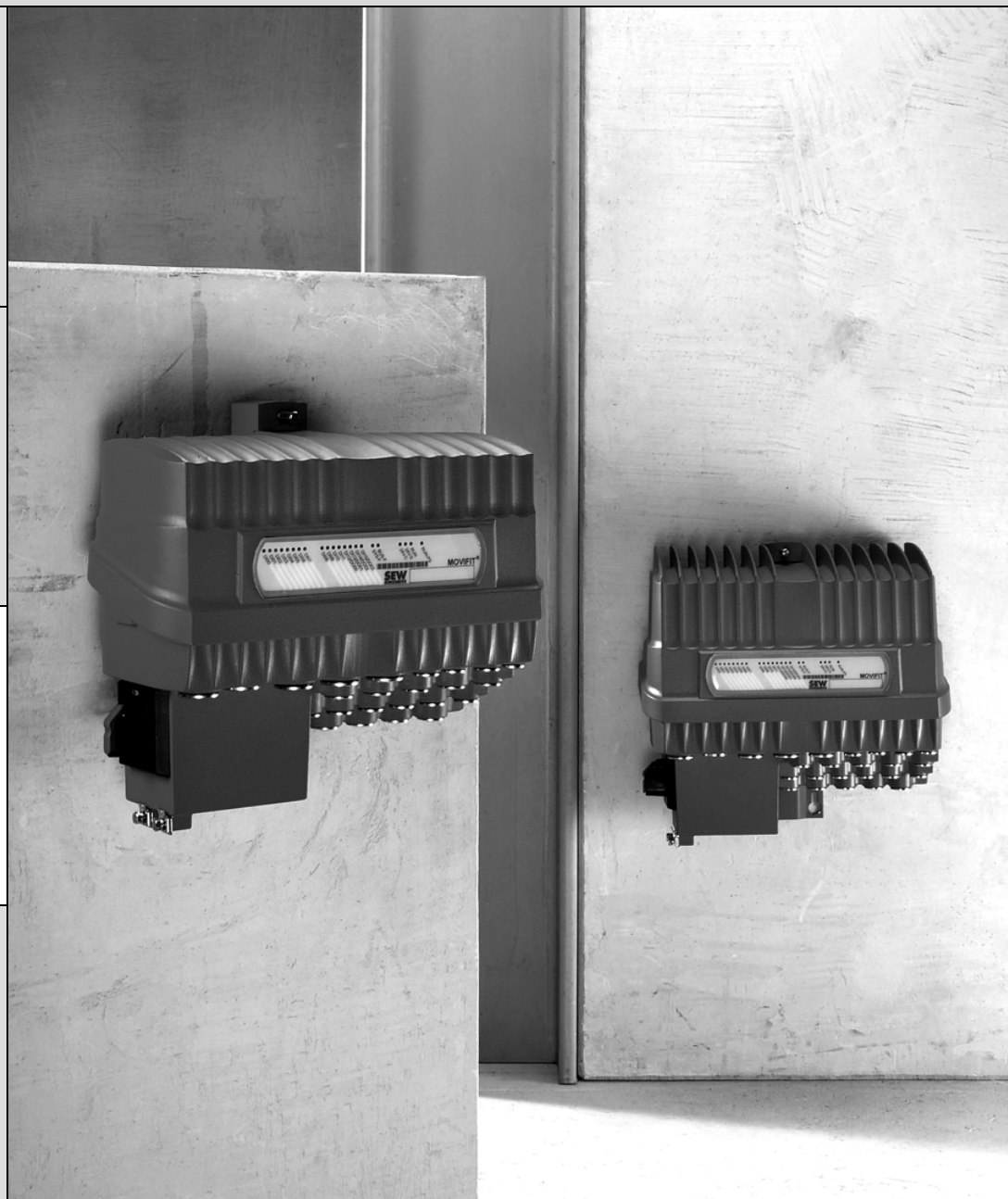
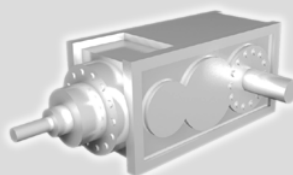
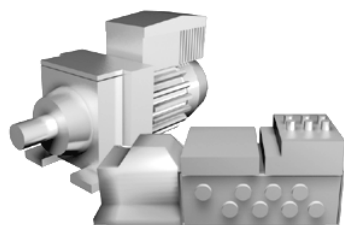
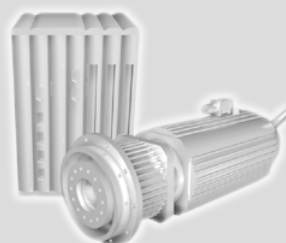
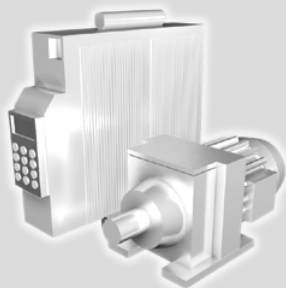




SEW
EURODRIVE



MOVIFIT® **Function Level "Classic"**

Edition 05/2007

11591811 / EN

Manual





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1 General Notes

1.1 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

Symbol	 SIGNAL WORD
	Nature and source of hazard. Possible consequence(s) if disregarded. Measure(s) to avoid the hazard.

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

1.2 Right to claim under warranty

As a prerequisite to fault-free operation and fulfillment of warranty claims, you must adhere to the information in the MOVIFIT® documentation. Read the operating instructions before you start working with the unit.

Make sure that the operating instructions are legible and available to persons responsible for the plant and its operation, as well as to persons who work independently on the unit.

1.3 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 and performance features. 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.



1.4 Applicable documents

- 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.

1.5 General safety notes for bus systems

You are now in possession of a communication system that lets you adapt MOVIMOT[®] and MOVIFIT[®] frequency 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.

1.6 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.

- Safe disconnection for MOVIFIT[®]

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

1.7 Hoist applications

- Hoist applications can only be implemented with MOVIFIT[®]-FC in combination with the "Classic" function level under the following conditions:
 - A hoist startup must be performed.
- MOVIFIT[®]-FC is not designed for use 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 Index of Changes

2.1 Changes to the previous version

The following section lists the main changes made to the individual sections from the 06/2006 edition, part number 11461012 (EN).

**"PROFINET IO"
section**

- New section "Project planning for the PROFINET IO controller"
- New section "Assigning the PROFINET IO unit name"
- New section "Project Planning for MOVIFIT®-Classic"
- New section "PROFINET diagnostic alarms"

**"Device Net"
section**

- New section "Installing the EDS file via RSNetworx"
- New section "Project Planning for MOVIFIT®-Classic"
- New section "Parameter setting via DeviceNet"

**"Parameter
Setting and
Diagnostics"
section**

- New section "MOVITOOLS® Motion Studio"
- New section "Web diagnostics for Ethernet units"

**"Technical Data"
section**

- New section "PROFINET interface"
- New section "DeviceNet interface"

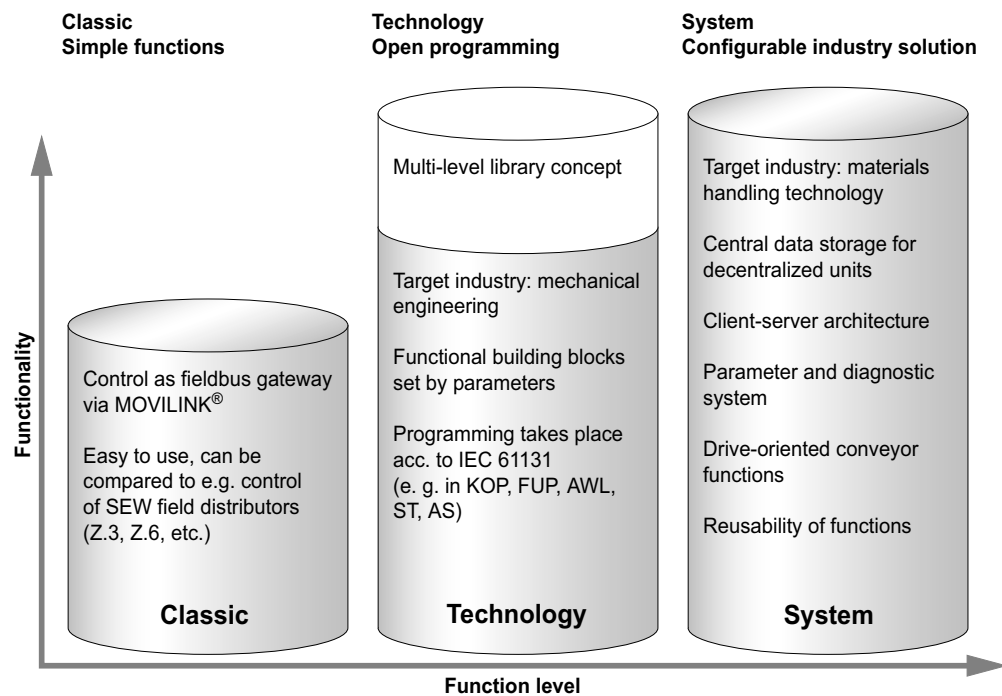


3 Introduction

3.1 MOVIFIT® function level

Function level indicates 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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NOTE

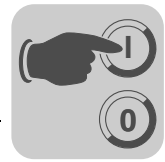
This manual describes the MOVIFIT® **"Classic"** function level. For information on the other MOVIFIT® function levels, refer to the MOVIFIT® system description and the appropriate manuals.

3.2 "Classic" function level

The Classic function level makes for simple and reliable communication with MOVIFIT® units.

The important drive parameters and the local I/Os can be transferred to and processed by the higher-level PLC. This means the PLC is capable of controlling drive-related functions.

Operating software is not mandatory for the Classic function level. Communication between the PLC and MOVIFIT® units is based on process data according to the uniform MOVILINK® unit profile from SEW-EURODRIVE. This means it is compatible with the existing decentralized components from SEW-EURODRIVE.

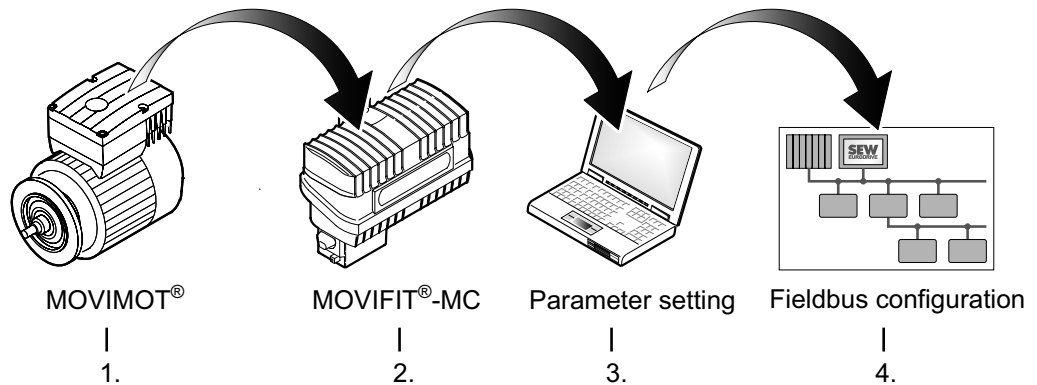


4 Startup

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

4.1 Startup procedure for MOVIFIT®-MC

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



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Function level	1. Startup MOVIMOT®	2. Startup MOVIFIT®-MC	3. Parameter setting	4. Fieldbus configuration
Classic PROFIBUS	- MOVIFIT®-MC operating instructions - MOVIMOT® operating instructions	MOVIFIT®-MC operating instructions	—	- PROFIBUS-DP, see page 11 - Process data description, see page 64 - Fault responses, see page 83 - Technical data, see page 132
Classic PROFINET IO				- PROFINET IO, see page 32 - Process data description, see page 64 - Fault responses, see page 83 - Technical data, see page 133
Classic DeviceNet				- DeviceNet, see page 46 - Process data description, see page 64 - Fault responses, see page 83 - Technical data, see page 133



! DANGER

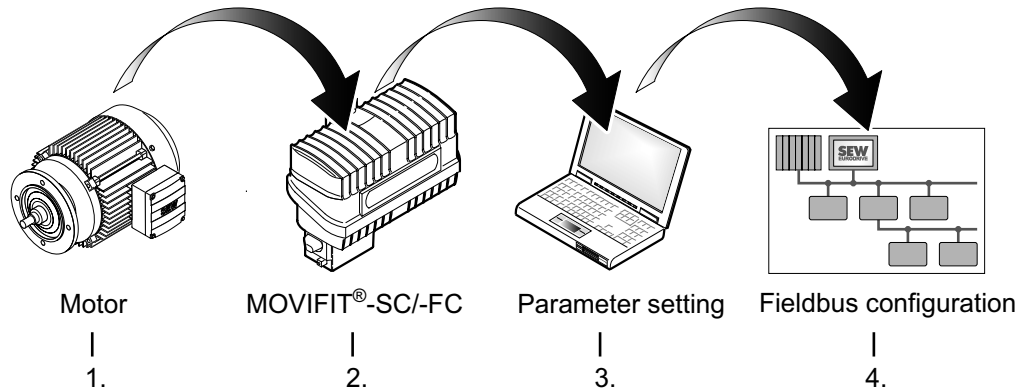
If you are using applications with safe disconnection (only possible with MOVIFIT®-MC or -FC), you must additionally observe the SEW publication "Safe Disconnection for MOVIFIT®".

Severe or fatal injuries.

- Observe additional startup instructions and safety conditions in the SEW publication "Safe Disconnection for MOVIFIT®".

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:



59761AEN

Function level	1. Startup Motor	2. Startup MOVIFIT®-SC/-FC	3. Parameter setting	4. Fieldbus configuration
Classic PROFIBUS	"DR/DV/DT/DTE/DVE AC Motors, CT/CV Asynchronous Servo-motors" operating instructions	- MOVIFIT®-SC operating instructions - MOVIFIT®-FC operating instructions	Parameter setting and diagnostics, see page 85	- PROFIBUS DP, see page 11 - Process data description, see page 64 - Fault responses, see page 83
Classic PROFINET IO				- PROFINET IO, see page 32 - Process data description, see page 64 - Fault responses, see page 83
Classic DeviceNet				- DeviceNet, see page 46 - Process data description, see page 64 - Fault responses, see page 83



NOTE

- Parameters only have to be set in the "Classic" function level when "expert mode" is activated.
- For information about "easy mode", see the relevant MOVIFIT® operating instructions.



! DANGER

If you are using applications with safe disconnection (only possible with MOVIFIT®-MC or -FC), you must additionally observe the SEW publication "Safe Disconnection for MOVIFIT®".

Severe or fatal injuries.

- Observe additional startup instructions and safety conditions in the SEW publication "Safe Disconnection for MOVIFIT®".



5 PROFIBUS



NOTE

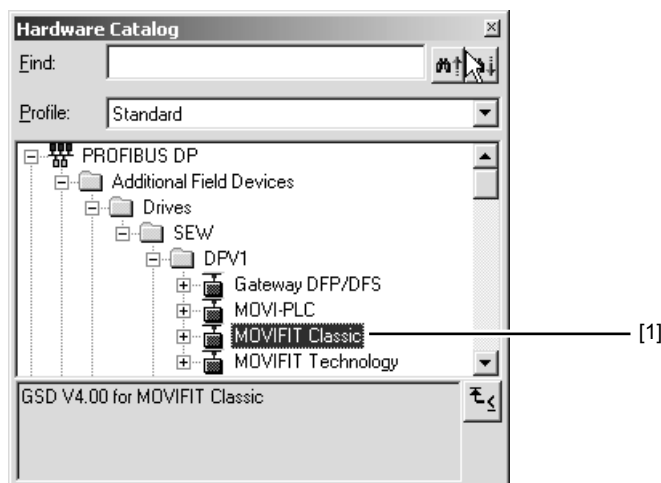
For information about PROFIBUS connection, PROFIBUS startup (addressing, etc.) or the description of the PROFIBUS LED displays, see the relevant MOVIFIT® operating instructions.

5.1 Project planning for the PROFIBUS master

There are GSD files for project planning of the DP master. These files are read in with the project planning software of the DP master and are then available for project planning of the DP master. Refer to the relevant project planning software manuals for details on the procedure.

- Read the information in the PDF files about the GSD file.
- Install the GSD file "SEW_600A.GSD" according to the instructions of the project planning software for the DP master.
- After successful installation, the "MOVIFIT®-Classic" unit is displayed in the list of slave stations.

The following screenshot shows how the MOVIFIT®-Classic GSD is displayed in the STEP7 HW Config:



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[1] MOVIFIT®-Classic GSD in STEP7 HW Config



NOTE

The latest version of the GSD files is always available on the Internet at the following address: <http://www.sew-eurodrive.com>

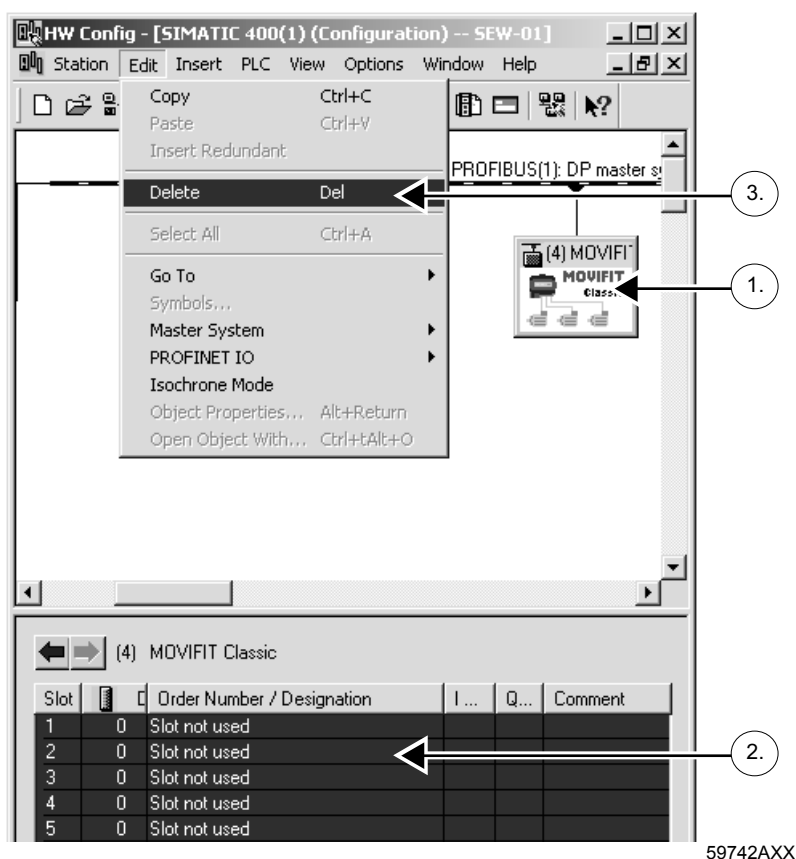


PROFIBUS

Project planning for the PROFIBUS master

1. Add "MOVIFIT®-Classic" to the PROFIBUS structure and assign the PROFIBUS address. This address must match the PROFIBUS address you set later in the MOVIFIT® connection box (see the appropriate MOVIFIT® operating instructions).
2. Select all MOVIFIT® slots.
3. Delete all slot entries so that you can begin project planning for your application. The HW Config displays the assignment of the slots in plain text.

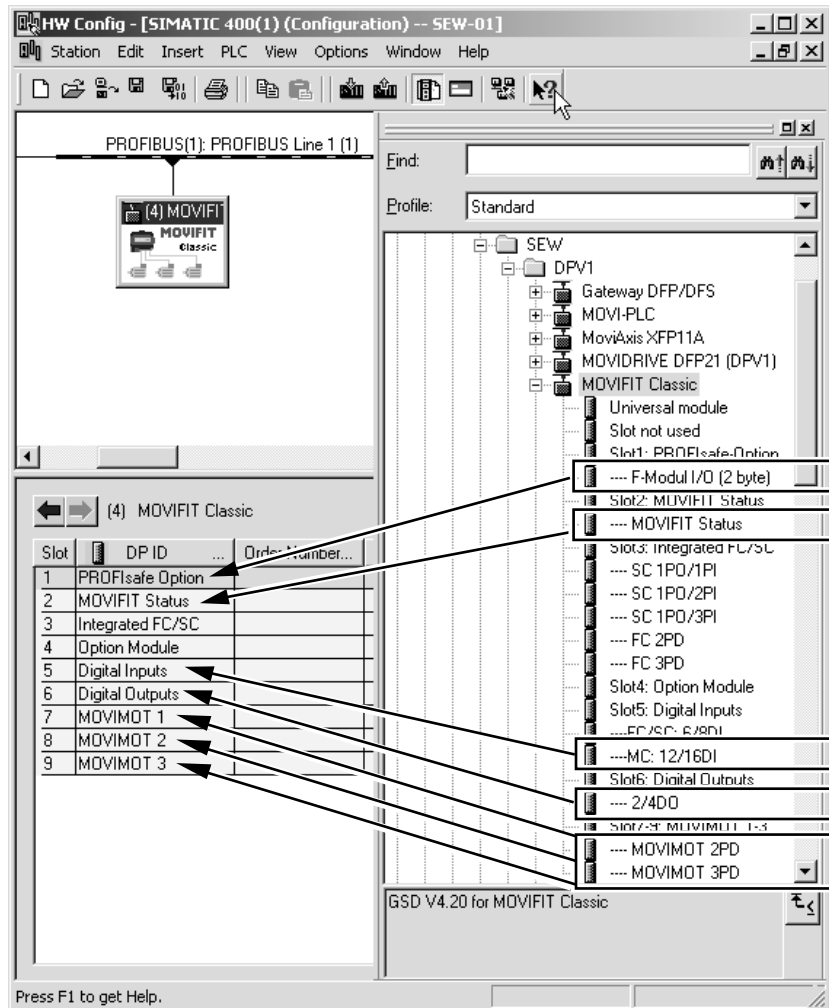
The following figure displays points 1 through 3:





4. Select the process data configuration required for your application (see the following examples for the various MOVIFIT[®] versions). Note: An empty module must be assigned to unused slots.
5. If you have performed project planning for a PROFIsafe option, you must also set the parameters for this option. Information about this is available in the "Safe Disconnection for MOVIFIT[®]" manual.

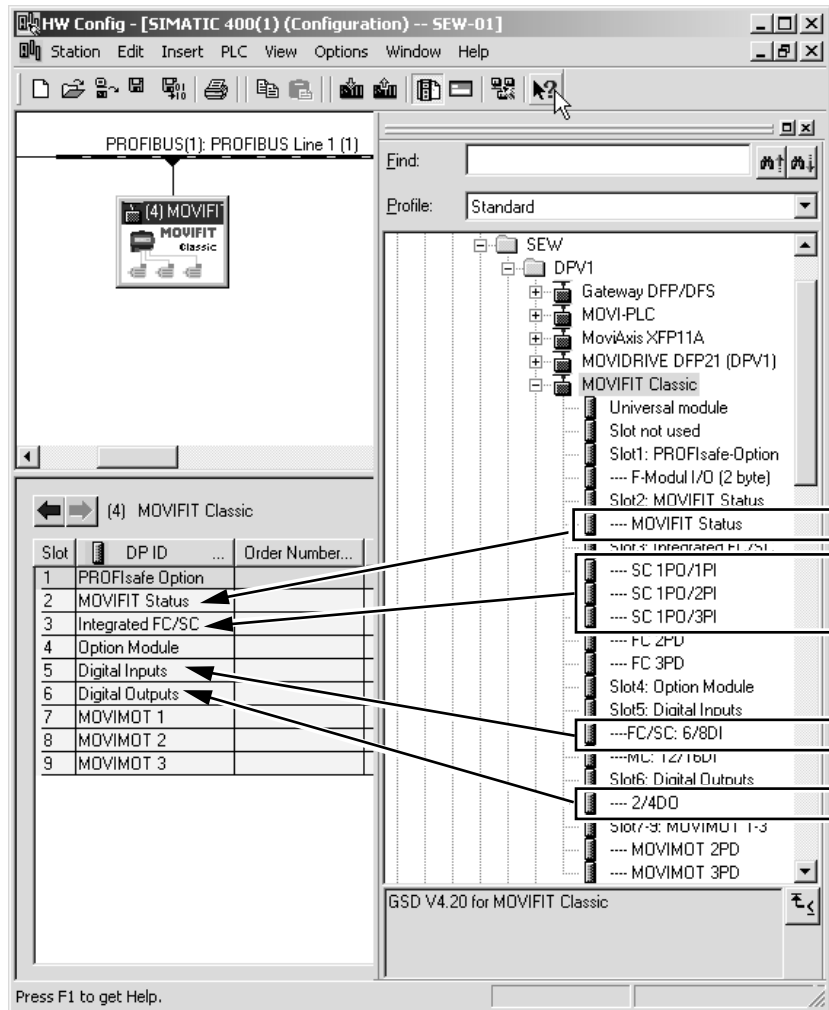
STEP 7 Project planning of a MOVIFIT[®]-MC:



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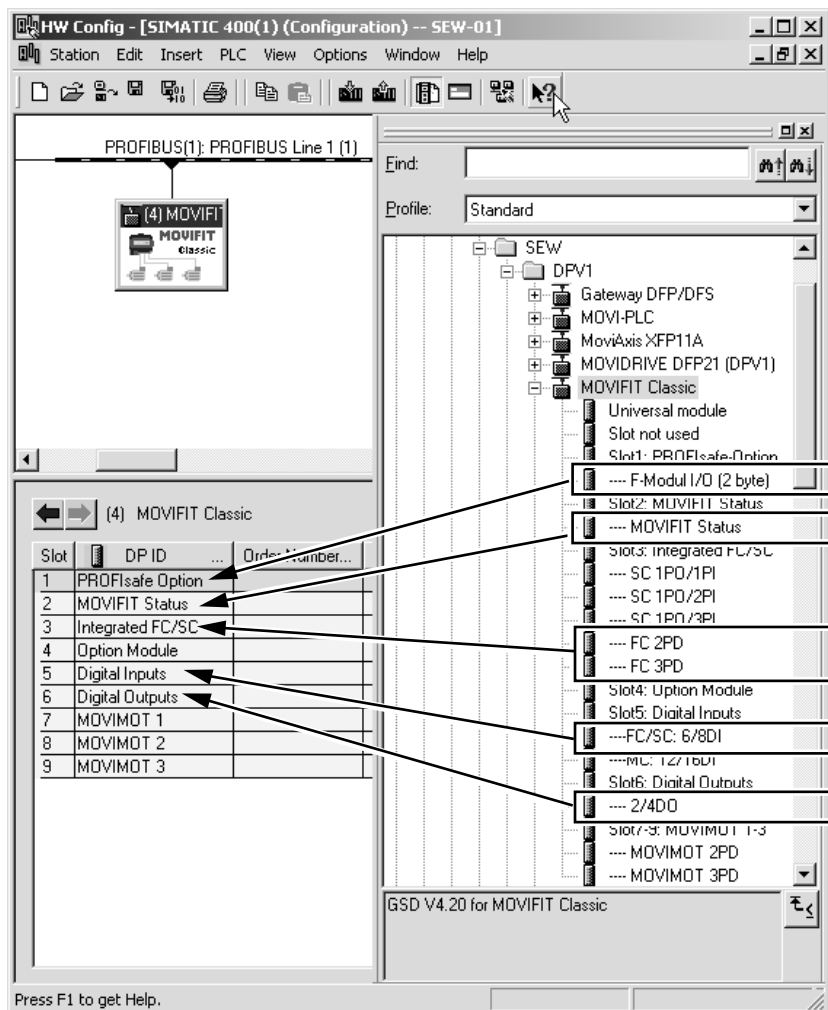
STEP 7 Project planning of a MOVIFIT®-SC:



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STEP 7 Project planning of a MOVIFIT®-FC:



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6. Enter the I/O or peripheral addresses for the configured data widths.
7. Save the configuration.
8. Add data exchange with the MOVIFIT® units to your program.
9. Save the project and load it into the DP master. Once the DP master has been started, the "BUS-F" LED of the MOVIFIT® should go out. If this is not the case, check the wiring and terminating resistors of the PROFIBUS and the project planning, especially the PROFIBUS address set in the connection box (see the corresponding MOVIFIT® operating instructions).

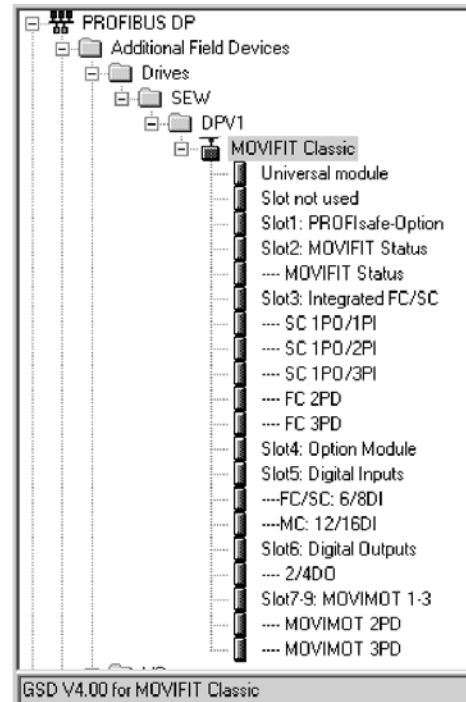


5.2 Project planning for MOVIFIT®-Classic

The slot model is used for project planning with PROFIBUS DPV1. Each slot is assigned to a MOVIFIT® communication interface. The project planning process is the same for the entire MOVIFIT®-Classic line. The following division is used:

The following figure demonstrates MOVIFIT®-Classic project planning in STEP7:

(4) MOVIFIT Classic			
Slot	DP ID	Order	
1	PROFIsafe Option		
2	MOVIFIT Status		
3	Integrated FC/SC		
4	Option Module		
5	Digital Inputs		
6	Digital Outputs		
7	MOVIMOT 1		
8	MOVIMOT 2		
9	MOVIMOT 3		



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The following table shows PROFIBUS project planning for MOVIFIT®-Classic:

Slot	Assignment (DP-ID)	Plug-in modules	Slot used in		
			MC	FC	SC
1	"PROFIsafe-Option"	"Slot not used"	x	x	
		"F module I/O" (2 byte)	x	x	
2	"MOVIFIT® Status"	"Slot not used"	x	x	x
		"MOVIFIT® Status"	x	x	x
3	"Integrated FC/SC"	"Slot not used"	x	x	x
		"SC 1PO/1PI"			x
		"SC 1PO/2PI"			x
		"SC 1PO/3PI"			x
		"FC 2PD"		x	
		"FC 3PD"		x	
4	"Option Module"	"Slot not used"	x	x	x
5	"Digital Inputs"	"Slot not used"	x	x	x
		"FC/SC: 6/8DI"		x	x
		"MC: 12/16DI"	x		
6	"Digital Outputs"	"Slot not used"	x	x	x
		"2/4 DO"	4DO	2DO	2DO
7	"MOVIMOT® 1"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		
8	"MOVIMOT® 2"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		
9	"MOVIMOT® 3"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		

Submodule IDs are assigned to ensure unique identification of the unit variants. These IDs are transferred to the Set PRM User data during startup of the PROFIBUS system.

