



# Manual



## MOVIKIT® Positioning / Velocity



## Table of contents

<b>1</b>	<b>General information.....</b>	<b>5</b>
1.1	About this documentation .....	5
1.2	Content of the documentation.....	5
1.3	Other applicable documentation .....	5
1.4	Short designation .....	5
1.5	Structure of the warning notes .....	5
1.5.1	Meaning of signal words .....	5
1.5.2	Structure of section-related safety notes.....	6
1.5.3	Structure of embedded safety notes .....	6
1.6	Decimal separator in numerical values .....	7
1.7	Rights to claim under limited warranty .....	7
1.8	Product names and trademarks.....	7
1.9	Copyright notice .....	7
<b>2</b>	<b>Safety notes .....</b>	<b>8</b>
2.1	Preliminary information .....	8
2.2	Target group .....	8
2.3	Designated use .....	8
2.4	Network security and access protection .....	8
<b>3</b>	<b>System description .....</b>	<b>9</b>
3.1	Module description.....	9
3.2	Areas of application .....	9
3.3	Functions .....	9
3.4	Scope of functions of the process data profiles .....	10
<b>4</b>	<b>Configuration .....</b>	<b>11</b>
4.1	Requirements.....	11
4.2	Hardware .....	11
4.3	Software.....	11
4.4	Licensing.....	11
<b>5</b>	<b>Startup .....</b>	<b>12</b>
5.1	Requirements.....	12
5.2	Startup procedure .....	12
5.3	Configuring fieldbus connection.....	13
5.4	Inserting the software module.....	14
5.5	Configuring the software module .....	15
5.5.1	Basic settings .....	16
5.5.2	Monitoring functions .....	16
5.5.3	Drive functions .....	18
5.5.4	Inputs/outputs.....	19
5.5.5	Fieldbus interface.....	19
5.6	Generating an IEC project .....	20
5.7	Importing MOVIKIT® process data monitor .....	21
5.8	Login and download.....	21
5.9	Starting the IEC program .....	22

5.10	Creating a boot application .....	22
5.11	Saving the project and logging out.....	23
<b>6</b>	<b>Operation.....</b>	<b>24</b>
6.1	Operating modes .....	24
6.1.1	Overview of operating modes .....	24
6.1.2	Requirements for cycle diagrams.....	24
6.1.3	Speed control .....	25
6.1.4	Jog mode .....	27
6.1.5	Referencing mode .....	30
6.1.6	Absolute positioning mode .....	32
6.1.7	Relative positioning mode .....	34
6.1.8	Modulo positive positioning mode .....	36
6.1.9	Modulo negative positioning mode.....	39
6.1.10	Modulo positioning mode – optimized direction .....	41
6.2	Other functions.....	43
6.2.1	Hardware limit switches .....	43
6.2.2	Software limit switches .....	44
6.2.3	Digital inputs/outputs .....	44
<b>7</b>	<b>MOVIKIT® process data monitor .....</b>	<b>46</b>
7.1	User interface.....	47
<b>8</b>	<b>Process data assignment .....</b>	<b>48</b>
8.1	Process output data .....	48
8.1.1	Control word .....	49
8.2	Process input data .....	51
8.2.1	Status word .....	53
<b>9</b>	<b>Fault lists .....</b>	<b>54</b>



# 1 General information

## 1.1 About this documentation

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work with the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

## 1.2 Content of the documentation

The descriptions in this documentation apply to the current software/firmware version at the time of publication. When new versions of software/firmware are installed, the descriptions may differ. In this case, contact SEW-EURODRIVE.

## 1.3 Other applicable documentation

Observe the corresponding documentation for all further components.

Always use the latest edition of documentation and software.

The SEW-EURODRIVE website ([www.sew-eurodrive.com](http://www.sew-eurodrive.com)) provides a wide selection of documents for download in various languages. If required, you can also order printed and bound copies of the documentation from SEW-EURODRIVE.

## 1.4 Short designation

The following short designations are used in this documentation.

Type designation	Short designation
MOVIKIT® Positioning	Software module
MOVIKIT® Velocity	Software module

## 1.5 Structure of the warning notes

### 1.5.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

Signal word	Meaning	Consequences if disregarded
<b>▲ DANGER</b>	Imminent hazard	Severe or fatal injuries
<b>▲ WARNING</b>	Possible dangerous situation	Severe or fatal injuries
<b>▲ CAUTION</b>	Possible dangerous situation	Minor injuries
<b>NOTICE</b>	Possible damage to property	Damage to the product or its environment

Signal word	Meaning	Consequences if disregarded
<b>INFORMATION</b>	Useful information or tip: Simplifies handling of the product.	

### 1.5.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



#### **SIGNAL WORD**


Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

### Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard

### 1.5.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

**⚠ SIGNAL WORD** Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

## **1.6 Decimal separator in numerical values**

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

## **1.7 Rights to claim under limited warranty**

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

## **1.8 Product names and trademarks**

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

## **1.9 Copyright notice**

© 2019 SEW-EURODRIVE. All rights reserved. Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

## **2 Safety notes**

### **2.1 Preliminary information**

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

### **2.2 Target group**

**Software specialist** Any work with the software may only be performed by a specialist with suitable training. A specialist in this context is someone who has the following qualifications:

- Appropriate training
- Knowledge of this documentation and other applicable documentation
- SEW-EURODRIVE recommends additional training for products that are operated using this software.

### **2.3 Designated use**

The software modules are used for implementing positioning applications (MOVIKIT® Positioning) and for applications with speed control (MOVIKIT® Velocity).

Use the device-independent MOVISUITE® engineering software to start up and configure the axes and to download the complete configuration to a MOVI-C® CONTROLLER.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

### **2.4 Network security and access protection**

A bus system makes it possible to adapt electronic drive technology components to the particulars of the machinery within wide limits. There is a risk that a change of parameters that cannot be detected externally may result in unexpected but not uncontrolled system behavior and may have a negative impact on operational safety, system availability, or data security.

Ensure that unauthorized access is prevented, especially with respect to Ethernet-based networked systems and engineering interfaces.

Use IT-specific safety standards to increase access protection to the ports. For a port overview, refer to the respective technical data of the device in use.

## 3 System description

### 3.1 Module description

MOVIKIT® Velocity is a software module for implementing applications with speed control and a permanently assigned fieldbus interface.

The MOVIKIT® Positioning software module provides the scope of functions of the MOVIKIT® Velocity software module and furthermore allows to implement positioning applications.

The software modules mainly use the basic functions of the application inverters in use by activating the respective function blocks (such as FCB 09 Position control) depending on the application. This means the scope of functions that can be used depends on the application inverter in use (for example encoder feedback available).

The software modules are integrated into the MOVISUITE® engineering software. No programming knowledge is required for startup and diagnostics.

### 3.2 Areas of application

The software modules are, among others, suited for the following areas of application:

#### Materials handling technology

- Trolleys
- Hoists
- Rail vehicles

#### Logistics

- Storage/retrieval systems
- Transverse carriage
- Rotary tables

### 3.3 Functions

The software modules offer the following scope of functions:

- Startup using a graphical user interface
- Own parameter tree with all parameters required for operation
- Operating modes: Jog mode, speed control, positioning mode (relative/absolute), referencing mode
- Diagnostic monitor for monitoring and controlling the axis
- Standardized process data interface



**3.4 Scope of functions of the process data profiles**

Profile	Scope of functions
5 PD	MOVIKIT® Velocity – 5 process data words for speed-variable applications. Encoder feedback is not necessarily required.
8 PD	MOVIKIT® Positioning – 8 process data words for the following operating modes. Encoder feedback is necessary to being able to use the entire scope of functions. <ul style="list-style-type: none"> <li>• Jog mode (encoder feedback not necessarily required)</li> <li>• Speed control (encoder feedback not necessarily required)</li> <li>• Referencing</li> <li>• Positioning (linear and modulo)</li> </ul> For further information, refer to the chapter "Operating modes" (→ 24).

## **4 Configuration**

### **4.1 Requirements**

Correct project planning and proper installation of the devices are required for successful startup and operation.

For detailed project planning information, refer to the documentation of the respective devices.

### **4.2 Hardware**

The following hardware is required for operating the software modules:

- MOVI-C® CONTROLLER (all power classes are possible)

The software modules are compatible with the following hardware:

- MOVIDRIVE® modular
- MOVIDRIVE® system

### **4.3 Software**

The following software is required for operating the software modules:

- MOVISUITE® engineering software

For more detailed information on the hardware requirements of the individual software components, see the documentation for the respective software.

### **4.4 Licensing**

The following license is required for operating the software modules:

- MOVIRUN® flexible

License for the software platform MOVIRUN® flexible

For further information on licensing, refer to the document "MOVI-C® Software Components". You can download the document from the SEW-EURODRIVE website ([www.sew-eurodrive.com](http://www.sew-eurodrive.com)).

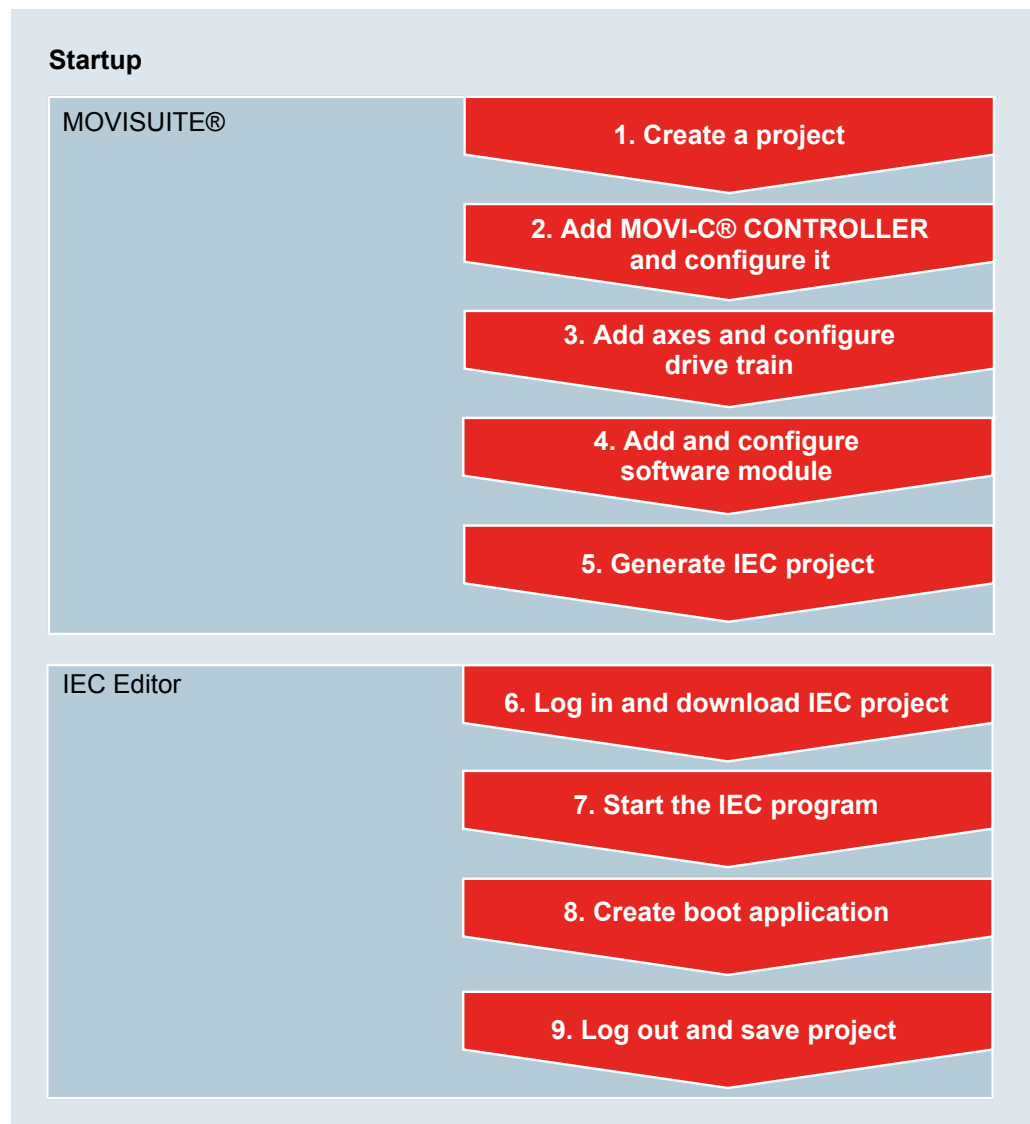
## 5 Startup

### 5.1 Requirements

- Check the installation of the MOVI-C® CONTROLLER as well as the installation of the inverters and the connection of the encoders.
- Observe the installation notes in the documentation of the devices and software components in use.
- The MOVISUITE® engineering software is installed on your engineering PC and is open.

