SEW EURODRIVE

Manual

MOVIKIT®

Positioning, Velocity

Edition 03/2020

26604981/EN

Table of contents

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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 software and firmware versions applicable at the time of publication. These descriptions might differ if you install later software or firmware versions. In this case, contact SEW-EURODRIVE.

1.3 Structure of the warning notes

1.3.1 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
⚠ **DANGER**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.3.2 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.

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Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard

1.3.3 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.

1.4 Decimal separator in numerical values

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

Example: 30.5 kg

1.5 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.

1.6 Product names and trademarks

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

1.7 Copyright notice

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1.8 Other applicable documentation

Observe the corresponding documentation for all further components.

Always use the latest edition of the documentation and the software.

The SEW-EURODRIVE website (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.

1.9 Short designation

The following short designations are used in this documentation:

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

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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 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.

2.4 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.

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3 System description

3.1 Module description

The MOVIKIT® Velocity software module is used for implementing applications with speed control and predefined 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 can be used, for example, in material handling applications (travel drives, lifting drives, rail vehicles) or in various logistics applications (storage/retrieval systems, pallet transfer shuttles or rotary tables).

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

3.2 Functions

Overview of functions:

All software modules

- Startup using a graphical user interface
- Own parameter tree with all parameters required for operation
- Diagnostic monitor for monitoring and controlling the axis
- Standardized process data interface

MOVIKIT® Velocity

- Operating modes: Speed control

MOVIKIT® Positioning

- Operating modes: Speed control, positioning mode (relative/absolute) referencing mode, jog mode

3.2.1 Additional functions

Overview of additional functions:

MOVIKIT® Velocity

- Variable jerk time via process data

MOVIKIT® Positioning

- Additional function of MOVIKIT® Velocity
- Touchprobe function

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3.3 Scope of functions of the process data profiles

Profile	Range 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 operating modes listed below. Encoder feedback is necessary to being able to use the entire scope of functions. • Jog in position control (FCB 20) or speed controlled (FCB 05) **Note:** Encoder feedback not absolutely necessary with FCB 05. • Speed control (encoder feedback not necessarily required) • Referencing • Positioning (linear and modulo) For further information, refer to chapter "Operating modes" (→ 🗎 36).
+1 PD	Additional function – variable jerk time This additional function extends the range of functions by providing the ability to specify the jerk time. The additional function extends the process data length by one process data word. For further information, refer to chapter "Variable jerk time" (→ 🗎 59).
+4 PD	Additional function – touchprobe 1 (only available with MOVIKIT® Positioning) This additional function extends the range of functions by providing the ability to read the acquired position and the trigger counter during a trigger event. Together with the “Touchprobe Positioning Absolute” operating mode, it is also possible to position to a specified position relative to the touchprobe position during a trigger event. The additional function extends the process data length by four process data words. For further information, refer to chapter "Touchprobe 1" (→ 🗎 60).

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4 Project planning information

4.1 Requirement

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:

- MOVI-C® CONTROLLER (all power classes possible)
- MOVIDRIVE® modular **or** MOVIDRIVE® system

4.3 Software

The following software is required:

- MOVISUITE® engineering software

  (includes MOVIRUN® flexible)

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 licenses are available and are required:

- MOVIRUN® flexible

  License for the MOVIRUN® flexible software platform

The license/licenses are referred to as performance licenses. They only have to be purchased once per MOVI-C® CONTROLLER and can then be used for any number of axes.

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).