The Prm structure ID 0x20 (32dec) is used for manufacturer-specific coding. The ID 0x05 defined according to the PROFIsafe specification is used for the F parameter block.



5.2.1 Application example MOVIFIT®-MC

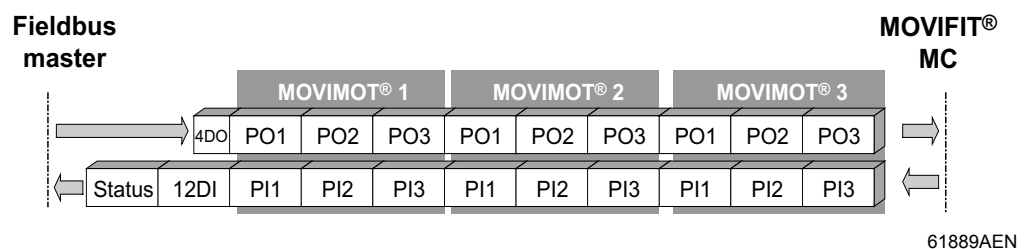
The following application requirements should be implemented with MOVIFIT®-MC:

- Three MOVIMOT® drives are controlled with 3 process data words, which means that the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- The 12 digital inputs and 4 digital outputs of MOVIFIT® are used to address external sensors and actuators.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-MC application.

Slot	Assignment (DP-ID)	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT®-Status"
3	"Integrated FC/SC"	"Slot not used"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"MC: 12/16DI"
6	"Digital Outputs"	"2/4 DO"
7	"MOVIMOT® 1"	"MOVIMOT® 3PD"
8	"MOVIMOT® 2"	"MOVIMOT® 3PD"
9	"MOVIMOT® 3"	"MOVIMOT® 3PD"

The following figure shows which process data is transferred via the bus system. 19 bytes are sent as output data from the fieldbus master to MOVIFIT®-MC and 22 bytes are sent as input data to the fieldbus master.

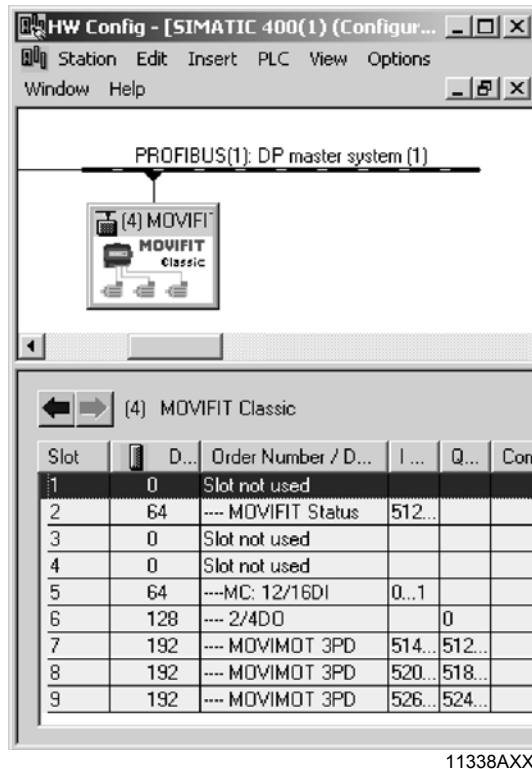


NOTE

For information on the coding of process data for MOVIMOT® drives, digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



The following figure shows the MOVIFIT®-MC project planning example in STEP7:



5.2.2 Application example MOVIFIT®-SC

The following application requirements should be implemented with MOVIFIT®-SC:

- The integrated motor starter (SC) is to operate two motors. The current actual value is also used for monitoring within the controller.
- Six digital inputs and two digital outputs of MOVIFIT®-SC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-SC application:

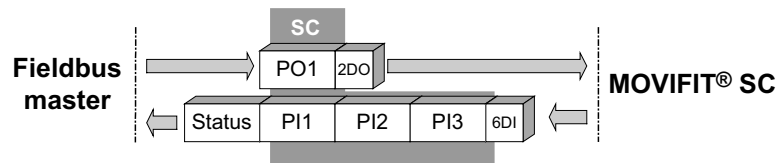
Slot	Assignment (DP-ID)	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT® Status"
3	"Integrated FC/SC"	"SC 1PO/3PI"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"FC/SC: 6/8DI"
6	"Digital Outputs"	"2/4 DO"
7	"MOVIMOT® 1"	"Slot not used"
8	"MOVIMOT® 2"	"Slot not used"
9	"MOVIMOT® 3"	"Slot not used"



PROFIBUS

Project planning for MOVIFIT®-Classic

The following figure shows which process data is transferred via the bus system. 3 bytes are sent as output data from the fieldbus master to MOVIFIT®-SC. 9 bytes are sent as input data to the fieldbus master.



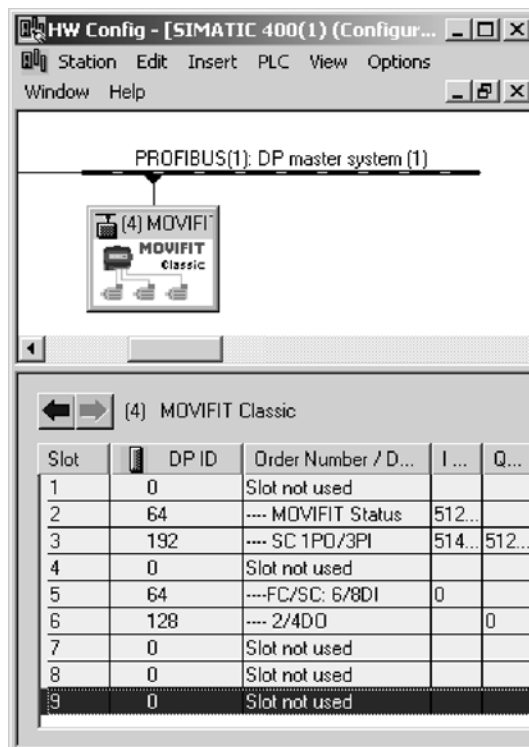
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NOTE

For information on the coding of process data for MOVIFIT®-SC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.

The following figure shows the MOVIFIT®-SC project planning example in STEP7:



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5.2.3 Application example MOVIFIT®-FC

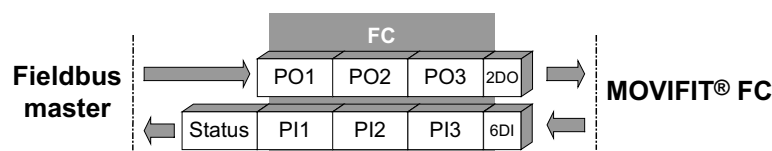
The following application requirements should be implemented with MOVIFIT®-FC:

- The integrated frequency inverter (FC) is controlled with 3 process data words. In other words, the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- Six digital inputs and two digital outputs of MOVIFIT®-FC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-FC application:

Slot	Assignment (DP-ID)	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT® Status"
3	"Integrated FC/SC"	"FC 3PD"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"FC/SC: 6/8DI"
6	"Digital Outputs"	"2/4 DO"
7	"MOVIMOT® 1"	"Slot not used"
8	"MOVIMOT® 2"	"Slot not used"
9	"MOVIMOT® 3"	"Slot not used"

The following figure shows which process data is transferred via the bus system. 7 bytes are sent as output data from the fieldbus master to MOVIFIT®-FC and 9 bytes are sent as input data to the fieldbus master.



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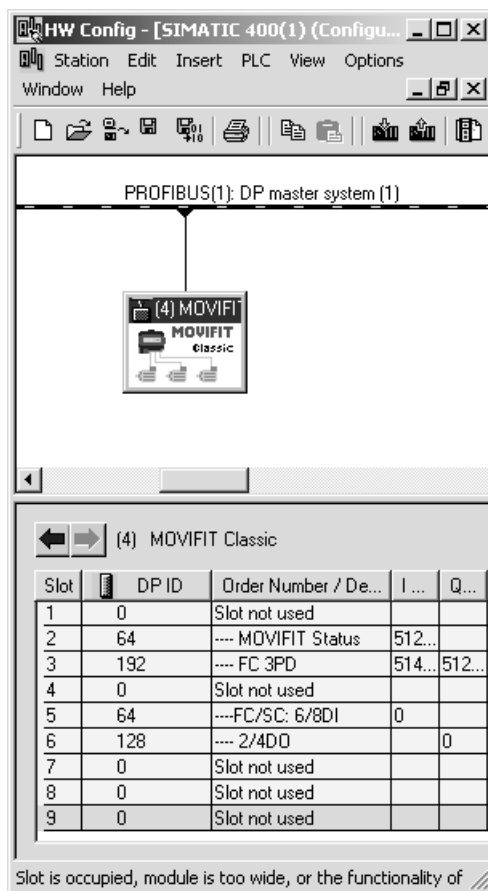


NOTE

For information on the coding of process data for MOVIFIT®-FC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



The following figure shows the MOVIFIT®-FC project planning example in STEP7:



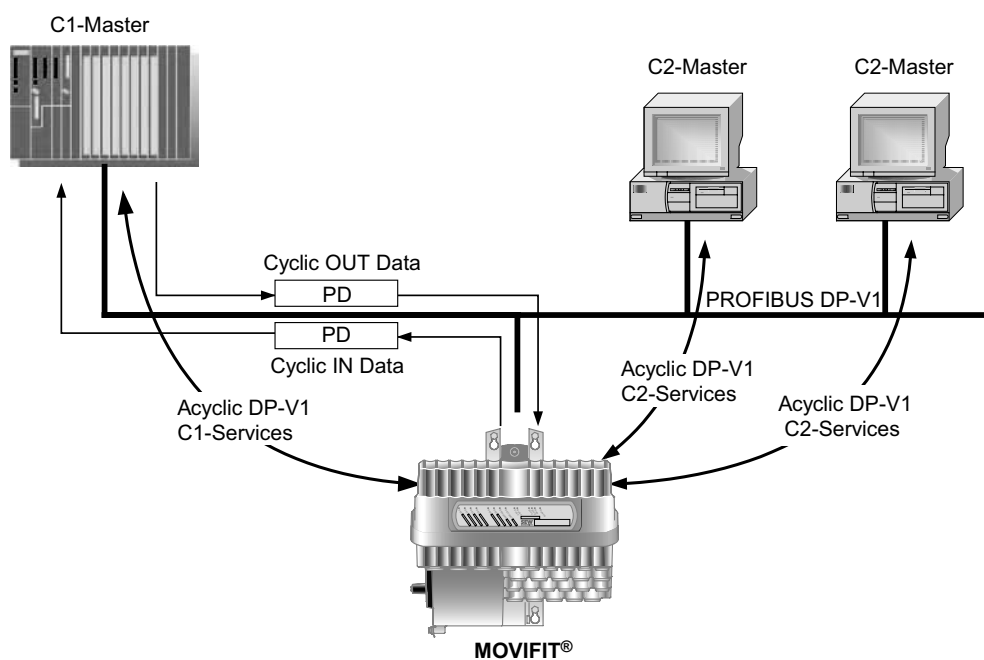
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5.3 Parameter setting using PROFIBUS-DPV1

The PROFIBUS-DPV1 specification introduced new acyclical read/write services within the context of the PROFIBUS-DP expansions. These acyclical services are added to the current cyclical bus operation in special telegrams to ensure compatibility of PROFIBUS-DP (version 0) and PROFIBUS-DPV1 (version 1).

The acyclical read/write services can be used for the exchange of larger volumes of data between master and slave (drive inverter). The advantage of the acyclical data exchange via DPV1 lies in the minimum load on the cyclical bus operation since DPV1 telegrams are only added to the bus cycle if required.



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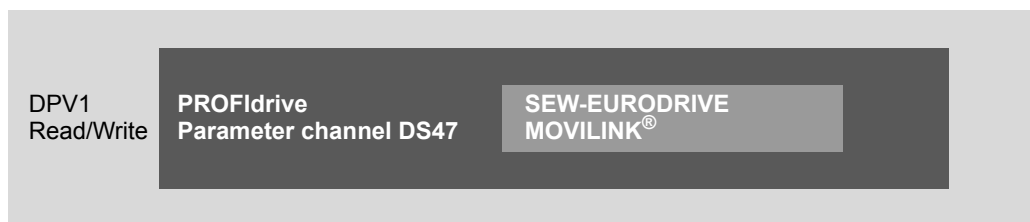


5.3.1 Structure of the DPV1 parameter channel

Data sets (DS)

The user data transported via a DPV1 service is grouped in a data set. Each data set is identified uniquely by its length, a slot number and an index. DPV1 communication with MOVIFIT[®] uses the structure of data set 47, which is defined as a DPV1 parameter channel for drives starting with V3.1 in the PROFIdrive profile "Drive engineering" of the PROFIBUS user organization. Different procedures for accessing parameter data in the drive inverter are provided via this parameter channel.

The drive parameters are usually set according to the PROFIdrive DPV1 parameter channel of profile version 3.0 via data set index 47. The "Request ID" entry is used to distinguish between parameter access based on PROFIdrive profile or via SEW-EURODRIVE MOVILINK[®] services. The "Elements of data set DS47" section shows the possible codings of the individual elements. The data set structure is the same for PROFIdrive and MOVILINK[®] access.



The following MOVILINK[®] services are supported:

- 8-byte MOVILINK[®] parameter channel with all the services supported by the drive inverter such as
- Read parameter
- Write parameter
- Write parameter volatile

The following PROFIdrive services are supported:

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



Elements of data set DS47

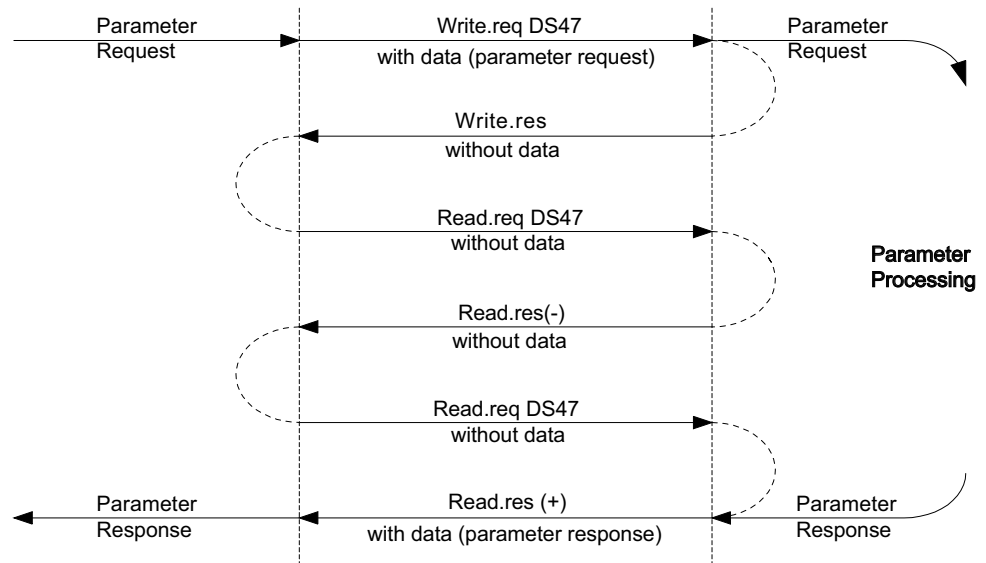
The following table shows the elements of data set DS47.

Field	Data type	Values
Request reference	Unsigned8	0x00 reserved
		0x01..0xFF
Request ID	Unsigned8	0x01 Request parameter (PROFIdrive)
		0x02 Change parameter (PROFIdrive)
		0x40 SEW-EURODRIVE MOVILINK® service
Response ID	Unsigned8	Response (+):
		0x00 reserved
		0x01 Request parameter (+) (PROFIdrive)
		0x02 Change parameter (+) (PROFIdrive)
		0x40 SEW-EURODRIVE MOVILINK® service (+)
		Response (-):
		0x81 Request parameter (-) (PROFIdrive)
		0x82 Change parameter (-) (PROFIdrive)
		0xC0 SEW-EURODRIVE MOVILINK® service (-)
Axis	Unsigned8	0x00..0xFF Number of axis 0..255
		0 = MOVIFIT® fieldbus control unit
		1 = MOVIFIT®-FC: Integrated frequency inverter or 1 = MOVIFIT®-SC: Integrated motor starter
		2 = MOVIFIT®-MC: MOVIMOT® at terminal X71
		3 = MOVIFIT®-MC: MOVIMOT® at terminal X81
		4 = MOVIFIT®-MC: MOVIMOT® at terminal X91
No. of parameters	Unsigned8	0x01..0x13 1..19 DWORDs (240 DPV1 data bytes)
Attribute	Unsigned8	0x10 Value
		For SEW-EURODRIVE MOVILINK® (Request ID = 0x40):
		0x00 No service
		0x10 Read Parameter
		0x20 Write Parameter
		0x30 Write Parameter volatile
		0x40 Read Minimum
		0x50 Read Maximum
		0x60 Read Default
		0x70 Read Scale
		0x80 Read Attribute
		0xA0..0xF0 reserved
No. of elements	Unsigned8	0x00 for non-indexed parameters
		0x01..0x75 Quantity 1..117
Parameter Number	Unsigned16	0x0000..0xFFFF MOVILINK® parameter index
Subindex	Unsigned16	0x0000..0x00FF
Format	Unsigned8	0x43 Double word
		0x44 Fault
No. of Values	Unsigned8	0x00..0xEA Quantity 0..234
Error Value	Unsigned16	0x0000..0x0064 PROFIdrive-Errorcodes
		0x0080 + MOVILINK®-AdditionalCode Low
		For SEW-EURODRIVE MOVILINK® 16 bit error value



5.3.2 Procedure for setting parameters via data set 47 for PROFIBUS DPV1

Parameter access takes place with the combination of the DPV1 services "Write" and "Read". The parameter setting service is transferred to the slave with Write.req, followed by slave-internal processing. The master now sends a Read.req to pick up the parameter setting response. The master repeats the Read.req if the answer (Read.res) from the slave is negative. As soon as the parameter processing in MOVIFIT[®] is concluded, it answers with a positive response (Read.res). The user data now contains the parameter setting response of the parameter setting request that was previously sent with Write.req (see following figure). This mechanism applies to both a C1 and a C2 master.



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5.3.3 MOVILINK® parameter requests

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

Request ID: 0x40 SEW MOVILINK®-Service

The actual service is defined by the data set element Attribute on the MOVILINK® parameter channel. The high nibble of this element corresponds to the service nibble in the management byte of the DPV0 parameter channel.

Example for reading a parameter via MOVILINK® (reading a parameter via DPV1)

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

Sending a parameter request:

The following tables show the coding of the user data for the Write.req service including the DPV1 header. The Write.req service is used to transfer the parameter setting request to the drive inverter.

	Service:	Write.request	Description
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set; constant index 47
	Length	10	10-byte user data for parameter request

	Byte	Field	Value	Description
PROFIdrive Parameter channel	0	Request reference	0x01	Individual reference number for the parameter setting request is reflected in the parameter response
	1	Request ID	0x40	SEW MOVILINK® service
	2	Axis	0x01	1: MOVIFIT®-FC: Integrated frequency inverter
	3	No. of parameters	0x01	1 parameter
	4	Attribute	0x10	MOVILINK® service "Read parameter"
	5	No. of elements	0x00	0 = access to direct value, no subelement
	6 to 7	Parameter Number	0x2267	Parameter index 8807 = P130 Ramp t11 UP
	8 to 9	Subindex	0x0000	Subindex 0

Query parameter response:

The following table shows the coding of the Read.req user data including the DPV1 header.

	Service:	Read.request	Description
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set; constant index 47
	Length	240	Maximum length of response buffer in the DPV1 master



Positive MOVILINK[®] parameter response

The following tables show the Read.res 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
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set: constant index 47
	Length	10	10-byte user data for order buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0x40	Positive MOVILINK [®] response
2	Axis	0x01	Reflected axis number
3	No. of parameters	0x01	1 parameter
4	Format	0x43	Parameter format: Double word
5	No. of values	0x01	1 value
6 to 7	Value Hi	0x0000	Higher-order part of the parameter
8 to 9	Value Lo	0x0BB8	Lower-order part of the parameter
			Decoding: 0x0000 0BB8 = 3000 ms



**Example for
writing a
MOVIFIT®-FC
parameter via
DPV1 with
MOVILINK®**

The following tables give an example of the structure of write and read services for writing the value 3000 ms (BB8_{hex}) to the parameter "P130 Ramp t11 up" in the non-volatile memory (parameter index 8807, subindex 0). Note: The parameters of a MOVIFIT®-FC unit can only be changed in expert mode.

	Service:	Read.request	Description
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set: constant index 47
	Length	16	16-byte user data for order buffer

Byte	Field	Value	Description
0	Request reference	0x01	Individual reference number for the parameter setting request is reflected in the parameter response
1	Request ID	0x40	SEW MOVILINK® service
2	Axis	0x01	1: MOVIFIT®-FC: Integrated frequency inverter
3	No. of parameters	0x01	1 parameter
4	Attribute	0x30	MOVILINK® service "Write parameter volatile"
5	No. of elements	0x00	0 = access to direct value, no subelement
6 to 7	Parameter Number	0x2267	Parameter index 8807 = P130 Ramp t11 UP
8 to 9	Subindex	0x0000	Subindex 0
10	Format	0x43	Double word
11	No. of values	0x01	Change 1 parameter value
12 to 13	Value HiWord	0x0000	Higher-order part of the parameter word
14 to 15	Value LoWord	0x0BB8	Lower-order part of the parameter word

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 results. Otherwise, the status fault is located in Error_code_1.

Query parameter response

The following tables show the coding of the Write.req user data including the DPV1 header.

	Field	Value	Description
DPV1 header	Function_Num		Read.req
	Slot_Number	X	Slot_Number not used
	Index	47	Index of data set
	Length	240	Maximum length of response buffer in DP master



Positive response to "Write parameter volatile"

	Service	Read.response	Description
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set; constant index 47
	Length	4	12-byte user data in response buffer

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

5.3.4 Return codes for parameter setting

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:	Read.response	Description
DPV1 header	Slot_Number	0	Random (is not evaluated)
	Index	47	Index of the data set; constant index 47
	Length	8	8-byte user data in response buffer

Byte	Field	Value	Description
0	Response reference	0x01	Reflected reference number from the parameter setting order
1	Response ID	0xC0	Negative MOVILINK® response
2	Axis	0x00	Reflected axis number
3	No. of parameters	0x01	1 parameter
4	Format	0x44	Error
5	No. of values	0x01	1 error code
6 to 7	Error value	0x0811	MOVILINK® return code, e.g. ErrorClass 0x08, Add.-Code 0x11 (see the table MOVILINK® return codes for DPV1)



**MOVILINK®
parameter
response**

The following table shows the return codes that are returned by MOVIFIT® in case of an error in the DPV1 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
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 option card
0x0502	Timeout of secondary connection (e.g. during Reset or with Sys-Fault)



6 PROFINET IO



NOTE

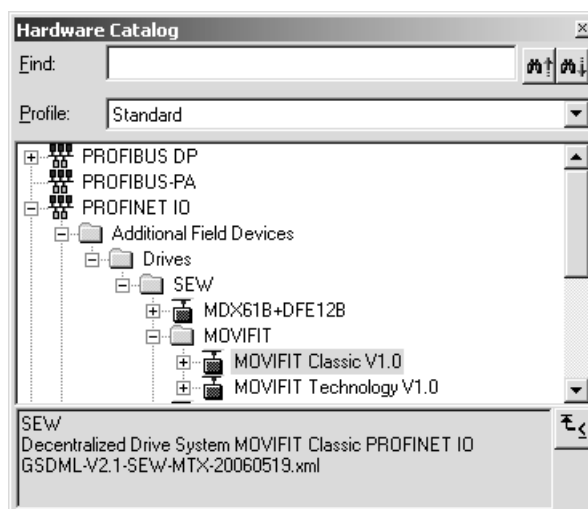
For information about PROFINET connection, PROFINET startup or the description of the PROFINET LED displays, see the relevant MOVIFIT® operating instructions.

6.1 Project planning for the PROFINET IO controller

There is a shared GSD(ML) file available for the project planning of the PROFINET IO controller for MOVIFIT®-Classic and Technology. This file is read in with the project planning software of the PROFINET IO controller and is then available for the project planning of the MOVIFIT® unit in the PROFINET IO controller. Refer to the relevant project planning software manuals for details on the procedure.

- Observe the information in the PDF files about the GSD(ML) file.
- Install the GSD(ML) file "GSDML-V2.1-SEW-MTX-????.xml" according to the instructions of the project planning software for the PROFINET IO controller.
- After successful installation, the "MOVIFIT®-Classic" unit is displayed in the list of slave stations.

The following figure shows how the MOVIFIT® GSD(ML) for PROFINET is displayed in the STEP7 HW Config:



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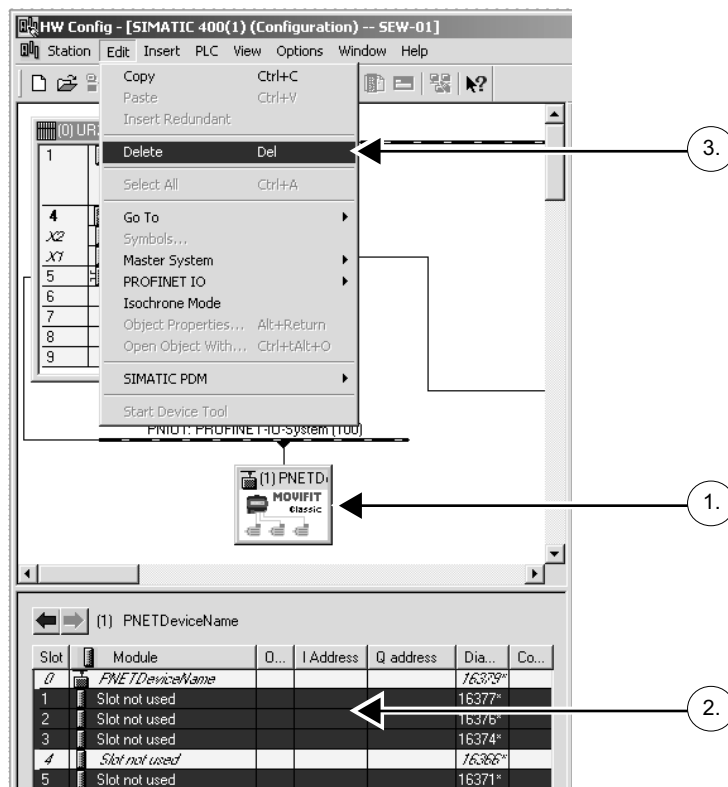
NOTE

The latest version of the GSD(ML) files is always available on the Internet at the following address: <http://www.sew-eurodrive.com>.



1. Add "MOVIFIT®-Classic V1.0" to the PROFINET structure and assign the PROFINET station name. This name must later correspond to the PROFINET unit name specified in the MOVIFIT®.
2. Select all nine MOVIFIT® slots.
3. Delete all slot entries so that you can begin project planning for your application.

The following figure displays points 1 through 3:



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4. Select the process data configuration required for your application (see the following examples for the various MOVIFIT® versions). Note: An empty module must be assigned to unused slots.
5. If you have performed project planning for a PROFIsafe option, you must also set the parameters for this option. Information about this is available in the "Safe Disconnection for MOVIFIT®" manual.
6. Enter the I/O or periphery addresses for the configured data widths.
7. Save the configuration.
8. Add data exchange with the MOVIFIT® units to your program.
9. Process data transfer is not consistent. Do not use SFC14 and SFC15 to transfer process data.
10. Save the project and load it into the PROFINET® master. Once the master has been started, the "BF" LED of the MOVIFIT® should go out. If this is not the case, check the wiring of the PROFINET, the link/act LEDs (see the corresponding MOVIFIT® operating instructions) and the project planning, especially the set PROFINET unit name.

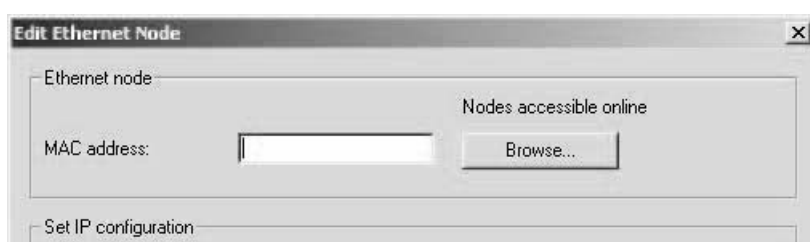


6.2 Assigning the PROFINET IO unit name

The IP address parameters are assigned using the DCP (Discovery and Configuration Protocol) for PROFINET IO. For this, DCP uses the set unit name. The unit name uniquely identifies a PROFINET IO station in the network. It is identified with the PROFINET IO controller for the project planning of the station and also set using the project planning software on the PROFINET IO device. Using the unit name, the controller identifies the unit during startup and transfers the corresponding IP address parameters. Settings directly on the slave are no longer required. The general procedure is described in the example in Simatic Step7.