### 5.2 Startup procedure

The schematic diagram below shows the startup procedure:



28307105035

Only the startup procedures specific to these software modules are explained in detail in the following chapters of this manual. Therefore also observe the documentation for all the other components in use when performing startup.

25951076/EN – 03/2019

## 5.3 Configuring fieldbus connection

Perform the following steps to allow the MOVI-C® CONTROLLER access to the fieldbus via IEC function blocks. This setting is required for direct fieldbus connection of software modules.

- ✓ A MOVISUITE® project has been created and is open.
  - ✓ The MOVISUITE® project includes a MOVI-C® CONTROLLER.
1. In the function view of MOVISUITE®, click on the node of the MOVI-C® CONTROLLER.
    - ⇒ The configuration menu of the MOVI-C® CONTROLLER opens.

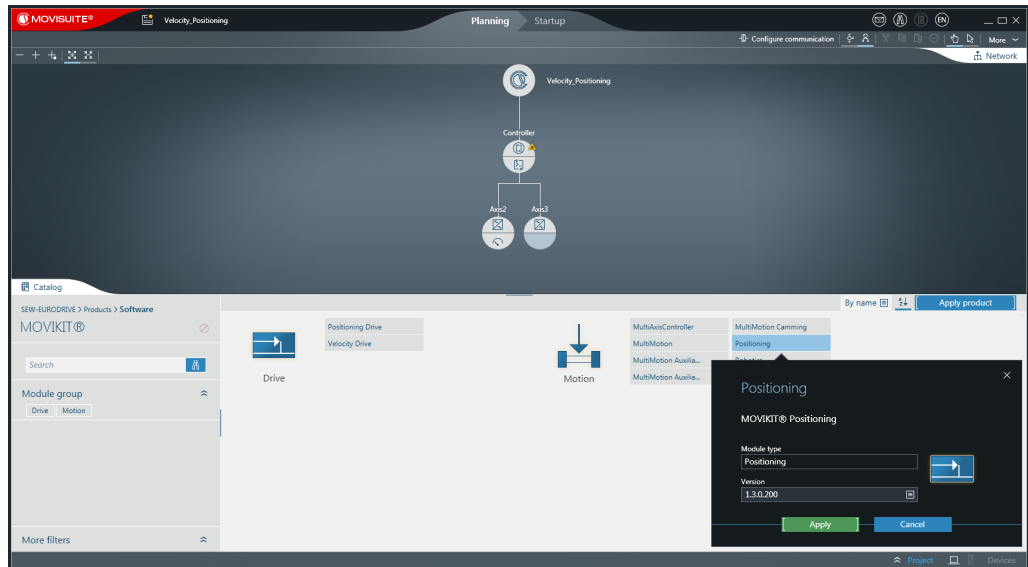


28339198731

2. Under "MOVIRUN® flexible", open the "Fieldbus" menu.
3. Select the fieldbus protocol in use in the "Fieldbus card" section.
4. In the section "Fieldbus connection via IEC function blocks", set the value of the field "Activate fieldbus connection" to "Yes".

## 5.4 Inserting the software module

- ✓ A MOVISUITE® project with the node structure of your device structure has been created and is open.
- 1. Click on the empty software module section of the node of an axis that is subordinate to the MOVI-C® CONTROLLER.
  - ⇒ The catalog opens and the available software modules are displayed.
- 2. In the catalog section, click on the desired software module.



28316396939

- ⇒ Doing so opens the context menu of the selected software module.
- 3. Select the version of the software module from the context menu and confirm your selection using [Apply].
  - ⇒ The software module is assigned to the axis, the configuration is created, and the basic settings are performed.

## INFORMATION

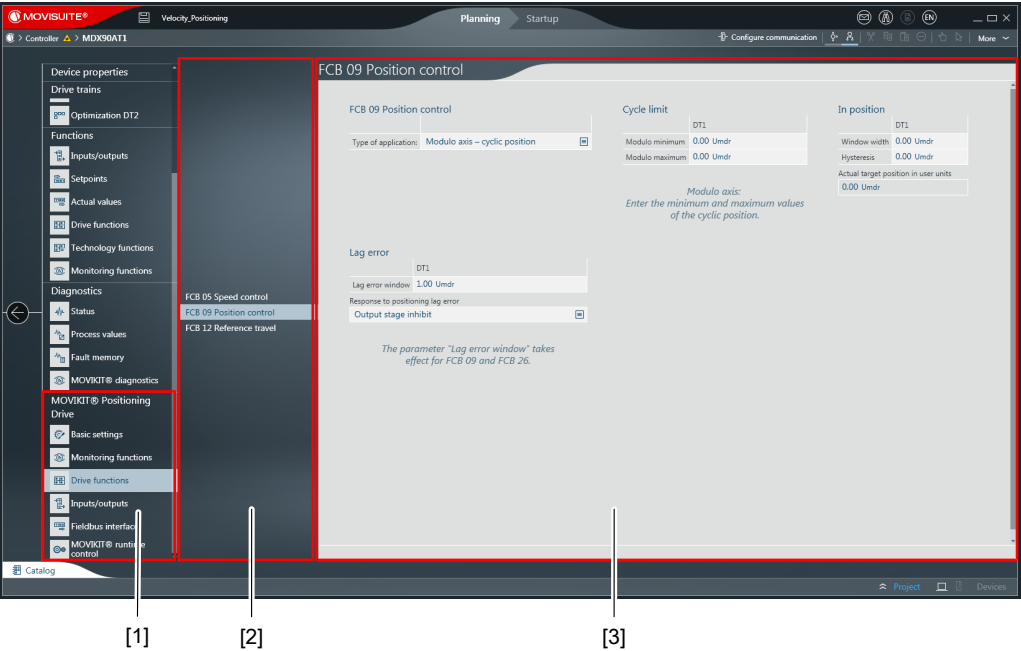


If the respective axes are enabled, you have to confirm that you are changing to startup state. Startup state will be disabled automatically once you have finished the steps described in this chapter.



5.5     Configuring the software module

1. In the function view of MOVISUITE®, click on the software module.
- ⇒ The configuration menus of the software module are displayed.



28202733195

- [1] Main menu for configuring the software module
- [2] Submenus of the configuration
- [3] Configuration parameters of the respective submenus

INFORMATION



When using drives without encoders, the stop by setpoint function must be enabled in the submenu "FCB05 Speed control" of the "Drive functions" menu, and both the stop setpoint and the start offset must be set.

INFORMATION



When using drives with encoders, we recommend that you enable the setting "Position controlled" in the submenu "FCB 26 Stop at user-defined limits" in the "Drive functions" menu under "Functions" in the configuration menu of the axis.

INFORMATION



Changes made after initial startup to the configuration of the software modules or to the user units in the drive train do not take effect until the configuration data are updated. To do so, open the context menu of the MOVI-C® CONTROLLER and click [Update configuration data]. The MOVI-C® CONTROLLER is stopped and restarted for updating the configuration data.

25951076/EN – 03/2019

## 5.5.1 Basic settings

Parameter group	Description
Initialization	<p>Initialization of the settings if the process data profile has been changed.</p> <p><b>⚠ CAUTION!</b> If you perform an initialization, add a software module, or update the version, the inputs of the inverter are set to "No function". Settings, such as HW limit switches or reference cams, will be lost. For information on how to update the version of a software module, refer to the installation instructions "MOVISUITE® standard – Installation and Project Adjustment".</p>
Select process data profile	<p>Specify the number of process data to be created. For the basic function, do not change the setting for "AuxPositioning" with 8 process data. For expansions, you can choose between the settings "AuxPositioning Variable4PD" with 4 additional process data, and "AuxPositioning8PD" with 8 additional process data.</p>
Drive train	<p>Setting whether only drive train 1 or drive trains 1 and 2 are to be processed.</p> <p><b>NOTICE!</b> Drive train 2 is only available with single-axis modules and can be used, for example, to implement emergency mode without encoder feedback. The user units and the speed window for the "Setpoint/actual speed comparison active" signal must be set identical with those of drive train 1.</p>

## 5.5.2 Monitoring functions

## Reference signals

Parameter group	Description
Comparison of setpoint and actual speed values	Speed window for the "Setpoint/actual speed comparison active" signal (PI 1:11)

## Limit switches

### INFORMATION



"Software limit switches" are only available when using MOVIKIT® Positioning.

Parameter group	Description
Hardware limit switches	Activation and configuration of hardware limit switches
Software limit switches	Activation and configuration of software limit switches
Limit switch fault response	Setting of the fault response of the limit switches

## Limit values

Parameter group	Description
Application limits	<p>The application limits are set using the following parameters:</p> <ul style="list-style-type: none"> <li>• Speed, positive/negative</li> <li>• Acceleration/deceleration</li> <li>• Jerk time</li> <li>• Torque</li> <li>• Apparent output current</li> <li>• Emergency stop deceleration</li> </ul>
Limit values from startup	<p>The limit values from startup are set using the following parameters:</p> <ul style="list-style-type: none"> <li>• Maximum speed at motor shaft</li> <li>• Maximum torque at motor shaft</li> </ul>

## Control functions

Parameter group	Description
Stop functions	<p>Setting of the stop function for drives with encoder. The following settings can be made for the behavior at standstill:</p> <ul style="list-style-type: none"> <li>• Brake released/drive energized</li> <li>• Brake applied/drive not energized</li> <li>• No brake installed/drive not energized</li> </ul> <p>The stop function is active if enable is revoked (stop with FCB 13/14), if no operating mode is selected (FCB 02), and if the stop by setpoint function is enabled.</p> <p>For drives without encoder, this setting is ignored, which means the brake function is always active.</p>
Speed monitoring	Settings for the behavior of speed monitoring

## 5.5.3 Drive functions

## FCB 05 Speed control

Parameter group	Description
Stop by setpoint function	Setting of stop by setpoint function  For axes without encoder, the stop by setpoint function must be enabled and both the stop setpoint and the start offset must be set. The brake will then only release when "speed control" mode is selected and the specified setpoint speed is greater than the stop setpoint + start offset.

## FCB 09 Position control

## INFORMATION



The configuration is only available when using MOVIKIT® Positioning.

Parameter group	Description
FCB 09 Position control	Selection of the type of application (linear axis or modulo axis)
Cycle limit (only visible if modulo axes are selected)	Minimum and maximum value of the cyclic position when using modulo axes
In position	Position window for the "In position active" signal (PI 1:7)
Lag error	Lag error window and monitoring response  <b>NOTICE!</b> The setting applies to FCB 09 and FCB 26. For FCB 20 Jog mode, for example, a separate lag error window is available.

## FCB 12 Reference travel

## INFORMATION



The configuration is only available when using MOVIKIT® Positioning.

Parameter group	Description
FCB 12 Reference travel	Setting of the reference travel type and associated parameters. Other setting windows are available depending on the selected reference travel type.
Advanced settings	Homing can be activated and set as option.