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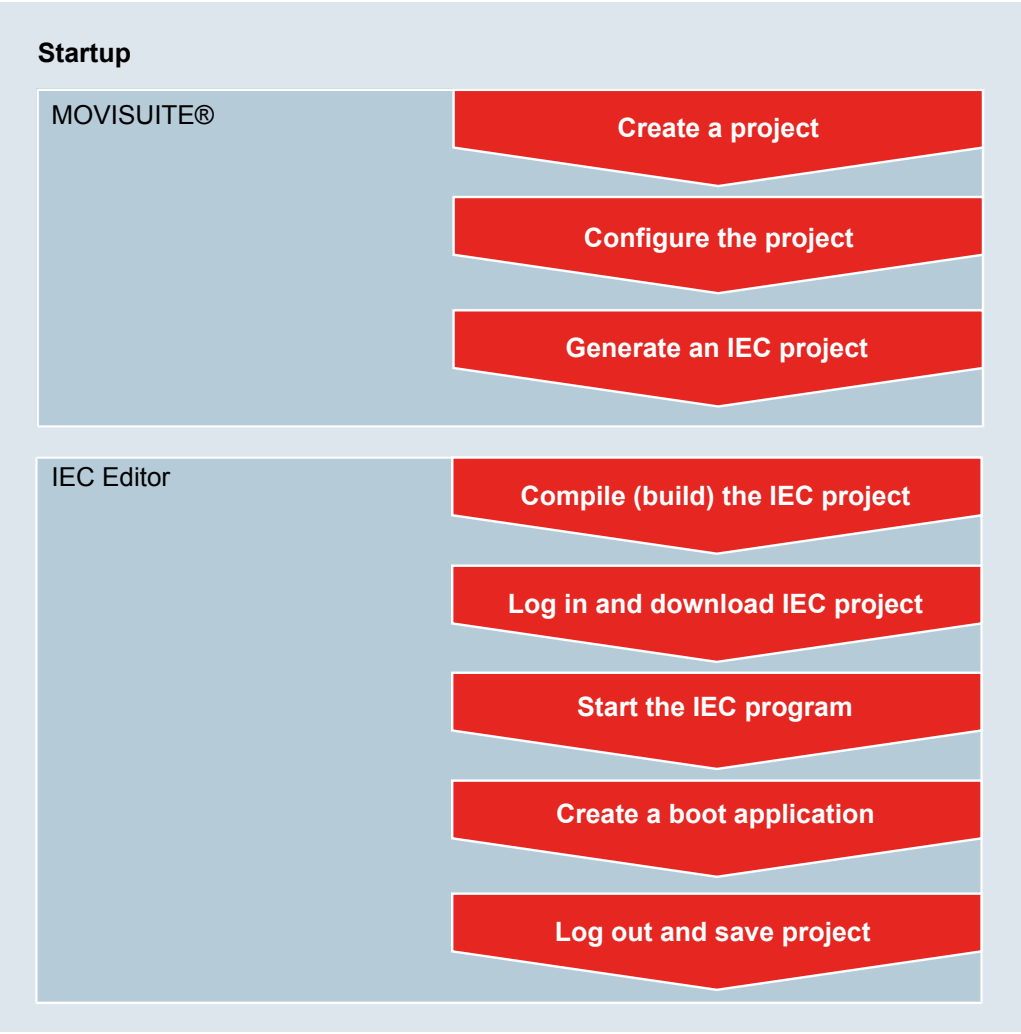
5 Startup

5.1 Requirements

- Check the installation of the inverters and, if installed, also check the encoder connection.
- Observe the installation notes in the documentation of the respective device and software components.
- The devices to be started up are displayed in MOVISUITE®.

5.2 Startup procedure

The schematic diagram below shows the startup procedure:



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The startup steps specific to these software modules are explained in detail in the following chapters of this manual. For startup, also observe the documentation of all the other components in use.

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5.3 Configuring a project

INFORMATION

For detailed information on how to use the MOVISUITE® engineering software, refer to the corresponding documentation.

✓ A MOVISUITE® project has been created and is open.

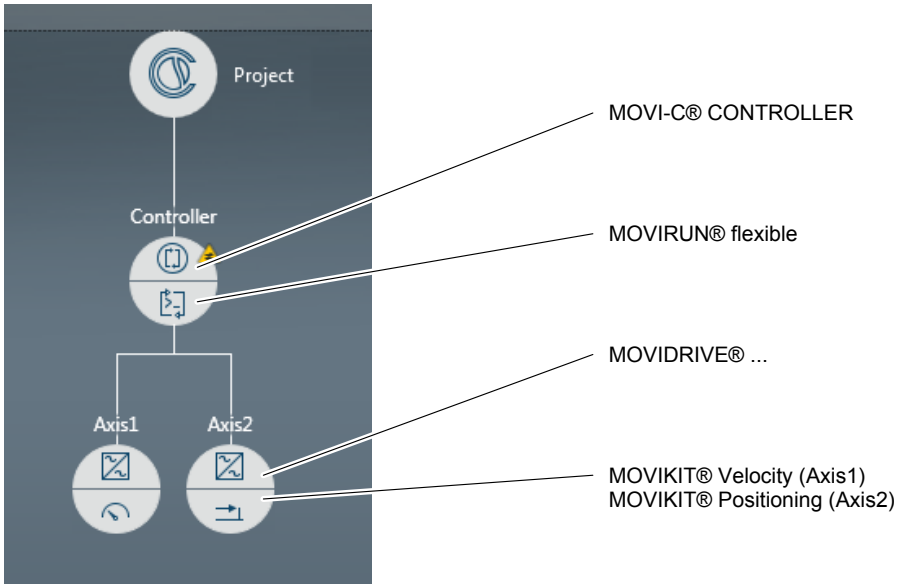
1. Add required device nodes, software nodes (MOVI-C® SoftwareNode) and software modules to the project.

   ⇨ See "Example project".

2. Configure the added devices or software modules. If available, observe the specific notes in the following chapters that apply to MOVIKIT® Positioning, Velocity. For detailed information on the configuration of devices or other software modules, refer to the respective documentation.

5.3.1 Example project

The following figure shows an example project:



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5.3.2 Configuring the MOVI-C® CONTROLLER

INFORMATION

For detailed information on how to configure the MOVI-C® CONTROLLER, refer to the corresponding documentation.

If you use a MOVI-C® CONTROLLER UHX25A or UHX45A, we recommend increasing the cycle time to 5 ms. For information on increasing the cycle time, refer to chapter "Setting the cycle time" (→ 🗎 14).

Setting the cycle time

The cycle time is set in the following steps:

Setting the "Controller setpoint cycle" on the axes

In MOVISUITE®, perform the following steps for all lower-level axes:

1. Open the configuration for the axis.
2. In the "Functions" section, open the "Setpoints" configuration menu and its submenu "Basic settings".
3. In the "Basic settings" section, set the value in the "Controller setpoint cycle" edit box to the required value.