1. In STEP7 HW-Config, select the submenu "PLC Æ Ethernet Æ Edit Ethernet Node...".

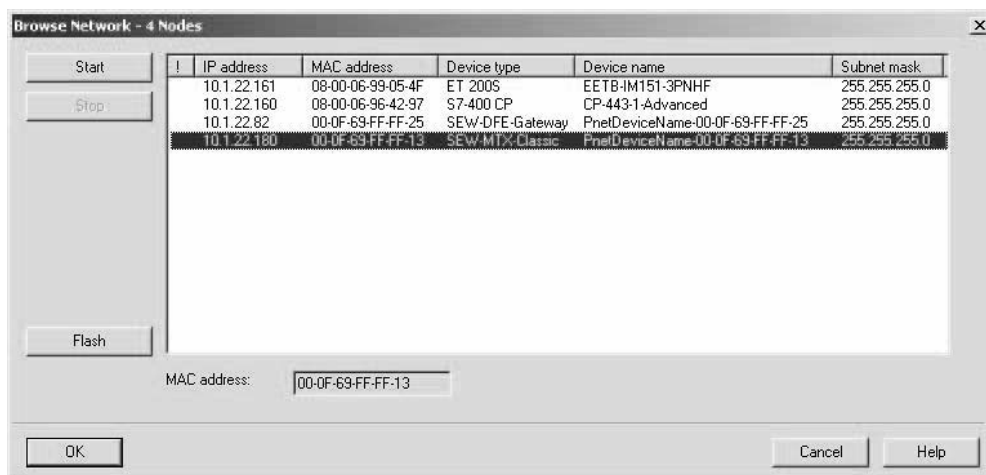
The following window is displayed:



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2. Click on the "Browse" button

You receive an overview of all PROFINET IO stations that you can reach online with your project planning tool.



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Choose the required station. MOVIFIT®-Classic is displayed as "SEW-MTX-Classic". The station name is set at the factory to a default name including the MAC ID, for example, "PnetDeviceName-00-0F-69-XX-XX-XX".

You can distinguish between several "SEW-MTX-Classic" units by their displayed MAC addresses. The MAC address is affixed to the MOVIFIT® option. You can identify the selected MOVIFIT® with the "Flash" button (the BF LED of the selected MOVIFIT® will flash green or green/red). This means you can check your selection in the project planning software in the system using the installed MOVIFIT®.



3. After you have selected the required station, the following window is displayed:

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Enter the device name in the "Device name" field [1] and click the "Assign name" button [2]. The device name is now transferred to the station and saved there. It can be up to 255 characters long. Specify an IP address and a subnet mask as well as a router address [3] if required. Click the "Assign IP configuration" button [4].

Note: It is only possible to assign the IP configuration if the PROFINET IO controller and MOVIFIT® are not being used for cyclical data exchange (BF LED switched off).

You can reset the unit name of the MOVIFIT® unit online using the "Reset" button [5]. It is then necessary to restart the MOVIFIT® unit (switch off/on).

4. Click the "Browse" button again to check whether your settings were adopted.
5. Close the "Edit Ethernet Node" window.



6.3 Project planning for MOVIFIT®-Classic

The slot model is used for project planning with PROFINET. Each slot is assigned to a MOVIFIT® communication interface. The project planning process is the same for the entire MOVIFIT®-Classic line.

The following table shows PROFINET project planning for MOVIFIT®-Classic:

Slot	Assignment (DP-ID)	Plug-in modules	Slot used in		
			MC	FC	SC
1	"PROFIsafe-Option"	"Slot not used"	x	x	
		"F module I/O" (2 byte)	x	x	
2	"MOVIFIT® Status"	"Slot not used"	x	x	x
		"MOVIFIT® Status"	x	x	x
3	"Integrated FC/SC"	"Slot not used"	x	x	x
		"SC 1PO/1PI"			x
		"SC 1PO/2PI"			x
		"SC 1PO/3PI"			x
		"FC 2PD"		x	
		"FC 3PD"		x	
4	"Option Module"	"Slot not used"	x	x	x
5	"Digital Inputs"	"Slot not used"	x	x	x
		"12/16DI"	x	x	x
6	"Digital Outputs"	"Slot not used"	x	x	x
		"4 DO"	x	x	x
7	"MOVIMOT® 1"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		
8	"MOVIMOT® 2"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		
9	"MOVIMOT® 3"	"Slot not used"	x	x	x
		"MOVIMOT® 2PD"	x		
		"MOVIMOT® 3PD"	x		



6.3.1 Application example MOVIFIT®-MC

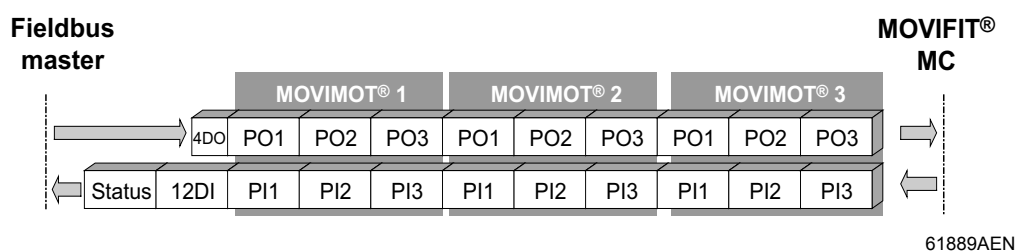
The following application requirements should be implemented with MOVIFIT®-MC:

- Three MOVIMOT® drives are controlled with 3 process data words. In other words, the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- The 12 digital inputs and 4 digital outputs of MOVIFIT® are used to address external sensors and actuators.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-MC application.

Slot	Assignment	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT® Status"
3	"Integrated FC/SC"	"Slot not used"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"12/16DI"
6	"Digital Outputs"	"4 DO"
7	"MOVIMOT® 1"	"MOVIMOT® 3PD"
8	"MOVIMOT® 2"	"MOVIMOT® 3PD"
9	"MOVIMOT® 3"	"MOVIMOT® 3PD"

The following figure shows which process data is transferred via PROFINET. 19 bytes are sent as output data from the fieldbus master to MOVIFIT®-MC and 22 bytes are sent as input data to the fieldbus master.



NOTE

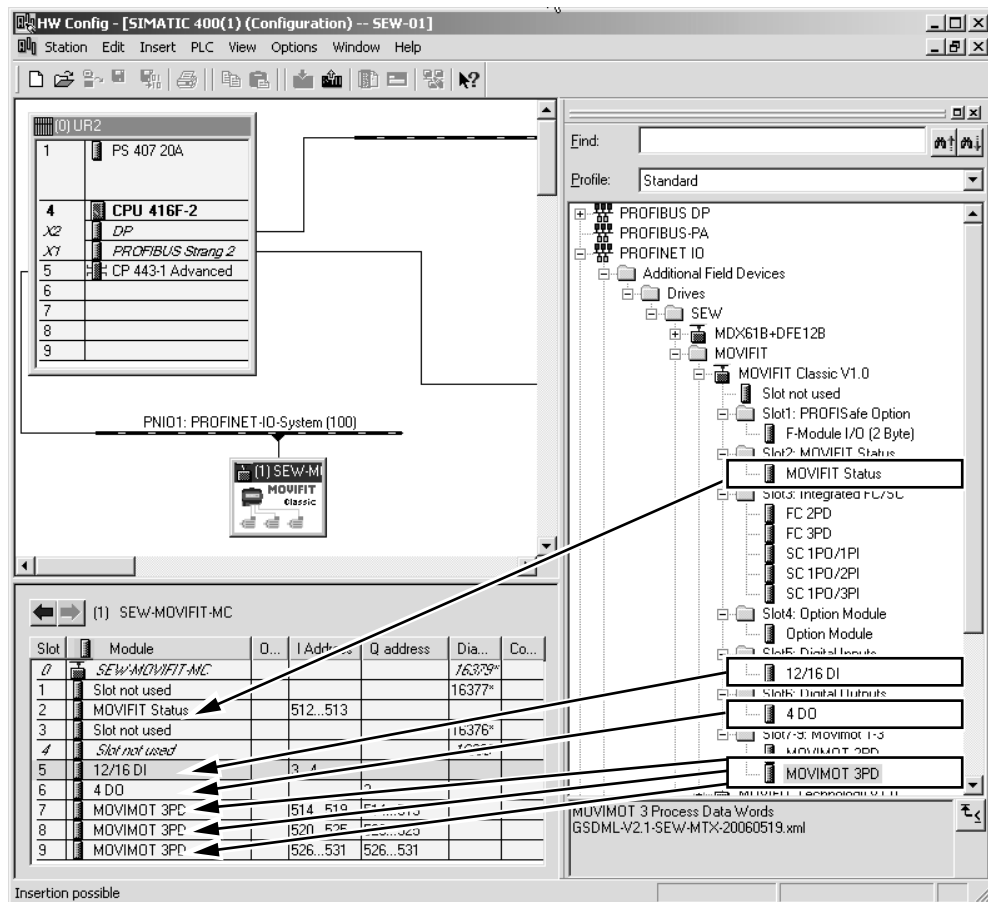
For information on the coding of process data for MOVIMOT® drives, digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



PROFINET IO

Project planning for MOVIFIT®-Classic

The following figure shows the MOVIFIT®-MC project planning example in STEP7:



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6.3.2 Application example MOVIFIT®-SC

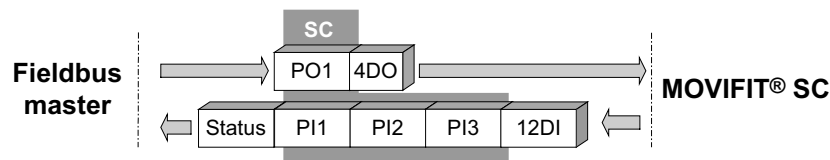
The following application requirements should be implemented with MOVIFIT®-SC:

- The integrated motor starter (SC) is to operate two motors. The current actual value is also used for monitoring within the controller.
- Six digital inputs and two digital outputs of MOVIFIT®-SC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-SC application:

Slot	Assignment (DP-ID)	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT® Status"
3	"Integrated FC/SC"	"SC 1PO/3PI"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"12/16DI"
6	"Digital Outputs"	"4 DO"
7	"MOVIMOT® 1"	"Slot not used"
8	"MOVIMOT® 2"	"Slot not used"
9	"MOVIMOT® 3"	"Slot not used"

The following figure shows which process data is transferred via PROFINET. 3 bytes are sent as output data from the fieldbus master to MOVIFIT®-SC. 9 bytes are sent as input data to the fieldbus master.



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NOTE

For information on the coding of process data for MOVIFIT®-SC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



The following figure shows the MOVIFIT®-SC project planning example in STEP7:

HW Config - [SIMATIC 400(1) (Configuration) -- SEW-01]

Station Edit Insert PLC View Options Window Help

[0] UR2

1	PS 407 20A
4	CPU 416F-2
X2	DP
X7	PROFIBUS Strang 2
5	CP 443-1 Advanced
6	
7	
8	
9	

PNIO1: PROFINET-IO-System (100)

[1] SEW-MI

[1] SEW-MOVIFIT-SC

Slot	Module	Q...	I Address	Q address	Di...	Co...
0	SEW-MOVIFIT-SC				16372*	
1	Slot not used				16377*	
2	MOVIFIT Status		512...513			
3	SC 1PD/3PI		514...519	514...		
4	Slot not used				16376*	
5	12/16 DI					
6	4 DO			2		
7	Slot not used				16374*	
8	Slot not used				16371*	
9	Slot not used				16370*	

Insertion possible

Hardware Tree:

- PROFIBUS DP
- PROFIBUS-PA
- PROFINET IO
 - Additional Field Devices
 - Drives
 - SEW
 - MDX61B+DFE12B
 - MOVIFIT
 - MOVIFIT Classic V1.0
 - Slot not used
 - Slot1: PROFISafe Option
 - F-Module I/O (2 Byte)
 - Slot2: MOVIFIT Status
 - MOVIFIT Status
 - Slot3: Integrated FC/SC
 - FC 2PD
 - FC 3PD
 - SC 1PD/1PI
 - SC 1PD/2PI
 - SC 1PD/3PI
 - Slot4: Option Module
 - Option Module
 - Slot5: Digital Inputs
 - 12/16 DI
 - Slot6: Digital Outputs
 - 4 DO
 - Slot7-9: Movimot 1-3
 - MOVIMOT 2PD
 - MOVIMOT 3PD

SC Motorswitch 1PD/3PI
GSDML-V2.1-SEW-MTX-20060519.xml

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6.3.3 Application example MOVIFIT®-FC

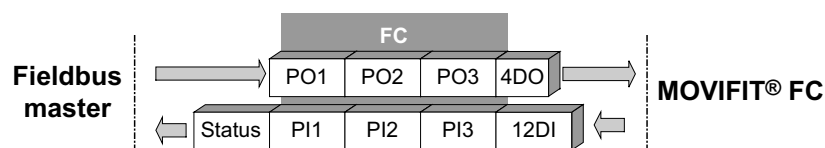
The following application requirements should be implemented with MOVIFIT®-FC:

- The integrated frequency inverter (FC) is controlled with 3 process data words. In other words, the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- Six digital inputs and two digital outputs of MOVIFIT®-FC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following table shows the configuration example for this MOVIFIT®-FC application:

Slot	Assignment (DP-ID)	Plug-in module
1	"PROFIsafe-Option"	"Slot not used"
2	"MOVIFIT® Status"	"MOVIFIT® Status"
3	"Integrated FC/SC"	"FC 3PD"
4	"Option Module"	"Slot not used"
5	"Digital Inputs"	"12/16DI"
6	"Digital Outputs"	"4 DO"
7	"MOVIMOT® 1"	"Slot not used"
8	"MOVIMOT® 2"	"Slot not used"
9	"MOVIMOT® 3"	"Slot not used"

The following figure shows which process data is transferred via PROFINET. 7 bytes are sent as output data from the fieldbus master to MOVIFIT®-FC and 9 bytes are sent as input data to the fieldbus master.



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NOTE

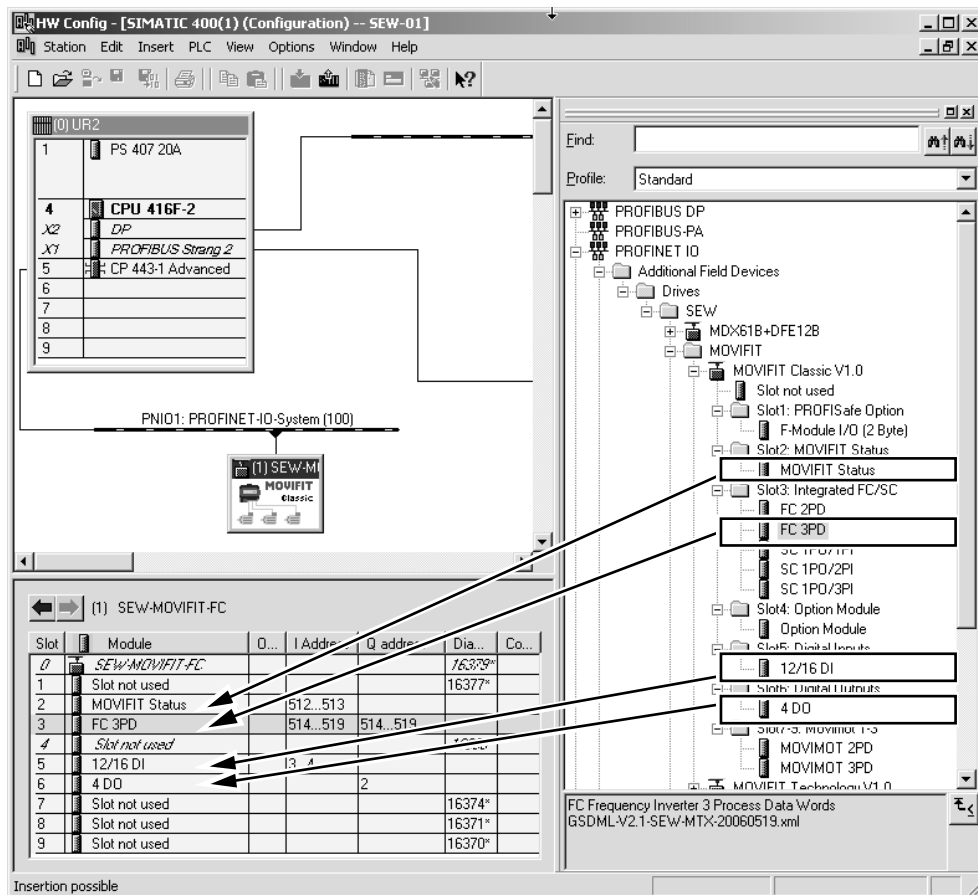
For information on the coding of process data for MOVIFIT®-FC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



PROFINET IO

Project planning for MOVIFIT®-Classic

The following figure shows the MOVIFIT®-FC project planning example in STEP7:



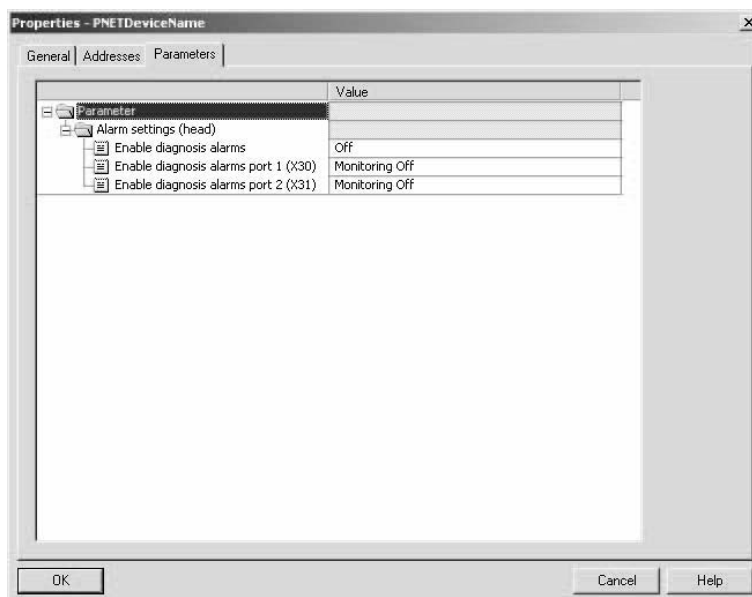
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6.4 PROFINET diagnostic alarms

6.4.1 Switching on the diagnostic alarms

The PROFINET interface supports diagnostic alarms in case of a unit fault. These diagnostic alarms are switched off at the factory. You can switch on the alarms in STEP7-HW-Config by selecting a slot and by right-clicking and selecting "Object Properties" and opening the dialog for setting the parameter. Set the alarms to "On".

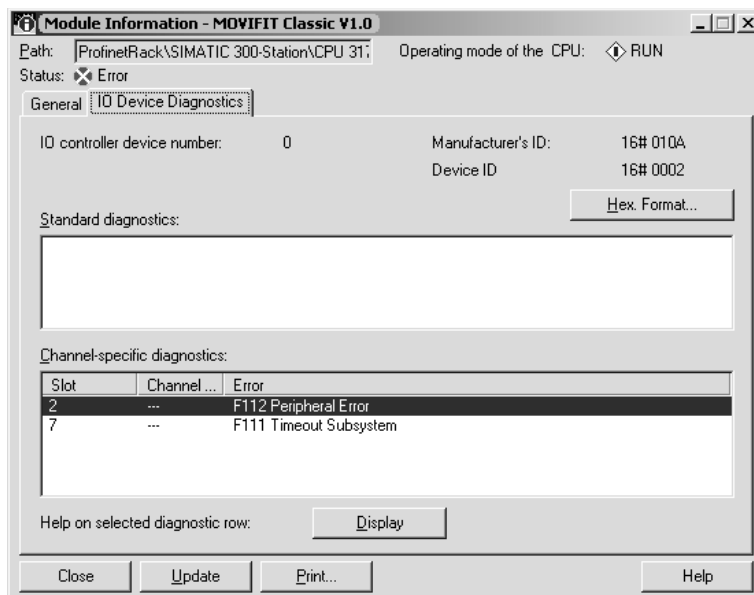


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6.4.2 Determining the cause of fault

A fault in the function unit belonging to the plug-in module causes a diagnostic alarm to be sent to the SIMATIC controller as an "incoming event". The SF LED lights up red. The cause of fault can be determined in STEP7 HW Config by going online, selecting the SEW PROFINET connection icon and calling up the "Module Information" using the right mouse button.



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If you click "Display", you will receive details about the fault.

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

6.4.3 Monitoring the Ethernet connection

A special feature is the possibility to monitor the Ethernet connections using the integrated switch. The monitoring of both Ethernet ports can be activated separately via "Slot 0". For line topology, it makes sense to activate the monitoring of the port to which more PROFINET devices are attached, rather than the PROFINET controller (master).



6.4.4 MOVIFIT® diagnostic alarms

Slot	Possible causes of fault
0	Port 1 Link Down Port 2 Link Down MOVIFIT® EBOX hardware fault (e.g. Watchdog fault)
1	Fault in the connection with PROFIsafe option S11. This fault is described in the "Safe Disconnection for MOVIFIT®" manual.
2	Fault in connecting with the information displayed via the MOVIFIT® status word (e.g. maintenance switch activated)
3	F111: Communication link to internal power section interrupted.
4	–
5	–
6	–
7	F111: Communication link to MOVIMOT® interrupted.
8	F111: Communication link to MOVIMOT® interrupted.
9	F111: Communication link to MOVIMOT® interrupted.



7 DeviceNet

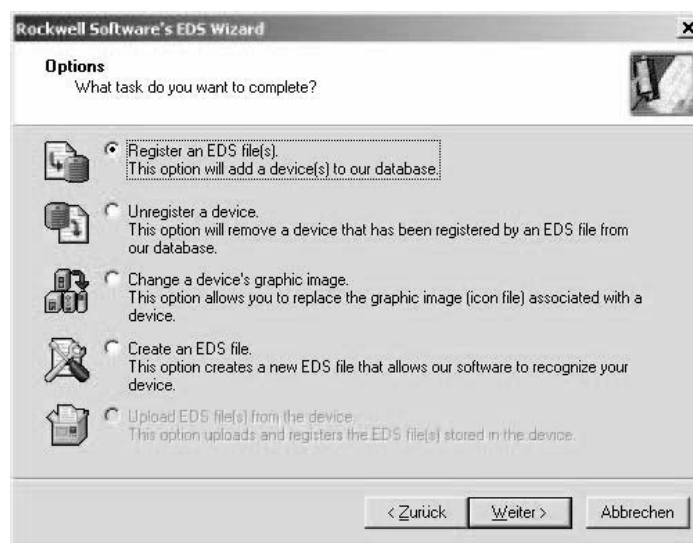


NOTE

For information about the DeviceNet connection, DeviceNet startup (MAC ID, baud rate, etc.) or the description of the DeviceNet LED displays, see the relevant MOVIFIT® operating instructions.

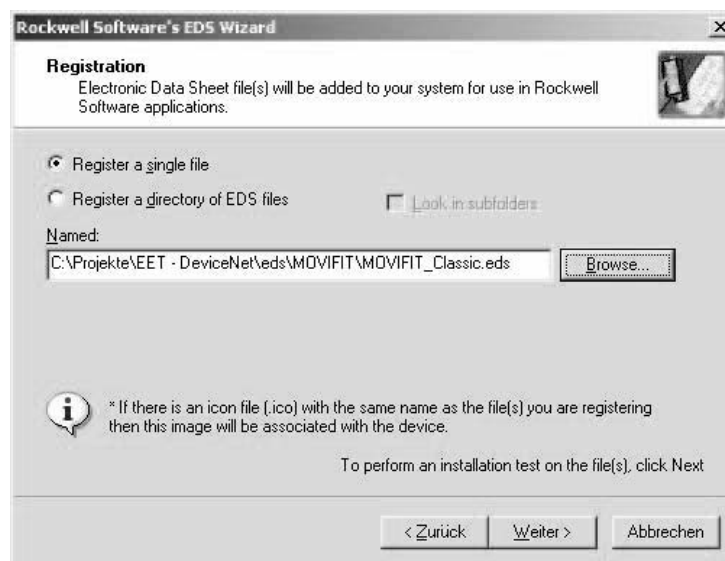
7.1 Installing the EDS file via RSNetworkx

1. Open RSNetworkx
2. Activate the "Tools/EDS Wizard ..." menu item, the following window appears:



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3. Select "Register an EDS file(s)" and the following window appears:

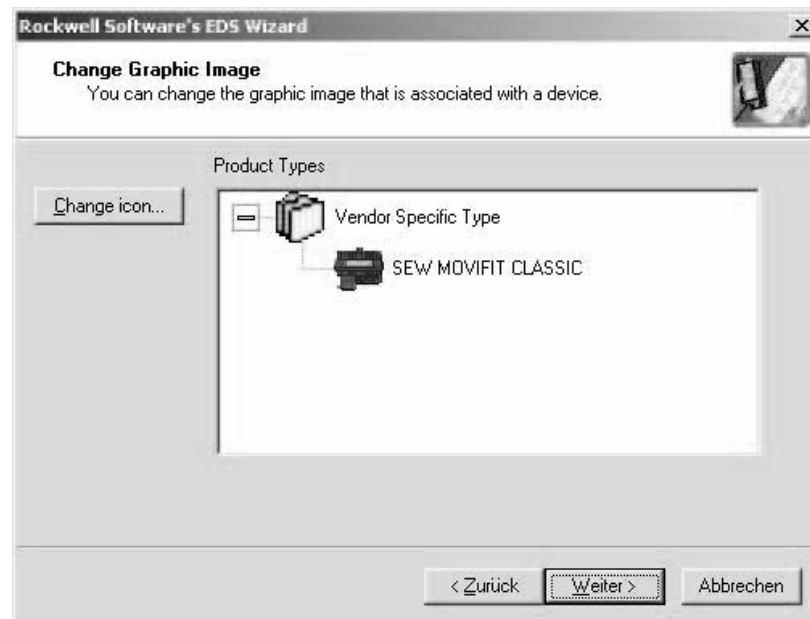


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4. Select the EDS file with the "Browse" button.



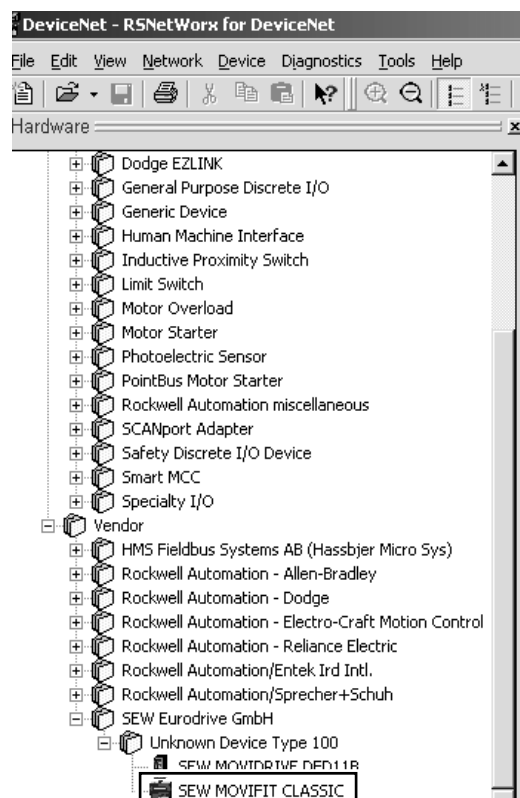
5. Confirm the selection and the following window appears:



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6. Select the icon file.
7. Finish the installation

After successfully completing the installation, MOVIFIT® is displayed in the hardware list:

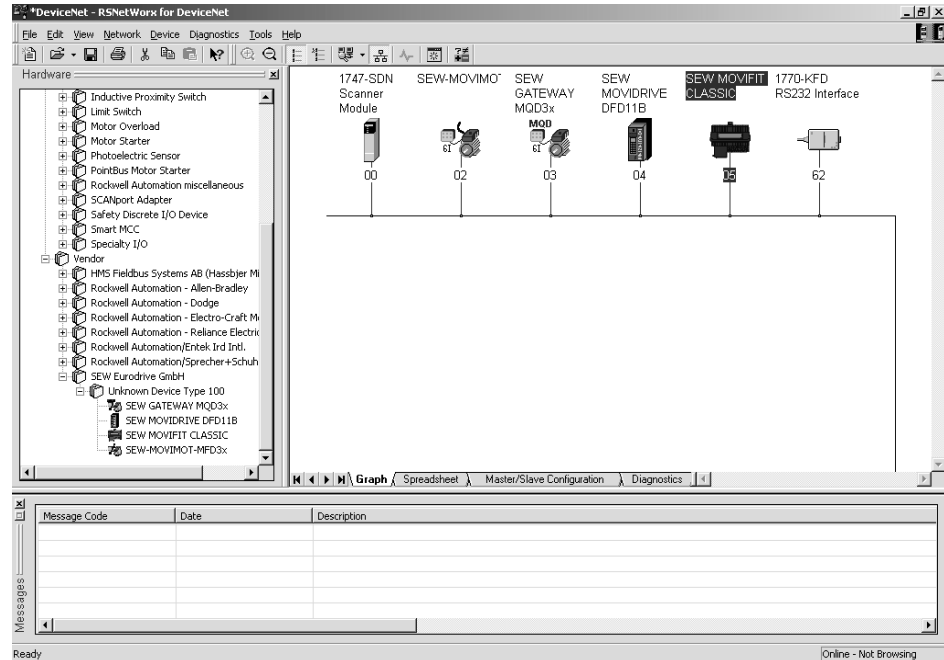


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7.2 Project planning for MOVIFIT®-Classic

After scanning the DeviceNet (e.g. with RSNetWorx via a single scan or when changing to online mode), the MOVIFIT® is displayed in the network tree.



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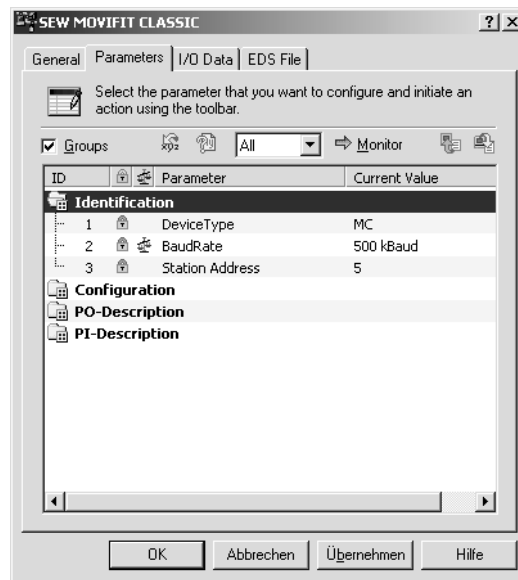
7.2.1 Configuration of MOVIFIT®

Double-click on the MOVIFIT® symbol to open a dialog box in which you can set the configuration parameters of the MOVIFIT® unit.

Identification

In this group, the MOVIFIT® unit type can be read out. In this example, a MOVIFIT®-MC is connected.

In addition, the baud rate and MAC ID (station address) are displayed.

