to the MOVIMOT® operating instructions.



14.2 Fault list MOVIFIT®-SC

The following table lists the faults that can occur with MOVIFIT®-SC:

The factory set fault response is listed in the "Response" column. (P) indicates that the response is programmable.

Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
00	No fault	—	—	—	—	—
01	Overcurrent	Immediate disconnection	3	Overcurrent fault/ limit drive 1	The measured output current of drive 1 or 2 exceeds the configured cut-off current for the duration of the delay time specified in the parameters.	- Check parameterization - Reduce the load on the drive
			4	Overcurrent fault/ limit drive 2		
06	Mains phase failure	Immediate disconnection	1	"Mains phase failure" / Mains phase failure during initialization phase	Mains phase failure during network recognition. Note:	Check supply cable for phase failure
			2	"Mains phase failure" / Mains phase failure with running system	The failure of 2 mains phases fail does not lead to the error "Mains phase failure". Instead, the state "Not ready, 24 V" is displayed without an error display.	
09	Startup	Immediate disconnection (P) P201	99	Startup fault / connection sequence of mains phases	With dual-motor operation, the mains phases L1, L2 and L3 must be connected to the terminals in the correct order. The direction of rotation for both motors will only be "CW" if the motor phase connection is correct. MOVIFIT® detects a faulty connection and triggers a fault.	- Check connection sequence of mains phases. - Switch 2 mains phases to provide for a CW rotating field.
		Immediate disconnection	100	Startup fault / Motor connection drive 2	In single-motor operation only: - Motor connected to the wrong terminals (X9 instead of X8). - There are two motors connected.	- Connect motor to correct terminal (X8). - Disconnect second motor (X9) Important: In single-motor operation, only one drive can be connected at the terminals provided for drive 1.
11	Overtemperature	Immediate disconnection	1	Overtemperature axis module fault / Heat sink temperature exceeded	The measured heat sink temperature has exceeded the permitted limit value.	- Lower ambient temperature - Prevent heat build-up - Reduce the load on the drive(s)
			4	Overtemperature axis module fault / Utilization in S3 operation	In dual-motor operation only: The total drive utilization is too high.	- Reduce load. - Provide for cooling
20	System malfunction	Immediate disconnection	0	Undefined opcode fault	Starter electronics disrupted, possibly due to EMC issues.	- Check grounding and shielding and improve, if necessary. - If the problem occurs again, consult SEW-EURODRIVE Service.
21	System malfunction	Immediate disconnection	0	Protection fault		
25	EEPROM	Immediate disconnection	0	EEPROM fault	Fault when accessing EEPROM	- Restore factory settings - Consult SEW-EURODRIVE Service - Replace ABOX
26	External terminal	Immediate disconnection (P) P830	0	External terminal fault (only with SBus slave)	"0" signal at terminal that has been programmed for "External fault".	Eliminate cause, re-program terminal if necessary.



Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
31	TF/TH sensor tripped	Immediate disconnection (P) P835	100	TF/TH thermal motor protection fault / TF message for drive 1	- Motor too hot, TF/TH has triggered. - TF/TH sensor not (correctly) connected. - Connection between MOVIFIT® and TF/TH interrupted at the motor.	- Let motor cool off and reset fault. - Check connections/link between MOVIFIT® and TF/TH. - If no TF/TH is connected: Install bridge X81:1 w. X81:2 (drive 1) and X91:1 w. X91:2 (drive 2). - Set P835 to "No response".
			101	TF/TH thermal motor protection fault / TF message for drive 2		
37	System watchdog	Immediate disconnection	0	System watchdog overflow fault	Fault in system software sequence	Consult SEW-EURODRIVE Service
44	Unit utilization	Immediate disconnection	100	Ixt utilization fault / Ixt utilization (total current drives 1 and 2)	The total current from the measured output currents of drives 1 and 2 exceeds 180% of I_N .	- Reduce the load on the drives. - Do not enable both drives at the same time.
45	Initialization network recognition	Immediate disconnection	9	System initialization fault / Unable to recognize mains phase sequence.	Unable to recognize mains phase sequence.	Check mains connection of MOVIFIT®. Is a 3-phase power supply connected correctly? Note: MOVIFIT® automatically detects the mains phase sequence.
47	System bus 1 timeout	Immediate disconnection (P) P836	0	Time-out SBus 1 fault / Timeout system bus (CAN) 1	Fault during communication via internal system bus	Check system bus connection.
82	Open output	Immediate disconnection (P) P839	2	Output fault / Open output drive 1	The current to the motor is lower than 1% of I_N .	Check connection between MOVIFIT® and motor(s).
			3	Output fault / Open output drive 2		
84	Motor protection	Immediate disconnection	5	Motor temperature simulation fault / Utilization S3 operation drive 1	Cycle monitoring time of drive 1/2 has triggered.	- Reduce the load on the drive - Reduce starting frequency
			6	Motor temperature simulation fault / Utilization S3 operation drive 2		
			7	Motor temperature simulation fault UL monitoring drive 1	I_N UL monitoring has triggered.	- Remove blocking of the drive. - Reduce the load on the drive
			8	Motor temperature simulation fault UL monitoring drive 2		
			9	Motor temperature simulation fault Drive 1	When motor 1/2 reaches a thermal utilization of 110%, the unit shuts down.	- Reduce the load on the drive - Lower ambient temperature - Prevent heat build-up Note: You must let the drive cool down before resetting the fault.
			10	Motor temperature simulation fault Drive 2		
89	Thermal overload brake	Immediate disconnection	2	Thermal brake overload fault / Drive 1	Cyclical monitoring has triggered for brake 1/2.	Reduce the starting frequency for releasing the brake without enable.
			3	Thermal brake overload fault / Drive 2		
94	EEPROM checksum	Immediate disconnection	0	Checksum fault / power section parameter	Starter electronics disrupted, possibly due to EMC issues.	Send in MOVIFIT® to SEW-EURODRIVE Service.



Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
97	Copy error	Immediate disconnection	0	Copy parameter fault	Error during data transmission	• Repeat copying process. • Restore delivery condition (P802) and repeat copying process. • Consult SEW-EURODRIVE Service



14.3 Fault list MOVIFIT® FC

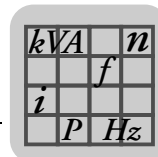
The following table lists the faults that can occur with MOVIFIT®-FC:

The factory set fault response is listed in the "Response" column. (P) indicates that the response is programmable.

Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
00	No fault	—	—	—	—	—
01	Overcurrent	Immediate disconnection	0	Overcurrent	- Short circuit output - Motor too big. - Output stage defective. - Ramp time too short.	- Rectify the short circuit. - Connect a smaller motor. - Consult SEW-EURODRIVE Service if the output stage is defective - Extend the ramp time
04	Brake chopper	Immediate disconnection	0	Error brake chopper	- Too much generative power. - Braking resistor circuit interrupted. - Short circuit braking resistor circuit. - Braking resistance too high.	- Extend deceleration ramps. - Check brake chopper supply cables. - Check technical data of braking resistor. - Replace MOVIFIT® if the brake chopper is defective.
06	Mains phase failure	Immediate disconnection	0	Mains phase failure	Mains phase failure	Check the supply system cable
07	DC link overvoltage	Immediate disconnection	0	DC link overvoltage fault	DC link voltage too high.	- Extend deceleration ramps. - Check braking resistor supply cable. - Check technical data of braking resistor.
08	Speed monitoring	Immediate disconnection	0	Speed monitoring error	Motor an regenerative speed monitoring function has triggered. In operating mode VFC: Output frequency ≥ 150 Hz In operating mode V/f: Output frequency ≥ 600 Hz	- Reduce load. - Increase P501/P503. - Check current limitation. - Extend the ramp times - Check motor supply cable - Check mains phases.
09	Startup	Immediate disconnection	0	Startup fault / Startup missing	No motor startup performed.	Perform motor startup in easy mode (DIP switches) or in expert mode (MotionStudio).
			4	Startup fault / Invalid motor power	Invalid motor started up in expert mode (MotionStudio).	- Repeat startup. - Check/correct motor data
			7	Startup fault / automatic brake selection function is not available with this firmware	Parameters of an older MOVIFIT®-FC has been copied to a newer MOVIFIT®-FC version. Faults can occur depending on the constellation.	Repeat startup. (Motor and brake startup)
11	Overtemperature	Emergency stop	10	Overtemperature	Thermal overload of inverter	- Reduce load. - Provide for cooling
15	Power supply to control electronics	Immediate disconnection	0	24 V internal fault	Voltage continuously ≤ 18 V (min. 1 s)	Check 24 V voltage supply.



Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
17	System malfunction	Immediate disconnection	0	Stack overflow fault	inverter electronics disrupted, possibly due to EMC issues.	- Check grounding and shielding and improve, if necessary. - If the problem occurs again, consult SEW-EURODRIVE-Service.
18			0	Stack underflow fault		
19			0	External NMI fault		
20			0	Undefined opcode fault		
21			0	Protection fault		
22			0	Illegal word operand access fault		
23			0	Illegal instruction access fault		
24			0	Illegal external bus access fault		
25	EEPROM	emergency stop	0	EEPROM fault	Fault when accessing EEPROM	- Restore factory setting - Consult SEW-EURODRIVE Service - Replace ABOX
			3	Non-volatile parameter memory fault / NV memory import fault		
			6	Non-volatile parameter memory fault / NV memory non-compatible data		
			7	Non-volatile parameter memory fault / NV memory initialization fault		
			8	Non-volatile parameter memory fault / NV memory internal fault		
			9 / 10	Non-volatile parameter memory fault / NV memory flash memory fault		
26	External terminal	Immediate disconnection (P) P830	0	External terminal fault	External enable signal read at programmable input.	Eliminate cause, re-program terminal if necessary.
31	TF/TH sensor tripped	Immediate disconnection (P) P835	8	TF/TH thermal motor protection fault / Motor overtemperature (TF/TH)	- Motor too hot, TF/TH has triggered. - TF/TH sensor not (correctly) connected. - Connection between MOVIFIT® and TF/TH interrupted at the motor.	- Let motor cool off and reset fault. - Check connections/link between MOVIFIT® and TF/TH. - If no TF/TH is connected: Install bridge X81:1 w. X81:2. - Set P835 to "No response".
37	System watchdog	Immediate disconnection	0	System watchdog overflow fault	Fault in system software sequence	Consult SEW-EURODRIVE Service
38	System software	Immediate disconnection	0	System software fault	System malfunction	Consult SEW-EURODRIVE Service
45	Initialization	Immediate disconnection	0	System initialization fault / General fault during initialization	Faulty or missing data in power section	- Restore factory setting - Consult SEW-EURODRIVE Service - Replace ABOX
47	System bus 1 timeout	Immediate disconnection (P) P836	0	Time-out SBus 1 fault / Timeout system bus (CAN) 1	Fault during communication via system bus 1	Check system bus connection.
80	RAM test	Immediate disconnection	0	RAM test error	Internal unit fault, RAM defective.	Consult SEW-EURODRIVE Service