Setting the TaskHighPrio cycle time for the MOVI-C® CONTROLLER

In MOVISUITE®, perform the following steps for the MOVI-C® CONTROLLER:

4. Open the configuration of the MOVI-C® CONTROLLER.
5. In the "MOVIRUN® flexible" section, open the "Task system" configuration menu.
6. Under "Task system", enter the required value in the "Cycle time of the HighPrio Task" edit box.
7. Click on the blue arrow in the "Task system" area of the "Sync offset EtherCAT" edit box to accept the suggested value.

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

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5.3.3 Adding MOVIKIT® Positioning, Velocity

INFORMATION

For detailed information on how to use the MOVISUITE® engineering software, refer to the corresponding documentation.

✓ A MOVISUITE® project has been created and is open.

1. Click on the empty software module section of the required node.
   ⇨ The catalog section opens and displays the available software modules.
2. In the catalog section, click on MOVIKIT® Positioning, Velocity.
   ⇨ A context menu opens.
3. Select the version from the respective drop-down list in the context menu and confirm your selection with [Apply].

⇨ MOVIKIT® Positioning, Velocity is assigned to the node, the configuration is created, and the basic settings are made.

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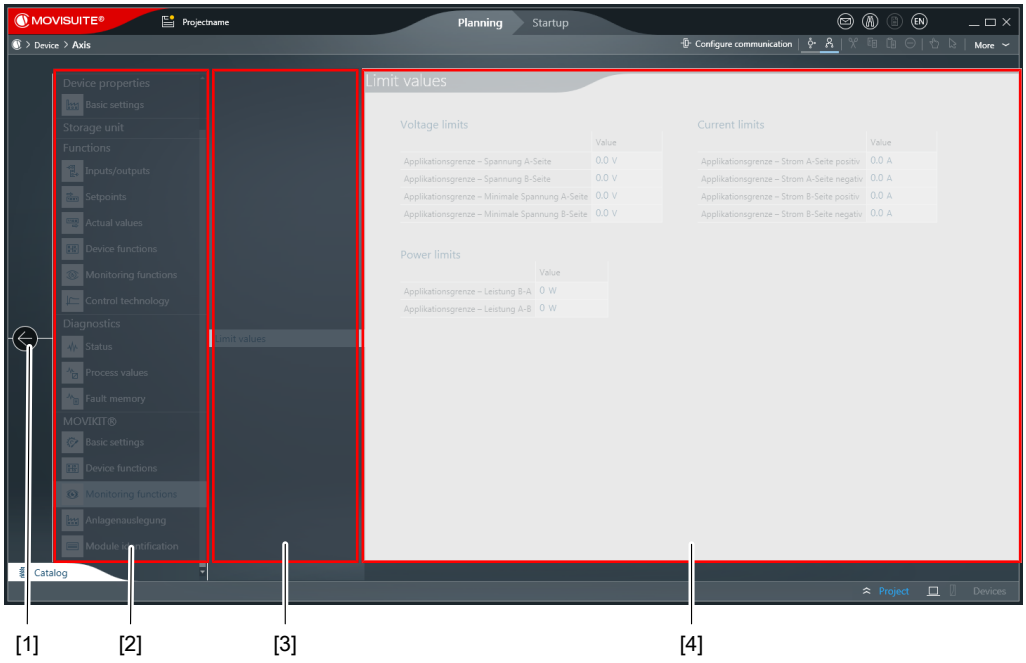
5.3.4 Configuring MOVIKIT® Positioning, Velocity

INFORMATION

For detailed information on how to use the MOVISUITE® engineering software, refer to the corresponding documentation.

1. In MOVISUITE®, click on MOVIKIT® Positioning, Velocity.
   ⇨ The configuration menus of the software module are displayed. The configuration menus are explained in the following subchapters.



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[1] Button to return to the project overview
[2] Main menu of the software module configuration (MOVIKIT® section)
[3] Submenus of the configuration
[4] Setting fields of the respective submenu

2. Configure the software module using the respective setting fields.
3. Click button [1] after having completed the configuration.
   ⇨ The project overview is displayed.

INFORMATION

For the changes made to the configuration to take effect, you have to update the configuration data. To do so, click [Update configuration data] in the respective notification at the node or in the context menu of the MOVI-C® CONTROLLER. The MOVI-C® CONTROLLER is stopped and restarted to update the configuration data.