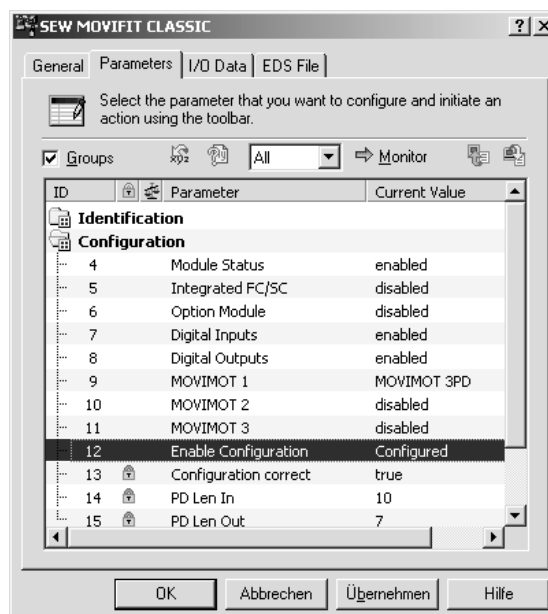


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Configuration

The configuration parameters for the DeviceNet process data interface can be changed in the "Configuration" group. When the unit has been scanned for the first time, the individual MOVIFIT® variants are displayed with their maximum process image.

The following figure shows the configuration of the DeviceNet process data.



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Changing the process data interface

Individual configurations can be deactivated via "Configuration" if required. These settings will be saved to the ABOX of the MOVIFIT® and are thus still available even when the unit has been changed. Parameter 12 "Enable Configuration = Change" causes the set parameters to become operative in the unit. Subsequently, the parameter "Enable Configuration" is automatically set to "configured" again. The transferred values can be displayed by repeating the upload. After the new upload, parameter 13 "Configuration correct" indicates whether the set configuration is valid (true) or invalid (false).

Upon successful configuration, the process data lengths are displayed in bytes in parameters 14 and 15. The calculation of this process data length is based on the configuration of MOVIFIT®. If you change the configuration, you will also have to set the new process data length in the parameters of the controller.

Depending on the unit types MC, FC and SC, different configuration groups can be set.

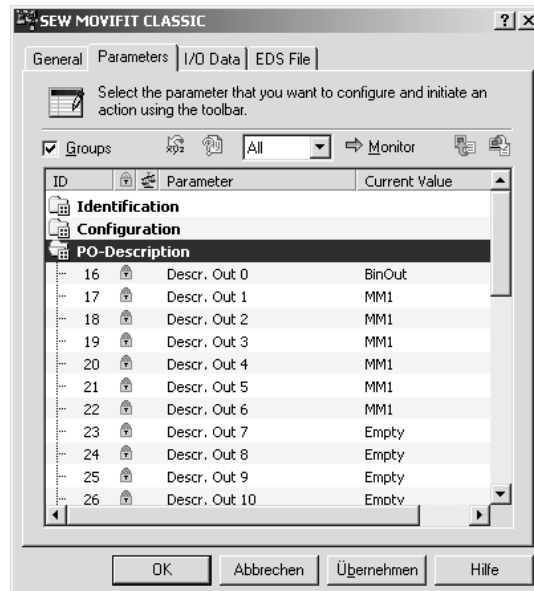
The following table shows the overview of all DeviceNet configurations for MOVIFIT®-Classic:

Configuration	Name of configuration	Possible settings	used with			Length in bytes	
			MC	FC	SC	In	Out
4	"Module Status"	"disabled"	x	x	x	0	0
		"enabled"	x	x	x	2	0
5	"Integrated FC/SC"	"disabled"	x	x	x	0	0
		"SC 1PO/1PI"			x	2	2
		"SC 1PO/2PI"			x	4	2
		"SC 1PO/3PI"			x	6	2
		"FC 2PD"		x		4	4
		"FC 3PD"		x		6	6
6	"Option Module"	"disabled"	x	x	x	0	0
7	"Digital Inputs"	"disabled"	x	x	x	0	0
		"enabled"	12/16DI	6/8DI	6/8DI	2/1	0
8	"Digital Outputs"	"disabled"	x	x	x	0	0
		"enabled"	4DO	2DO	2DO	0	1
9	"MOVIMOT® 1"	"disabled"	x	x	x	0	0
		"MOVIMOT® 2PD"	x			4	4
		"MOVIMOT® 3PD"	x			6	6
10	"MOVIMOT® 2"	"disabled"	x	x	x	0	0
		"MOVIMOT® 2PD"	x			4	4
		"MOVIMOT® 3PD"	x			6	6
11	"MOVIMOT® 3"	"disabled"	x	x	x	0	0
		"MOVIMOT® 2PD"	x			4	4
		"MOVIMOT® 3PD"	x			6	6
12	"Enable Configuration"	"Configured"	x	x	x	–	–
		"Change"	x	x	x	–	–
13	"Configuration correct"	"false"	x	x	x	–	–
		"true"	x	x	x	–	–
14	"PD Len In"	Number of bytes	x	x	x	–	–
15	"PD Len Out"	Number of bytes	x	x	x	–	–



PO-Description

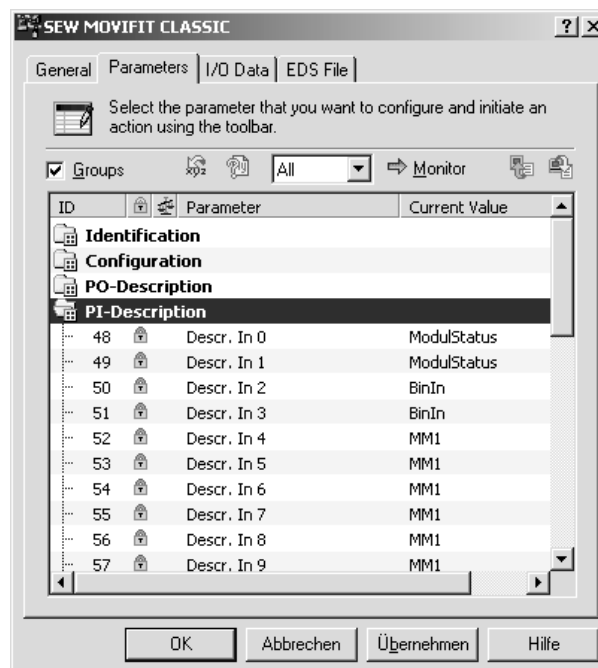
The PO-Description group displays the process data assignment of the output data bytes. In this example, byte 0 describes the binary outputs, while bytes 1 – 6 describe the three process data words for MOVIMOT® 1.



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PI-Description

The PI-Description group displays the process data assignment of the input data bytes. In this example, bytes 0 and 1 describe the module status, bytes 2 and 3 the binary inputs, and bytes 4 – 9 the three process data words for MOVIMOT® 1.



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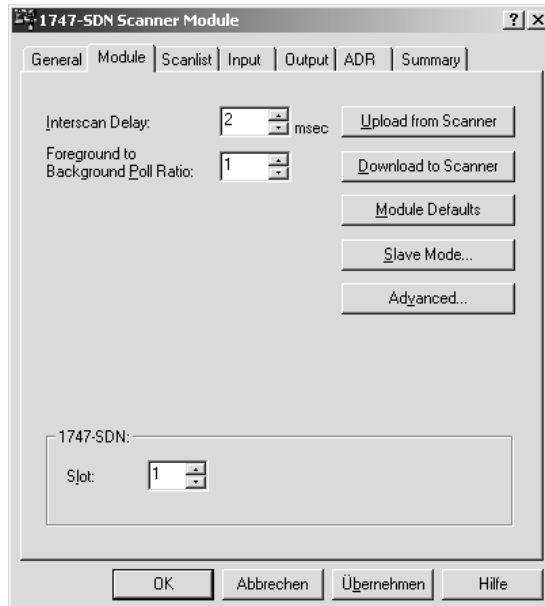


7.2.2 Configuration of the PLC

Double-click on the PLC icon to start the configuration process.

"Module" tab

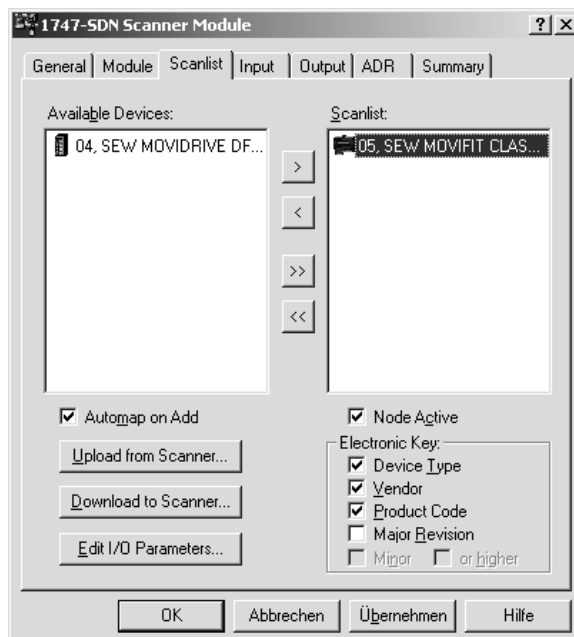
On the "Module" tab, you can enter the interscan delay, which determines the cycle time of the process data.



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"Scanlist" tab

On the "Scanlist" tab, the available devices are displayed on the left part of the window. Choose the MOVIFIT® from this list and add it to the scanlist by clicking on the ">" button.



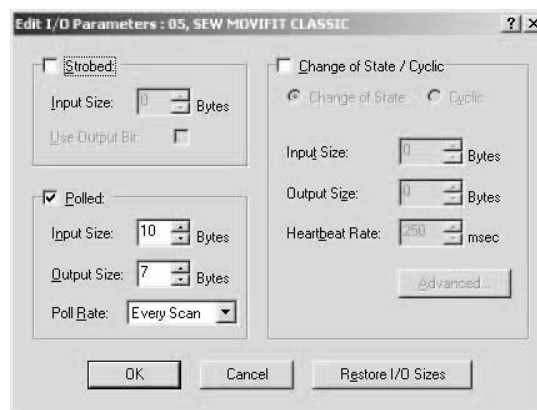
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Double-click the unit in the scanlist to configure the process data width. Set the process data width that is displayed in the parameter object (parameter no. 14 and 15). Press OK to close this dialog box.

The data must then be loaded into the PLC by clicking the "Apply" button. (You must first switch the controller to programming mode!)

The following figure shows the I/O parameters for MOVIFIT®-MC with a MOVIMOT®:



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Data consistency:

You will have to copy the values in the controller to a temporary area via copy block to exchange the data consistently.

Control via DeviceNet with polled I/O:

The process data width is based on the type of MOVIFIT® used (MC, FC, SC). The DeviceNet scanner stores the process data in the PLC via a direct I/O area or via M files.

Idle mode of DeviceNet interface:

In idle mode, the process data is sent by the controller without contents. In this case, the process output data of the MOVIFIT® is set to zero while all outputs are disabled and all subordinate drives are stopped.

Duplicate MAC ID detection:

A duplicate MAC ID check is performed to ensure that all DeviceNet-compliant stations connected to the bus have a different address. This test is performed after power up and indicated via LEDs.



7.2.3 Project planning for a MOVIFIT®-MC

The following table gives an overview of configuration possibilities for MOVIFIT®-MC, Classic function level. On delivery, the entries highlighted in bold are preset so that the maximum functionality of the MOVIFIT® unit is available via DeviceNet.

Configuration	Name of configuration	Possible settings	Length in bytes	
			In	Out
4	"Module Status"	"disabled"	0	0
		"enabled"	2	0
5	"Integrated FC/SC"	"disabled"	0	0
6	"Option Module"	"disabled"	0	0
7	"Digital Inputs"	"disabled"	0	0
		"enabled"	2	0
8	"Digital Outputs"	"disabled"	0	0
		"enabled"	0	1
9	"MOVIMOT® 1"	"disabled"	0	0
		"MOVIMOT® 2PD"	4	4
		"MOVIMOT® 3PD"	6	6
10	"MOVIMOT® 2"	"disabled"	0	0
		"MOVIMOT® 2PD"	4	4
		"MOVIMOT® 3PD"	6	6
11	"MOVIMOT® 3"	"disabled"	0	0
		"MOVIMOT® 2PD"	4	4
		"MOVIMOT® 3PD"	6	6
12	"Enable Configuration"	"Configured"	0	0
		"Change"	0	0
13	"Configuration correct"	"false"	0	0
		"true"	0	0
14	"PD Len In"	Number of bytes	22	0
15	"PD Len Out"	Number of bytes	–	19



NOTE

Caution: If there are more MOVIMOT® drives connected than configured, the MOVIFIT®-MC issues a system fault message. The "SF" LED lights up in red. Set the MOVIMOT® units that are not being used to "disabled" in the DeviceNet configuration.

Note on changing the default configuration:

The default configuration of MOVIFIT®-MC can be changed if in the DeviceNet application:

- Less than three MOVIMOT® units are operated
- The MOVIMOT® drives are to be controlled via two process data words
- The digital inputs, outputs or the MOVIFIT® status are not to be evaluated



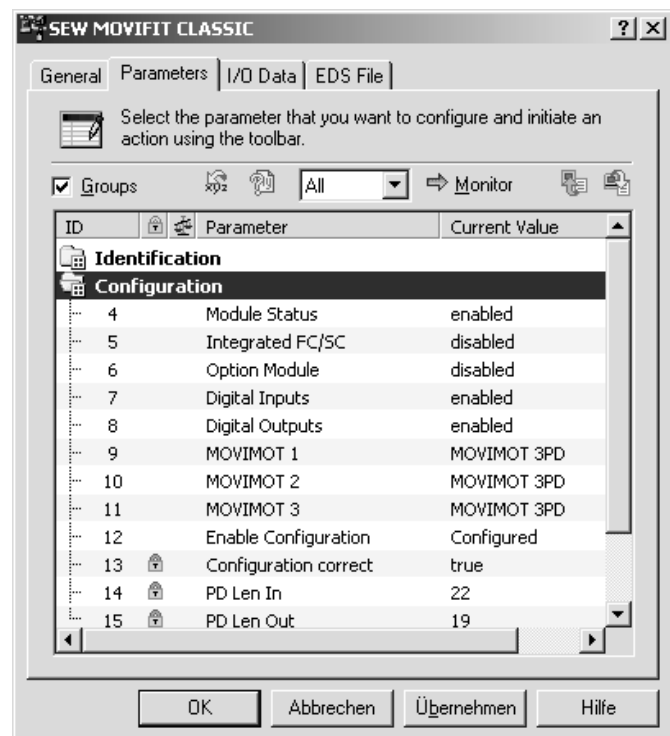
**Application
example
MOVIFIT®-MC**

The following application requirements should be implemented with MOVIFIT®-MC:

- Three MOVIMOT® drives are controlled with 3 process data words. In other words, the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- The 12 digital inputs and 4 digital outputs of MOVIFIT® are used to address external sensors and actuators.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

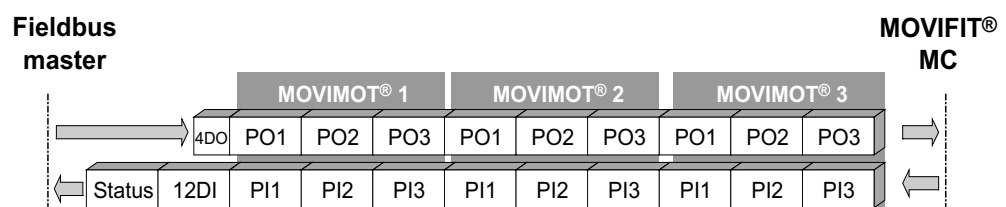
The following figure shows the default configuration for MOVIFIT®-MC. Parameter 14 "PD Len In" and parameter 15 "PD Len Out" specify the number of input and output data bytes, which have to be entered in the PLC project planning of "Polled I/Os".

Polled I/O Parameters	
Input size:	22 bytes
Output size:	19 bytes



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The following figure shows the process data of the MOVIFIT®-MC default configuration.



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NOTE

For information on the coding of process data for MOVIMOT® drives, digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



7.2.4 Project planning for a MOVIFIT®-SC

The following table gives an overview of configuration possibilities for MOVIFIT®-SC (motor starter), Classic function level. On delivery, the entries highlighted in bold are preset so that the maximum functionality of the MOVIFIT® unit is available via DeviceNet.

Configuration	Name of configuration	Possible settings	Length in bytes	
			In	Out
4	"Module Status"	"disabled"	0	0
		"enabled"	2	0
5	"Integrated FC/SC"	"disabled"	0	0
		"SC 1PO/1PI"	2	2
		"SC 1PO/2PI"	4	2
		"SC 1PO/3PI"	6	2
6	"Option Module"	"disabled"	0	0
7	"Digital Inputs"	"disabled"	0	0
		"enabled"	1	0
8	"Digital Outputs"	"disabled"	0	0
		"enabled"	0	1
9	"MOVIMOT® 1"	"disabled"	0	0
10	"MOVIMOT® 2"	"disabled"	0	0
11	"MOVIMOT® 3"	"disabled"	0	0
12	"Enable Configuration"	"Configured"	0	0
		"Change"	0	0
13	"Configuration correct"	"false"	0	0
		"true"	0	0
14	"PD Len In"	Number of bytes	9	0
15	"PD Len Out"	Number of bytes	—	3

Note on changing the default configuration

The default configuration of MOVIFIT®-SC can be changed if in the DeviceNet application:

- The integrated motor starter is to be operated with a different process data configuration
- The digital inputs, outputs or the MOVIFIT® status are not to be used



NOTE

Caution: Activating a configuration not supported by MOVIFIT®-SC will lead to an invalid configuration. This will be displayed by parameter 13 "Configuration correct" = "false".

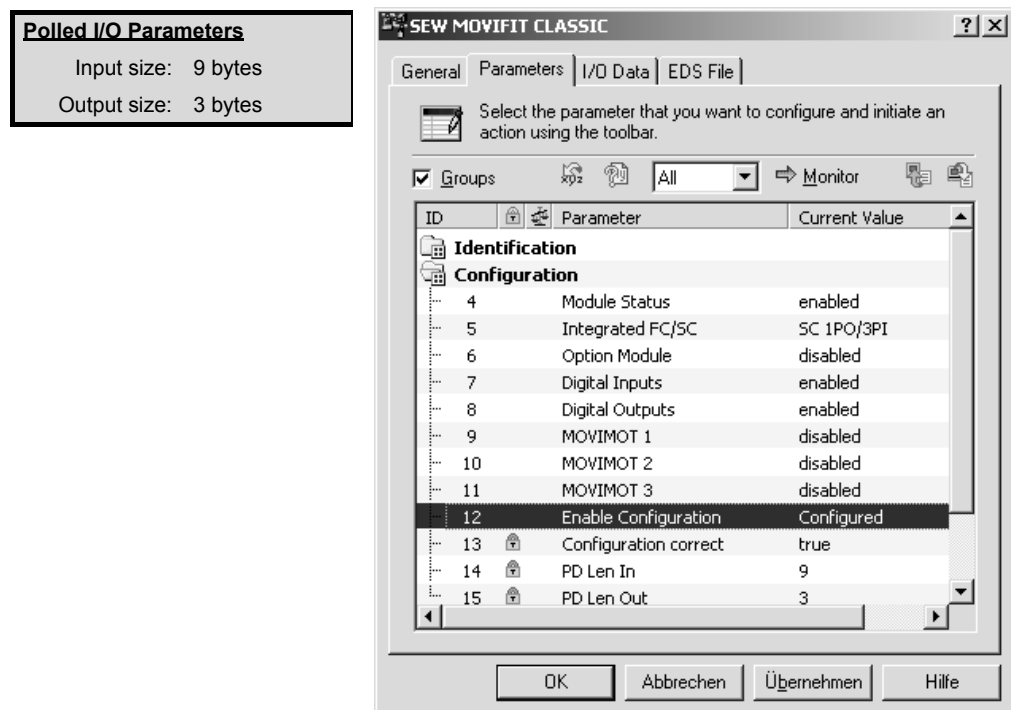


**Application
example
MOVIFIT®-SC**

The following application requirements should be implemented with MOVIFIT®-SC:

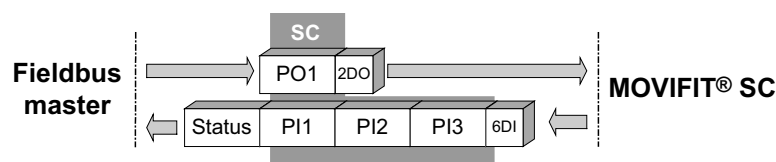
- The integrated motor starter (SC) is to operate two motors. The current actual value is also used for monitoring within the controller.
- Six digital inputs and two digital outputs of MOVIFIT®-SC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

The following figure shows the default configuration for MOVIFIT®-SC. Parameter 14 "PD Len In" and parameter 15 "PD Len Out" specify the number of input and output data bytes, which have to be entered in the PLC project planning of "Polled I/Os".



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The following figure shows the process data of the MOVIFIT®-SC default configuration.



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NOTE

For information on the coding of process data for MOVIFIT®-SC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



7.2.5 Project Planning for a MOVIFIT®-FC

The following table gives an overview of configuration possibilities for MOVIFIT®-FC (frequency inverter), Classic function level. On delivery, the entries highlighted in bold are preset so that the maximum functionality of the MOVIFIT® unit is available via DeviceNet.

Configuration	Name of configuration	Possible settings	Length in bytes	
			In	Out
4	"Module Status"	"disabled"	0	0
		"enabled"	2	0
5	"Integrated FC/SC"	"disabled"	0	0
		"SC 1PO/1PI"	2	2
		"SC 1PO/2PI"	4	2
		"SC 1PO/3PI"	6	2
		"FC 2PD"	4	4
		"FC 3PD"	6	6
6	"Option Module"	"disabled"	0	0
7	"Digital Inputs"	"disabled"	0	0
		"enabled"	1	0
8	"Digital Outputs"	"disabled"	0	0
		"enabled"	0	1
9	"MOVIMOT 1"	"disabled"	0	0
10	"MOVIMOT 2"	"disabled"	0	0
11	"MOVIMOT 3"	"disabled"	0	0
12	"Enable Configuration"	"Configured"	0	0
		"Change"	0	0
13	"Configuration correct"	"false"	0	0
		"true"	0	0
14	"PD Len In"	Number of bytes	9	0
15	"PD Len Out"	Number of bytes	–	7

Note on changing the default configuration

The default configuration of MOVIFIT®-FC can be changed if in the DeviceNet application:

- The integrated frequency inverter is to be controlled via two process data words only (without ramp specification)
- The digital inputs, outputs or the MOVIFIT® status are not to be used



NOTE

Caution: Activating a configuration not supported by MOVIFIT®-FC will lead to an invalid configuration. This will be displayed by parameter 13 "Configuration correct" = "false".



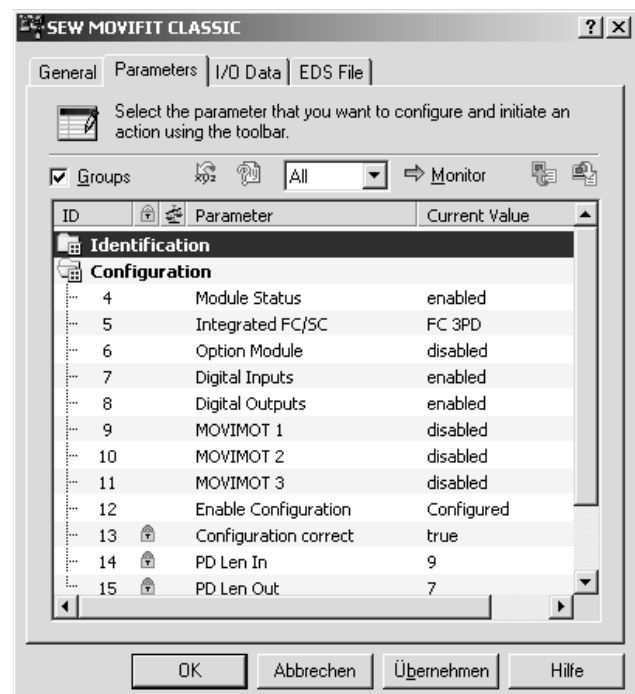
**Application
example
MOVIFIT®-FC**

The following application requirements should be implemented with MOVIFIT®-FC:

- The integrated frequency inverter (FC) is controlled with 3 process data words. In other words, the control word, the speed and the times for acceleration and deceleration ramps are specified cyclically by the higher-level controller.
- Six digital inputs and two digital outputs of MOVIFIT®-FC are used for external sensors and actuators around MOVIFIT®.
- The sensor/actuator channels and the maintenance switches are to be monitored within the control program.
- No options are to be used.

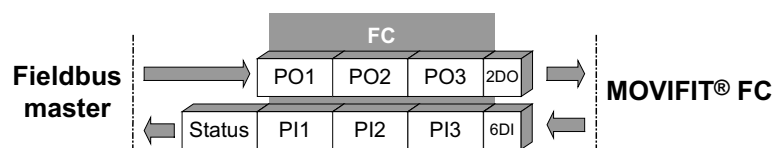
The following figure shows the default configuration for MOVIFIT®-FC. Parameter 14 "PD Len In" and parameter 15 "PD Len Out" specify the number of input and output data bytes, which have to be entered in the PLC project planning of "Polled I/Os".

Polled I/O Parameters	
Input size:	9 bytes
Output size:	7 bytes



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The following figure shows the process data of the MOVIFIT®-FC default configuration.



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NOTE

For information on the coding of process data for MOVIFIT®-FC digital I/Os and status information (maintenance switches), see the "Process Data Description" section from page 64.



7.3 Parameter setting via DeviceNet

7.3.1 SEW parameter channel

The SEW parameter channel is a connection that you can use to change or read parameters in MOVIFIT®. It is represented in form of explicit messages. Access to the SEW parameter channel is by means of the register object (class 7) and the parameter object (class 15).

7.3.2 Register object (class 7)

The SEW parameter channel can be addressed via the services

- Get_Attribute_Single
- Set_Attribute_Single

The following possibilities for addressing the parameter data channel derive from the way the register object is specified by DeviceNet so that Input objects can only be read and Output objects can be read and written.

The following table shows the assignment of instances to the MOVILINK® parameter services:

Instance	Input/Output	Resulting MOVILINK® service with	
		Get_Attribute_Single	Set_Attribute_Single
1	Input	Read	Invalid
2	Output	Read	Write
3	Output	Read	Write volatile
4	Input	Read Minimum	Invalid
5	Input	Read Maximum	Invalid
6	Input	Read Default	Invalid
7	Input	Read Scaling	Invalid
8	Input	Read Attribute	Invalid
9	Input	Read EEPROM	Invalid



7.3.3 Register object for parameter setting via DeviceNet

Parameter request

The following table shows the parameter request message with an example for reading the parameter "Firmware part number" (index 8300 = 206C_{hex}, subindex 0). In the example, the lower-level power section of MOVIFIT®-FC is being accessed via subaddress 1 and subchannel 1.

ByteOffset	Function	Significance	Example
0	MACID		01 _{hex}
1	Service		90 _{hex}
2	Class		07 _{hex}
3	Instance		02 _{hex}
4	Attribute		04 _{hex}
5	Index	Low	6C _{hex}
6	Index	High	20 _{hex}
7	Data	LSB	00 _{hex}
8	Data		00 _{hex}
9	Data		00 _{hex}
10	Data	MSB	00 _{hex}
11	Subindex		00 _{hex}
12	Reserved		00 _{hex}
13	Subaddress 1		01 _{hex}
14	Subchannel 1		01 _{hex}
15	Subaddress 2		00 _{hex}
16	Subchannel 2		00 _{hex}

Parameter response

The following table shows the parameter response message with an example for reading the parameter "Firmware part number" (index 8300 = 206C_{hex}, subindex 0). Value XX is replaced with the read data for real application.

ByteOffset	Function	Significance	Example
0	MACID		01 _{hex}
1	Service		90 _{hex}
2	Index	Low	6C _{hex}
3	Index	High	20 _{hex}
4	Data	LSB	XX _{hex}
5	Data		XX _{hex}
6	Data		XX _{hex}
7	Data	MSB	XX _{hex}
8	Subindex		00 _{hex}
9	Reserved		00 _{hex}
10	Subaddress 1		01 _{hex}
11	Subchannel 1		01 _{hex}
12	Subaddress 2		00 _{hex}
13	Subchannel 2		00 _{hex}



7.3.4 Return codes for parameter setting

SEW-specific return codes

The following table shows the data format for a parameter response message.

	Byte offset			
	0	1	2	3
Function	MAC-ID	Service code (=94 _{hex})	General error code	Additional code
Example	01 _{hex}	94 _{hex}	1F _{hex}	10 _{hex}

The service code of a fault message is always 94_{hex}. The general error code is always 1F_{hex} = manufacturer-specific error. The additional code can be taken from the table below.

DeviceNet- specific return codes

DeviceNet-specific return codes are sent in the error message if the data format is not maintained during the transfer or if a service is performed which has not been implemented. The coding of these return codes is normally described in the documentation for the DeviceNet scanner.

MOVILINK® parameter response

The following table shows the return codes that are returned by MOVIFIT® in additional code in case of an error in the DeviceNet parameter access.

MOVILINK® return code (hex)	Description
0x10	Invalid index, parameter index does not exist in the unit
0x11	Function/parameter not implemented
0x12	Read access only
0x13	Parameter lock activated
0x14	Factory setting is active
0x15	Value for parameter too large
0x16	Value for parameter too small
0x17	Required option card not installed
0x18	Error in system software
0x19	Parameter access via RS-485 process interface only
0x1A	Parameter access via RS-485 diagnostic interface only
0x1B	Parameter is access-protected
0x1C	Controller inhibit is required
0x1D	Invalid value for parameter
0x1E	Factory setting was activated
0x1F	Parameter was not saved in EEPROM
0x20	Parameter cannot be changed with output stage enabled / reserved
0x24	Parameter may only be changed when auto setup is deactivated



**Timeout of
explicit
messages**

Timeout is triggered by MOVIFIT®. The timeout interval must be set by the master after the connection has been established. The DeviceNet specification refers to an "expected packet rate" rather than a timeout interval in this case. The expected packet rate is calculated on the basis of the timeout interval using the following formula:

$$t_{\text{Timeout_ExplicitMessages}} = 4 \times t_{\text{Expected_Packet_Rate_ExplicitMessages}}$$

It can be set using connection object class 5, instance 1, attribute 9. The range of values runs from 0 ms to 65535 ms in 5 ms steps. If a timeout is triggered for the explicit messages, this connection type for the explicit messages is automatically dropped provided that the polled I/O or bit-strobe connections are not in the ESTABLISHED state. This is the default setting of DeviceNet.