#### 5.5.4 Inputs/outputs

Parameter group	Description
Digital inputs	Configuration of digital inputs We recommend that you set the default assignment of the input with or without HW limit switches.
Digital outputs	Configuration of digital outputs

#### 5.5.5 Fieldbus interface

Parameter group	Description
Fieldbus configuration	Activation of the fieldbus connection as well as definition of the start address and the process data length of the process data profile selected under Basic Settings.
Fieldbus interface	Representation of the process data profile and selection of the assignment of PI 4 (torque, relative apparent current or absolute apparent current)
Decimal places via fieldbus	Display of the decimal places set in the drive train



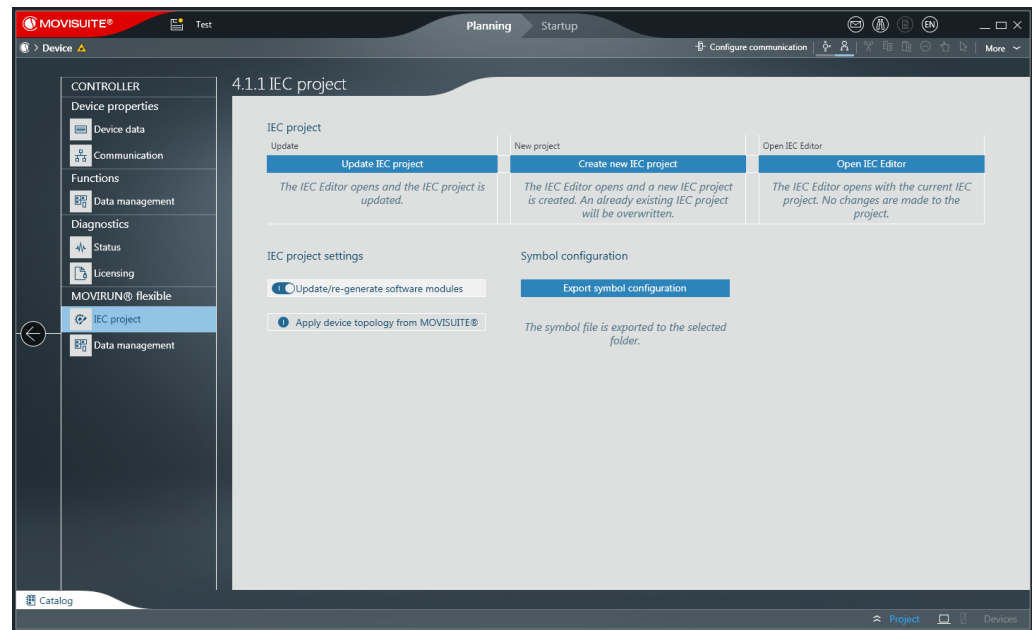
## 5.6 Generating an IEC project

Carry out the following steps to create an IEC project by means of automatic code generation and based on the configurations made in MOVISUITE®.

✓ Configuration of the software module in MOVISUITE® is complete.

1. In the function view of MOVISUITE®, click the software module section of the MOVI-C® CONTROLLER node.

⇒ The "IEC project" menu opens.



18014419193896075

## INFORMATION



If you have carried out the configuration in MOVISUITE® using the "Startup" mode and the message "Device cannot be reached" appears, proceed as follows:

- If the MOVI-C® CONTROLLER is not available via the network, switch over to "Planning" mode.
- If the MOVI-C® CONTROLLER is available via the network, carry out a network scan and connect the MOVI-C® CONTROLLER in the network view with the MOVI-C® CONTROLLER in the function view.

2. Click [Create new IEC project].

⇒ The IEC Editor opens and a new IEC project is created. An existing IEC project is overwritten in full.

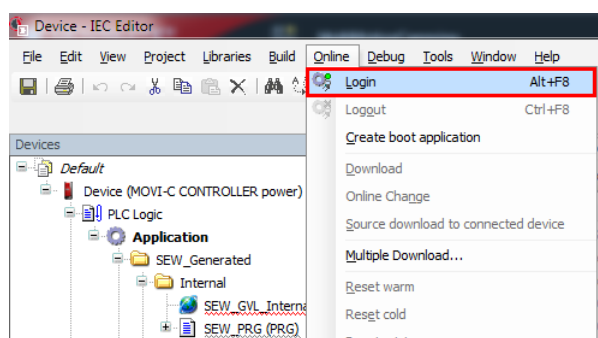
## 5.7 Importing MOVIKIT® process data monitor

You have to import the MOVIKIT® process data monitor to being able to use it for monitoring and controlling the process data interface.

From the menu [Tools] > [Scripting] > [Scripts] > [E] select the menu entry [Fieldbus-monitor.py]. For further information on how to use the MOVIKIT® process data monitor, refer to the chapter "MOVIKIT® process data monitor" (→ 46).

## 5.8 Login and download

1. Open the [Online] menu and click on [Login]. You can also log in with the key shortcut **Alt + F8**.



9007225001182603

- ⇒ The IEC Editor performs the login to the MOVI-C® CONTROLLER.
  - ⇒ After the login, a dialog opens asking you whether you want to download the program.
2. Confirm the prompt with "Yes"

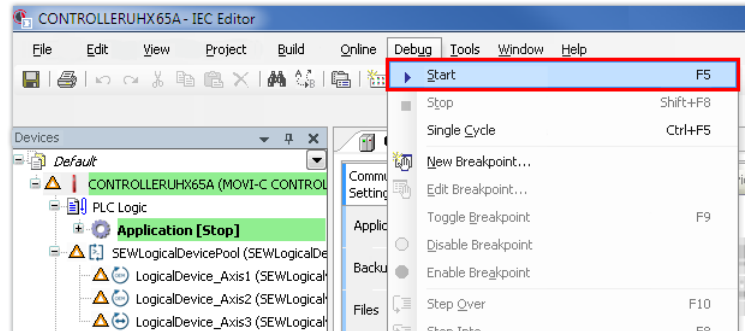
### INFORMATION



You have to create a boot application so that the program will still be available after switching off and on the MOVI-C® CONTROLLER. See the chapter "Creating a boot application" (→ 22).

## 5.9 Starting the IEC program

- ✓ The IEC Editor is logged in and the IEC project has been downloaded to the MOVI-C® CONTROLLER.
- 1. Open the [Debug] menu and select [Start]. You can also start the IEC program using the key shortcut **F5**.



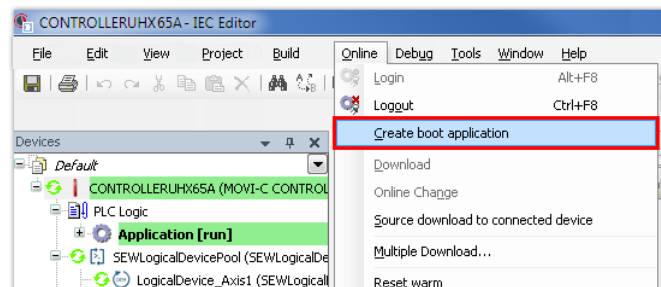
9007226459233675

⇒ The IEC program on the MOVI-C® CONTROLLER starts.

## 5.10 Creating a boot application

You have to create a boot application so that the previous program will still be available after switching off and on the MOVI-C® CONTROLLER.

1. Open the [Online] menu and select [Create boot application].



27204414475

⇒ The boot application is saved on the MOVI-C® CONTROLLER so that the MOVI-C® CONTROLLER starts with the IEC program after deactivation and activation.

### INFORMATION



You have to generate the boot application again after a change to the IEC project. Else the old program will be started after deactivation and activation of the MOVI-C® CONTROLLER.

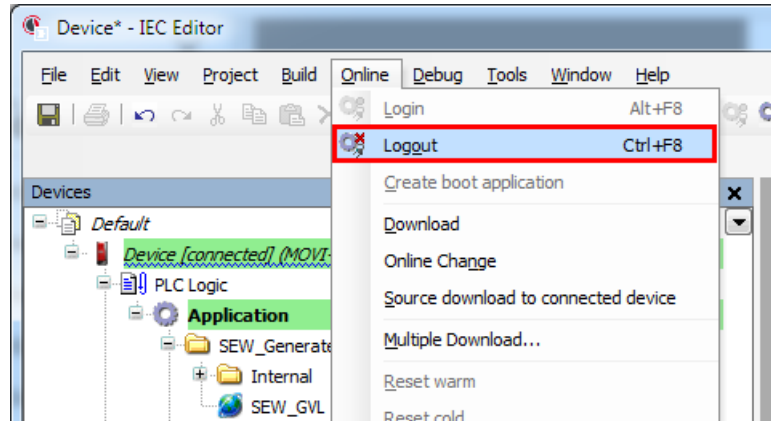
### INFORMATION



The fault-free boot application is always switched to "Run" state after having activated the MOVI-C® CONTROLLER.

## 5.11 Saving the project and logging out

- ✓ An IEC project is open in the IEC Editor.
  - ✓ The IEC Editor is logged in.
1. Open the [File] menu and select the menu entry [Save project].
  2. Open the [Online] menu and select the menu entry [Logout]. You can also log out using the key shortcut *Ctrl + F8*.



28340020619

- ⇒ The IEC Editor performs the logout from the MOVI-C® CONTROLLER.
3. Close the IEC Editor.
    - ⇒ The MOVISUITE® user interface is displayed.
  4. Click the [Save] button in the top left corner next to the MOVISUITE® button.

## 6 Operation

### 6.1 Operating modes

#### INFORMATION



The MOVIKIT® Velocity software module uses the speed control operating mode (200). The operating mode cannot be selected manually when using MOVIKIT® Velocity.

#### 6.1.1 Overview of operating modes

Operating modes of MOVIKIT® Positioning and their areas of application:

Operating mode	Decimal	Description
Jog mode	100	Position-controlled jogging (FCB 20) Encoder feedback required
	101	Speed-controlled jogging (FCB 05) Encoder feedback not required
Speed control	200	Speed control (FCB 05) Encoder feedback not required
Referencing mode	300	Reference travel – offset via parameter (FCB 12)
	301	Reference travel – offset via fieldbus (FCB 12)
Positioning mode	400	Absolute position control (FCB 09)
	401	Relative position control (FCB 09)
	402	Modulo position control – positive (FCB 09)
	403	Modulo position control – negative (FCB 09)
	404	Modulo position control – shortest distance (FCB 09)

#### INFORMATION



The configurations performed in MOVISUITE® apply to operating the function blocks FCB 05, FCB 09, FCB 12, and FCB 20. Modulo operating modes can only be used if the following setting is made in the configuration of the software module in the "Drive functions" menu in the submenu "FCB 09 Position control" in the field "Type of application": "Modulo axis – cyclic position" is set as well as the cycle limit.

#### 6.1.2 Requirements for cycle diagrams

The following chapters provide a cycle diagram for each operating mode to help you better understand the operating principle. They also provide a process sequence with a description of the signals to be set as well as of signal states. The following requirements apply:

Requirement	Process data	Signal state
Ready	PI 1:0	"1": Ready
STO inactive	PI 1:1	"1": STO inactive



Requirement	Process data	Signal state
No fault present	PI 1:8	"0": No fault
No warning present	PI 1:9	"0": No warning
Positioning mode: Axis is referenced	PI 1:5	"1": Axis referenced
Startup has been performed correctly		
Output stage enabled (DI00 = 1)		