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Basic settings

Parameter group	Description
Drive train	
Show drive train 2	Setting whether only drive train 1 or drive trains 1 and 2 are to be processed. **NOTICE!** 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.
	Index: 8347.6 Offset 0, bit 7
	IEC name: -
Functions used	
Variable jerk time	• **Off** • On This additional function extends the range of functions by providing the ability to specify the jerk time. The additional function extends the process data length by one process data word. **INFORMATION:** When using the additional function, please refer to the more detailed information in chapter"Variable jerk time" (→ 🗎 59).
	Index: 50040.100
	IEC name: -
Touchprobe 1 **Information:** "Configuration menu" (→ 🗎 26) becomes visible when activated.	• **Off** • On This additional function extends the range of functions by providing the ability to read the acquired position and the trigger counter during a trigger event. Together with the “Touchprobe Positioning Absolute” operating mode, it is also possible to position to a specified position relative to the touchprobe position during a trigger event. The additional function extends the process data length by four process data words. For further information, refer to chapter "Touchprobe 1" (→ 🗎 60).
	Index: 50000.20
	IEC name: -

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Monitoring functions

Reference signals

Parameter group	Description
Comparison of setpoint/actual speed values	
Half window width	Speed setpoint window
	Index: 8324.3
	IEC name: -
Delay time	Delay time for the comparison of setpoint and actual value. The condition for the signal must be fulfilled for at least this time period so that the signal is issued.
	Index: 8324.4
	IEC name: -
Polarity	Determines when the signal is issued. • Signal if actual value = setpoint • Signal if actual value <> setpoint
	Index: 8324.5
	IEC name: -
In position	
Window width	The "In position" signal is set when the difference between the actual position and setpoint position is smaller than half this value.
	Index: 8331.1
	IEC name: -
Hysteresis	Target position hysteresis. When the position window is left, the "In position" signal is maintained until this value is exceeded.
	Index: 8331.2
	IEC name: -
Actual target position in user units	Actual target position in user units
	Index: 8331.3
	IEC name: Parameter.InPosSignal.ActualTargetPosition
Setpoint/actual torque comparison	
Half window width	Torque setpoint hysteresis of FCB 07 in drive train 1
	Index: 8339.3
	IEC name: Parameter.TorqueSetpointActValComp.HalfWindowWidth1

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Parameter group	Description
Delay time	Delay time for comparison of setpoint and actual value in drive train 1. To have the signal issued, the condition for the signal must be fulfilled for at least this time period.
	Index: 8339.4
	IEC name: Parameter.TorqueSetpointActVal-Comp.DelayTime1
Polarity	Specifies when the signal is issued in drive train 1: • Signal if actual value = setpoint • Signal if actual value <> setpoint
	Index: 8339.5
	IEC name: Parameter.TorqueSetpointActVal-Comp.Polarity1

Software limit switches

Parameter name	Value
Software limit switches	
Monitoring negative SW limit switch	• On Activate monitoring of negative software limit switch • **Off** Deactivate monitoring of negative software limit switch
	Index: 8572.3
	IEC name: LimitSwitchEvaluation.SoftwareLimit-Switch.In.xActivateMonitoringNegative
SW negative limit switch	Position of the negative software limit switch (in user units)
	Index: 8572.4
	IEC name: LimitSwitchEvaluation.SoftwareLimit-Switch.In.lrLimitNegative
Monitoring positive SW limit switch	• On Activate monitoring of positive software limit switch • **Off** Deactivate monitoring of positive software limit switch
	Index: 8572.5
	IEC name: LimitSwitchEvaluation.SoftwareLimit-Switch.In.xActivateMonitoringPositive

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Parameter name	Value
SW positive limit switch	Position of the positive software limit switch (in user units)
	Index: 8572.6
	IEC name: LimitSwitchEvaluation.SoftwareLimit-Switch.In.IrLimitPositive
Fault response	
SW limit switch hit response	• No response • **Emergency stop + output stage inhibit** • Emergency stop + output stage inhibit with self-reset
	Index: 8572.2
	IEC name: Parameter.LimitSwitch-Data1.SwLsHitResp

Hardware limit switches

Parameter name	Value
Fault response	
HW limit switch hit response	• No response • **Emergency stop + output stage inhibit** • Emergency stop + output stage inhibit with self-reset
	Index: 8572.1
	IEC name: Parameter.LimitSwitch-Data1.HwLsHitResp

Limit values

Parameter name	Value
Application limits	
Positive speed	Limits the maximum positive speed permitted for moving the system. (in user units)
	Index: 8357.10
	IEC name: ConfigHandling._stAxisConfig.IrAppLim-itVelocityPositive
Negative speed	Limits the maximum negative speed permitted for moving the system. (in user units)
	Index: 8357.11
	IEC name: ConfigHandling._stAxisConfig.IrAppLim-itVelocityNegative

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Parameter name	Value
Acceleration	Limits the maximum acceleration permitted for accelerating the system. (in user units)
	Index: 8357.12
	IEC name: ConfigHandling._stAxisConfig.lrAppLimitAcceleration
Deceleration	Limits the maximum deceleration permitted for braking the system. (in user units)
	Index: 8357.13
	IEC name: ConfigHandling._stAxisConfig.lrAppLimitDeceleration
Jerk time	Limits the jerk time in [ms] The jerk time is effective for the stop FCBs and in manual mode. The positioning process extends to twice the set jerk time.
	Index: 8357.14
	IEC name: ConfigHandling._stAxisConfig.lrAppLimitJerkTime
Torque	Limits the maximum torque that may be applied to the system in [Nm]
	Index: 8357.15
	IEC name: -
Limits	
Emergency stop deceleration	Deceleration for the ramp that is activated during an emergency stop. An emergency stop can be programmed as a response to a fault (in user units).
	Index: 8357.20
	IEC name: ConfigHandling._stAxisConfig.lrRapidStopDeceleration
Cycle limit	
Modulo minimum	Lower modulo limit (in user units).
	Index: 8357.30
	IEC name: ConfigHandling._stAxisConfig.lrModuloMin
Modulo maximum	Upper modulo limit (in user units).
	Index: 8357.31
	IEC name: ConfigHandling._stAxisConfig.lrModuloMax
Limit values from startup	