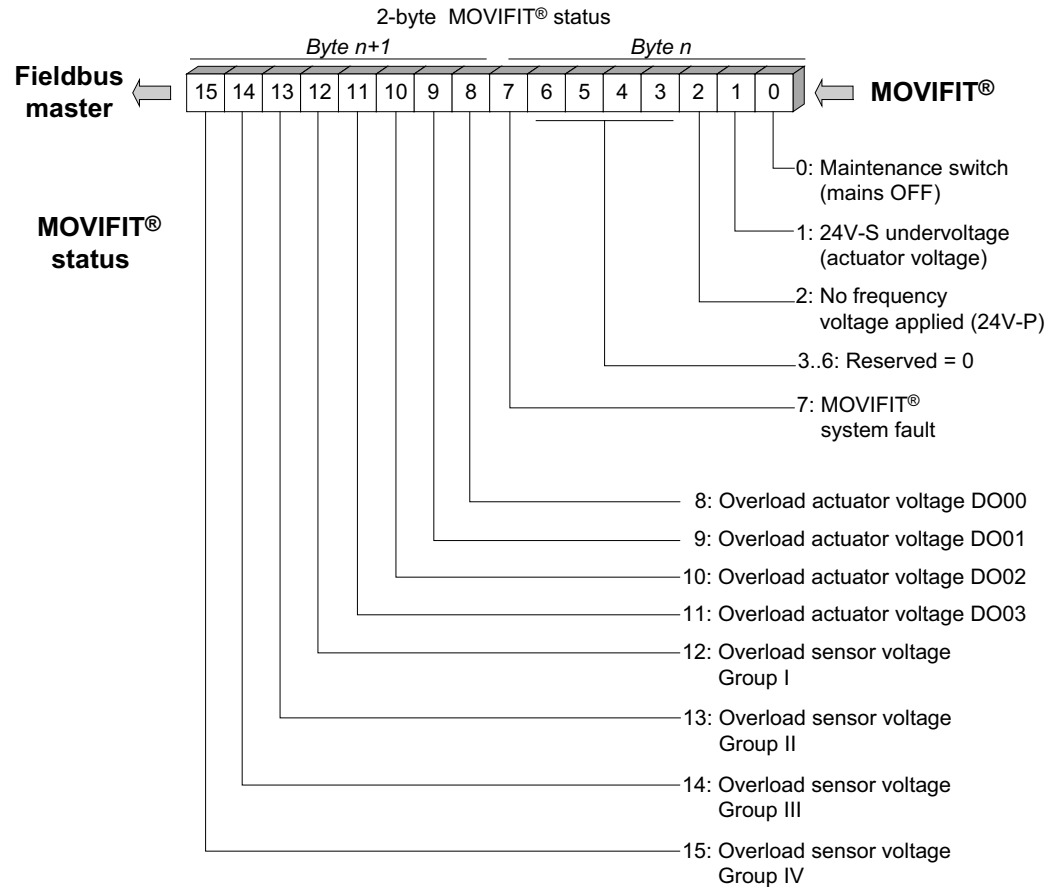
The connection for explicit messages must be re-established to communicate through these messages again. The timeout is not forwarded to the inverter.



8 Process Data Description

8.1 Process image for diagnostics

The following figure shows the MOVIFIT[®] status coding:



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The following table shows the diagnostic information of MOVIFIT® that is set up for evaluation 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 24 V-P for integrated inverter (FC) or external MOVIMOT® 1 = 24V-P not available 0 = 24V-P OK
7	MOVIFIT® system fault	MOVIFIT® system fault 1 = MOVIFIT® system fault is present 0 = OK For more information, see the 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 in 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 in 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 in 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 in sensor supply 0 = Sensor supply OK



8.2 Process image for digital I/Os

Eight or 16 terminal signals are provided depending on the variant.

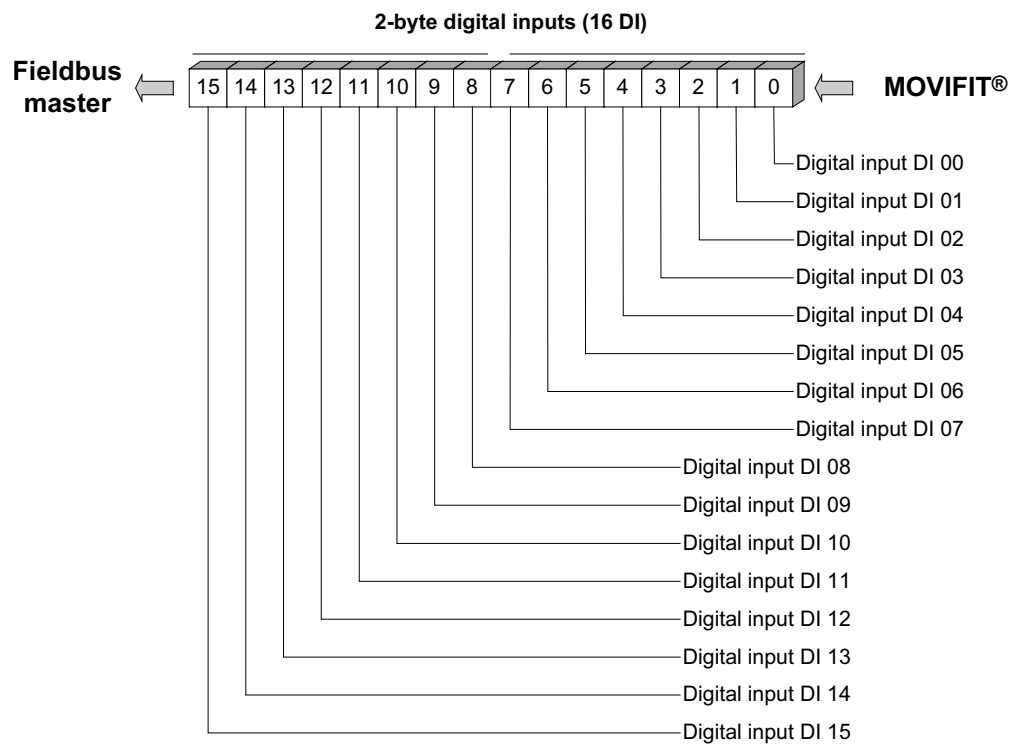
- MOVIFIT[®]-MC (PROFIBUS, PROFINET or DeviceNet): 16DI or 12DI/4DO
- MOVIFIT[®]-FC/SC (PROFINET): 16DI or 12DI/4DO
- MOVIFIT[®]-FC/SC (PROFIBUS or DeviceNet): 8DI or 6DI/2DO

The digital outputs are only active when they are also configured at the fieldbus end. In this case, the output information of the digital inputs is reflected back to the (highest-value) digital input terminals as the status. When MOVIFIT[®] is started (without bus configuration), these signals are always set to digital inputs.

8.2.1 Input bytes with 16 DI

The following figure shows the structure of the input bytes with 16 DI:

	NOTE
	The following structure is valid for: • MOVIFIT[®]-MC (PROFIBUS, PROFINET or DeviceNet) • MOVIFIT[®]-FC/-SC (PROFINET)



61800AEN



8.2.2 Input/output bytes for 12DI/4DO

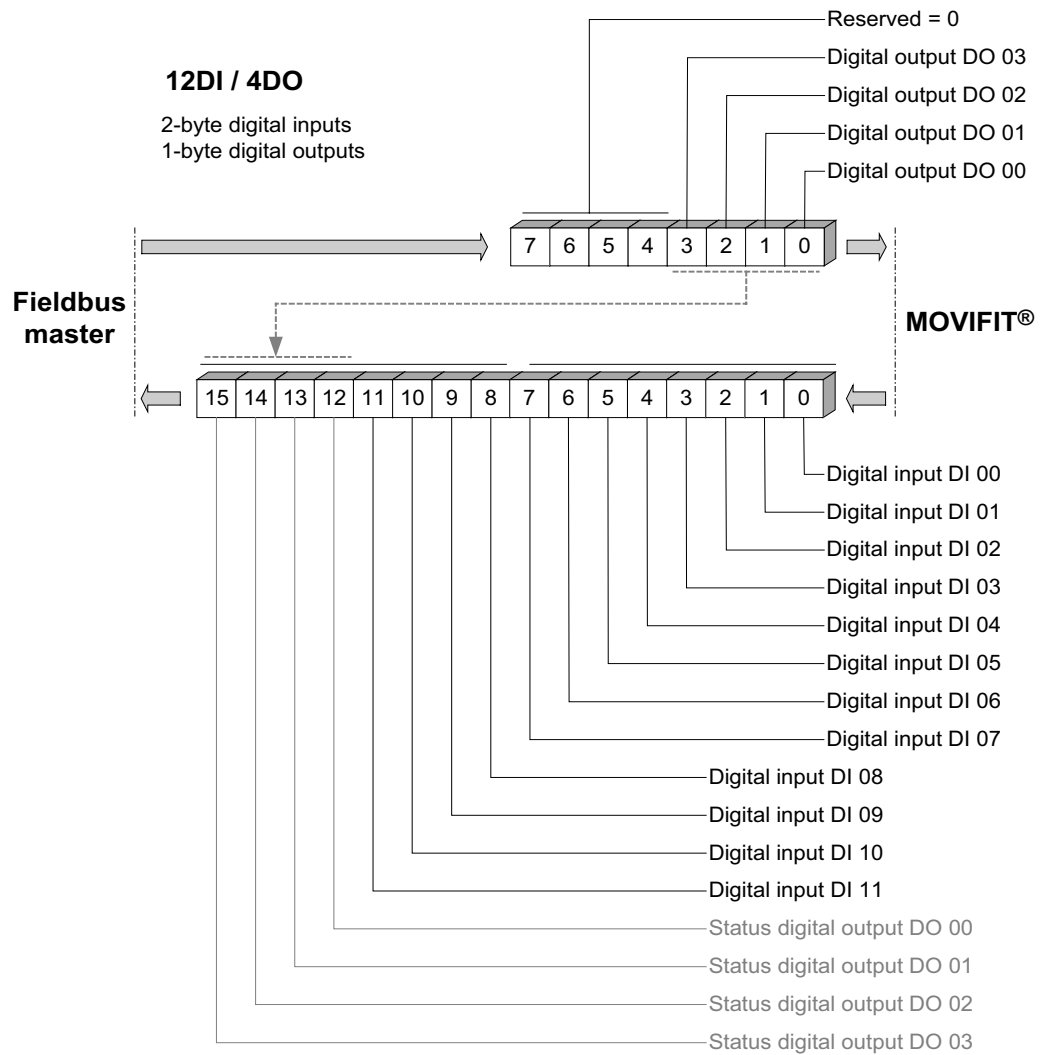


NOTE

The following structure is valid for:

- MOVIFIT®-MC (PROFIBUS, PROFINET or DeviceNet)
- MOVIFIT®-FC/-SC (PROFINET)

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



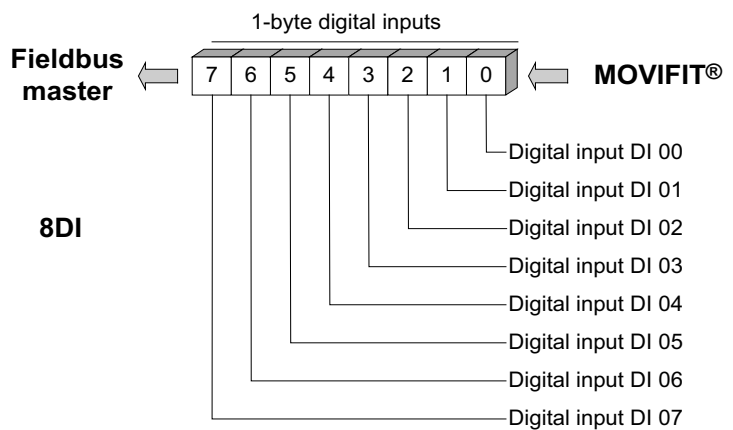
61801AEN



8.2.3 Input bytes for 8 DI

The following figure shows the structure of the input bytes for 8 DI:

	NOTE
	The following structure is valid for: • MOVIFIT[®]-FC/-SC (PROFIBUS or DeviceNet)

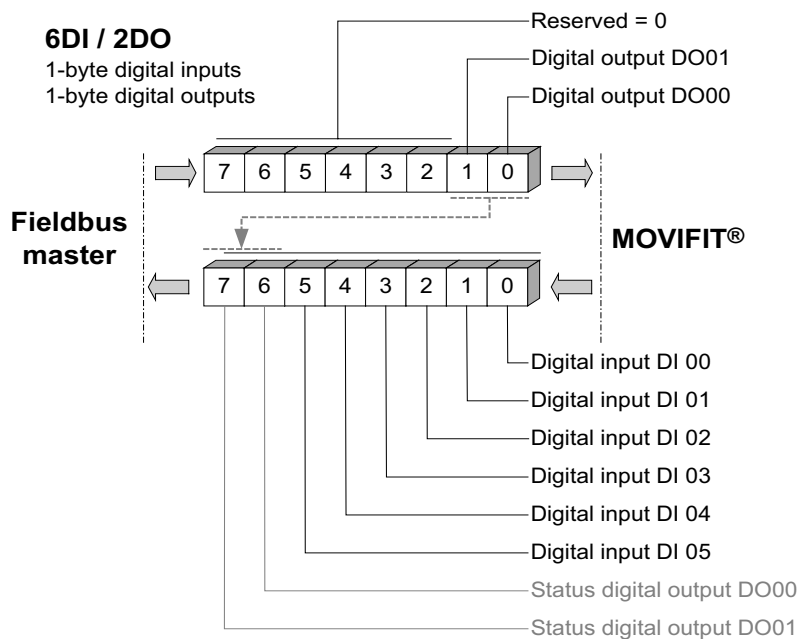


61802AEN

8.2.4 Input/output bytes for 6DI/2DO

The following figure shows the structure of the input/output bytes for 6DI/2DO:

	NOTE
	The following structure is valid for: • MOVIFIT[®]-FC/-SC (PROFIBUS or DeviceNet)



61795AEN

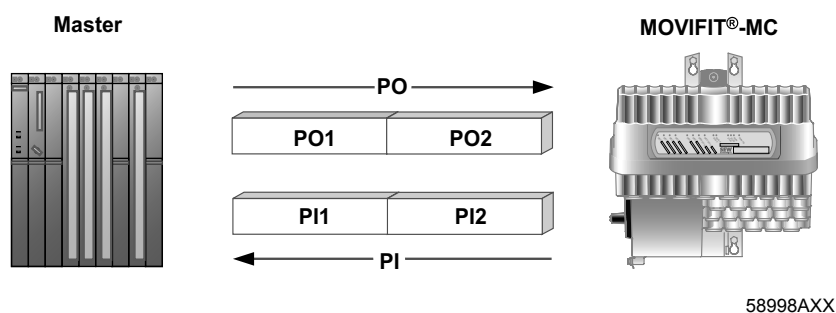


8.3 Process image of drive systems

8.3.1 MOVIMOT® on RS485

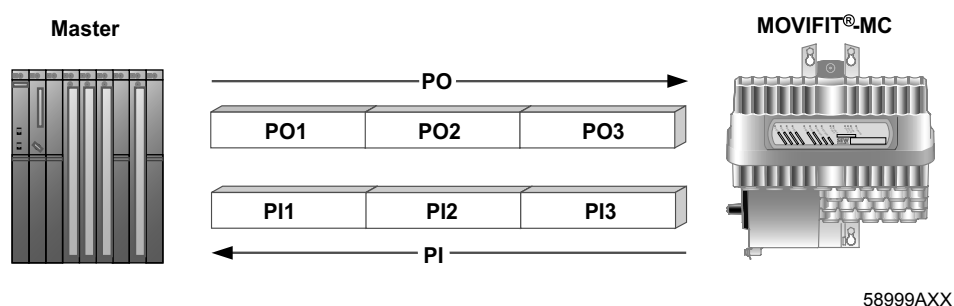
MOVIMOT® Classic communicates via the process data variants 2 PD or 3 PD with the MOVIFIT® control section.

2PD interface for MOVIMOT® on the fieldbus and RS485:



Process output data	Process input data
PO1: Control word	PI1: Status word 1
PO2: Speed [%]	PI2: Current

3PD interface for MOVIMOT® on the fieldbus and RS485:

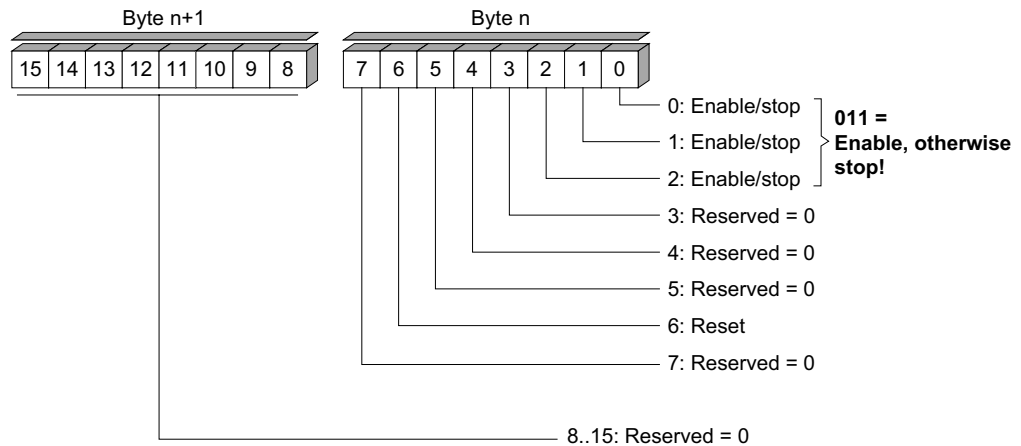


Process output data	Process input data
PO1: Control word	PI1: Status word 1
PO2: Speed [%]	PI2: Current
PO3: Ramp	PI3: Status word 2



Assignment of MOVIMOT® control word

The following figure shows the assignment of the MOVIMOT® control word.



59000AEN



NOTE

The assignment of the control word can change depending on the DIP switch setting of the MOVIMOT® additional functions. The bits 8 to 15 are then partially assigned.

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)
 $4000_{\text{hex}} = +100\%$ (clockwise direction)
 1 digit = 0.0061 %

Example: 80 % n_{max} (counterclockwise rotation)

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

Coding of the ramp

The integrator ramp set with switch t1 (on MOVIMOT®) is used if MOVIMOT® is controlled by two process data.

The current integrator ramp in the process output data word PO3 is transferred if the process data exchange takes place using three process data words.

Coding: 1 digit = 1 ms

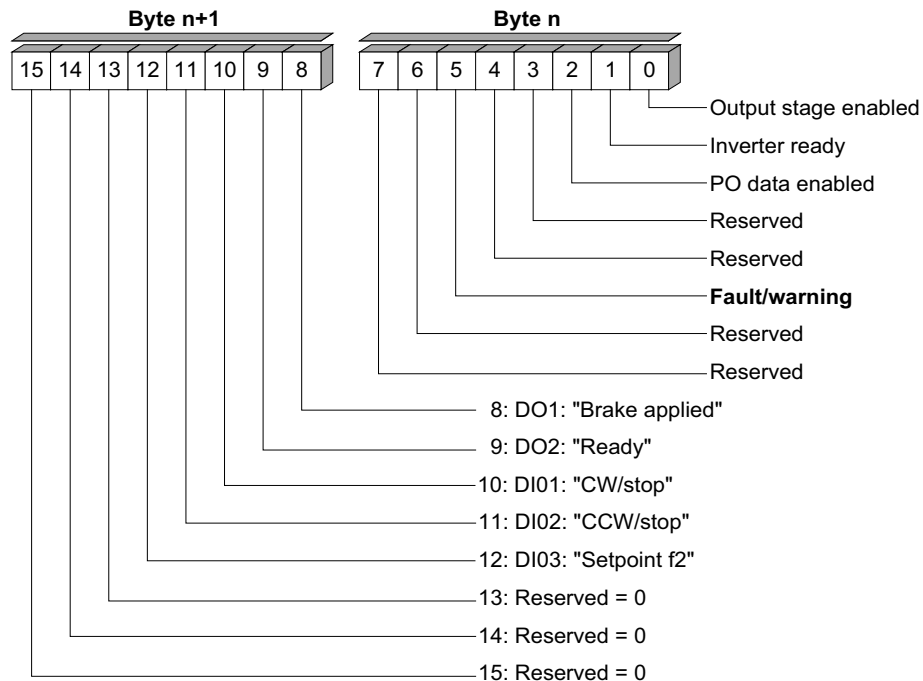
Range: 100...10000 ms

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



Assignment of MOVIMOT® status word 2

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



59002AEN

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: Output DO1 is set 0: Output DO1 is not set
10	DI1 (clockwise)	1: Input DI1 is set 0: Input DI1 is not set
11	DI2 (counterclockwise)	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

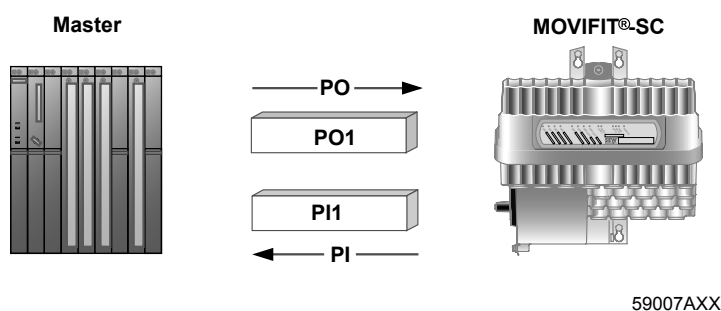
1) The functionality of the output can change depending on the additional function setting.



8.3.2 MOVIFIT®-SC

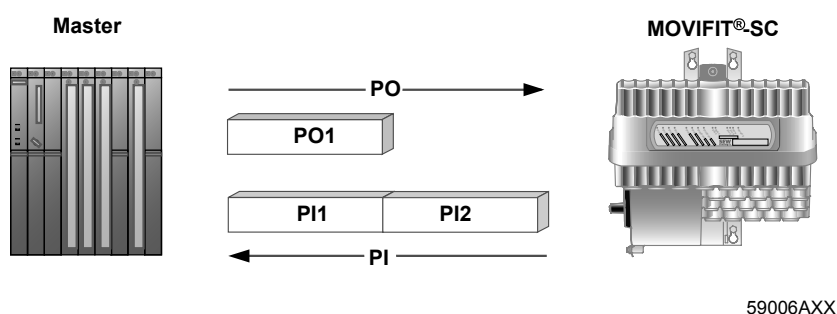
The motor starter can be used for single or dual-motor operation. The process data assignment is the same for both modes of operation.

SC single-motor operation with fieldbus configuration 1PO/1PI:



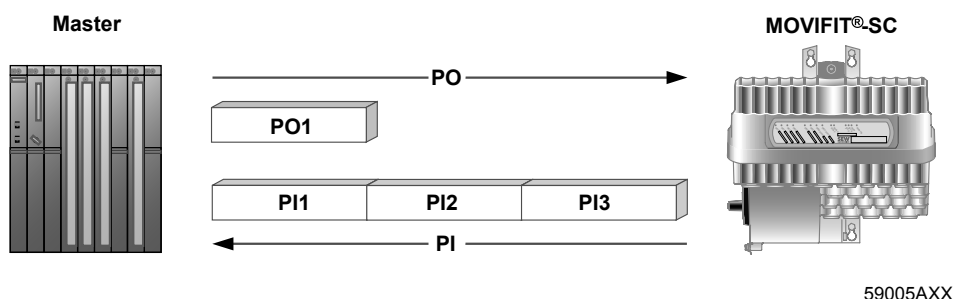
Process output data	Process input data
PO1: SC control word	PI1: Status word drive 1

SC dual-motor operation with fieldbus configuration 1PO/2PI:



Process output data	Process input data
PO1: SC control word	PI1: Status word drive 1
	PI2: Status word drive 2

SC single-motor operation or SC dual-motor operation with current actual value and fieldbus configuration 1PO/3PI:



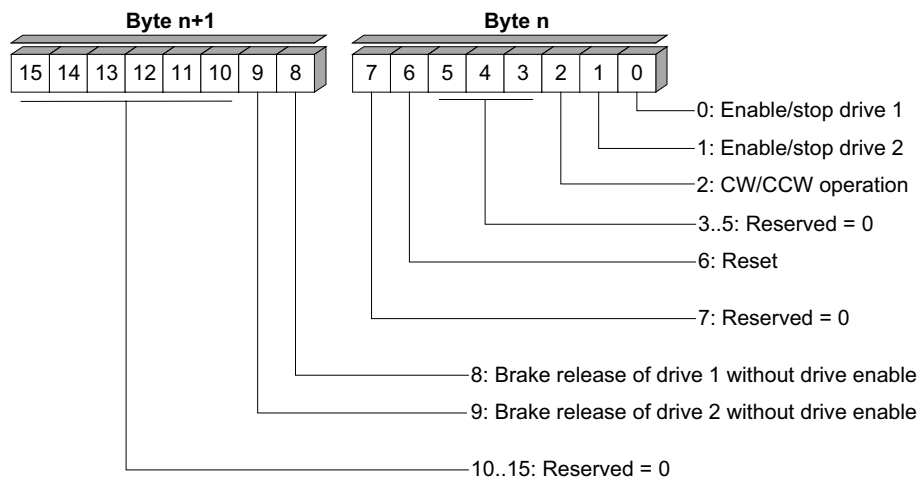
Process output data	Process input data
PO1: SC control word	PI1: Status word drive 1
	PI2: Status word drive 2
	PI3: Current drive 1 and 2



Assignment of MOVIMOT®-SC control word

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 SC control word:



59009AEN

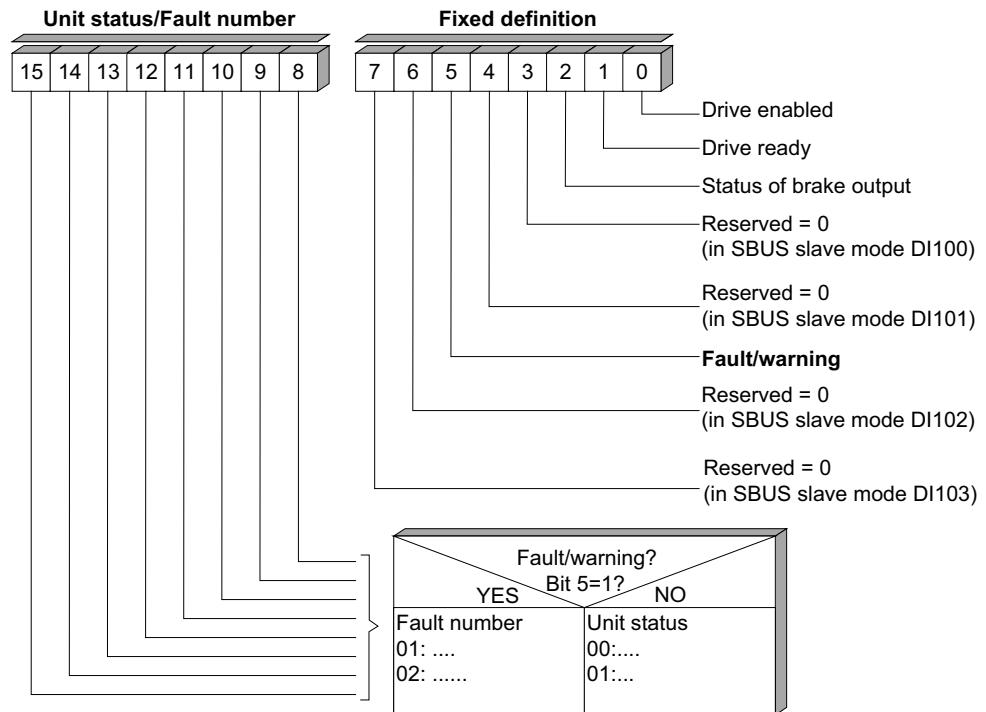
The following table shows functions of the control bits for MOVIFIT®-SC:

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	Clockwise/counter-clockwise 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..15	Reserved	For reserved bits, the value 0 must be transferred for later use



Assignment of MOVIFIT®-SC status word

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.



59010AEN

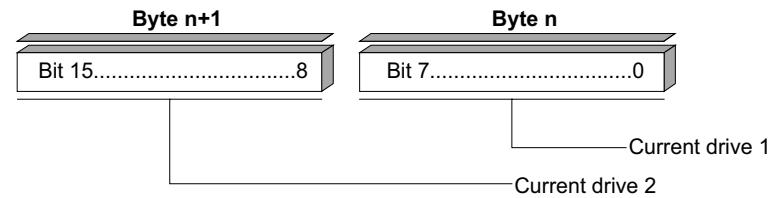
The following table shows assignment of the status word bits for MOVIFIT®-SC:

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 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.



**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 current SC:



59011AEN

The following table shows the coding of the current values:

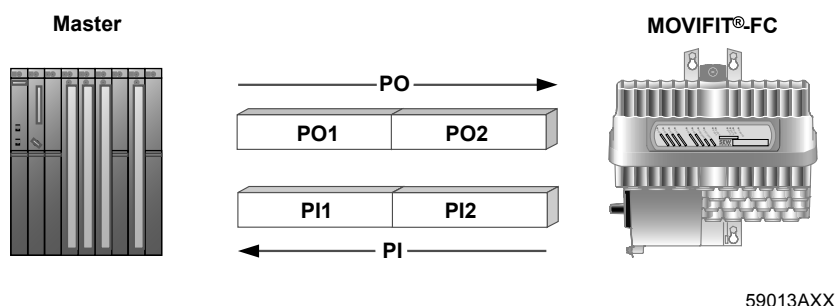
Current drive 2	Current drive 1
Coding with 8 bits: 0...(2 ⁸ -1) corresponds to 0 ... 200% I _{Rated,Unit}	Coding with 8 bits: 0...(2 ⁸ -1) corresponds to 0 ... 200% I _{Rated,Unit}



8.3.3 MOVIFIT®-FC

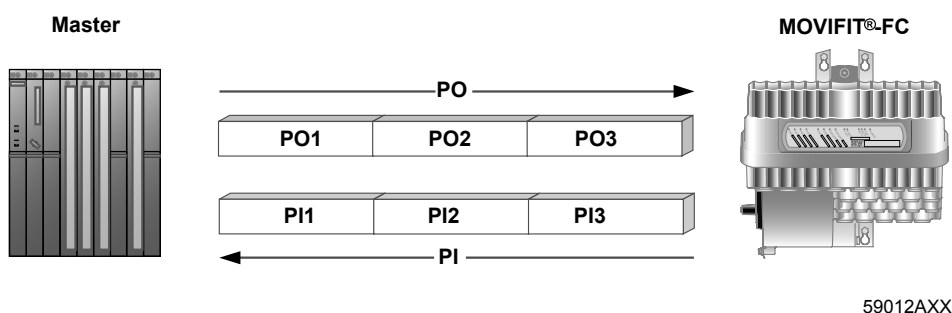
The integrated frequency inverter works with the same process data interface as MOVIMOT®. The process data lengths specified by the fieldbus is mapped directly on the internal CAN bus. In this way, the operating mode of the frequency inverter can be configured from 2PD (without bus ramp) to 3 PD (with bus ramp) via the fieldbus interface.