Fault			Suberror		Possible cause	Measure
Code	Meaning	Response	Code	Meaning		
81	Start condition	Immediate disconnection	0	Start condition fault / Start condition fault with VFC hoist	(Only in "VFC hoist" operating mode) The motor could not be supplied with the correct amount of current during the pre-magnetizing time: - Rated motor power too small in relation to rated inverter power. - Motor cable cross section too small	- Check startup data and repeat startup if required. - Check connection between inverter and motor. - Check cross-section of motor cable and increase if necessary.
82	Open output	Immediate disconnection	0	Output fault / Open output at VFC hoist	No connection between MOVIFIT® and motor during startup.	- Check connection between MOVIFIT® and motor. - Check startup data and repeat startup if required.
			4	Output fault / output phase failure	At least one phase failed at motor.	
84	Motor protection	Immediate disconnection (P) P340	0	Motor temperature simulation fault	- Motor utilization is too high. - UL monitoring has triggered, limit value exceeded for at least 1 minute.	- Reduce the load on the drive - Check motor for blocking, remove blocking. - Observe longer pause times. - Use a larger motor.
89	Thermal overload brake	Immediate disconnection	0	Thermal overload in brake	- Overtemperature in brake - Assignment motor/inverter incorrect	- Check inverter/motor combination. - If motor uses regenerative power, use/increase braking resistor - Extend stop ramp
90	Output stage detection	Immediate disconnection	0	Wrong output stage detection	Invalid inverter/motor combination	- Check startup data and repeat startup if required. - Motor not suitable, replace motor
94	EEPROM checksum	Immediate disconnection	0	Checksum fault / power section parameter	inverter electronics disrupted, possibly due to EMC issues or defective	Send in MOVIFIT® to SEW-EURODRIVE Service.
			11	Checksum fault / power section parameter		
			13	Fault		
			15	Unit configuration data / Unit configuration data		
			17	power section: CRC checksum error		
			19	Checksum fault / power section parameter		
97	Copy error	Immediate disconnection	0	Copy parameter fault	Error during data transmission	- Repeat copying process. - Restore delivery condition (P802) and repeat copying process.
			1	Copy parameter set fault / Download canceled		
98	CRC fault	Immediate disconnection	0	CRC via internal flash memory fault	- Internal unit fault - Flash memory defective	Send in MOVIFIT® to SEW-EURODRIVE Service.



14.4 Transparent mode fault list

14.4.1 Notes

"LT" stands for power section.

Depending on the plant, the power section is one of the following units:

- MOVIFIT®-SC/-FC power section
- MOVIMOT® (with MOVIFIT®-MC)
- MOVIFIT® SBus slave power section

Example: MOVIFIT®-FC + 6 SBus slaves

"LT" Unit

- | | |
|---|---|
| 1 | integrated power section (with MOVIFIT®-FC) |
| 2 | SBus slave 1 |
| 3 | SBus slave 2 |
| 4 | SBus slave 3 |
| 5 | SBus slave 4 |
| 6 | SBus slave 5 |
| 7 | SBus slave 6 |

Example: MOVIFIT®-MC with 3 MOVIMOT® + 6 SBus slaves

"LT" Unit

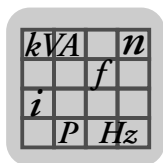
- | | |
|---|--------------|
| 1 | MOVIMOT®1 |
| 2 | MOVIMOT®2 |
| 3 | MOVIMOT®3 |
| 4 | SBus slave 1 |
| 5 | SBus slave 2 |
| 6 | SBus slave 3 |
| 7 | SBus slave 4 |
| 8 | SBus slave 5 |
| 9 | SBus slave 6 |



14.4.2 Error table

The following table lists the faults that may occur in conjunction with the transparent mode application module.

Fault		Subfault		Cause	Measure
Code	Designation	Code	Designation		
00	No fault			-	-
111	Communication time-out	0xLT02	Communication time-out during startup to a configured station / Station cannot be reached	Communication to configured internal power section or external slave interrupted.	- Check electrical installation - Check configuration.
121	Replace unit	0x28	Fault when accessing memory	Internal unit fault	- Consult SEW-EURODRIVE SERVICE - Send in MOVIFIT® to SEW-EURODRIVE service if problem re-occurs.
		0x29	Invalid data in memory	Invalid data stored in ABOX	Perform data backup
		0xLT20	Fault during auto-update / unable to read unit detection of a lower-level station	Wrong firmware version in slave unit SBus overload	- Check SBus for additional load - Reduce load on SBus, e.g. no engineering via SBus. - Replace power section
		0xLT22	Internal unit fault	Internal unit fault	- Consult SEW-EURODRIVE SERVICE - Send in MOVIFIT® to SEW-EURODRIVE service if problem re-occurs.
		0xLT23	Fault during auto-update / download to lower-level station failed	- Bus load on SBus too high - Parameter lock activated - Easy mode activated in MOVIFIT®	- Check SBus for additional load - Reduce load on SBus, e.g. no engineering via SBus. - Activate expert mode - Remove parameter lock (P803)
		0xLT24	Fault during data backup / Upload from lower-level station failed	Bus load on SBus too high	- Check SBus for additional load - Reduce load on SBus, e.g. no engineering via SBus.
239	Internal error	0x00	Internal unit fault	Internal unit fault	- Consult SEW-EURODRIVE SERVICE - Send in MOVIFIT® to SEW-EURODRIVE service if problem re-occurs.
		0x01			
		0xLT01			
		0x10600			
		0x10610			
		0x10620			
		0x10630			
		0x10710			