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Parameter name	Value
Maximum speed at motor shaft	Maximum permitted speed at the motor shaft calculated from motor and gear unit data during startup in [min^{-1}].
	Index: 8360.9
	IEC name: -
Maximum torque at motor shaft	Maximum permitted torque at the motor shaft calculated from motor and gear unit data during startup in [Nm].
	Index: 8360.11
	IEC name: -

Control functions

Parameter group	Description
Speed monitoring	
Activation	Activation of speed monitoring • Off • Motor mode • Generator mode • Motor/generator mode
	Index: 8550.1
	IEC name: -
Delay time	The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You can prevent speed monitoring from responding too sensitively by setting the delay time accordingly. The current limit must be reached permanently for the duration of the delay time before the monitoring function trips.
	Index: 8550.2
	IEC name: -
Reset time factor	When the control output limit of the speed controller is reached, a counter for the delay time is incremented every millisecond. If the speed controller leaves its control limit before the delay time expires, the counter is decremented until "0" is reached. You can use this parameter to set a factor that specifies how fast the counter decrements when leaving the control output limit compared to the delay time. This factor is usually set to "1", which means the counter is decremented every millisecond. If the factor is set to "2", the counter is decremented by 2 every millisecond, etc.
	Index: 8550.3
	IEC name: -

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Parameter group	Description
Stop function	
Behavior at standstill	The following settings can be made for the behavior at standstill: • Drive energized (brake released) • Drive not energized (brake applied) 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. For drives without encoder, this setting is ignored, which means the brake function is always active.
	Index: 8563.1":
	IEC name: -

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Drive functions

FCB 05 Speed control

INFORMATION

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.

Parameter name	Description
Stop by setpoint function	
Activation	Activation of the stop by setpoint function
	Index: 8570.1
Stop setpoint	Setpoint of the stop by setpoint function The drive is stopped when the speed setpoint drops below the stop setpoint.
	Index: 8570.2
Start offset	Start offset of the stop by setpoint function The drive is only enabled when the setpoint exceeds the enable setpoint (stop setpoint + start offset).
	Index: 8570.3

FCB 09 Position control

INFORMATION

The configuration is only available when using MOVIKIT® Positioning.

Parameter name	Value
Lag error	
Lag error window	Specifies from which lag error the drive signals a fault (drive train 1). The "Lag error window" parameter takes effect for FCB 09 and FCB 26. **Information:** The setting applies to FCB 09 and FCB 26. For FCB 20 Jog mode, for example, a separate lag error window is available.
	Index: 8509.4
Response to positioning lag error	Specifies how the device responds to a lag error (lag error window exceeded, Index 8509.4). The "Response to positioning lag error" parameter takes effect for FCB 09, FCB 10, and FCB 26.
	Index: 8622.3

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FCB 12 Reference travel

INFORMATION

The configuration is only available when using MOVIKIT® Positioning.

Parameter name	Value
FCB 12 Reference travel	
Type	• Deactivated • Zero pulse – negative direction • Reference cam – negative end • Reference cam – positive end • Positive limit switch • Negative limit switch • Reference cam flush – positive limit switch • Reference cam flush – negative limit switch • Referencing without reference travel • Positive fixed stop • Negative fixed stop
	Index: 8552.1
Reference to zero pulse	Activates or deactivates referencing to zero pulse
	Index: 8552.2
Reference offset	Deviation of the cam from the machine zero
	Index: 8552.5
Search speed	Search speed for reference travel
	Index: 8552.8
Retraction speed	Retraction speed for reference travel
	Index: 8552.9
Acceleration	Acceleration of reference travel
	Index: 8552.11
Deceleration	Deceleration of reference travel
	Index: 8552.12
Advanced settings	
Go to home position	Activates or deactivates homing
	Index: 8552.3
Home position	Home position that is approached automatically after reference travel is complete.
	Index: 8552.7
Homing speed	Speed for approaching the home position after referencing.
	Index: 8552.10

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Parameter name	Value
Jerk time	Homing jerk time
	Index: 8552.13
Speed changeover before fixed stop	For setting whether search speed changes over to retraction speed.
	Index: 8552.4
Dwell time at fixed stop	Dwell time at fixed stop
	Index: 8552.15
Torque limit fixed stop	Limits the torque when referencing to the fixed stop.
	Index: 8552.14

FCB 20 Jog mode

Parameter name	Description
FCB 20 Jog mode	
Lag error window	Lag error window in [rev] **Default value: 1.00000 rev.**
	Index: 8520.10

Touchprobe 1

INFORMATION

Only included if the function is activated in the "Basic settings" configuration menu under "Functions used".