2PD interface for MOVIFIT®-FC on the fieldbus:



Process output data	Process input data
PO1: Control word	PI1: Status word 1
PO2: Speed [%]	PI2: Current

3PD interface for MOVIFIT®-FC on the fieldbus:



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

 = Parameters can be set



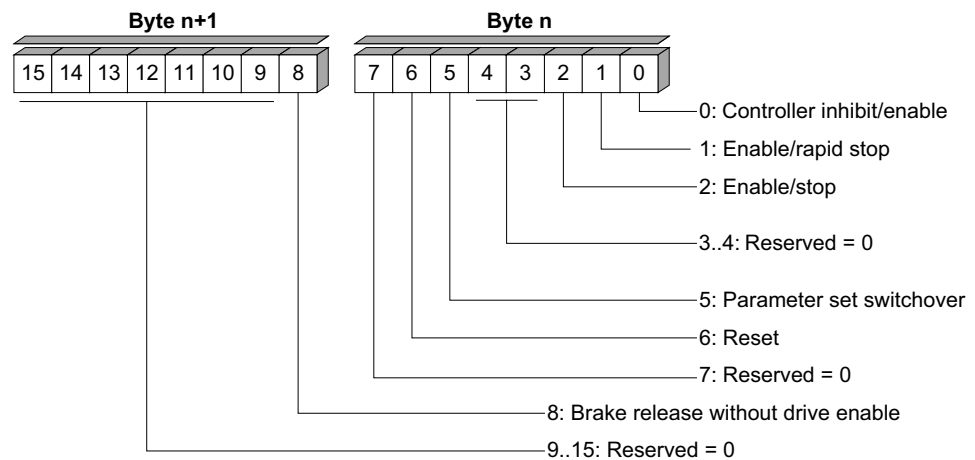
NOTE

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



Assignment of MOVIFIT®-FC control word

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



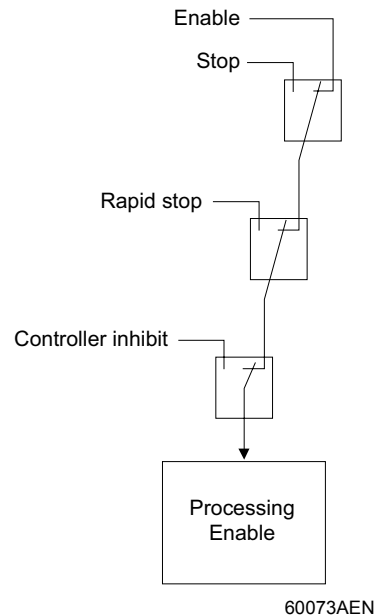
59026AEN

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 switchover	0: Parameter set 1 1: Parameter set 2
6	Fault reset	If there is a fault in the inverter power section, request a fault 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 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:



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)
 $4000_{\text{hex}} = +100\%$ (clockwise direction)
 1 digit = 0.0061 %

Example: 80 % n_{max} , CCW rotation:

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

Coding of the ramp

When MOVIFIT[®]-FC is controlled via 2 process data, the internal ramp parameters are used:

Parameter no.	Index/subindex	Name	Factory setting for Easy mode
P130 (parameter set 1) P140 (parameter set 2)	8807, Sub 0 9264, Sub 0	Ramp up	1s
P131 (parameter set 1) P141 (parameter set 2)	8808, Sub 0 9265, Sub 0	Ramp down	1s

The current integrator ramp in the process output data word PO3 is transferred if the process data exchange takes place using three process data words. The indicated time refers to a change in speed of 1500 rpm. Presetting the ramp via process data will deactivate parameters P130/P140 and P131/P141.

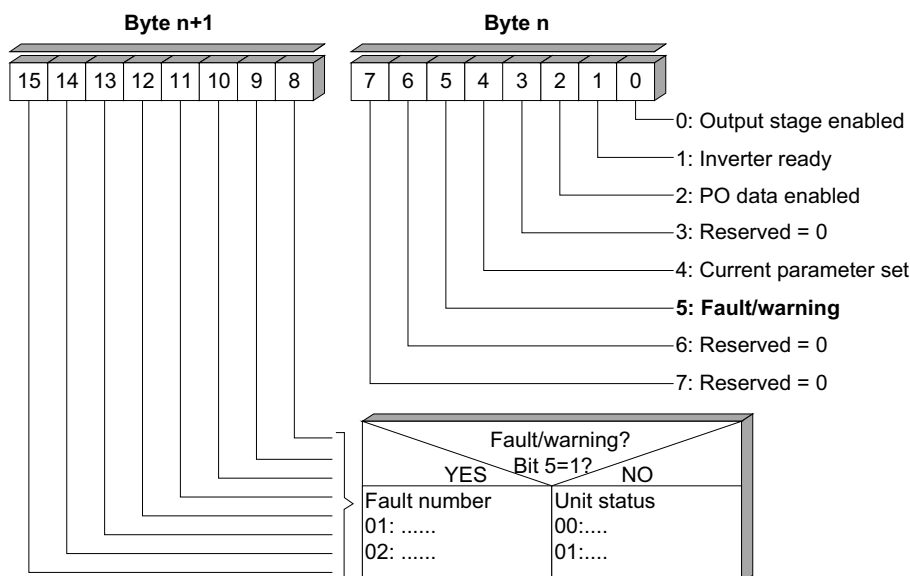
Coding: 1 digit = 1 ms

Range: 100 ms ...65 s

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

Assignment of status word 1 for MOVIFIT®-FC

Status word 1 is used to display the unit status and, in case of a fault, the fault number. The following figure shows the assignment of status word 1 for MOVIFIT®-FC:



59031AEN

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 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.



Coding of the current value for MOVIFIT®-FC

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

Coding: 1 digit = 0.1 % I_{Rated}

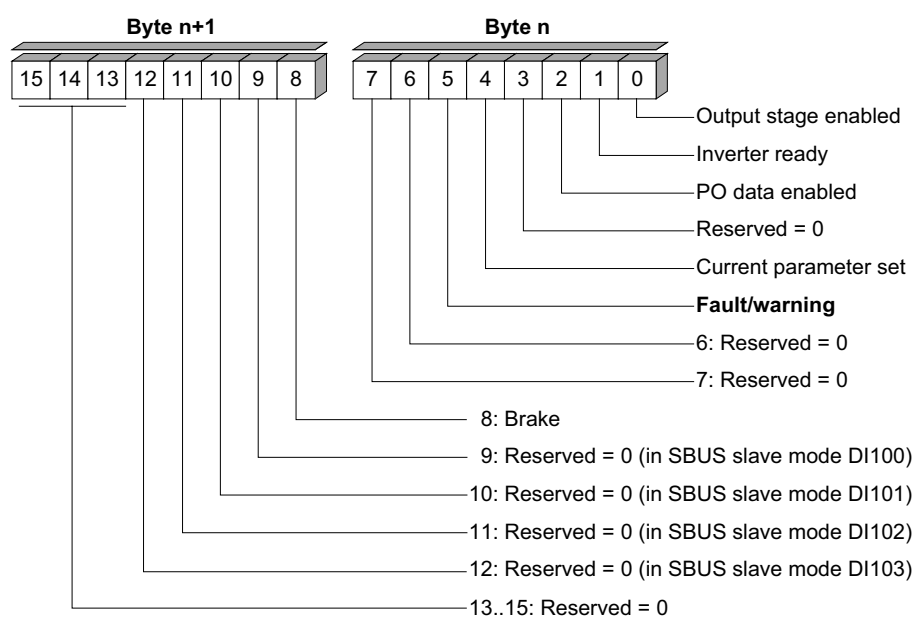
Range: Signed 16 bit integer

Example: $0320_{hex} = 800 \times 0.1 \% I_{Rated} = 80 \% I_{Rated}$

Assignment of status word 2 for MOVIFIT®-FC

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 MOVIFIT®-FC:



61899AEN



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 Fault Responses

9.1 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 lights up (or flashes) to signal that no new user data is being received. The connected drives are stopped by setting the control bits 0 to 2 and 8 to 15 to "0" in PO1. The digital outputs are then set to "0".

	! DANGER
	Risk of crushing if the drive starts up automatically. Severe or fatal injuries. • The "Fieldbus timeout" fault resets itself automatically. This means that the drives will receive the current process output data from the controller again as soon as the fieldbus communication has been reestablished. • If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the mains before correcting the fault.



9.2 System fault (SYS-F)

The system fault "111: Station communication interrupted" is triggered when system communication with a lower-level drive system (MOVIMOT® or MOVIFIT®-FC/-SC) is interrupted (timeout). Drives not containing any process data are stopped. Both the digital inputs/outputs and the drives, which still contain their process data, can be controlled as usual.

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. The "SYS-F" LED lights up. With MOVIFIT®-SC, this fault 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.

! DANGER

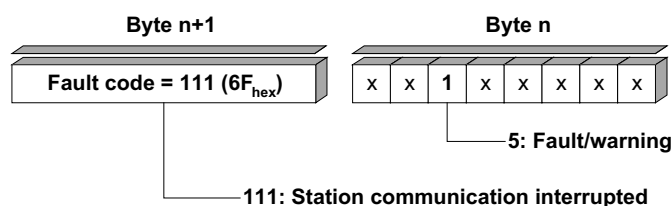
Risk of crushing if the drive starts up automatically.
Severe or fatal injuries.

- 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 mains before correcting the fault.

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.

A MOVIFIT®-FC or -SC drive stops within 100 ms if system fault "111" occurs (**due to reasons of system safety, it is essential that you do not change the factory setting of 100 ms!**)

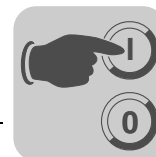
The following figures shows system fault 111 (Station communication interrupted) in the status word:



x = Statuses of the last lower-level PD exchange

59045AEN

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
MOVIFIT®-SC Single-motor operation	PI1: Status word SC	Fault code 111 (6F _{hex}), bit 5 (malfunction) = 1, all other status information remains unchanged
MOVIFIT®-SC Dual-motor operation	PI1: Status word SC motor 1 PI2: Status word SC motor 2	Fault code 111 (6F _{hex}), bit 5 (malfunction) = 1, all other status information remains unchanged



10 Parameter Setting and Diagnostics

10.1 MOVITOOLS® MotionStudio

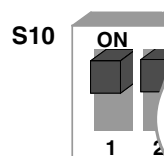
"MOVITOOLS® MotionStudio" is the SEW engineering tool that you can use to access all SEW drive units. With simple applications, you can use MOVITOOLS® MotionStudio to perform diagnostics for the MOVIFIT® unit series. For more demanding applications, you can use the wizards available in MOVITOOLS® MotionStudio to startup, configure and program MOVIFIT® units.

MOVITOOLS® MotionStudio can communicate with the drive units via a wide range of communication and fieldbus systems.

In the following section, the most simple application for connecting a PC/laptop and a MOVIFIT® unit via the diagnostics interface (serial RS485) is described (point-to-point connection).

10.1.1 Preparations on MOVIFIT®

1. **Always follow the safety and warning instructions in these operating instructions when working on the 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").



57958AXX

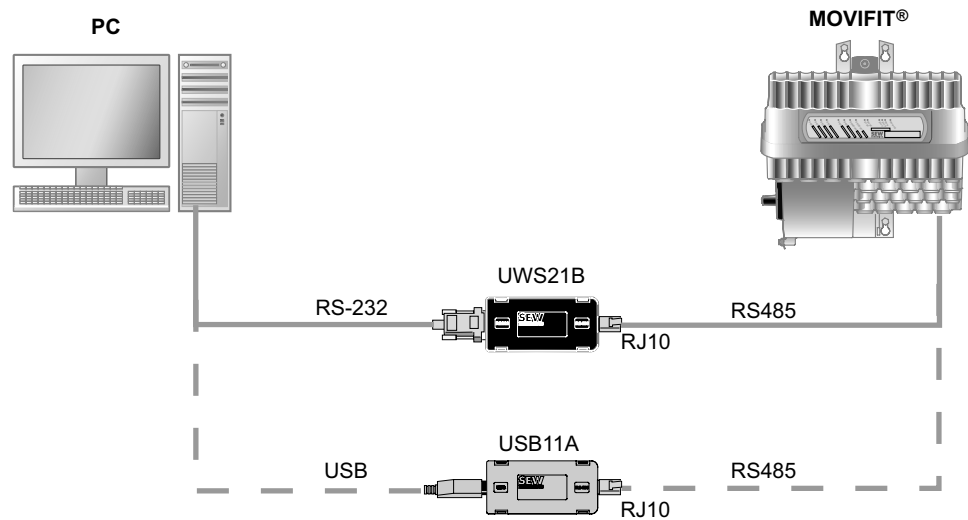


NOTE

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.

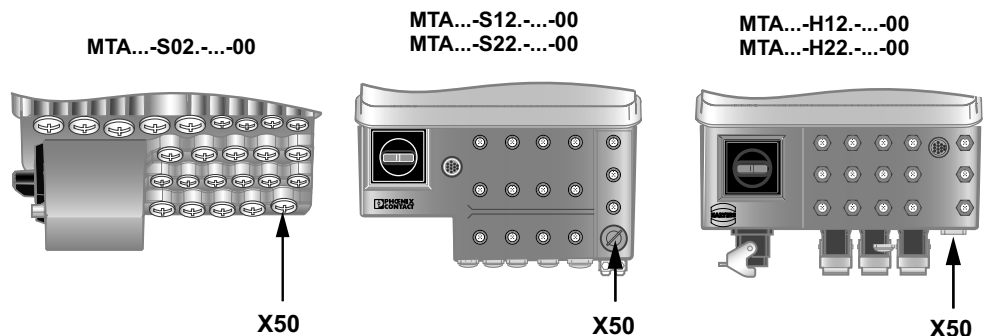


4. Connect MOVIFIT® to the PC or laptop using option USB11A or UWS21B:

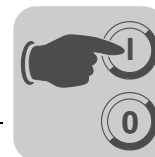


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Connect USB11A or UWS21B to MOVIFIT® via the X50 diagnostics socket. The diagnostics socket is located under the screw fitting, as shown in the following illustration (depending on connection box used).



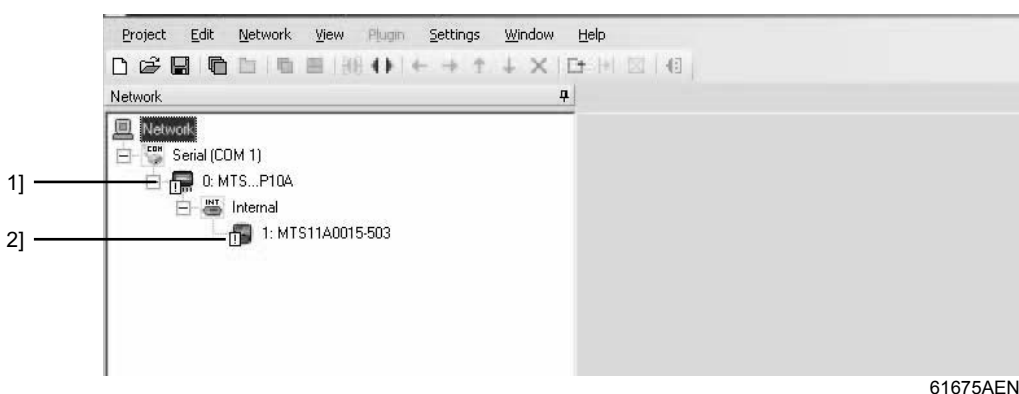
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10.1.2 Integrating MOVIFIT® in MOVITOOLS® MotionStudio

	NOTE
	A detailed description of the following steps can be found in the comprehensive online help in MOVITOOLS® MotionStudio.

1. Start MOVITOOLS® MotionStudio.
2. Create a project and network.
3. Configure communication channels.
4. Perform an online scan.
5. MOVIFIT® is displayed in the MOVITOOLS® MotionStudio as shown in the example below:



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- [1] Communication unit
[2] Power section

6. A right click will open the context menu in which you will find various tools (depending on MOVIFIT® version in use) for startup and diagnostics. These include:
 - [1] Communication unit
 - Bus monitor
 - [2] Power section
 - Startup
 - Parameter setting



10.2 Motor/brake startup with MOVIFIT®-SC

	NOTE
	- 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®-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.

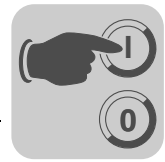
All other parameters are described in detail in the "Parameter list for the MOVIFIT®-SC power section" section and in the "Parameter Description for MOVIFIT®-SC" section.

Parameter 200

Rated supply 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 700

Starter operating mode

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

- 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.
- 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
	Important: For operation with only one motor, use X8 and X81 terminals or the X8 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.

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



Parameter Setting and Diagnostics

Motor/brake startup with MOVIFIT®-SC

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.**

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.**

Parameters 620 to 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.

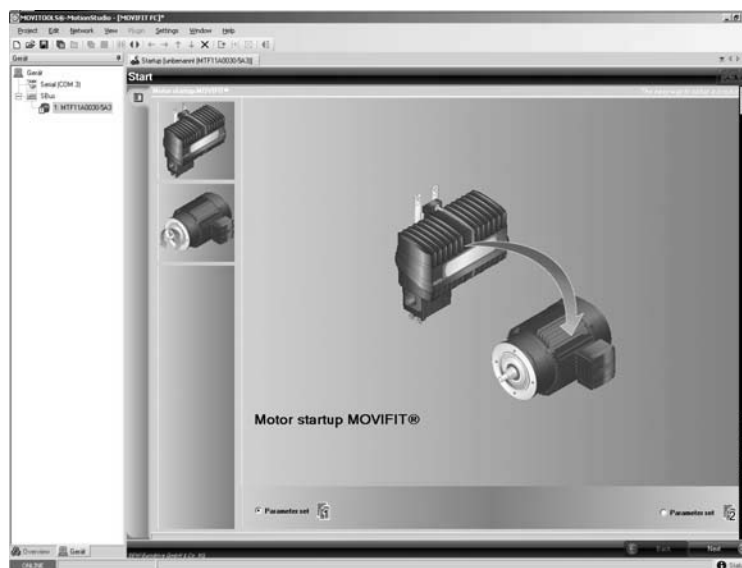


10.3 Motor/brake startup with MOVIFIT®-FC

	NOTE
	- 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.

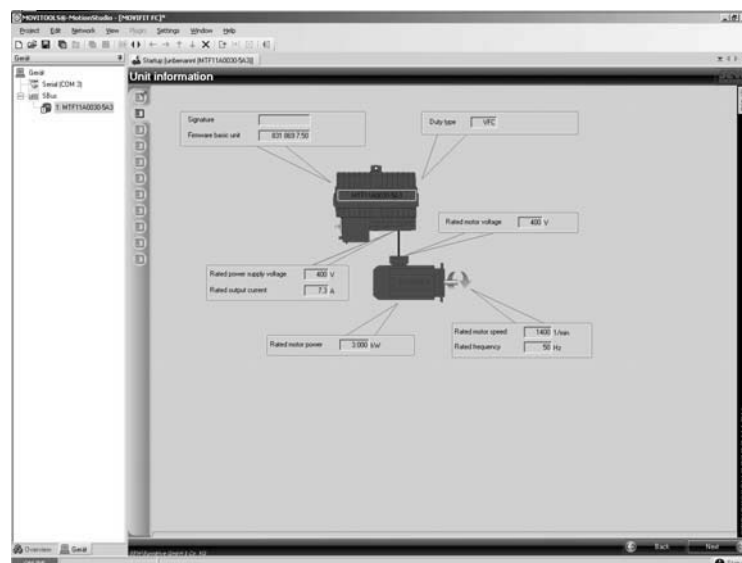
10.3.1 Startup procedure

- After selecting the startup tools (see "Integrate MOVIFIT® in MOVITOOLS® MotionStudio"), a window for selecting the parameter set is displayed. In this window, select the parameter set for which startup should be performed.



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- After you have selected the parameter set, an overview displaying the current unit information is displayed (display values only):



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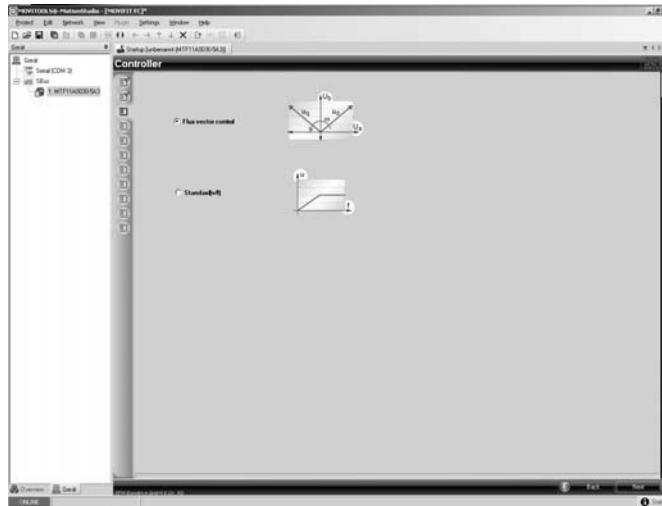


Parameter Setting and Diagnostics

Motor/brake startup with MOVIFIT®-FC

3. Select the controller procedure

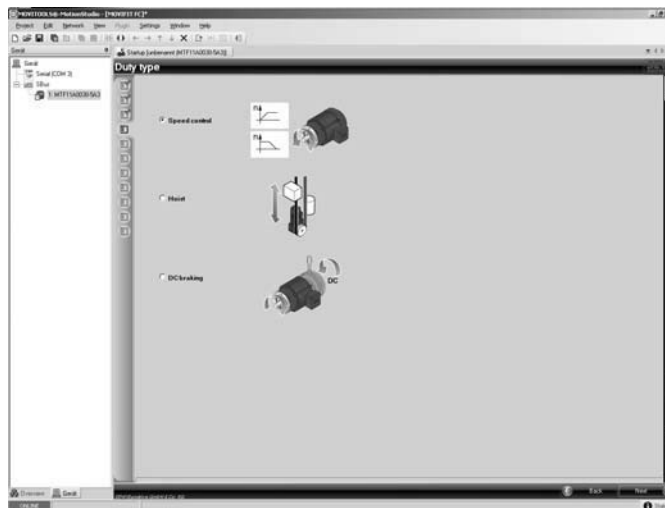
- The vector-controlled operating mode (VFC) is adapted for use with SEW motors.
- For non-SEW motors, select the operating mode U/f characteristic curve when the VFC operating mode does not produce a satisfactory result.



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4. Choose one of the following operating modes:

- Speed control
- Hoist (only available with VFC operating mode)
- DC braking



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! DANGER

Risk of fatal injury if the hoist falls.

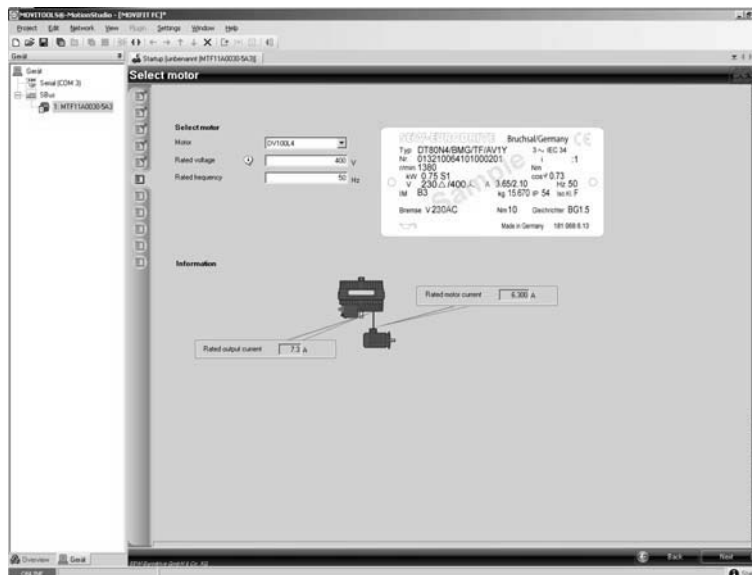
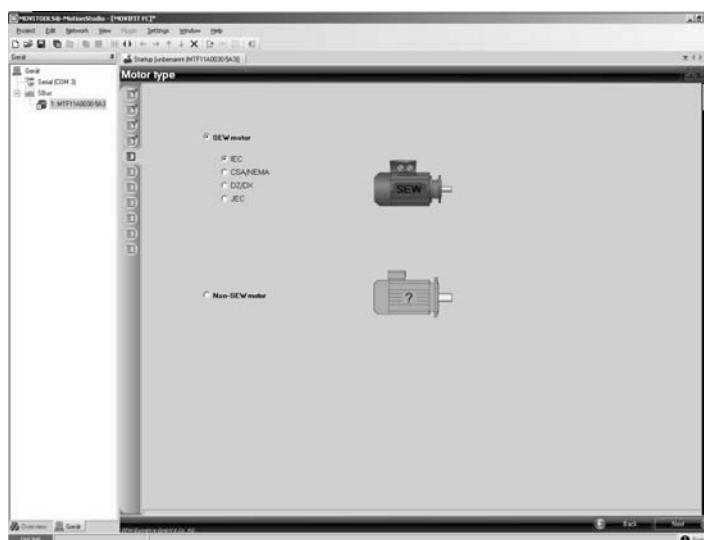
Severe or fatal injuries.

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



NOTE

The operating method "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.



Non-SEW motors:

You have to specify additional motor data for non-SEW motors. This data can be found on the nameplate of the motor. You must start a calibration process to determine additional motor parameters.

Before starting the calibration process, make sure that the motor is connected, the supply voltage applied and the unit ready for operation.

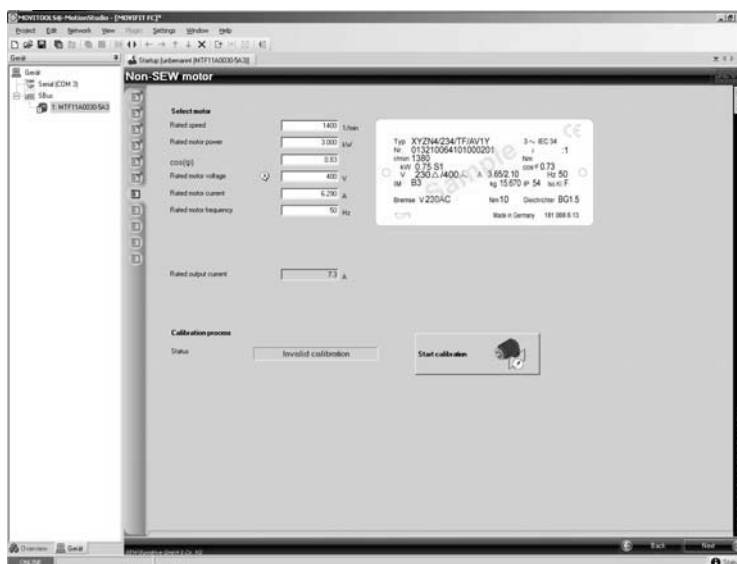


⚠ DANGER

The connected motor is energized during the calibration procedure.

Severe or fatal injuries from electric shock.

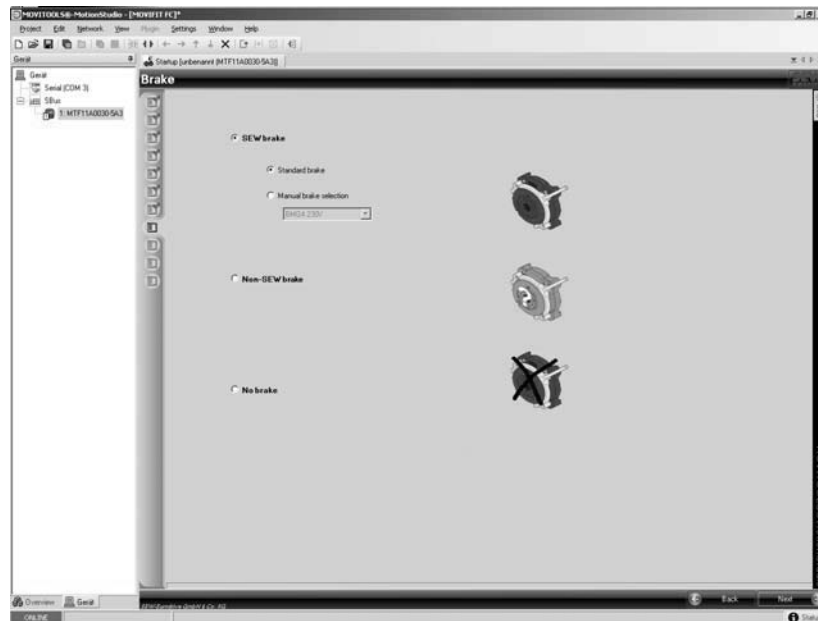
- The terminal box of the drive that has been connected must be closed during the calibration process.



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6. With brake motors, once motor startup has been concluded, you must now select the brake:



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- If the motor has a standard MOVIFIT® brake (see the following table), the default setting "MOVIFIT® standard brake" can be kept.
- If an SEW brake other than one of the standard MOVIFIT® brakes is installed, you must select the brake from the list field "Manual brake selection".
- A standard MOVIFIT® brake or other SEW brake is supplied directly from the DC link, which means it can be used to breakdown regenerative energy.
- A non-SEW brake can only be controlled via binary output DB00. In this case, the functionality of the output is set to "Brake released".