15 Additional Documentation

Further information can be found in the following publications:

Documentation
"MOVIFIT®-MC" operating instructions
"MOVIFIT®-SC" operating instructions
"MOVIFIT®-FC" operating instructions
"MOVIMOT® MM..C" operating instructions
"MOVIMOT® MM..D with AC Motors DRS/DRE/DRP" operating instructions
"MOVIFIT® functional safety" manual
"MOVITOOLS® MotionStudio" manual
"MOVI-PLC® Programming in the PLC Editor" system manual
"Libraries MPLCMotion_MC07 and MPLCMotion_MM for MOVI-PLC®" manual
Manuals for application modules



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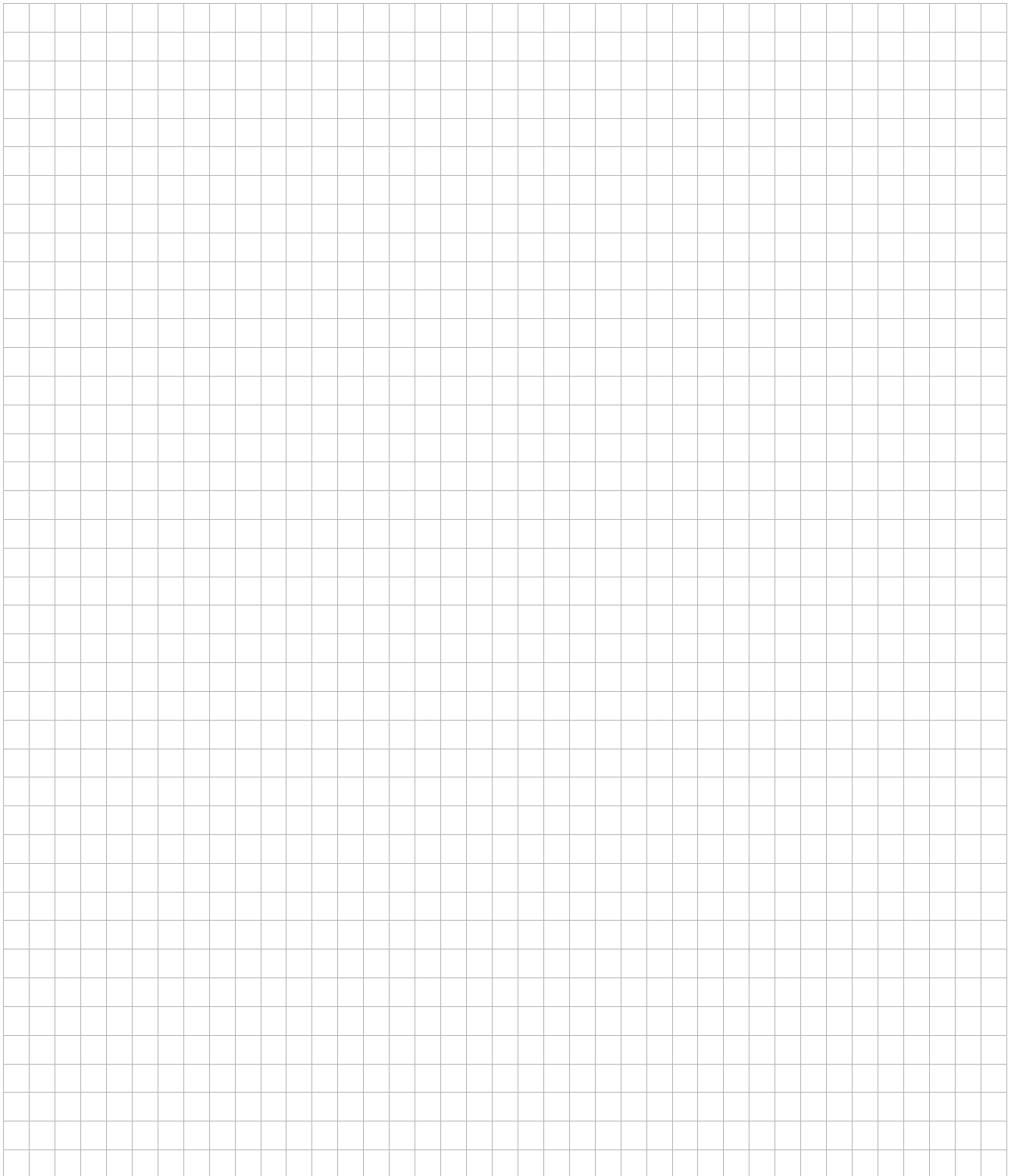