### 6.1.3 Speed control

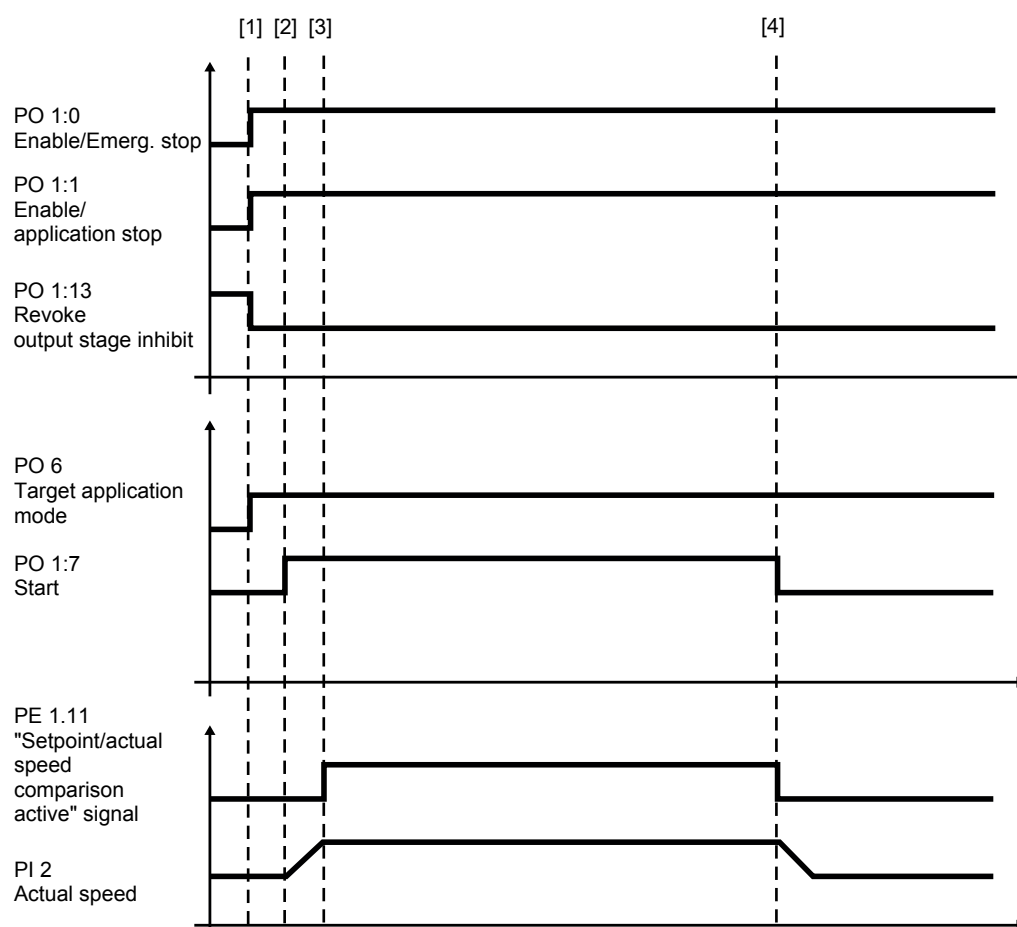
An axis is moved in a speed-controlled manner with or without encoder feedback. The direction depends on the sign of the speed setpoint. A positive setpoint corresponds to a positive motor direction of rotation.

## INFORMATION



Monitoring of the software limit switches is disabled in operation without encoder. Use hardware limit switches to monitor the travel range.

### Cycle diagram



28317944843

**Process sequence and signal states**
**INFORMATION**

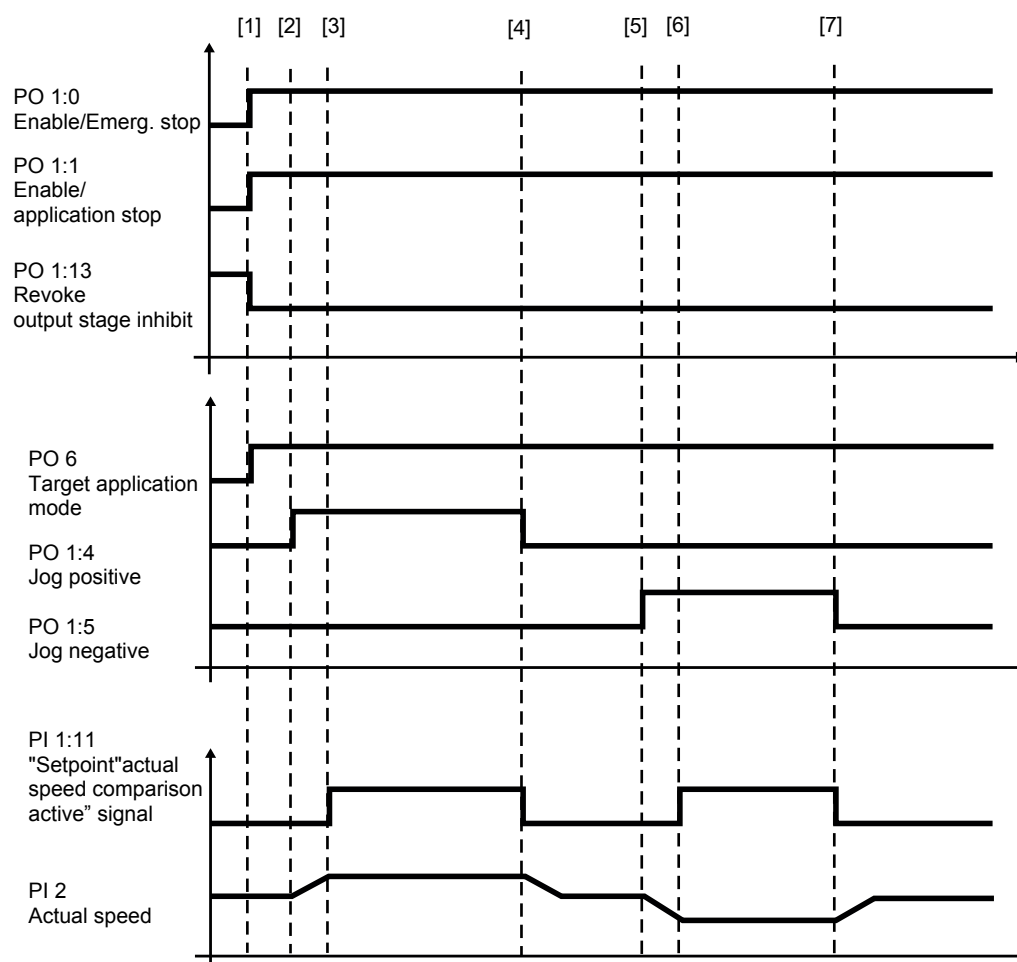

For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied)</li> </ul>
[1]	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed (signed) Acceleration Deceleration
[2] to [4]	Start/stop of the axis	PO 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": Deceleration with the value specified by PO 4.</li> </ul> <p>Standstill behavior: The motor is held at speed 0 subject to speed control. For motors without encoder, the "Stop by setpoint function" (→ 18) must be used.</p>
[3] to [4]	If the actual speed lies within the configured window width, the feedback "Setpoint/actual speed comparison active" is issued.	PI 1:11	<ul style="list-style-type: none"> <li>"1": "Setpoint/actual speed comparison active"</li> </ul>

### 6.1.4 Jog mode

An axis is moved position controlled (100) or speed controlled (101) with activation of the direction of rotation. Selecting both directions of rotation or not selecting a direction of rotation at all will stop an ongoing movement.

#### Cycle diagram



28318277515

**Process sequence and signal states**
**INFORMATION**


For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

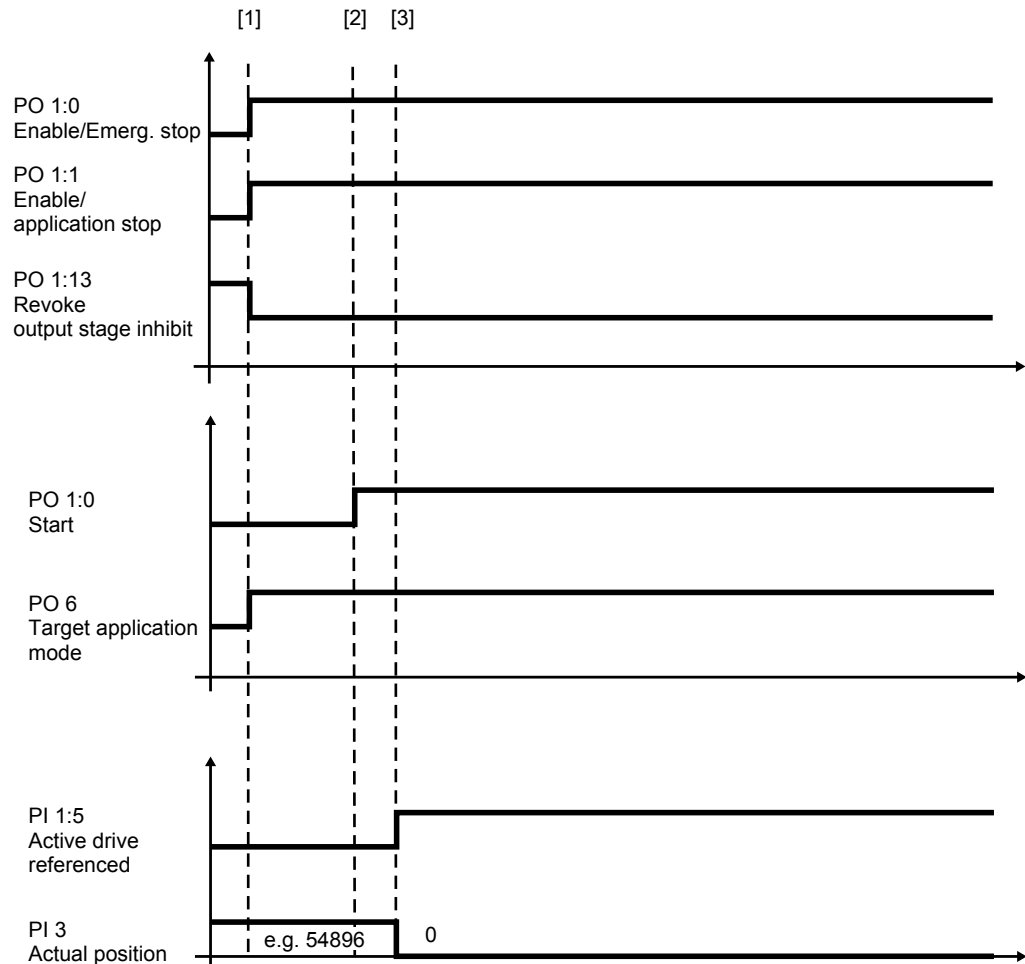
No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied)</li> </ul>
[1]	"Jog mode" activated	PO 6	100/101 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2	Setpoint speed
		PO 3	Acceleration
		PO 4	Deceleration
[2] to [4]	Positive jog direction selected	PO 1:4	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": Deceleration with the value specified by PO 4.</li> </ul> <p>Operating mode 100: The motor is held at speed 0 subject to position control.</p> <p>Operating mode 101: The motor is held at speed 0 subject to speed control.</p> <p>For motors without encoder, the "Stop by setpoint function" (→ 18) must be used.</p>

No.	Sequence	PD	Signal states
[5] to [7]	Negative jog direction selected	PO 1:5	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": Deceleration with the value specified by PO 4.</li> </ul> <p>Operating mode 100: The motor is held at speed 0 subject to position control.</p> <p>Operating mode 101: The motor is held at speed 0 subject to speed control.</p> <p>For motors without encoder, the "Stop by setpoint function" (→ 18) must be used.</p>
[3] to [4] and [6] to [7]	If the actual speed lies within the configured window width, the feedback "Setpoint/actual speed comparison active" is issued.	PI 1:11	<ul style="list-style-type: none"> <li>"1": "Setpoint/actual speed comparison active"</li> </ul>

### 6.1.5 Referencing mode

Setting of the actual position dependent on the selected reference travel type (300 – Offset via parameter, 301 – Offset via fieldbus) to the specified reference offset. In referencing mode with offset via fieldbus, the reference offset is specified via PO7/PO8.

#### Cycle diagram (type – referencing without reference travel)



28318269963

## Process sequence and signal states

### INFORMATION



For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied)</li> </ul>
[1]	Selecting an operating mode "Referencing mode"	PO 6	300/301 (decimal)
[2]	Start/stop of reference travel	PO 1:7	<ul style="list-style-type: none"> <li>"1": Reference travel start</li> <li>"0": Stop with drive function FCB 26 (Stopp an benutzerdefinierten Grenzen). Deceleration with the value specified by PO 4.</li> </ul>
[3]	Message "Active drive referenced"	PI 1:5	<ul style="list-style-type: none"> <li>"1": "Active drive referenced"</li> </ul>

### 6.1.6 Absolute positioning mode

Absolute positioning (400) of an axis with reference to machine zero (reference point). The setpoint position is processed with sign.