Parameter name	Value
Status	
Wait for trigger	Activated, if waiting for a trigger event.
	Index: 8352.2
Trigger activated	Activated, if a trigger event has occurred.
	Index: 8352.2
Detected value	Position at the time of the trigger event.
	Index: 8352.3
Trigger	
Source	Source for activating the trigger for recording a signal.
	Index: 8352.10
Event	Selects the type of edge that triggers the system: • Rising edge • Falling edge • Rising and falling edge
	Index: 8352.11

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Parameter name	Value
Sensor delay rising edge	Delay of the sensor used for the rising edge at the trigger input. This time will be included in the calculation of the touchprobe event value.
	Index: 8352.12
Sensor delay falling edge	Delay of the sensor used for the falling edge at the trigger input. This time will be included in the calculation of the touchprobe event value.
	Index: 8352.13
Counter	Counter of trigger events. This value is incremented by the value 1 with each trigger event.
	Index: 8352.14
Data source	
Data source	Selects the data source for recording **Information:** If modulo limits have been configured, set “Actual position in user units – modulo” here.
	Index: 8352.30
PO data format	Selects the format of the process data: • 16 bits • 32 bits – big endian • 32 bits – little endian The data format is specified when accessing the PO data words. The PO data has a word width of 16 bits and can be compiled as a 32-bit value using the PO data format. This parameter has no effect for data sources with a word width of 32 bits.
	Index: 8352.31
Process data - Modulo minimum	Modulo minimum of the source. Is required only if the data source is to be recorded at the time of the modulo change.
	Index: 8352.32
Process data - Modulo maximum	Modulo maximum of the source. Is required only if the data source is to be recorded at the time of the modulo change.
	Index: 8352.33
Process data – dead time	Delay of the process data. In the case of touchprobe, the value of the data source is recorded. Using this setting, the runtime of the process data can be compensated.
	Index: 8352.34
Process data – cycle time	Cycle time of the process data. In the case of touchprobe, the value of the data source is recorded. Using this setting, the runtime of the process data can be compensated.
	Index: 8352.35

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Inputs/outputs

INFORMATION

For more information on this topic, refer to chapter "Digital inputs/outputs" (→ 🗎 71).

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

Fieldbus interface

Parameter name	Description
Fieldbus configuration	
Activating the fieldbus connection	• Yes • **No**
	Index: 50000.150
	IEC name: -
Start address	Start address of the fieldbus process data words in the array of the bus system. Counting starts at 1
	Index: 50000.151
	IEC name: -
Basic process data	Number of process data for the software module without activated “Functions used”
	Index: 50000.159
	IEC name: -
Process data of the function used	Additional process data of the activated “Functions used”
	Index: 50000.161
	IEC name: -
Additional process data	Additional process data that is not occupied by the software module and can be freely assigned by the user. The assignment of this process data must be programmed in the IEC program.
	Index: 50000.160
	IEC name: -
Process data length	Length of the process data of the software module
	Index: -
	IEC name: -
Decimal places via fieldbus	

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Parameter name	Description
Define number of decimal places for position, speed, acceleration and jerk via fieldbus.	
Index: 50000.155 (position), 50000.156 (speed), 50000.157 (acceleration), 50000.158 (jerk)	
Fieldbus interface	
MOVIKIT® default assignment for process data input PI 4	Assignment of the process data word PI 4: • Torque [0.1 % nominal motor torque]
	Index: 50040.12
	IEC name: -

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Advanced settings

Parameter settings

Parameter name	Value
Delivery state	
"Initialize settings" button	Initialize the software module and the process data interface between controller and inverter. **Information:** 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".

Process data profile

Parameter name	Value
Select process data profile	
Process data profile	Setting regarding how much and which data is exchanged between inverter and MOVI-C® CONTROLLER.
	Index: 50000.10
	IEC name: -
Apply process data settings	
“Apply process data settings” button	Configure the process data interface according to the selected process data profile.

Module identification

Parameter group	Description
Module identification	Includes name and version for identifying the software module.

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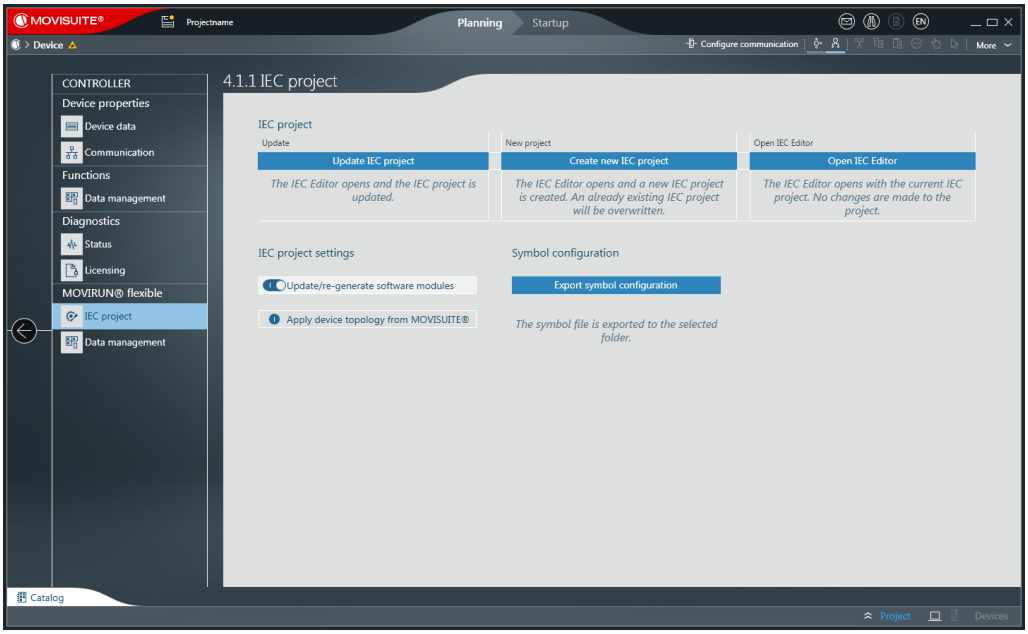
5.4 Generating an IEC project