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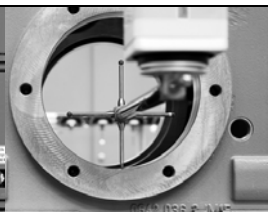
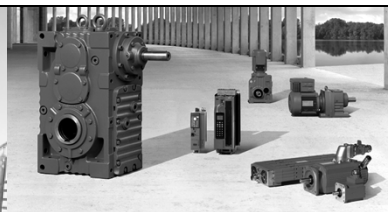
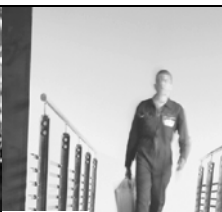
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MOVIFIT[®] Function Level "Technology" with Ethernet Interface Additional Information on Firmware Version 10

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Addendum to the Manual

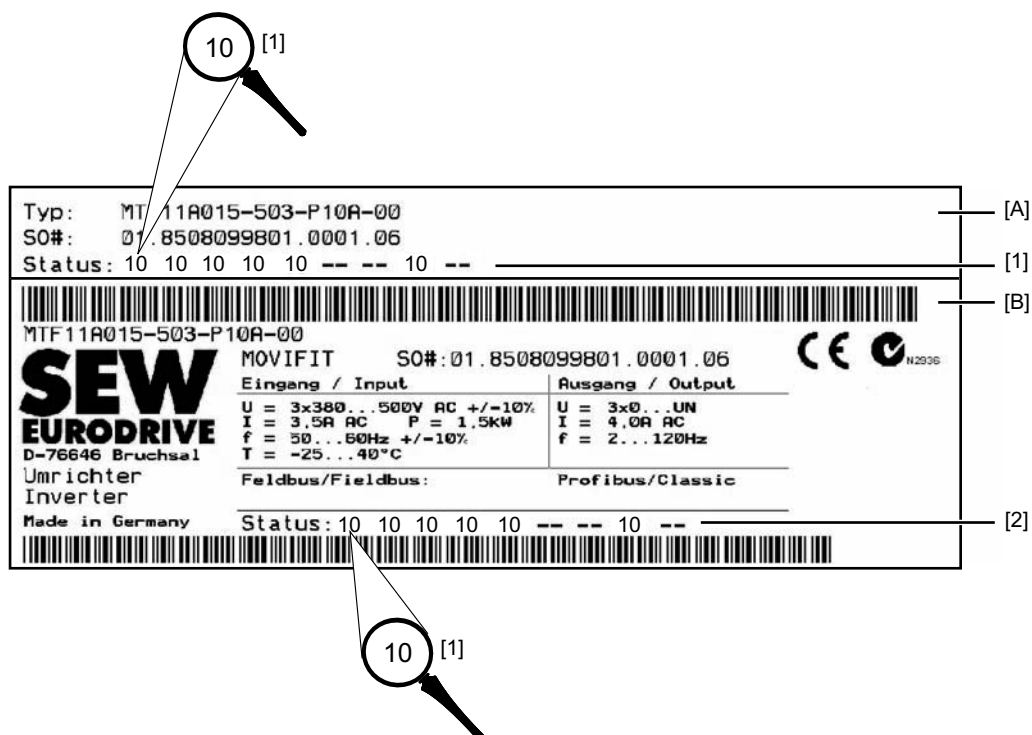


1 Additional information on firmware version 10

1.1 Other applicable documentation

- This document does not replace the detailed manual.
- Installation and startup only by trained personnel observing the relevant accident prevention regulations and the following manuals:
 - "MOVIFIT® Function Level "Technology" with EtherNet/IP or Modbus TCP Interface"
 - "MOVIFIT® Function Level "Technology" with PROFINET IO Interface"

1.2 Identification of firmware version 10



- [A] External nameplate
 [B] Internal nameplate
 [1] Firmware version 10
 [2] EBOX status field

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1.3 Changes compared to standard firmware

Firmware version 10 of MOVIFIT[®] function level "Technology" provides a different functionality compared to the ones described in the manuals mentioned above:

- The "Transparent mode" application module does not support the MOVIFIT[®] slave units.

None of the corresponding functions with MOVIFIT[®] slave units are available.

- The meaning of the flashing codes of the "link/act 1" LED changes as follows:

(not for MOVIFIT[®] with PROFINET IO interface)

The following table lists the states of the "link/act 1" LED of the respective MOVIFIT[®] unit:

link/act 1	Meaning
Flashing red	• "Localizing" function activated • and Ethernet cable connects device with other Ethernet stations. • and Ethernet communication activated
Flashing green	• "Localizing" function activated • and <u>no</u> Ethernet connection with other Ethernet station

- The function of DIP switch S11/1 "DHCP" changes as follows:

If DIP switch S11/1 "DHCP" = "ON" and there is no response from the DHCP server yet:

- no communication with MOVIFIT[®] via serial or Ethernet interface
- LED "MS" and "NS" are off
- IEC program remains in boot status awaiting response from DHCP server.

- As opposed to MOVIFIT[®] function level "Classic", the LEDs of MOVIFIT[®] function level "Technology" do not indicate the status of the communication with the lower-level devices (MOVIMOT[®] connected to MOVIFIT[®]-MC or integrated power sections in MOVIFIT[®]-FC or MOVIFIT[®]-SC).
- The evaluation of the signals of encoders NV26, ES16 and EI7 is not possible, see "MOVIFIT[®]-" operating instructions / section "Encoder connection".
- The external SBus (CAN) at X35 is not supported. Communication with MOVIFIT[®] slave units, CAN encoders and CAN-I/O modules via SBus is not possible.



1.4 New installation of transparent mode application module

Proceed as follows to install the transparent mode application module on the MOVIFIT® if it has been deleted:

Prerequisite:

The following software is installed on the PC:

- MOVITOOLS® MotionStudio 5.5 Complete, incl. Service Pack 3
- AddIn "Transparent-Mode Loader for MOVIFIT® Technology"

1. Note down the original IP parameters of the MOVIFIT®.
2. In the ABOX, switch DIP switch S11/2 "DEF IP" to "ON".

The IP parameters are set to the following values:

- IP address: 192.168.10.4
- Subnet mask: 255.255.255.0
- Default gateway: 1.0.0.0

3. Establish a point-to-point connection between the PC and the MOVIFIT®.
4. Open the MOVITOOLS® MotionStudio installation folder,
e.g.: C: \ Programs \ SEW \ MotionStudio.
5. Open:

FTP Loader \ PROFINET_18213480.10v20195 \ 18213480.10v20195
or

FTP Loader \ ETHERNET_IP_18218105.10v20196 \ 18218105.10v20196

6. Double-click on Do_Update_Bootprogramm.bat.

7. You are prompted to enter the IP address.

Enter "192.168.10.4" and confirm via [ENTER].

Now the transparent mode application module is loaded to the MOVIFIT®.

8. Press any key to confirm the new installation of the transparent mode application module.
9. In the ABOX, switch DIP switch S11/2 "DEF IP" back to "OFF".
10. Restore the original IP parameters.