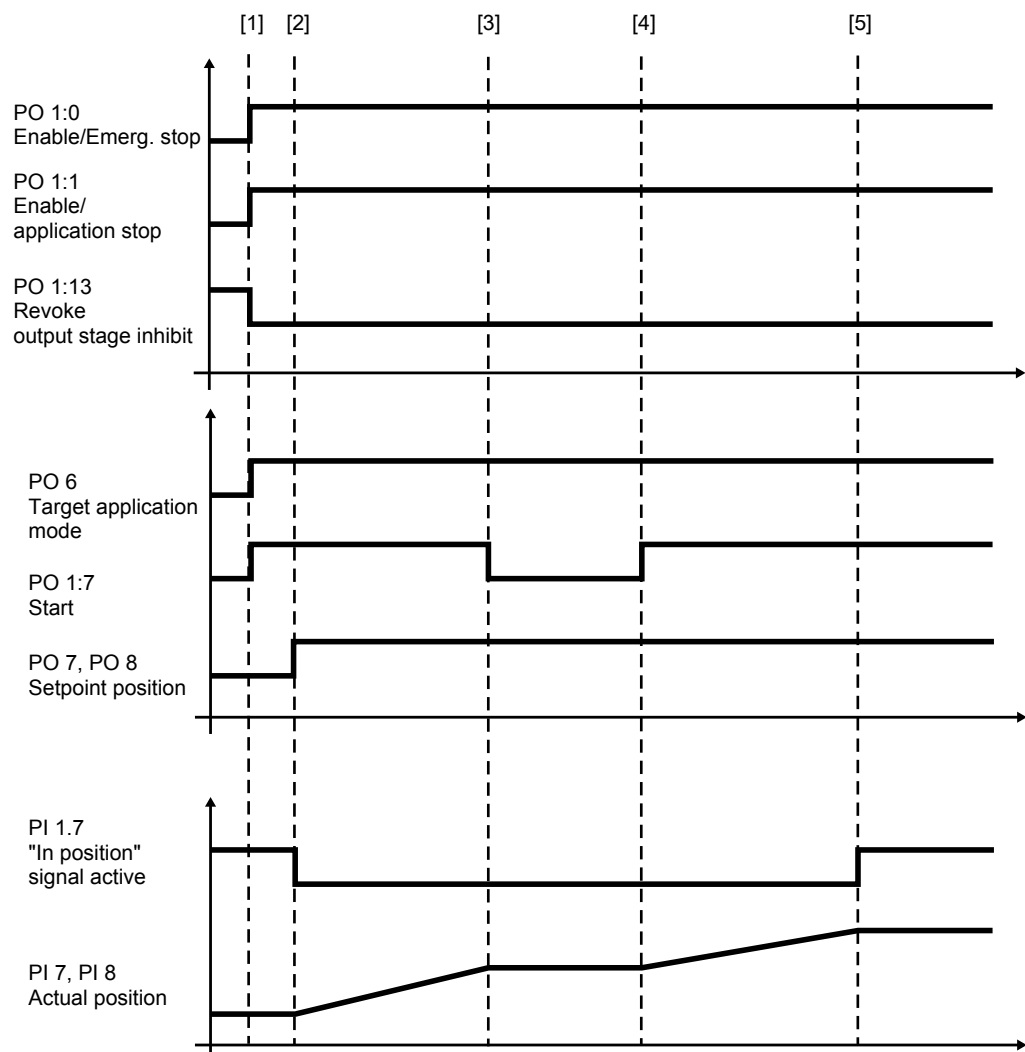
- "Linear" axis type: Setpoint position with processing of signs
- "Modulo" axis type: Setpoint position =  $0 \leq \text{target position} < \text{modulo max.}$

**NOTICE!**

The specified setpoint position should be smaller than modulo max.

The required axis type is set in the configuration of the software module in the "Drive functions" menu in the submenu "FCB 09 Position control" in the field "Type of application".

#### Cycle diagram (type of application – linear axis)



28317949195

25951076/EN – 03/2019



## Process sequence and signal states

### INFORMATION



For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied).</li> </ul>
[1]	Selecting an operating mode "Absolute positioning mode"	PO 6	400 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
[1] to [3] and from [4]	Start/stop of the axis	PO 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": The motor is held at speed 0 subject to position control.</li> </ul>
[2]	Specification of the setpoint position (a new setpoint position is also adopted during ongoing movement)	PO 7	"Setpoint position" (high word)
		PO 8	"Setpoint position" (low word)
Up to [2] and from [5]	If the actual position lies within the configured window width, the feedback "In position" is issued. The drive stops subject to position control.	PI 1:7	<ul style="list-style-type: none"> <li>"1": "In position" signal active.</li> </ul>

### 6.1.7 Relative positioning mode

Positioning of a drive relative to the current position (401).

Example: Cyclical operation at a conveyor belt.

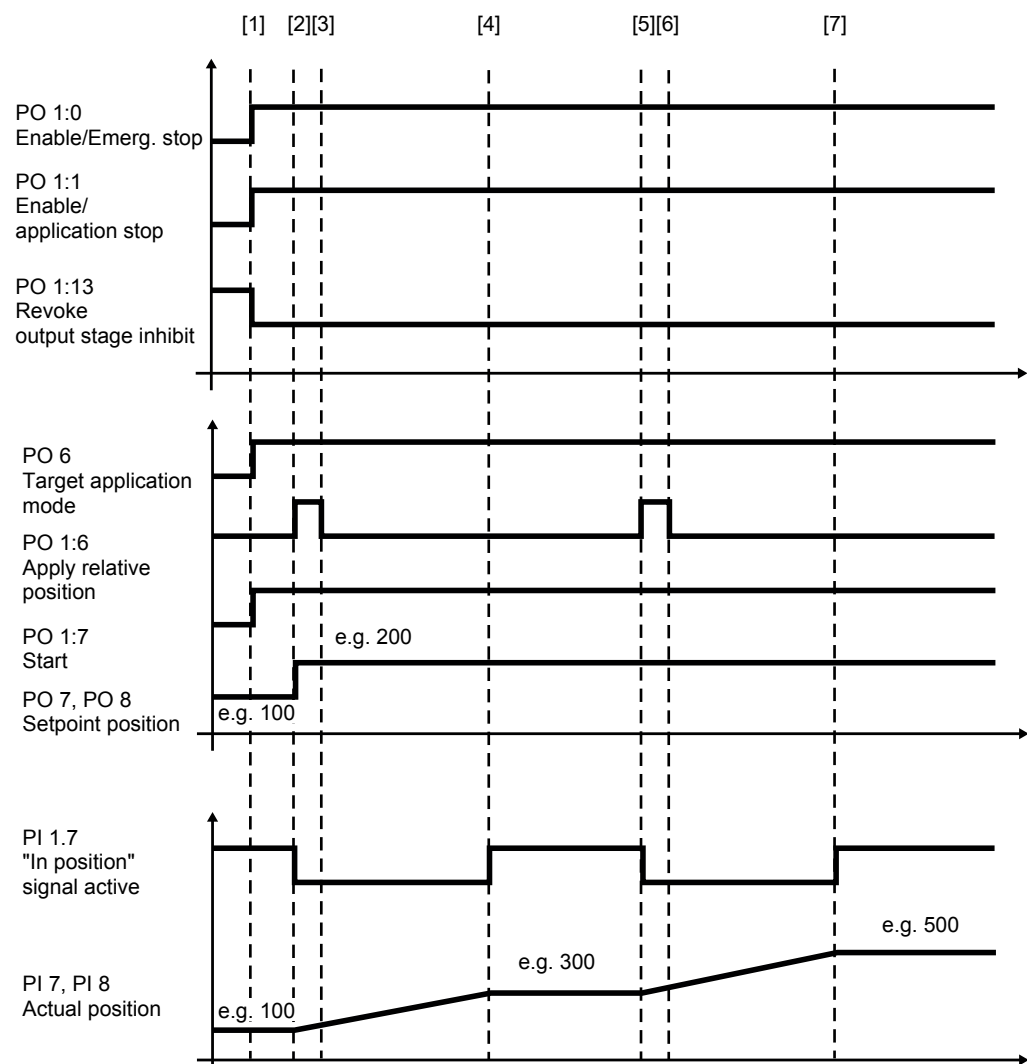
- "Linear" axis type: Setpoint position with processing of signs
- "Modulo" axis type: Setpoint position =  $0 \leq \text{target position} < \text{modulo max.}$

#### NOTICE!

The specified setpoint position should be smaller than modulo max.

The required axis type is set in the configuration of the software module in the "Drive functions" menu in the submenu "FCB 09 Position control" in the field "Type of application".

#### Cycle diagram (type of application – linear axis)



28358476171

25951076/EN – 03/2019

## Process sequence and signal states

### INFORMATION



For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied).</li> </ul>
[1]	"Relative positioning mode" is activated	PO 6	401 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
	Start/stop of the axis. If the "Start" signal is revoked during movement to the first target, the drive is stopped and continues to move to the original target if this signal is set again.	PI 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": The motor is held at speed 0 subject to position control.</li> </ul>
[2]	Specification of the distance (relative position)	PO 7 PO 8	"Setpoint position" (high word) "Setpoint position" (low word)
[2] to [3] and [5] to [6]	Accept relative position <b>Note:</b> The relative position is calculated once with the rising edge of the signal, and is saved. With the next positive edge (also during movement to the first target), the travel distance can be extended or shortened by the specified relative position.	PO 1:6	<ul style="list-style-type: none"> <li>"1": Accept relative position</li> </ul>

No.	Sequence	PD	Signal states
Up to [2], [4] to [5] and from [7]	If the actual position lies within the configured window width, the feedback "In position" is issued. The drive stops subject to position control.	PI 1:7	<ul style="list-style-type: none"> <li>"1": "In position" signal active</li> </ul>

## INFORMATION



If the motion sequence is interrupted by revoking the enable signals PO1:0, PO1:1 or PO1:13, the movement must be restarted by setting "Accept relative position". The target position is then recalculated and saved.

### 6.1.8 Modulo positive positioning mode

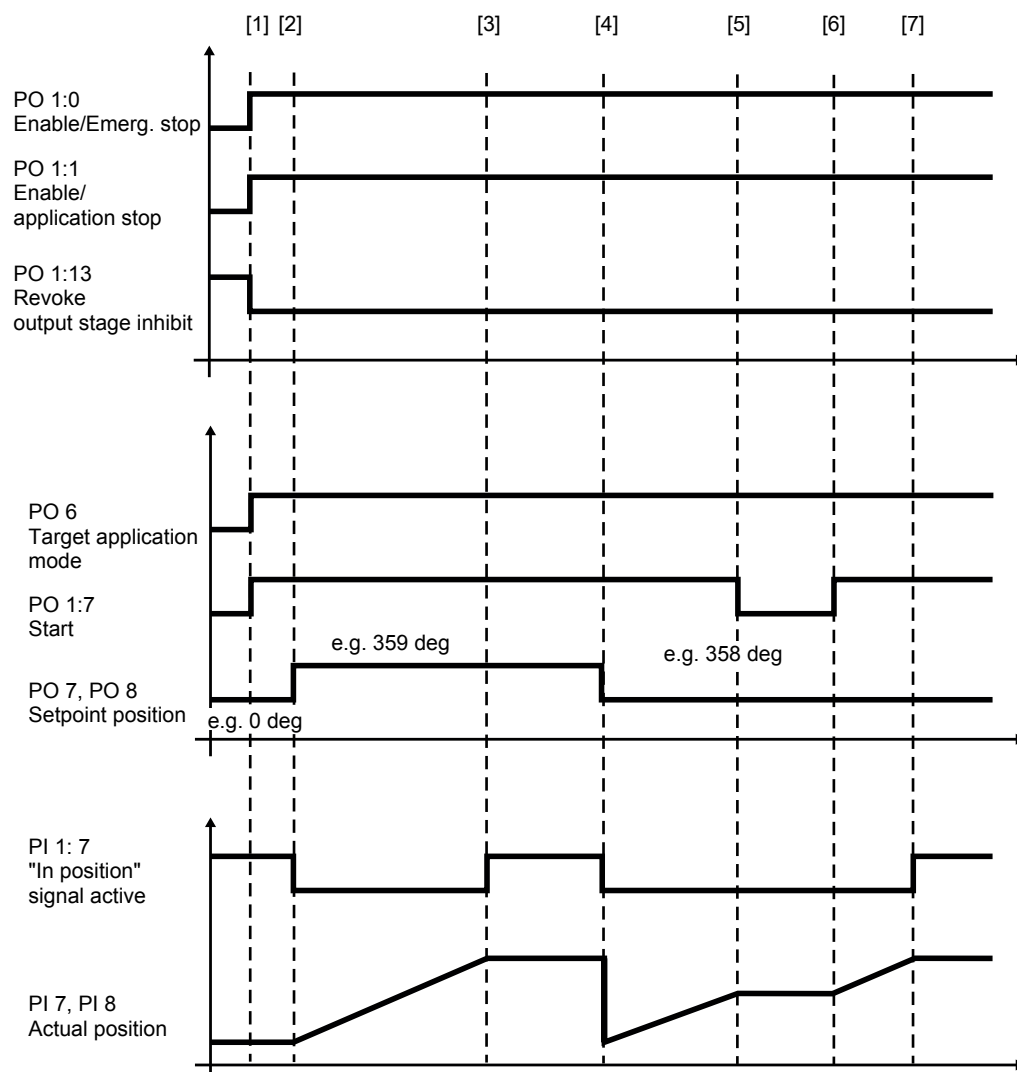
Absolute positioning (402) of a drive with reference to the modulo travel range. The modulo travel strategy is "positive".