Carry out the following steps to create an IEC project using automatic code generation and based on the configuration settings in MOVISUITE®.

✓ Configuration of the MOVISUITE® project has been completed.

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

   ⇨ The "IEC project" menu opens.



27021618448637067

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].

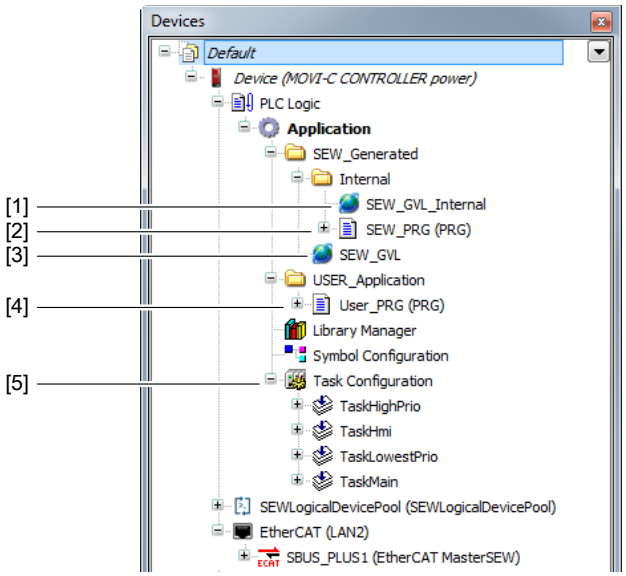
   ⇨ The IEC Editor opens and a new IEC project is created.

INFORMATION

If changes are made to the project structure, to inverter data sets, or to a software module configuration after the IEC project is generated for the first time, a notification symbol is displayed on the MOVI-C® CONTROLLER node. Click on the message icon for more information about the change, and to update the IEC project.

5.4.1 IEC project structure

The IEC project has the following basic structure:



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No.	Name	Description
[1]	SEW_GVL_Internal	The SEW_GVL_Internal global list of variables contains the instances that correspond to the software module used. These variables may not be written to from the user program. In addition, the structure contains an instance as a communication buffer for controlling or monitoring the software module by means of a monitor.
[2]	SEW_PRG	Program that contains all the important instance calls. Automatic code generation recreates this program in accordance with the configuration made in MOVISUITE® each time the IEC project is created, thereby overwriting the previous version. Therefore, you should not make any changes to this program.
[3]	SEW_GVL	The SEW_GVL global list of variables is the interface for accessing the software module features.
[4]	User_PRG	The user program is created once, initially, by automatic code generation. Since the program is not overwritten with each subsequent creation, this is the appropriate place for integrating user programs. The program is divided into five actions. These actions differ in the time at which they are called during the program sequence.
[5]	Task configuration	The list of tasks created in the project. Automatic code generation initially adds tasks that differ in how they are prioritized. The user can add additional programs to existing tasks or create new tasks. It is the responsibility of the user to design the capacity utilization of the tasks to enable the tasks to be processed within the required cycle time. Moving beyond the cyclical tasks, in particular, prevents setpoints for the interpolating axes from being generated in time, which means that these axes cannot be operated properly.

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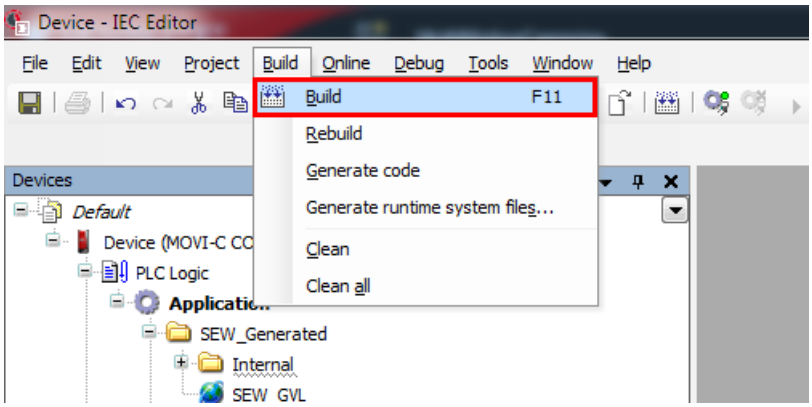
5.5 Importing the MOVIKIT® fieldbus monitor

You have to import the MOVIKIT® fieldbus monitor to being able to monitor and control the fieldbus interface.