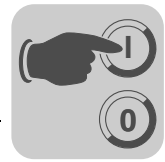


Parameter Setting and Diagnostics

Motor/brake startup with MOVIFIT®-FC

The following table shows the assignments of MOVIFIT® motor and standard brake:

MOVIFIT®	Assigned motor and standard brake							
	S10/5 = OFF				S10/5 = ON			
	Ö connection		Ö connection		Ö connection		Ö connection	
	Motor	Brake	Motor	Brake	Motor	Brake	Motor	Brake
MTF..003	DT71 D4	BMG05 110V BMG05 230V BMG05 400V	DR63 L4	BR03 110V BR03 230V BR03 400V	DR63 L4	BR03 110V BR03 230V BR03 400V	–	–
MTF..005	DT80 K4	BMG1 110V BMG1 230V BMG1 400V	DT71 D4	BMG05 110V BMG05 230V BMG05 400V	DT71 D4	BMG05 110V BMG05 230V BMG05 400V	DR63 L4	BR03 110V BR03 230V BR03 400V
MTF..007	DT80 N4	BMG1 110V BMG1 230V BMG1 400V	DT80 K4	BMG1 110V BMG1 230V BMG1 400V	DT80 K4	BMG1 110V BMG1 230V BMG1 400V	DT71 D4	BMG05 110V BMG05 230V BMG05 400V
MTF..011	DT90 S4	BMG2 110V BMG2 230V BMG2 400V	DT80 N4	BMG1 110V BMG1 230V BMG1 400V	DT80 N4	BMG1 110V BMG1 230V BMG1 400V	DT80 K4	BMG1 110V BMG1 230V BMG1 400V
MTF..015	DT90 L4	BMG2 110V BMG2 230V BMG2 400V	DT90 S4	BMG2 110V BMG2 230V BMG2 400V	DT90 S4	BMG2 110V BMG2 230V BMG2 400V	DT80 N4	BMG1 110V BMG1 230V BMG1 400V
MTF..022	DV100 M4	BMG4 110V BMG4 230V BMG4 400V	DT90 L4	BMG2 110V BMG2 230V BMG2 400V	DT90 L4	BMG2 110V BMG2 230V BMG2 400V	DT90 S4	BMG2 110V BMG2 230V BMG2 400V
MTF..030	DV100 L4	BMG4 110V BMG4 230V BMG4 400V	DV100 M4	BMG4 110V BMG4 230V BMG4 400V	DV100 M4	BMG4 110V BMG4 230V BMG4 400V	DT90 L4	BMG2 110V BMG2 230V BMG2 400V
MTF..040	DV112 M4	BMG8 110V BMG8 230V BMG8 400V	DV100 L4	BMG4 110V BMG4 230V BMG4 400V	DV100 L4	BMG4 110V BMG4 230V BMG4 400V	DV100 M4	BMG4 110V BMG4 230V BMG4 400V



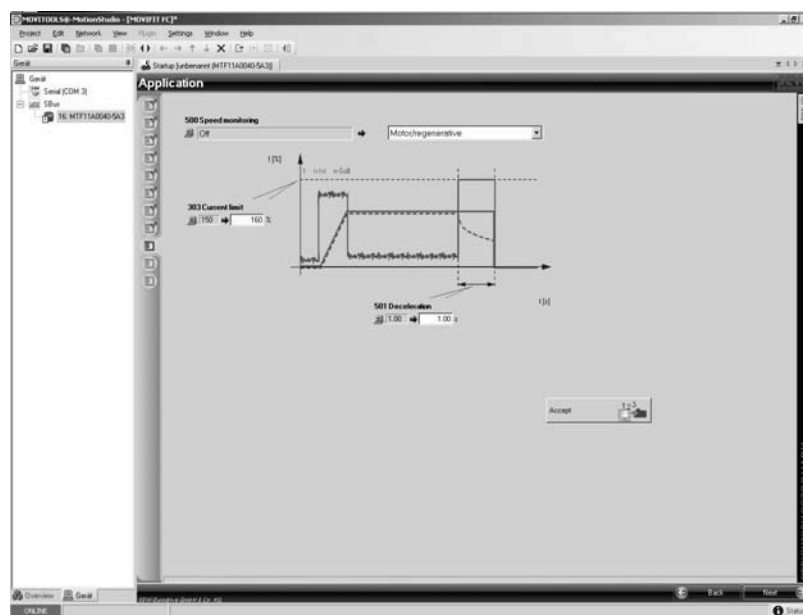
7. The next step "Application parameters" is used to activate the "Speed monitoring" function and set the current limit.

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.

Click the black arrow to accept the default values. 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 choosing the "Accept" button.



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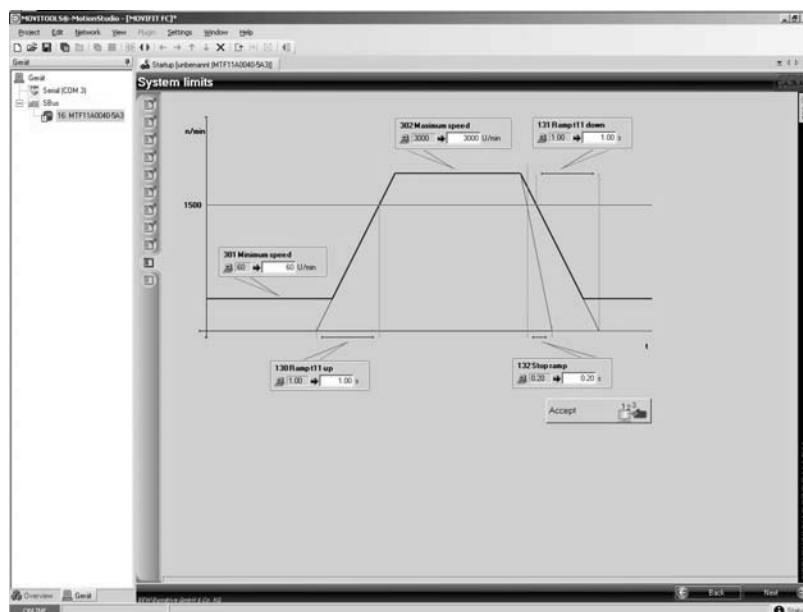
Parameter Setting and Diagnostics

Motor/brake startup with MOVIFIT®-FC

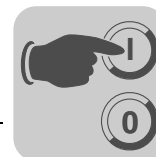
8. In the next step parameters are set for the speed limits and ramp times. The ramp times are always based on a change in the output speed of 1500 rpm. The ramp times apply when a ramp time has not been specified via the process data and an enable/revoke enable occurs. The stop ramp is active when a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

Click the black arrow to accept the default values. Click the right mouse button in the input field to display additional input options.

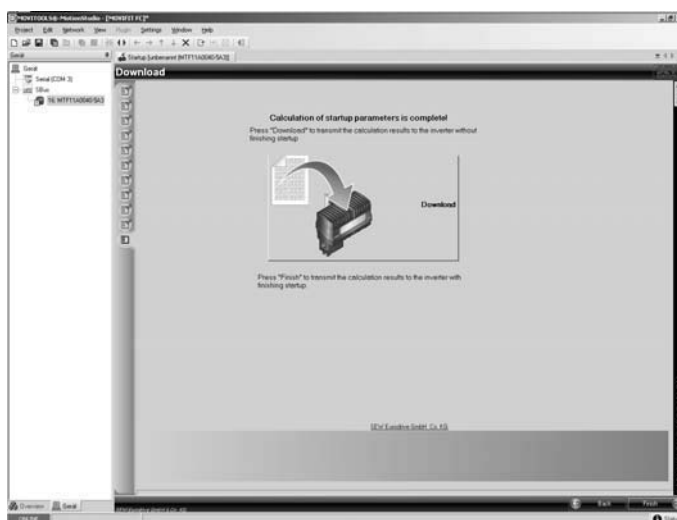
You can accept each default value individually, or you can accept all default values by choosing the "Accept" button.



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9. Click the "Download" or "Finish" button to download the parameters to the unit. Before you download the parameters, you can switch to any of the previous pages. The settings are not lost.



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10.4 Hoist startup with MOVIFIT®-FC in "Expert mode"

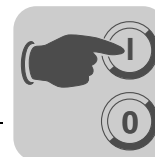
You must always set the operating mode to "Hoist" (only available with the VFC operating mode) when using hoist applications during motor startup or brake startup (see page 91 and following).

	! DANGER Risk of fatal injury if the hoist falls. • Severe or fatal injuries. MOVIFIT® is not designed for use as a safety device in hoist applications. Use monitoring systems or mechanical protection devices to ensure safety.
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10.5 Parameter list for the MOVIFIT®-SC power section

No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
0_	Display values				
00_	Process values				
000	10096	11	Output current drive 1	[%]	
001	10096	12	Output current drive 2	[%]	
002	10096	13	Rated supply frequency	[Text]	
003	10096	14	Mains phase sequence	[Text]	
01_	Status displays				
010	8310	0	Starter status	[Text]	
011	8310	0	Operating status	[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 input DB00 assignment	BRAKE RELEASED (factory setting)	
051	8349 Bit 1	0	Position binary output DB01	[Bit field]	
	8351	0	Binary input 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 faults that occurred in the past when t-0
09_	Bus diagnostics				
094	8455	0	PO 1 setpoint	[hex]	
095	8456	0	PO 2 setpoint	[hex]	
096	8457	0	PO 3 setpoint	[hex]	
097	8458	0	PI 1 actual value	[hex]	
098	8459	0	PI 2 actual value	[hex]	
099	8460	0	PI 3 actual value	[hex]	



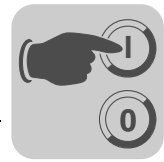
No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
1__ Setpoints / integrators					
13_ Soft startup time 1					
130	10096	1	Soft startup time drive 1	0... 0.2 ...1 [s]	
131	10096	2	Soft startup time drive 2	0... 0.2 ...1 [s]	
14_ Change in direction of rotation					
140	10096	20	Reversing time	0.05... 0.2 ...10 [s]	
2_ Mains supply					
200	10096	19	Rated supply 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 ...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 ...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 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 4: Drive 1 on 5: Drive 2 on 6: Brake 1 released 7: Brake 2 released	
7_ Control functions					
70_ Operating modes					
700	10096	3	Operating mode	0: Single-motor operation 1: Dual-motor operation	



Parameter Setting and Diagnostics

Parameter list for the MOVIFIT®-SC power section

No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
73_	Brake function				
731	10096	4	Brake application time drive 1	0...10 [s]	
734	10096	5	Brake application time drive 2	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	off 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	Response TF signal	0: No response 2: Immediate stop / Locking	
836	8615	0	Response timeout SBus	2: Immediate stop / Locking 5: Immediate stop / Warning	
839	10454	1	Error response output open	0: No response 2: Immediate stop / Locking	
84_	Reset behavior				
840	8617	0	Manual reset	No 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]	



10.6 Parameter description for MOVIFIT®-SC

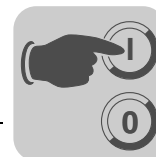
- Parameter 000** **Output current of drive 1**
Apparent motor current of drive 1 in range 0...200% of the rated unit current.
- Parameter 001** **Output current of drive 2**
Apparent motor current of drive 2 in range 0...200% of the rated unit current.
- Parameter 002** **Rated supply frequency**
The supply frequency is determined automatically and displayed here.
- Parameter 003** **Mains phase sequence**
The connection sequence of mains input phases is determined automatically and displayed here.
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.

- Parameter 010** **Starter status**
Statuses of the unit output stage:
- INHIBITED
 - ENABLED
- Parameter 011** **Operating status**
The following operating statuses are available:
- 24V OPERATION
 - NO ENABLE
 - ENABLE
 - FACTORY SETTING
 - FAULT
- Parameter 012** **Fault status**
Current fault status of the starter power section.



Parameter 014	Heat sink temperature Heat sink temperature of the starter.
Parameter 015	DIP switch setting S10 switch Displays DIP switch setting of S10 switch.
Parameter 031	Position binary input DI100 Binary input DI100 assignment Displays the status of binary input DI100 (only in "SBUS slave" operating mode).
Parameter 032	Position binary input DI101 Binary input DI101 assignment Displays the status of binary input DI101 (only in "SBUS slave" operating mode).
Parameter 033	Position binary input DI102 Binary input DI102 assignment Displays the status of binary input DI102 (only in "SBUS slave" operating mode).
Parameter 034	Position binary input DI103 Binary input DI103 assignment Displays the status of binary input DI103 (only in "SBUS slave" operating mode).
Parameter 050	Position binary output DB00 Binary output DB00 assignment The status of binary output DB00 is displayed.
Parameter 051	Position binary output DB01 Binary output DB01 assignment The status of binary output DB01 is displayed.
Parameter 070	Unit type The unit type is displayed.
Parameter 071	Rated output current The rated unit current is displayed in [A].
Parameter 076	Firmware power section Displays the part number and version of the firmware of the power section.
Parameter 080	Fault t-0 The unit saves diagnostic data when a fault occurs. The last error is displayed in the error memory.



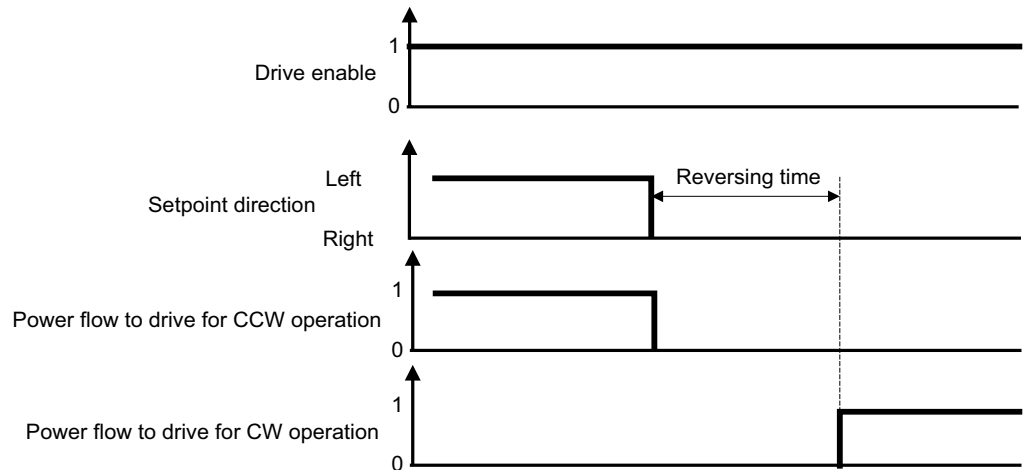
Parameter 094	PO 1 setpoint Process data output word 1
Parameter 095	PO 2 setpoint Process data output word 2
Parameter 096	PO 3 setpoint Process data output word 3
Parameter 097	PI 1 actual value Process data input word 1
Parameter 098	PI 2 actual value Process data input word 2
Parameter 099	PI 3 actual value Process data input word 3
Parameter 130	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.
Parameter 131	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.



Parameter 140

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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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.

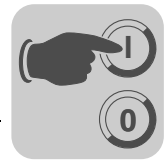
Deactivation for dual-motor operation must occur before the mains voltage supply is switched on with a counterclockwise rotating field.

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 "Motor over-temperature".



**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 "Deceleration time monitoring drive 2" specifies how long this switch-off current can be exceeded without the unit switching off with the error message "Motor overtemperature".

Parameter 340

Motor protection drive 1

Activates or deactivates the thermal protection model for drive 1.

When this function is activated, MOVIFIT® takes over the thermal protection of drive 1 by electronic means. Motor utilization is determined using the inverter output current, the rated current of drive 1 set in parameter 341, 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

Activates or deactivates the thermal protection model for drive 2.

When this function is activated, MOVIFIT® takes over the thermal protection of drive 2 by electronic means. Motor utilization is determined using the inverter output current, the rated current of drive 1 set in parameter 343, 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.



Parameters 600 to 603

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

In effect with	"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 to 621

Binary outputs DB00 and DB01

In effect with	"0" signal	"1" signal
0: No function	–	–
1: Fault drive 1	No fault	Fault drive 1
2: Fault drive 2	No fault	Fault drive 2
3: Ready	Not ready	Ready
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

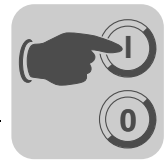


DANGER

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

Severe or fatal injuries can occur.

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



Parameter 700

Starter operating mode

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

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.

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
	Important: For operation with only one motor, use X8 and X81 terminals or the X8 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.

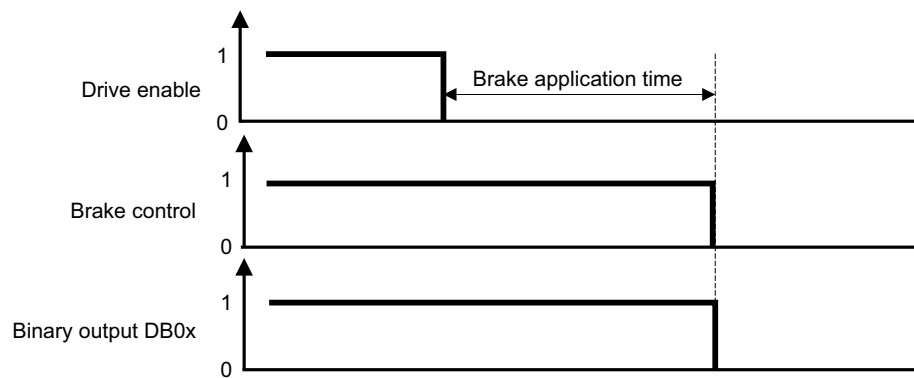
	NOTE
	If the current measured at the output for drive 2 in the "SINGLE-MOTOR OPERATION" starter operating mode exceeds a value of 10% $I_{Rated, Unit}$, the unit switches off with a fault message and the unit locks.

**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 the function "BRAKE 1 RELEASED".

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

This parameter is used to specify a delay between the time when 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 the function "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.

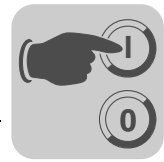
Parameter 737**Rated brake voltage brake 2**

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.

Parameter 738**Activate "Brake release without drive enable"**

This parameter is used to activate the brake release function without the drive being enabled. 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. If the unit displays a fault, the brakes are applied.



Parameter 802

Factory setting

If you have requested the factory settings to be reset by setting this parameter to "ON", all parameters that have a factory setting value are reset to their factory setting.

Choose "DELIVERY STATE" 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 supply 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 STATE" is selected.

Parameter 803

Parameter lock

If this parameter is set to ON, you cannot change any of the parameters except for parameter lock. It is a good idea to use this setting once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when the 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

Use this parameter to program the fault response that is triggered by an input terminal programmed to "/EXT. FAULT" (only in "SBUS slave" operating mode).

Parameter 835

Response TF signal

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 timeout SBus

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

Parameter 839

Response output open

Parameter 839 programs the fault response that the starter executes when the "Output open" fault is detected.

**Parameter 840****Reset**

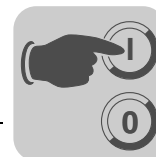
If the starter power section indicates a fault, the fault can be acknowledged by setting this parameter. Once the fault has been reset, the parameter is set automatically to OFF again. If the power section does not indicate a fault, setting the parameter to ON has no effect.

**Parameters
870 – 872****Setpoint description PO1 – PO3**

Displays the assignment of the process output data words.

**Parameters
873 – 875****Actual value description PI1 – PI3**

Displays the assignment of the process input data words.



10.7 Parameter list for the MOVIFIT®-FC power section

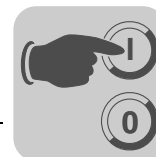
No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
0__	Display values				
00_	Process values				
000	8318	0	Speed (signed)	[rpm]	
002	8319	0	Frequency (signed)	[Hz]	
004	8321	0	Output current (amount)	[%I _{Rated}]	
005	8322	0	Active current (signed)	[%I _{Rated}]	
007	8660	0	Rated supply voltage	[V]	
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 status	[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			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 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 faults that occurred in the past when t-0
081			Fault t-1	Fault code	Background information for faults that occurred in the past when t-1



Parameter Setting and Diagnostics

Parameter list for the MOVIFIT®-FC power section

No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
082			Fault t-2	Fault code	Background information for faults that occurred in the past when t-2
083			Fault t-3	Fault code	Background information for faults that occurred in the past when t-3
084			Fault t-4	Fault code	Background information for faults that occurred in the past when t-4
09_	Bus diagnostics				
094	8455	0	PO 1 setpoint	[hex]	
095	8456	0	PO 2 setpoint	[hex]	
096	8457	0	PO 3 setpoint	[hex]	
097	8458	0	PI 1 actual value	[hex]	
098	8459	0	PI 2 actual value	[hex]	
099	8460	0	PI 3 actual value	[hex]	
1_	Setpoints / integrators				
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]	
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 _{Rated}]	
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 adjustment 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
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	off on	OFF ON
501/503	8558/8560	0	Deceleration time 1 / 2	0.1...1...10[s]	
52_	Mains-off check				
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



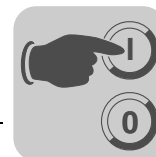
No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
6__	Terminal assignment				
60_	Binary inputs (only in "SBUS slave" operating mode)				
600	8335	0	Binary input DI100	0: No function 11: External fault 0 active 12: Fault reset	
601	8336	0	Binary input DI101		
602	8337	0	Binary input DI102		
603	8338	0	Binary input DI103		
62_	Binary outputs				
620	8350	0	Binary output DB00	0: No function 2: Ready 3: Output stage on 4: Rotating field on 5: Brake released 6: Brake applied	
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	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]	
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	off 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_	Fault responses				
830	8609	0	Response external fault	0: No response 2: Immediate stop / Locking 5: Immediate stop / Warning	
835	8616	0	Response TF signal	0: No response 2: Immediate stop / Locking	
836	8615	0	Response timeout SBus	2: Immediate stop / Locking 5: Immediate stop / Warning	



Parameter Setting and Diagnostics

Parameter list for the MOVIFIT®-FC power section

No.	Index dec.	Subindex dec.	Name	Range / Factory setting	MOVITOOLS® MotionStudio
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	

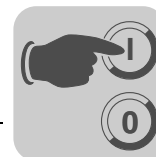


10.8 Parameter description for MOVIFIT®-FC

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 the range 0 ... 200% of the rated unit current.
Parameter 005	Active current (signed) Active current in the range –200% ... +200% of the rated unit current. For motor load, the value is positive; for regenerative load, the value is negative.
Parameter 009	Rated supply voltage Supply input voltage in [V].
Parameter 010	Inverter status States of the unit output stage: • INHIBITED • ENABLED
Parameter 011	Operating status The following operating statuses are available: • 24V OPERATION • CONTROLLER INHIBIT • NO ENABLE • STANDSTILL CURRENT • ENABLE • FACTORY SETTING • FAULT
Parameter 013	Current parameter set Displays parameter set 1 or 2.
Parameter 014	Heat sink temperature Heat sink temperature of the inverter.
Parameter 015	DIP switch setting S10 switch Displays DIP switch setting of S10 switch.



Parameter 031	Position binary input DI100 / Binary input DI100 assignment Displays the status of binary input DI100 (only in "SBUS slave" operating mode).
Parameter 032	Position binary input DI101 / Binary input DI101 assignment Displays the status of binary input DI101 (only in "SBUS slave" operating mode).
Parameter 033	Position binary input DI102 / Binary input DI102 assignment Displays the status of binary input DI102 (only in "SBUS slave" operating mode).
Parameter 034	Position binary input DI103 / Binary input DI103 assignment Displays the status of binary input DI103 (only in "SBUS slave" operating mode).
Parameter 050	Position binary output DB00 / Binary output DB00 assignment The status of binary output DB00 is displayed.
Parameter 070	Unit type The unit type is displayed.
Parameter 071	Rated output current The rated unit current is displayed in [A].
Parameter 076	Firmware power section Displays the part number and firmware version for the power section.
Parameter 100	Setpoint source The setpoint source of the power section is displayed.
Parameter 101	Control signal source The control signal source of the power section is displayed.
Parameters 080..084	Fault code The unit saves diagnostic data when a fault occurs. The last five faults are displayed in the fault memory.
Parameter 094	PO 1 setpoint (display values) Process data output word 1



Parameter 095	PO 2 setpoint (display values) Process data output word 2
Parameter 096	PO 3 setpoint (display values) Process data output word 3
Parameter 097	PI 1 actual value (display values) Process data input word 1
Parameter 098	PI 2 actual value (display values) Process data input word 2
Parameter 099	PI 3 actual value (display values) Process data input word 3
Parameters 130 / 140	Ramp t11 / t21 up Acceleration ramp
Parameters 131 / 141	Ramp t11 / t21 down Deceleration ramp
Parameters 136 / 146	Stop ramp t13 / t23 Activates the stop ramp • for faults that are set to stop at the stop ramp when a fault occurs • when the stop ramp is selected using the corresponding bit in the process data
Parameters 300 / 310	Start/stop speed 1 / 2 This setting defines the smallest speed request that the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint specification is made using the active acceleration ramp.
Parameters 301 / 311	Minimum speed 1 / 2 The drive does not fall below this speed value even when the setpoint specification is slower than the minimum speed.



Parameters 302 / 312

Maximum speed 1 / 2

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

If you set $n_{\min} > n_{\max}$, the value set in $n_{\max}$ 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

If the automatic adjustment parameter is deactivated, the inverter does not calibrate the motor. When the parameter is activated, the motor is calibrated each time the operating status changes to ENABLE.

Parameters 321 / 331

Boost 1 / 2

This value 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 adjustment 1 / 2

The inverter sets the value automatically when P320 / P330 Automatic "adjustment = ON". Only specialists are permitted to change this parameter manually to optimize the settings.

Parameters 323 / 333

Pre-magnetization 1 / 2

The pre-magnetization time makes sure a magnetic field builds 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 vibrations occur, reduce the slip compensation. It may even be necessary to set the value to 0.

Parameter 325

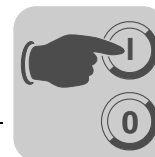
No-load vibration damping

No-load damping can be activated if the motor tends to be unstable under no-load conditions.

Parameter 340

Motor protection

This parameter can be used to deactivate TF monitoring in the motor.



Parameters
500 / 502

Speed monitoring 1 / 2

MOVIFIT® performs speed monitoring by evaluating operations 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 limitation can be reached during acceleration, deceleration or load peaks.

The deceleration time prevents speed monitoring from responding too sensitively. The current limit must be maintained for the duration of the set deceleration time before monitoring responds.

Parameter 522

Mains phase failure check

You can deactivate this monitoring function if you want to prevent the mains phase failure check from being triggered by an asymmetrical mains.

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

Parameters
600-603

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

In effect with	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

In effect with	0 signal	1 signal
0: No function	–	–
2: Ready	Not ready	Ready
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



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.

- Before using the binary output for controlling the brake, check the parameter settings.

Parameters 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 hoisting function automatically provides all functions necessary for operating a simple hoist application. For the hoisting 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 a braking resistor on the inverter.

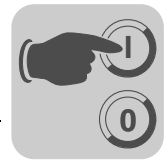


DANGER

Important: 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

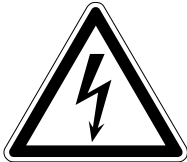
When the standstill current function is activated, the inverter injects a current into the motor at standstill.

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 (in particular of the disc 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 changeover is impossible.

If a fault occurs, the motor stops receiving current.



! 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

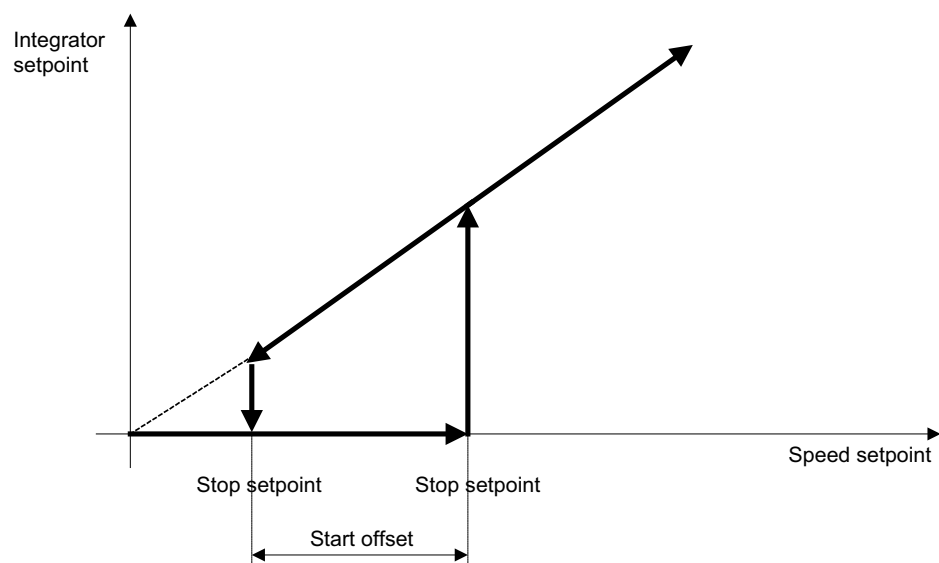
Setpoint stop function 1 / 2

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 determines how long the motor will remain at the minimum speed after expiration of the pre-magnetization time and how much time the brake has to release fully.

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

Activate "Brake release without drive enable"

If this parameter is set to "ON", the brake can be released even if the drive is not enabled.

This functionality is only available when the motor brake is being controlled by the inverter.

The brake is always applied when the unit is not ready.

The brake cannot be released when the drive is not enabled in conjunction with the hoisting function.

Parameter 802

Factory setting

If you have requested the factory settings to be reset by setting this parameter to "ON", all parameters that have a factory setting value are reset to their factory setting.

Choose "DELIVERY STATE" 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 STATE" is selected.

Parameter 803

Parameter lock

If this parameter is set to ON, you cannot change any of the parameters except for parameter lock. It is a good idea to use this setting once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when the parameter is set to OFF.

Parameter 813

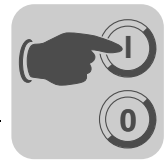
SBus address

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 Use this parameter to program the fault response that is triggered by an input terminal programmed to "/EXT. FAULT" (only in "SBUS slave" operating mode).
Parameter 835	Response TF signal 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 timeout SBus This parameter programs the fault response that is triggered by SBUS timeout monitoring.
Parameter 840	Manual reset If the inverter power section indicates a fault, the fault can be acknowledged by setting this parameter. Once the fault has been reset, the parameter is set automatically to OFF again. If the power section does not indicate a fault, setting the parameter to ON has no effect.
Parameters 860 / 861	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.
Parameters 870-872	Setpoint description PO1-PO3 Displays the assignment of the process output data words.
Parameters 873-875	Setpoint description PI1-PI3 Displays the assignment of the process input data words.



10.9 Web diagnostics for Ethernet units

A website for simple web diagnostics is integrated in versions of MOVIFIT®-Classic units that have Ethernet. To access the homepage, start your browser and enter the following IP address, for example:

- `http://192.168.10.4` (factory settings)

You can use the web page to access information about service and diagnostics.