"Modulo" axis type: Setpoint position =  $0 \leq \text{target position} < \text{modulo max.}$

#### NOTICE!

The specified setpoint position should be smaller than modulo max.

## Cycle diagram



28318262795

## Process sequence and signal states

### INFORMATION



For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied).</li> </ul>
[1]	"Modulo positive positioning mode" is activated.	PO 6	402 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
[1] to [5] and from [6]	Start/stop of the axis	PO 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": The motor is held at speed 0 subject to position control.</li> </ul>
[2], [4]	Specification of the setpoint position (a new setpoint position is also adopted during ongoing movement)	PO 7 PO 8	"Setpoint position" (high word) "Setpoint position" (low word)
Up to [2], [3] to [4] and from [7]	If the actual position lies within the configured window width, the feedback "In position" is issued. The drive stops subject to position control.	PI 1:7	<ul style="list-style-type: none"> <li>"1": "In position" signal active</li> </ul>

### 6.1.9 Modulo negative positioning mode

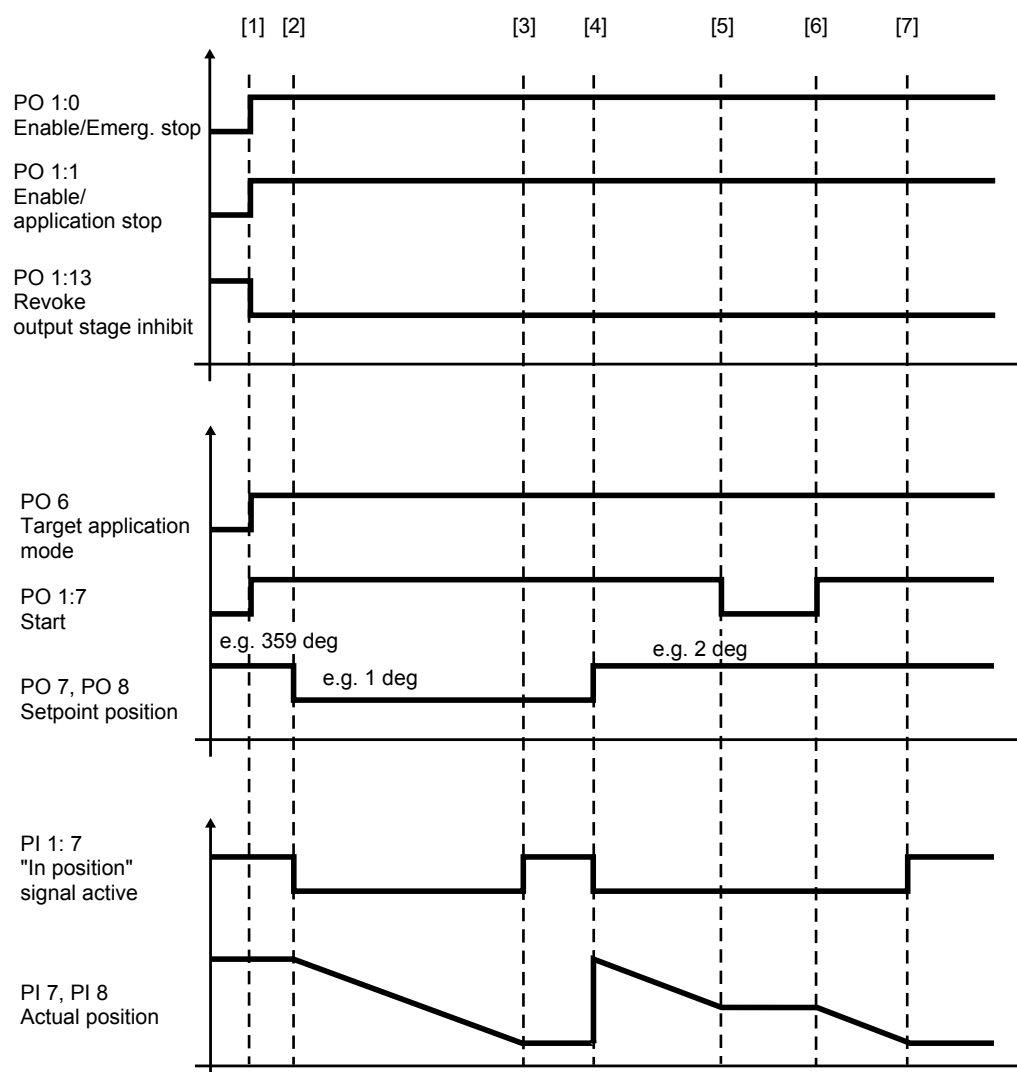
Absolute positioning (403) of a drive with reference to the modulo travel range. The modulo travel strategy is "negative".

"Modulo" axis type: Setpoint position =  $0 \leq \text{target position} < \text{modulo max}$ .

#### NOTICE!

The specified setpoint position should be smaller than modulo max.

#### Cycle diagram



28318291979

**Process sequence and signal states**
**INFORMATION**


For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied).</li> </ul>
[1]	"Modulo negative positioning mode" is activated.	PO 6	403 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2	Setpoint speed
		PO 3	Acceleration
		PO 4	Deceleration
[1] to [5] and from [6]	Start/stop of the axis	PO 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": The motor is held at speed 0 subject to position control.</li> </ul>
[2] and [4]	Specification of the setpoint position (a new setpoint position is also adopted during ongoing movement)	PO 7	"Setpoint position" (high word)
		PO 8	"Setpoint position" (low word)
Up to [2], [3] to [4] and from [7]	If the actual position lies within the configured window width, the feedback "In position" is issued. The drive stops subject to position control.	PI 1:7	<ul style="list-style-type: none"> <li>"1": "In position" signal active</li> </ul>



### 6.1.10 Modulo positioning mode – optimized direction

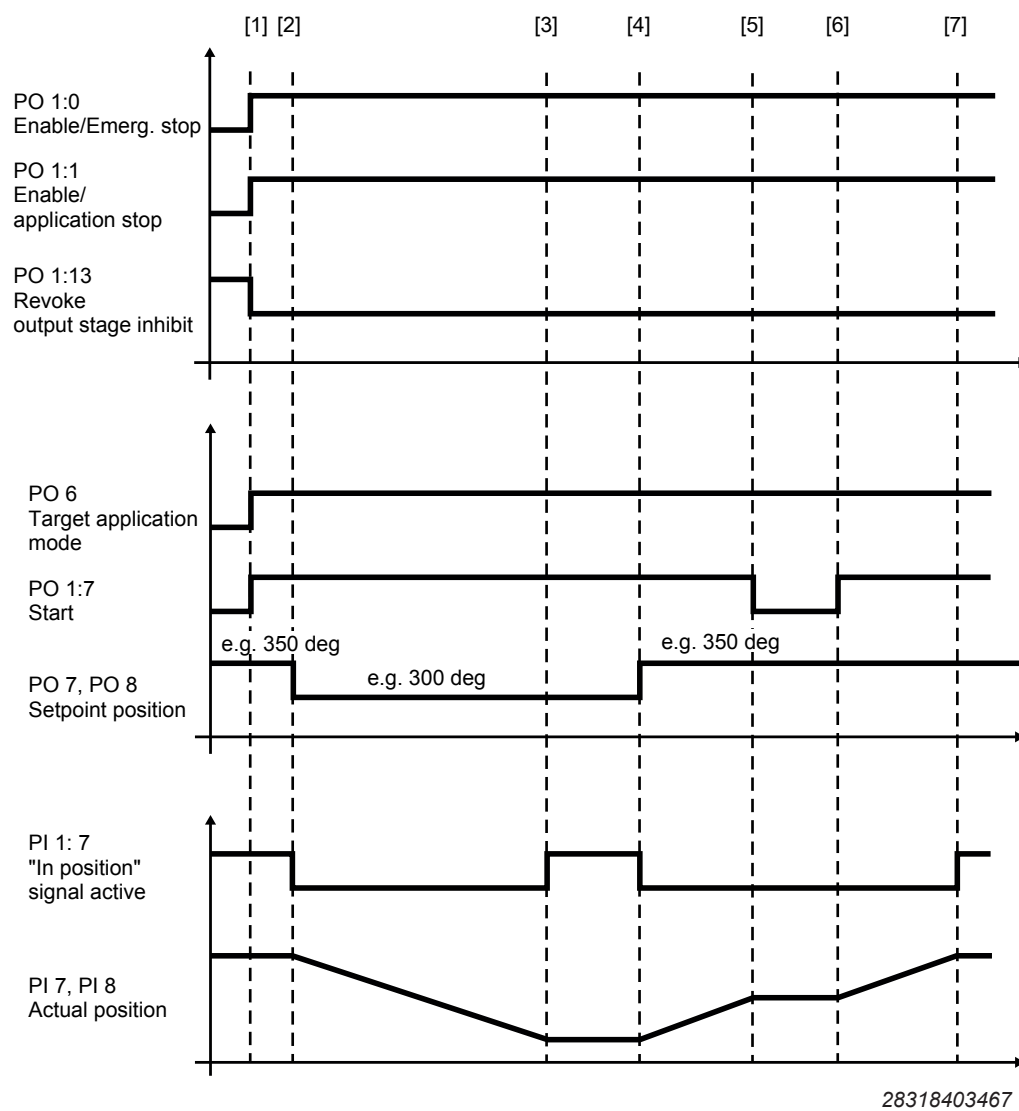
Absolute positioning (404) of a drive with reference to the modulo travel range. The modulo travel strategy is "shortest distance".

"Modulo" axis type: Setpoint position =  $0 \leq \text{target position} < \text{modulo max}$ .

#### NOTICE!

The specified setpoint position should be smaller than modulo max.

#### Cycle diagram



**Process sequence and signal states**
**INFORMATION**


For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17) under "Stop functions".

**INFORMATION**


The direction of rotation in this operating mode results from the distance to the target position.

No.	Sequence	PD	Signal states
[1] General enable	<ul style="list-style-type: none"> <li>PO 1:0 = "1" Enable/emergency stop</li> </ul>	PO 1:0	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration with emergency stop ramp</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:1 = "1" Enable/application stop</li> </ul>	PO 1:1	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Deceleration according to application limit</li> </ul>
	<ul style="list-style-type: none"> <li>PO 1:13 = "0" Output stage inhibit (signal with highest priority)</li> </ul>	PO 1:13	<ul style="list-style-type: none"> <li>"0": Output stage enabled</li> <li>"1": Output stage inhibited (the drive coasts to a stop or the brake is applied).</li> </ul>
[1]	"Modulo positioning shortest distance" is activated.	PO 6	404 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
[1] to [5] and from [6]	Start/stop of the axis	PO 1:7	<ul style="list-style-type: none"> <li>"1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3.</li> <li>"0": The motor is held at speed 0 subject to position control.</li> </ul>
[2] and [4]	Specification of the setpoint position (a new setpoint position is also adopted during ongoing movement)	PO 7 PO 8	"Setpoint position" (high word) "Setpoint position" (low word)
Up to [2], [3] to [4] and from [7]	If the actual position lies within the configured window width, the feedback "In position" is issued. The drive stops subject to position control.	PI 1:7	<ul style="list-style-type: none"> <li>"1": "In position" signal active</li> </ul>

## 6.2 Other functions

The functions described in the following complement the operating modes. The functions are activated by digital signals configured for this purpose.

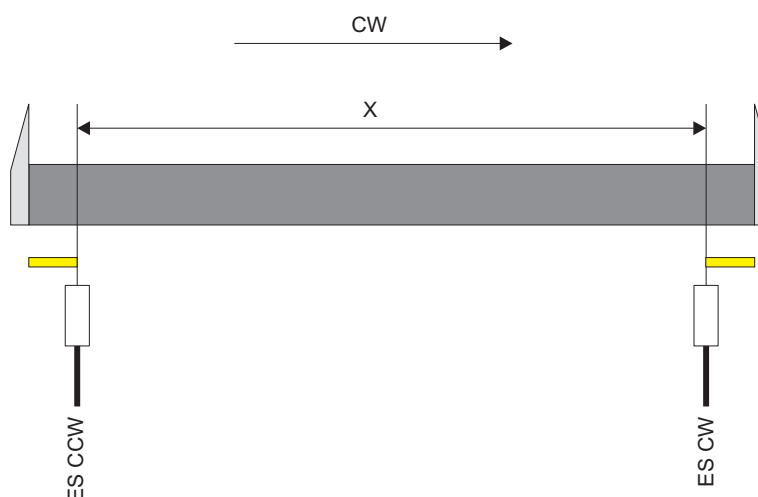
### 6.2.1 Hardware limit switches

The hardware limit switches are connected to the digital outputs configured for this purpose. The digital inputs are configured in the configuration of the software module in the "Inputs/outputs" menu.

The cams of the hardware limit switches must cover the travel range up to the stop.

#### ⚠ CAUTION

Only use hardware limit switches with normally closed contacts (low-active).



28303016587

[CW]	Drive inverter clockwise rotation
[X]	Travel distance
[ES CW]	Right hardware limit switch
[ES CCW]	Left hardware limit switch

#### INFORMATION



Make sure the hardware limit switch is assigned correctly. This means clockwise movement (CW) should be towards the clockwise hardware limit switch (LS CW) and counterclockwise movement (CCW) should be towards the counterclockwise hardware limit switch (LS CCW).

## 6.2.2 Software limit switches

## INFORMATION



This function is only available when using MOVIKIT® Positioning.

Software limit switches are used to limit the travel range of an axis. Monitoring of the software limit switches can be activated and configured in the configuration menu of the software module during startup. See the chapter "Monitoring functions" (→ 16). The drive must be referenced to allow for monitoring the software limit switches.

If software limit switch monitoring is enabled, the following response will be triggered depending on the active operating mode as soon as the configured negative or positive limit switch is exceeded:

- Jog mode, position controlled (100)

The drive stops at the software limit switch position using the deceleration specified via PO 4. If "Limit switch fault response" is enabled, the fault message E30.01/02 "Positive/negative limit switch hit" is issued.

- Jog mode, speed controlled (101) and with speed setpoint (200)

The drive stops along the configured emergency stop ramp if the respective "Limit switch fault response" is activated. The fault message E30.01/02 "Positive/negative limit switch hit" is issued.

- Positioning mode (400-404)

If a target position is specified that lies beyond the position of a limit switch, no travel job will be performed when the motor is at standstill. Else the drive stops with the deceleration set for the application limits. The fault message E19.02 "Position setpoint violation" is issued.

Fault messages can be reset using PO 1.8 "Fault reset". First specify a direction of rotation or a target position in the direction of the valid range of the software limit switches. If you want to move the drive outside the range limited by the software limit switches, you have to disable the software limit switches using the PO 1:12 signal.

## 6.2.3 Digital inputs/outputs



## NOTICE

If communication between higher-level controller, MOVI-C® CONTROLLER and drive is interrupted, the digital outputs will be frozen. In this case, connected actuators (such as valves) could result in an unexpected behavior of the system.

Death, severe injuries or damage to property

- Make sure that the digital outputs control only those parts of the system that cannot give rise to hazardous situations.

The digital outputs of the connected inverter are controlled using the control bits in the PO 5 process data word if the option "Control via fieldbus" is enabled in the configuration under "Digital outputs" in the "Inputs/outputs" menu in the field "Digital outputs DO 00-DO 03". Also refer to chapter "Inputs/outputs" (→ 19).

The digital inputs are the image of the input terminals of the connected inverter and are provided by process data word PI 5.

For the assignment of bits to digital inputs/digital outputs, refer to the chapter "Process data assignment" (→ 48).

## 7 MOVIKIT® process data monitor

The MOVIKIT® process data monitor is a tool in the IEC Editor for monitoring and controlling the process data interface. The MOVIKIT® process data monitor accesses solely the data of the process data interface and represents the process input and process output data exchanged between the higher-level controller and the software module.

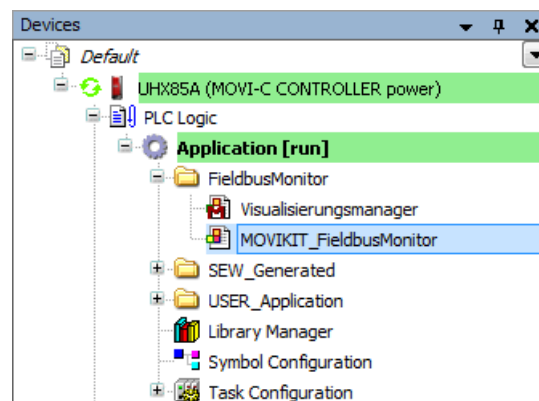
### INFORMATION



You have to import the MOVIKIT® process data monitor to being able to use it for monitoring and controlling the process data interface. For further information, refer to the chapter "Importing MOVIKIT® process data monitor" (→ 21).

Do the following to open the tool:

1. In the MOVISUITE® project, open the context menu of the MOVI-C® CONTROLLER and select [IEC Editor] from the "Tools" submenu.  
⇒ The IEC Editor opens.
2. Open the [Online] menu and click on [Login].
3. In the device tree, double-click the "MOVIKIT\_FieldbusMonitor" node. (Path: Default > SPS-Logik > Application [run] > FieldbusMonitor)



28324028555

⇒ The MOVIKIT® process data monitor opens in a new tab.

### NOTICE

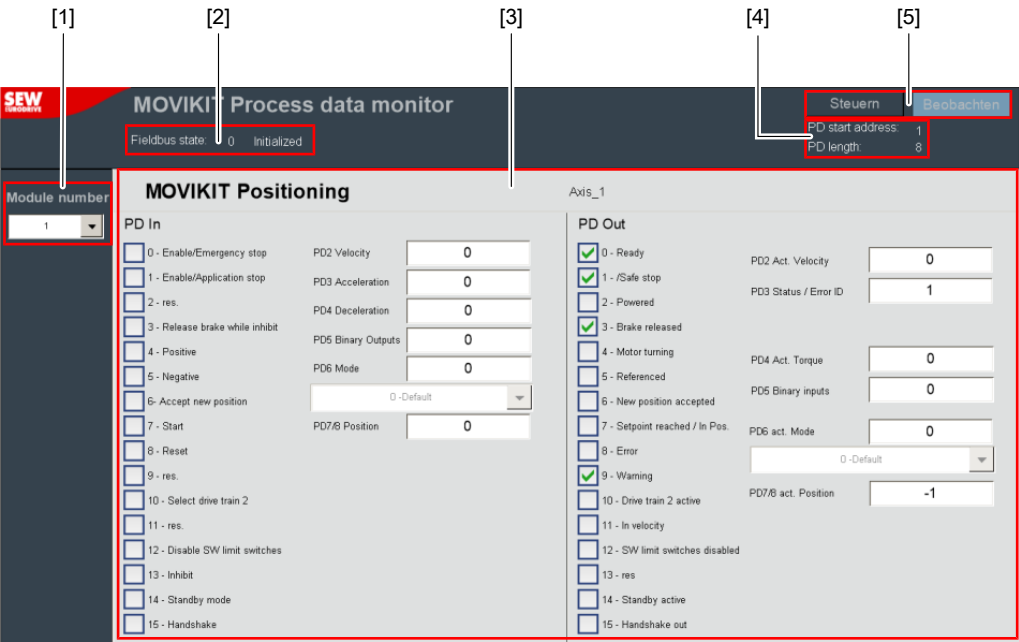


If the communication between PC and MOVI-C® CONTROLLER is interrupted, the specified setpoints will be effective until the connection to the IEC Editor is interrupted automatically after some time and the IEC Editor is logged out.

- In control mode, make sure that the drive can be stopped at any time by means of emergency stop measures.

7.1 User interface

The user interface consists of the following sections:



28326054667

No.	Description
[1]	Number of the software module that is to be monitored or controlled. If several software modules are available, the sequence depends on the start address specified in the configuration of the software module in the "Fieldbus interface" (→ 19) menu under "Fieldbus configuration".
[2]	Status information of the MOVIKIT® process data monitor
[3]	Visualization of the process data and control elements for controlling the bits
[4]	Start address and process data length of the software module selected under [1].
[5]	Button for toggling between "Monitor" and "Control". In "Control" mode, you can test functions of the software module without set-points from the higher-level controller. Control bits and process data words are directly applied to another edit box by pressing the enter key or clicking on it with the mouse.

## 8 Process data assignment

### 8.1 Process output data

The following table shows the process output data from the PLC to the inverter for control via fieldbus with 8 process data words.

#### INFORMATION



The "V/P" column indicates whether the respective process data word or bit is only available when using MOVIKIT® Positioning (P) or whether it is also available when using MOVIKIT® Velocity (V/P).

Word		Bit	V/P	Function
PO 1	Control word	0	V/P	Enable/emergency stop
		1	V/P	Enable/application stop
		2	V/P	Reserved
		3	V/P	Brake release (without enable)
		4	P	Jog positive
		5	P	Jog negative
		6	P	Accept relative position
		7	V/P	Start/stop with fieldbus ramp
		8	V/P	Fault reset
		9	V/P	Reserved
		10	V/P	Activate drive train 2
		11	V/P	Reserved
		12	P	Disable software limit switches
		13	V/P	Activate output stage enable
		14	V/P	Activate standby mode
		15	V/P	MOVIKIT® Handshake In
PO 2	Setpoint speed	0 – 15	V/P	User unit
PO 3	Setpoint acceleration	0 – 15	V/P	User unit
PO 4	Setpoint deceleration	0 – 15	V/P	User unit
PO 5	Digital outputs	0	V/P	DO 00 / DIO 01 (output)
		1	V/P	DO 01 / DIO 02 (output)
		...	V/P	...
		3	V/P	DO 03
		...	V/P	...
PO 6	Target application mode	0 – 15	P	Operating mode. See the chapter "Overview of operating modes" (→ 24).
PO 7	Target position high word	0 – 15	P	User unit
PO 8	Target position low word	0 – 15	P	User unit



## 8.1.1 Control word

## INFORMATION



For the behavior of the drive at standstill, refer to the information in the chapter "Control functions" (→ 17).