10.9.1 Software requirement

The website has been tested with Microsoft® Internet Explorer 5.0 / 7.0 and Mozilla® Firefox 2.0. To display dynamic elements you will need the Java 2 Runtime Environment SE, v1.5.0_3 or above. If the Java 2 Runtime Environment is not installed on your system, the program will connect to the Java Download Manager and automatically start downloading, if you allow it. If you have a problem downloading, you can go to www.sun.com and download it there, and then install it locally.

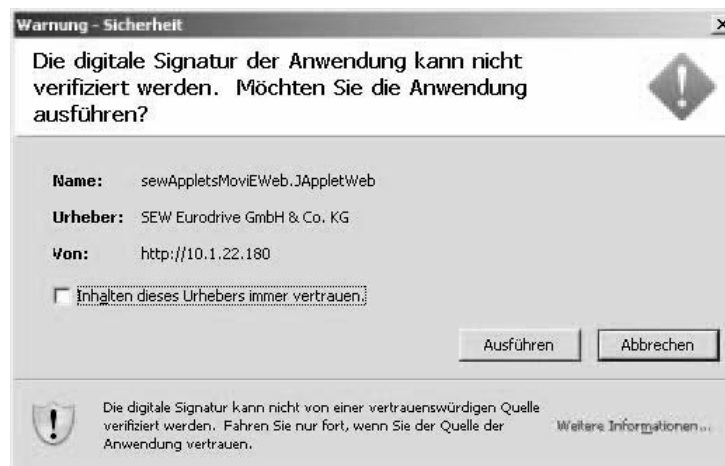
10.9.2 Recommended browser settings

- Use a current version of your browser.
- Javascript must be activated (default setting).
- Popups must be allowed for the page.

10.9.3 Security settings

If you are using a firewall or if you have a personal firewall installed on your system, they could prevent you from accessing the MOVIFIT® Ethernet unit. In this situation, you should allow outgoing TCP/IP and UDP/IP traffic.

An applet will ask you to accept a certificate; choose "Execute". To bypass this dialog box in the future, activate the control field "Always trust content from this publisher" and the certificate will be imported to the certificate list of the Java 2 Runtime Environment.

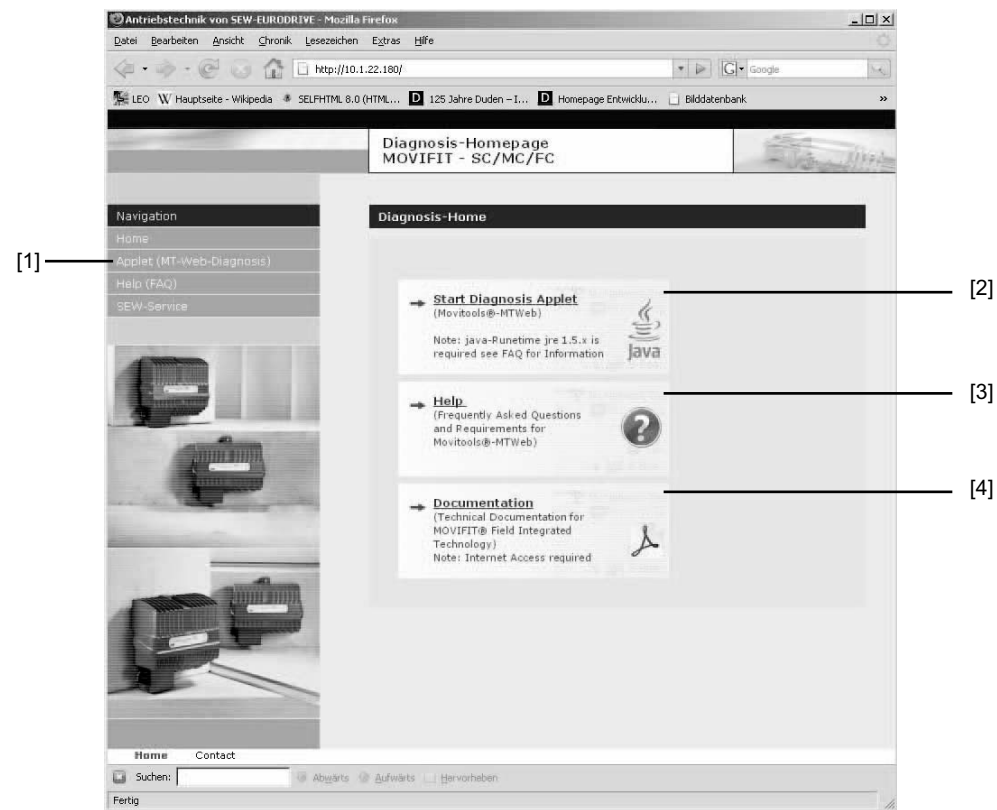


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10.9.4 Homepage layout for MOVIFIT® (SC / MC / FC)

The following figure shows the MOVIFIT® homepage:



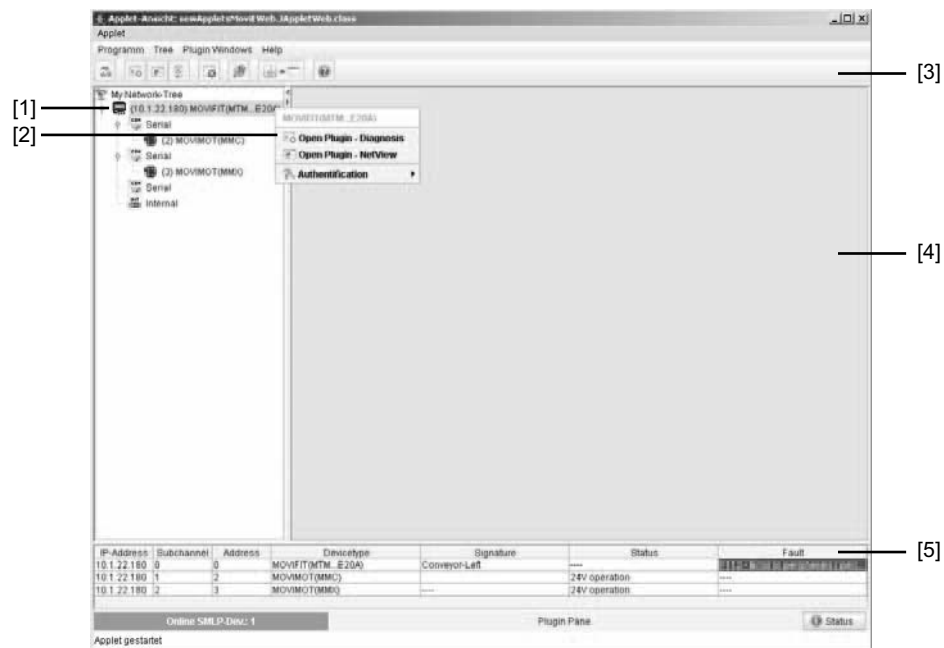
61601AXX

[1] Navigation bar	
[2] Main window (Home)	Button for starting the diagnostics applet
[3] Main window (Home)	Button for displaying website help
[4] Main window (Home)	Button for forwarding the documentation page of the MOVIFIT® series (internet access required)



10.9.5 Layout of the diagnostics applet

The following figure shows the layout of the diagnostics applet:

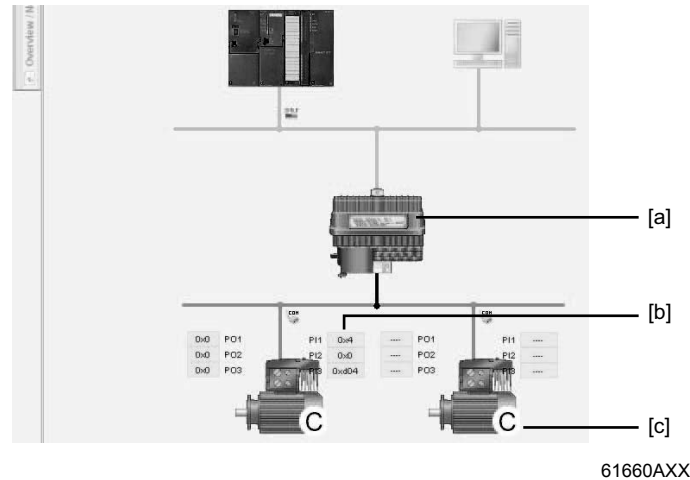


61604AXX

[1] Tree view / Overview	The tree displays the MOVIFIT [®] Ethernet unit in the network node "My Network Tree". Individual subsystems of the corresponding unit versions are displayed below that; they may contain additional units.
[2] Popup menu when you right-click on a unit in the tree	You can navigate to the plugins of an individual unit by right-clicking a unit in the tree. A popup window appears, which leads you to that unit's plugins. You can also edit the access settings for a MOVIFIT [®] Ethernet unit (see "Access protection" section on page 131). Clicking the network node will provide you with a "Scan" option. Click the button to detect new units and display them in the tree.
[3] Toolbar (Quick selection using buttons)	 [a] Rescan unit tree and display it in the tree [b] Open plugin for selected unit in unit tree [c] Overview plugin (Overview) for selected unit in unit tree, see "Overview plugin (Overview)" on page 129 [d] Close the selected plugin [e] Settings for Ethernet communication and scanner [f] Change to window mode or applet mode [g] Display information dialog box
[4] Plugin window	See "Plugin window" section on page 130.
[5] Status table and unit status	The table is visible by default. It lists all units and subunits found during a scan. Since the status table sends cyclical parameter requests to the unit, you can also close the table using the status button (bottom right).



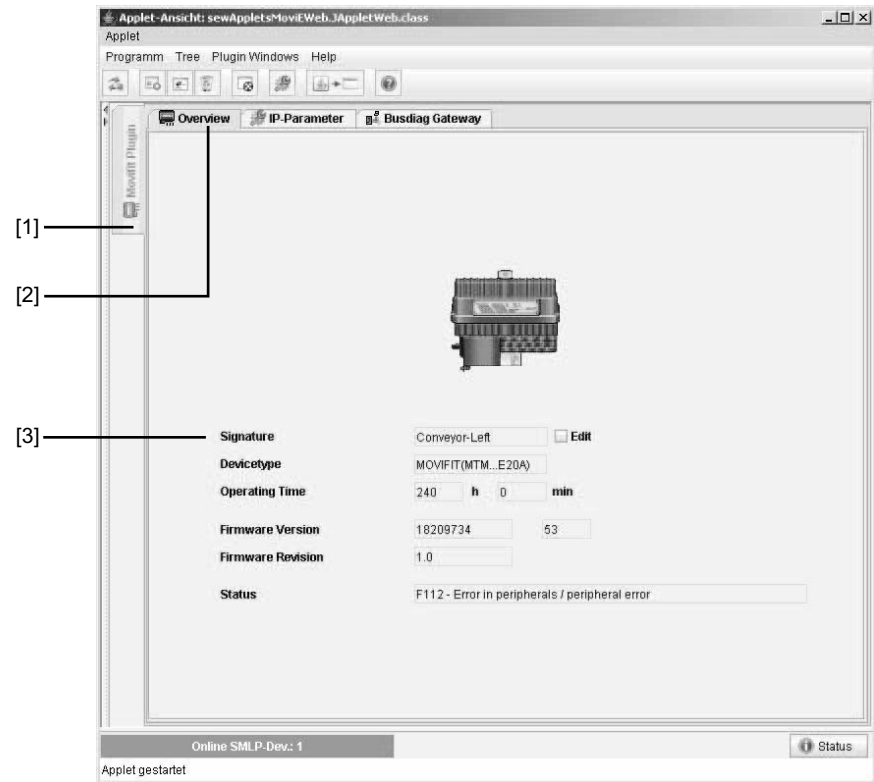
Overview plugin
(Overview)



[1] Main unit	Main unit being operated directly on the mains.
[2] Process data display	Displays process data if a parameter interface is integrated in the units.
[3] Subordinate units (here, MOVIMOT® connected in series)	Left-click to open the corresponding plug-in page, right-click to request specific parameters, or to navigate to the plugin pages.

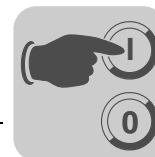


Plugin window



61657AXX

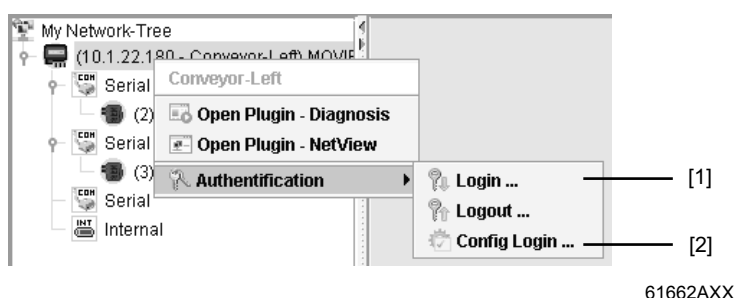
[1] Tab for opened plugins	If several plugins are open (e.g. plugins for various units), they will be listed on the tab.
[2] Tab within the plugin (shows parameter displays being implemented)	If the selected unit has several display columns, the tab will display those columns.
[3] Main window with display values and figures	The main window gives a visualization of the parameters.



10.9.6 Access protection

Access to the drive parameters and diagnostics information can be protected by a password. Access protection is deactivated at the factory. You can activate the access protection function by assigning a password [2]. To deactivate the function again, delete the password (blank password).

If access protection is activated, a login dialog [1] will appear to request the saved password.



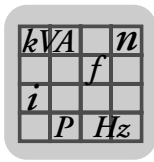
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[1] Login



[2] Config Login





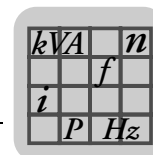
11 Technical Data

11.1 PROFIBUS interface

PROFIBUS interface	
Function level	Classic
PROFIBUS protocol option	PROFIBUS DP / DPV1
Supported baud rates	9.6 kbaud ... 1.5 Mbaud / 3 ... 12 Mbaud (with automatic detection)
Bus termination	Already installed in conjunction with ABOX "MTA...-S01...-00" and "MTA...-S02...-00", and can be activated via the switch according to IEC 61158. With all other ABOX versions, you must use an external terminating resistor.
Permitted cable length for PROFIBUS	• 9.6 kbaud: 1200 m (3937 ft) • 19.2 kbaud: 1200 m (3937 ft) • 93.75 kbaud: 1200 m (3937 ft) • 187.5 kbaud: 1000 m (3280 ft) • 500 kbaud: 400 m (1312 ft) • 1.5 Mbaud: 200 m (656 ft) • 12 Mbaud: 100 m (328 ft) To extend the length, several segments can be coupled using repeaters. The max. expansion/cascading depth can be found in the manuals for the DP Master or the repeater modules.
Address setting	Addresses 1..125 can be set using DIP switches in the connection box
DP ID number	Classic 600A hex (24586 dec)
GSD file name	Classic SEW_600A.GSD
Bitmap file name	Classic SEW600AN.BMP SEW600AS.BMP

11.2 MOVIFIT[®] module IDs and configuration data for PROFIBUS

Name	Description	Module ID	Ext. User Prm	Check-Cfg data
"Slot not used"	No data	100	0x03,0x20, 0x64	0x00
"SC 1PO/1PI"	1 output word, 1 input word Consistent for entire module	101	0x03,0x20, 0x65	0xC0, 0xC0, 0xC0
"SC 1PO/2PI"	1 output word, 2 input words Consistent for entire module	102	0x03,0x20, 0x66	0xC0, 0xC0, 0xC1
"SC 1PO/3PI"	1 output word, 3 input words Consistent for entire module	103	0x03,0x20, 0x67	0xC0, 0xC0, 0xC2
"FC/SC 6/8DI"	1 input byte	104	0x03,0x20, 0x68	0x40, 0x00
"MC: 12/16DI"	2 input bytes	105	0x03,0x20, 0x69	0x40, 0x01
"2/4DO"	1 output byte	106	0x03,0x20, 0x6A	0x80, 0x00
	Reserved for MOVIMOT [®] 1PD	107		
"MOVIMOT [®] 2PD"	2 output words, 2 input words Consistent for entire module	108	0x03,0x20, 0x6B	0xC0, 0xC1, 0xC1
"MOVIMOT [®] 3PD"	3 output words, 3 input words Consistent for entire module	109	0x03,0x20, 0x6C	0xC0, 0xC2, 0xC2
"MOVIFIT [®] Status"	1 input word	110	0x03,0x20, 0x6D	0x40, 0xC0
"FC 2PD"	2 output words, 2 input words Consistent for entire module	111	0x03,0x20, 0x6E	0xC0, 0xC1, 0xC1
"FC 3PD"	3 output words, 3 input words Consistent for entire module	112	0x03,0x20, 0x6F	0xC0, 0xC2, 0xC2



11.3 PROFINET interface

PROFINET interface	
Function level	Classic
PROFINET protocol option	PROFINET IO RT
Supported baud rates	100 Mbit / s (full duplex)
SEW identity number	010Ahex
Unit identity number	2
Connection technology	RJ45
Integrated switch	Supports autocrossing, autonegotiation
Permitted cable types	Category 5 and higher, class D according to IEC 11801
Maximum cable length (from switch to switch)	100 m (328 ft) according to IEEE 802.3
GSD file name	GSDML-V2.1-SEW-MTX-yyyymmdd.xml
Bitmap file name	SEW-MTX-Classic.bmp

11.4 DeviceNet interface

DeviceNet interface	
Function level	Classic
Protocol option	Master-slave connection set with polled I/O and bit-strobe I/O
Supported baud rates	500 kbaud 250 kbaud 125 kbaud
DeviceNet cable length 500 kbaud 250 kbaud 125 kbaud	See DeviceNet specification V 2.0 100 m (328 ft) 200 m (656 ft) 400 m (1312 ft)
Bus termination	120 Ω (switch on externally)
Bit-strobe response	Checkback signal of the unit status via bit-strobe I/O data
Address setting	DIP switches
Name of EDS files	MOVIFIT_Classic.eds
Name of icon files	MOVIFIT_Classic.ico



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	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
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	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au
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Belgium			
Assembly Sales Service	Brüssel	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
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Production Sales Service	Sao Paulo	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
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	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta, B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
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China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
Additional addresses for service in China provided on request!			
Colombia			
Assembly Sales Service	Bogotá	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr
Czech Republic			
Sales	Praha	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Kopenhagen	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Estonia			
Sales	Tallin	ALAS-KUUL AS Mustamäe tee 24 EE-10620 Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi
Gabon			
Sales	Libreville	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales Service	Athen	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr



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Hong Kong			
Assembly Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu
India			
Assembly Sales Service	Baroda	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	Bangalore	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com
Ireland			
Sales Service	Dublin	Alpertown Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458
Israel			
Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net
Italy			
Assembly Sales Service	Milano	SEW-EURODRIVE di R. Blicke & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp
Korea			
Assembly Sales Service	Ansan-City	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com



Lebanon			
Sales	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com
Lithuania			
Sales	Alytus	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt
Luxembourg			
Assembly Sales Service	Brüssel	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
Malaysia			
Assembly Sales Service	Johore	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Queretaro	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrail Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Morocco			
Sales	Casablanca	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma
Netherlands			
Assembly Sales Service	Rotterdam	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Peru			
Assembly Sales Service	Lima	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe



Address List

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

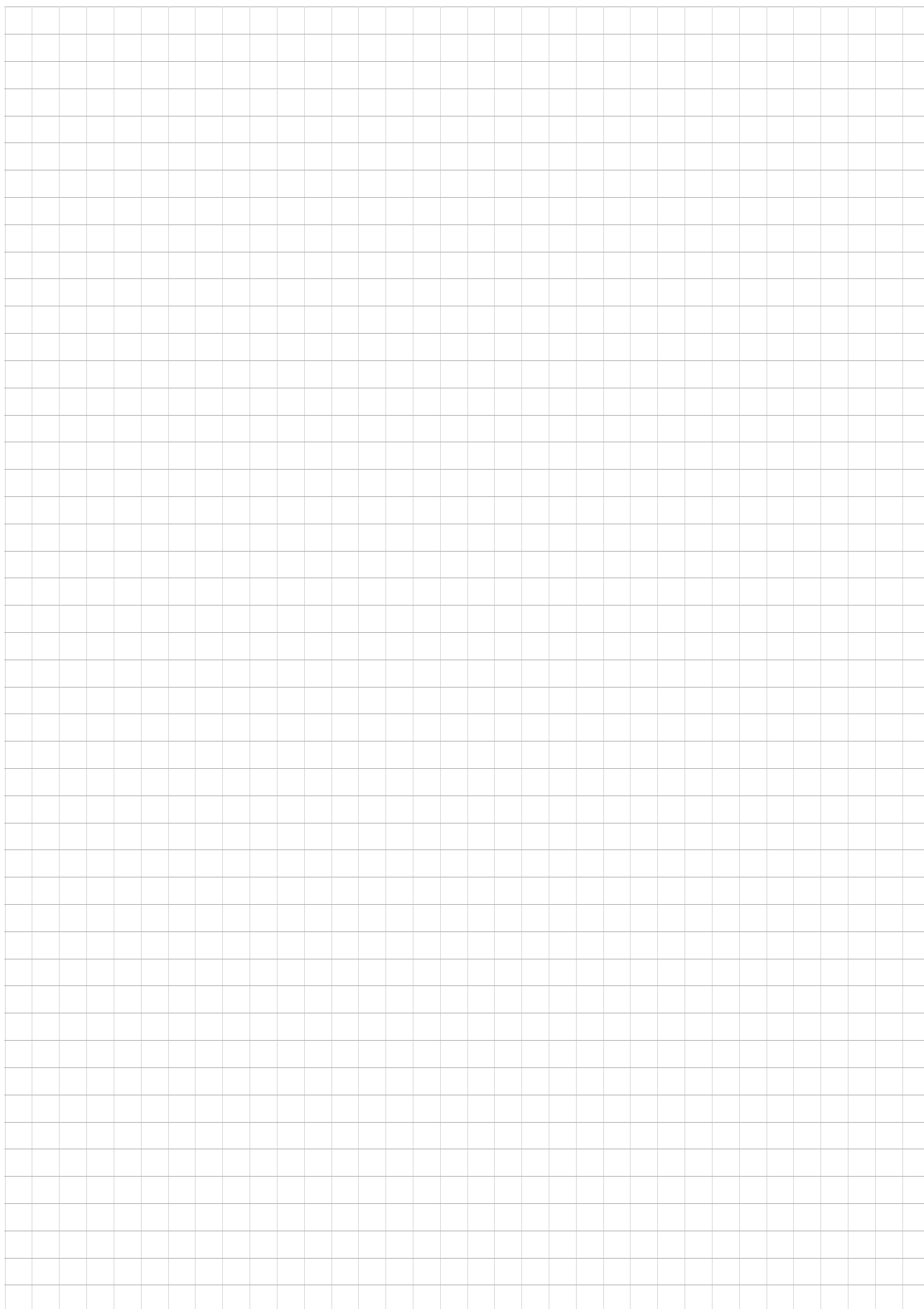


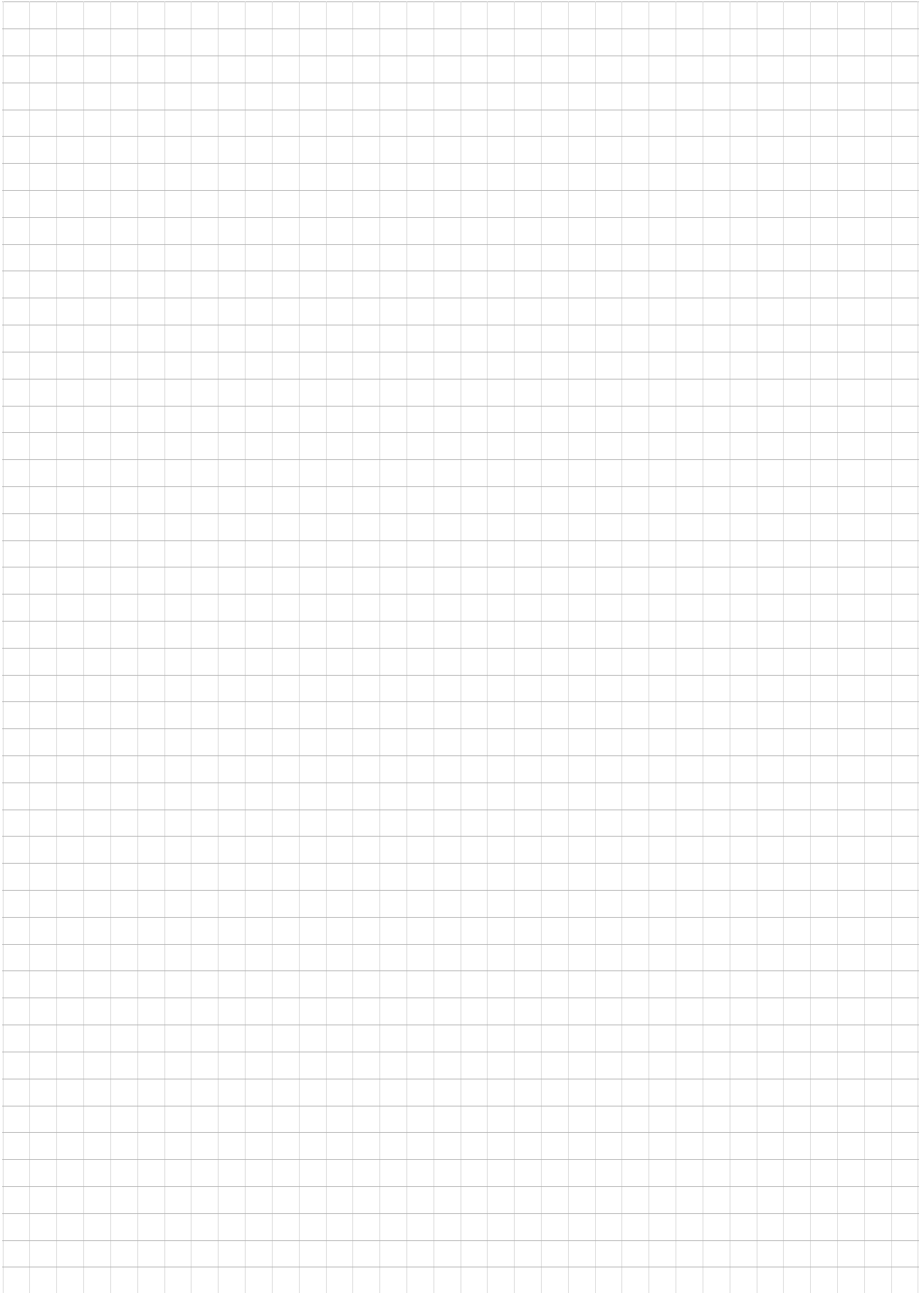
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly Sales Service	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn
Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr
Ukraine			
Sales Service	Dnepropetrovsk	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

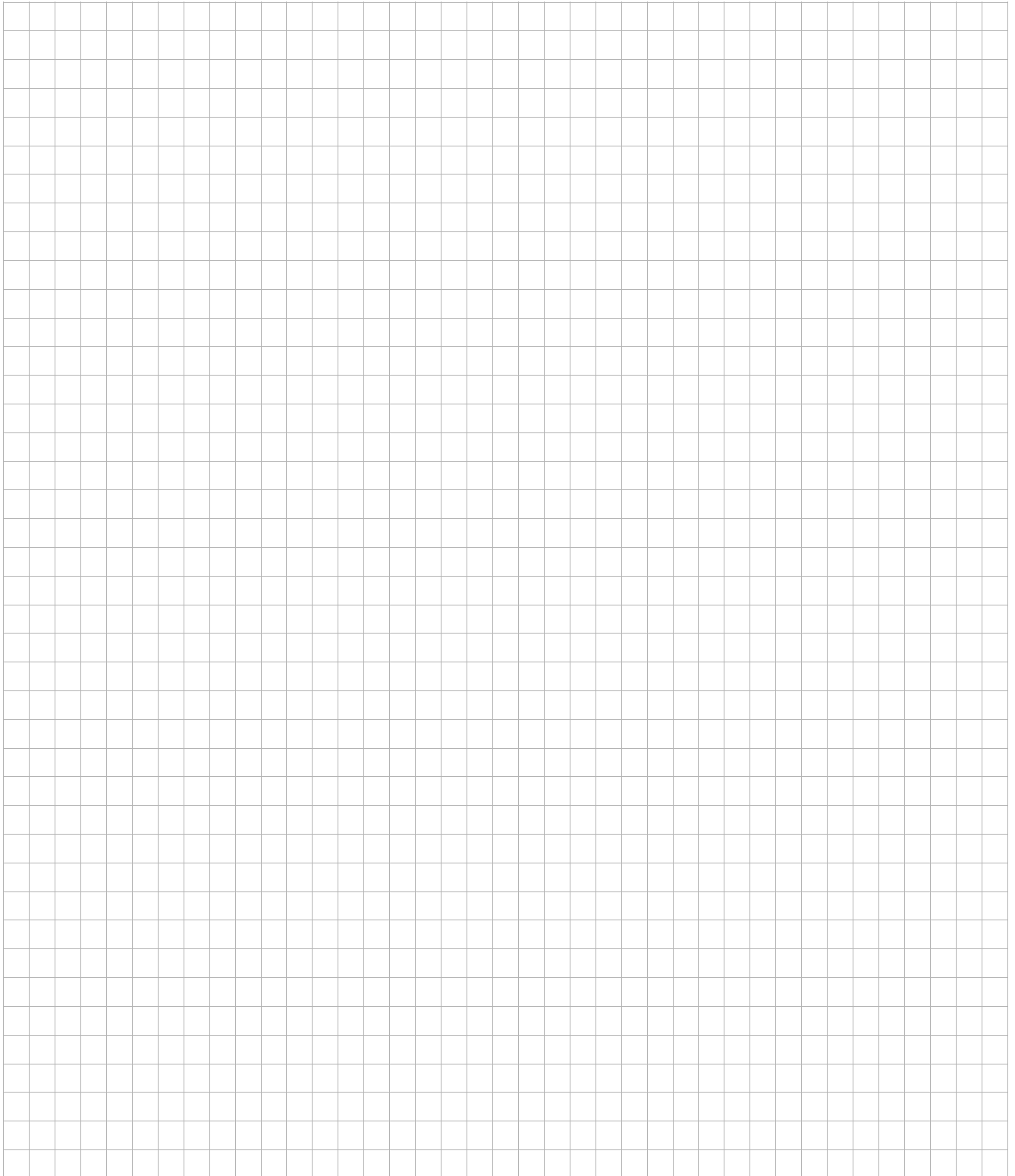


Address List

USA			
Production Assembly Sales Service	Greenville	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net







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