Bit	Function	PD	V/P	Description
0	Enable/emergency stop	PO 1.0	V/P	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Stop with drive function FCB 14 (emergency stop)</li> </ul>
1	Enable/application stop	PO 1.1	V/P	<ul style="list-style-type: none"> <li>"1": Enable</li> <li>"0": Stop with drive function FCB 13 (stop at application limits)</li> </ul>
2	Reserved	PO 1.2	V/P	-
3	Release brake (without enable)	PO 1.3	V/P	If required, activate this function using parameter 8501.2 (Release brake/ DynaStop® with FCB 01 – enable).
4	Jog positive	PO 1.4	P	Signal for moving the drive in positive direction in jog mode.
5	Jog negative	PO 1.5	P	Signal for moving the drive in negative direction in jog mode.
6	Accept relative position	PO 1.6	P	Apply relative target position in relative positioning mode (401). This signal is without effect for all the other operating modes.
7	Start/stop with fieldbus ramp	PO 1.7	V/P	<ul style="list-style-type: none"> <li>"1": Start – Movement enabled in all operating modes except for jog mode. In referencing mode, "Start" is also needed for referencing without reference travel.</li> <li>"0": Referencing mode Stop with FCB 26 (stop at user-defined limits). Deceleration to speed 0 using the value specified by PO 4. "0": Other operating modes Deceleration to speed 0 with the value specified by PO 4. Standstill behavior: The motor is held at speed 0 subject to speed control or position control depending on the operating mode. For motors without encoder, the "Stop by setpoint function" (→ 18) must be used.</li> </ul>
8	Fault reset	PO 1.8	V/P	Reset of fault messages with the positive edge of the signal.
9	Reserved	PO 1.9	V/P	-

Bit	Function	PD	V/P	Description
10	Activate drive train 2	PO 1.10	V/P	<ul style="list-style-type: none"> <li>"0": Drive train 1 selected</li> <li>"1": Drive train 2 selected</li> </ul> <p><b>NOTICE!</b> Drive train 2 is only available with single-axis modules and can be used, for example, to implement emergency mode without encoder feedback. The user units and the software module must be configured as in drive train 1.</p>
11	Reserved	PO 1.11	V/P	-
12	Disable SW limit switches	PO 1.12	P	<ul style="list-style-type: none"> <li>"0": Monitoring of software limit switches enabled.</li> <li>"1": Monitoring of software limit switches disabled.</li> </ul>
13	Activate output stage enable	PO 1.13	V/P	<ul style="list-style-type: none"> <li>"1" Output stage inhibit activated – The brake is applied or (if no brake is installed) the motor coasts to a halt.</li> <li>"0" Output stage inhibit inactive – Output stage can be enabled</li> </ul>
14	Activate standby mode	PO 1.14	V/P	<ul style="list-style-type: none"> <li>"1" Standby mode activated.</li> <li>"0" Standby mode not activated.</li> </ul> <p>Standby mode can only be activated when the output stage is inhibited.</p>
15	MOVIKIT® Handshake In	PO 1.15	V/P	<p>This signal is copied internally to status word bit 15 (MOVIKIT® Handshake Out). If the copying operation fails ("Handshake Out" remains constant with changing "Handshake In" signal), the device-internal processing of the MOVIKIT® software module is disrupted.</p>

## 8.2 Process input data

The following table shows the process input data from the inverter to the PLC for control via fieldbus with 8 process data words.

Word		Bit	Function
PI 1	Status word	0	"1": Ready
		1	"1": STO inactive
		2	"1": Output stage enable
		3	"1": Brake released
		4	"1": Motor running (motor standstill active)
		5	"1": Active drive referenced
		6	"1": New relative position applied
		7	"1": "In position" signal active
		8	"1": Fault
		9	"1": Warning "Warning" can be defined as response for certain faults. If a warning is signaled, both bit PI 1.9 and the associated fault code is indicated in PI 3. If a warning and a fault are active at the same time, only bit PI 1.8 is set and the respective fault code is indicated in PI 3.
		10	"1": Drive train 2 active
		11	"1": "Setpoint/actual speed comparison active" signal
		12	"1": Software limit switches inactive
		13	"1": Reserved (can be assigned individually using status word 2, bit 13)
		14	"1": Standby mode active
		15	MOVIKIT® Handshake Out (for details, see MOVIKIT® Handshake In)
PI 2	Actual speed	0 – 15	User unit
PI 3	Status Fault subfault	0 – 15	<ul style="list-style-type: none"> <li>No fault: Display of current FCB (low-byte)</li> <li>Device fault: Display of device fault code</li> <li>Fault in option: Display of option fault code</li> </ul> (High byte: fault, low-byte: subfault) For more information, refer to the product manual of the respective device.

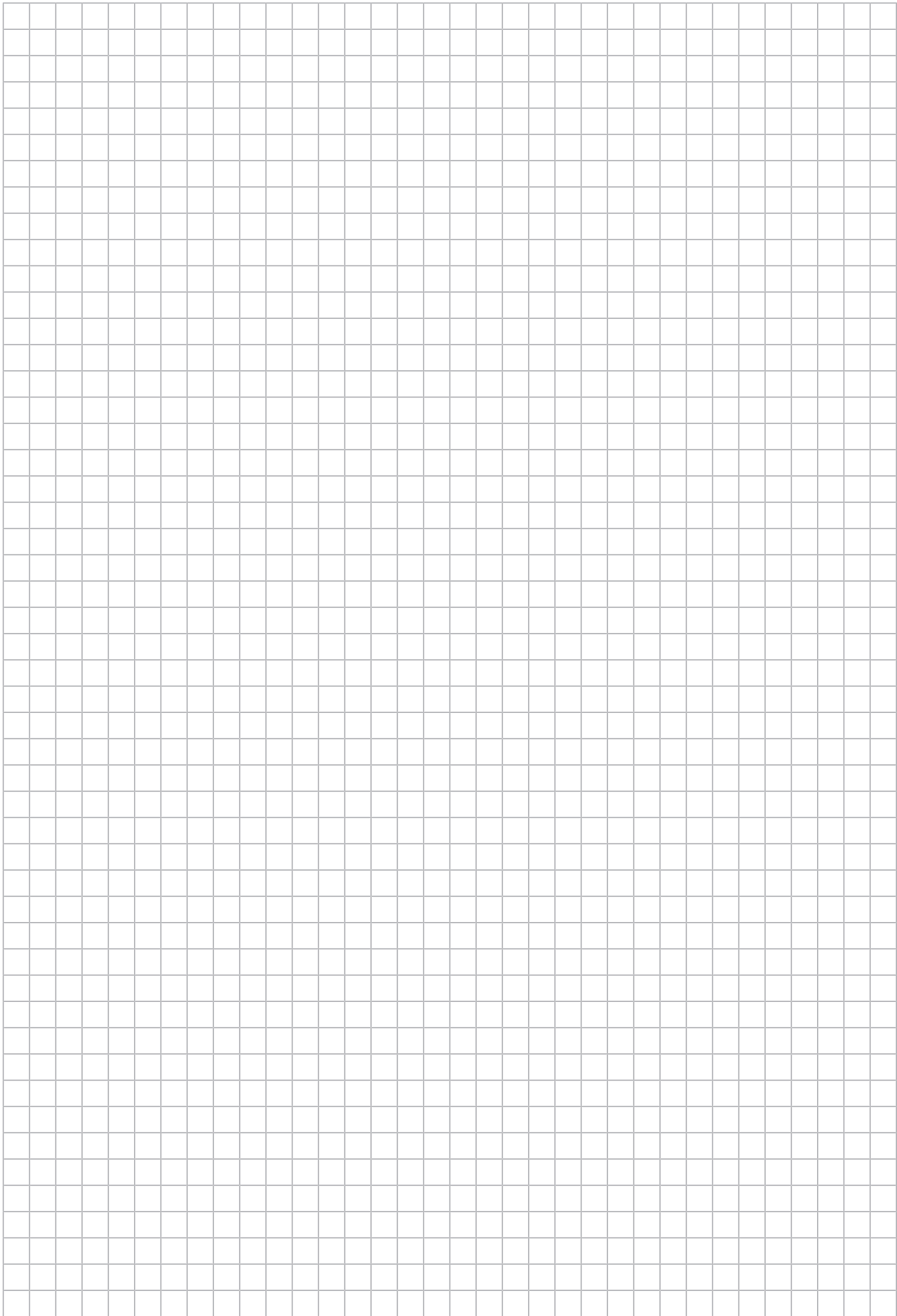
Word		Bit	Function
PI 4	Torque	0 – 15	<ul style="list-style-type: none"> <li>Current torque based on the nominal motor torque (unit: 0.1%)</li> <li>Relative apparent current based on the nominal inverter current (unit: 0.1%)</li> <li>Absolut apparent current (unit: 0.01 A)</li> </ul>
PI 5	Digital inputs	0	DI 00
		...	...
		7	DI 07
		...	...
		9	DI 09 / DIO 01 (input)
		10	DI 10 / DIO 02 (input)
		...	...
		13	DI 13
		...	...
PI 6	Actual application mode (operating mode)	0 – 15	Operating mode. See the chapter "Overview of operating modes" (→ 24).
PI 7	Actual position (high word)	0 – 15	User unit
PI 8	Actual position (low word)	0 – 15	User unit

## 8.2.1 Status word

Bit	Function	Process data	Description
8	Fault	PI 1:8	<ul style="list-style-type: none"> <li>"1": Fault present</li> <li>"0": No fault present</li> </ul> <p>Active faults can be reset by setting the signal PI 1:8 "Fault reset".</p>
9	Warning	PI 1:9	<ul style="list-style-type: none"> <li>"1": Warning present</li> <li>"0": No warning present</li> </ul> <p>Warnings can be reset by setting the signal PI 1:8 "Fault reset" if the reason for the warning no longer exists. Warnings that are set as warnings with self reset will delete themselves even if the reason for the warning no longer exists. In this case, the warning need not be reset.</p> <p>For more information, refer to the product manual of the respective device.</p>
...	...	...	...
12	SW limit switch Inactive	PI 1:12	<p>This signal is active if one of the following conditions is met:</p> <ul style="list-style-type: none"> <li>PO 1:12 is active</li> <li>Both software limit switches were set to the value "0".</li> </ul>

## 9 Fault lists

udiMessageID	Description
26688	Configuration read error
26689	Mode not supported
26690	Parameter service error
26691	Reference offset too large
26692	Reference offset too small



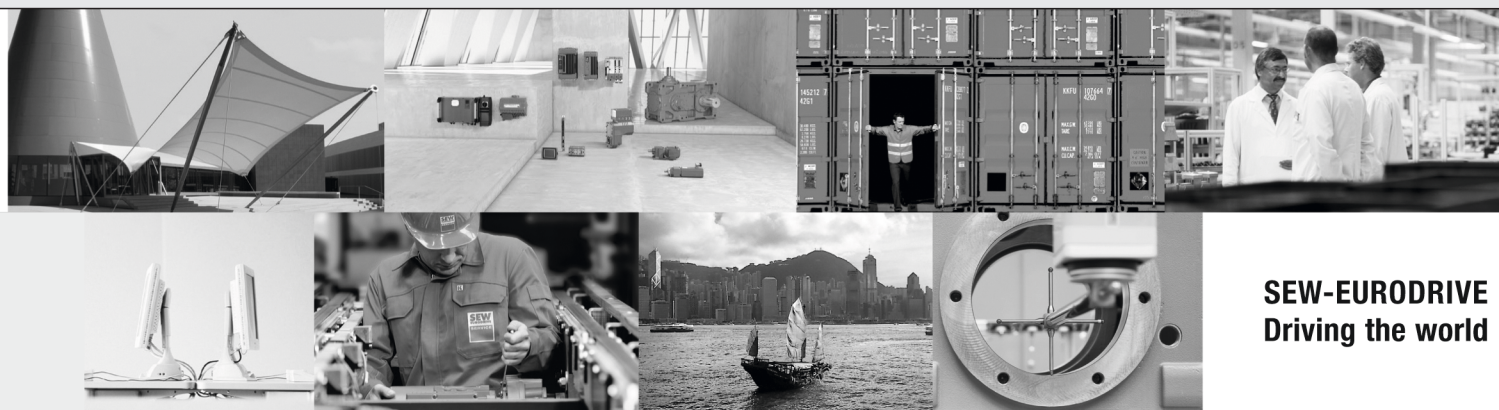












**SEW-EURODRIVE**  
Driving the world

**SEW**  
**EURODRIVE**

SEW-EURODRIVE GmbH & Co KG  
Ernst-Blickle-Str. 42  
76646 BRUCHSAL  
GERMANY  
Tel. +49 7251 75-0  
Fax +49 7251 75-1970  
sew@sew-eurodrive.com  
→ [www.sew-eurodrive.com](http://www.sew-eurodrive.com)