In the IEC Editor, open the menu [Tools] > [Scripting] > [Scripts] > [F] select the menu entry [Fieldbusmonitor.py]. For further information on how to use the MOVIKIT® fieldbus monitor, refer to the chapter "MOVIKIT® fieldbus monitor" (→ 🗎 73).

5.6 Compiling (building) the IEC project

1. Open the [Build] menu and select [Build]. You can also start the process using the key shortcut <F11>.



25745614219

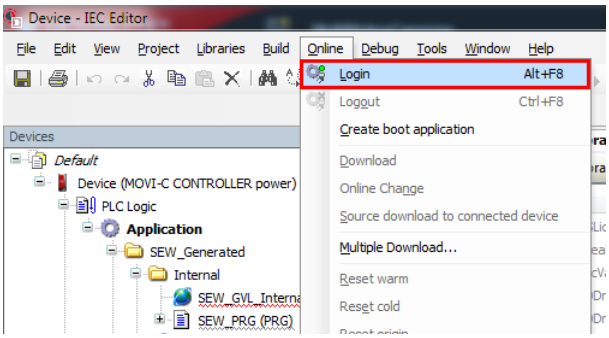
⇨ The result is displayed.

INFORMATION

If an error is indicated, double click the error message to navigate to the error. Eliminate the error and compile (build) the project again.

5.7 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"

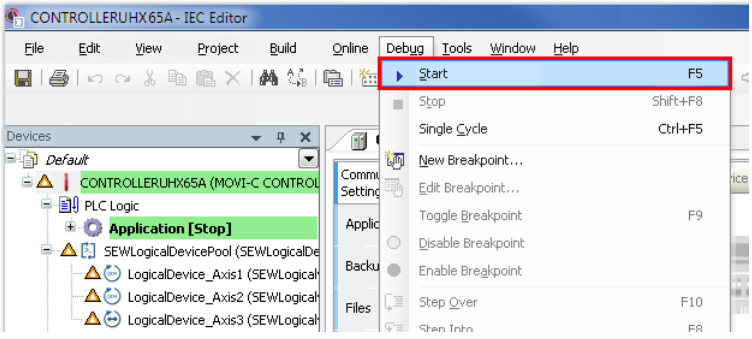
INFORMATION

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" (→ 🗎 35).

5.8 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 process using the key shortcut <F5>.



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

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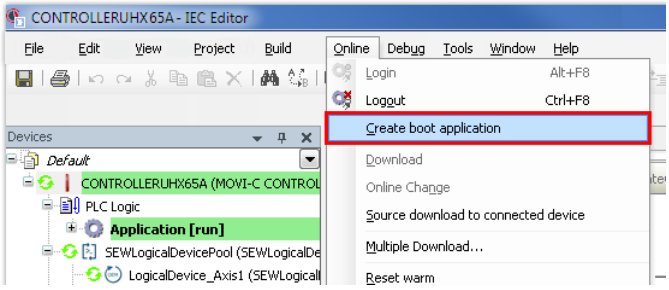
5.9 Creating a boot application

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].



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⇨ 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

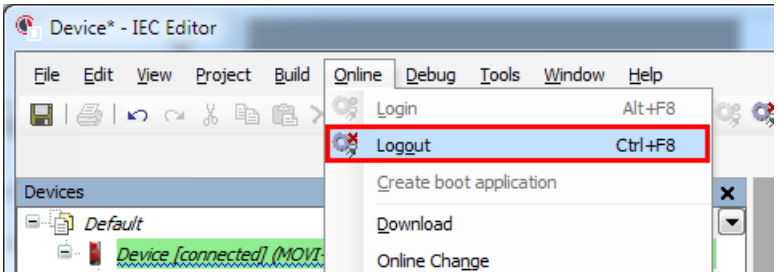
The fault-free boot application is always switched to "Run" state after having activated the MOVI-C® CONTROLLER.

5.10 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 [Save project] menu entry.
2. Open the [Online] menu and select the [Logout] menu entry. You can also log out using the key shortcut <Ctrl> + <F8>.



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⇨ The IEC Editor logs out 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
Velocity 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)
	420	Absolute positioning touchprobe (FCB 09)

INFORMATION

For operating function blocks, the configuration settings made in the MOVISUITE® configuration apply. Modulo operating modes can only be used if a cycle limit was set in the "Drive functions" configuration menu in the "FCB 09 Position control" submenu when configuring the software module.

INFORMATION

When selecting the operating modes positioning mode relative" (401), positioning mode modulo positive (402), positioning mode modulo negative (403), and positioning mode modulo-optimized direction (404) for the first time, a brief change is made to the FCB 26 to set the reference point of relative positioning correctly.

If the drive is still moving at the time when relative positioning mode is activated (401), it will be decelerated up to standstill using FCB 26. The stop point is the reference point for relative positioning. No deceleration is performed when changing to the other above mentioned operating modes.

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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 and of the signal states.

6.1.2 Requirements for cycle diagrams

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

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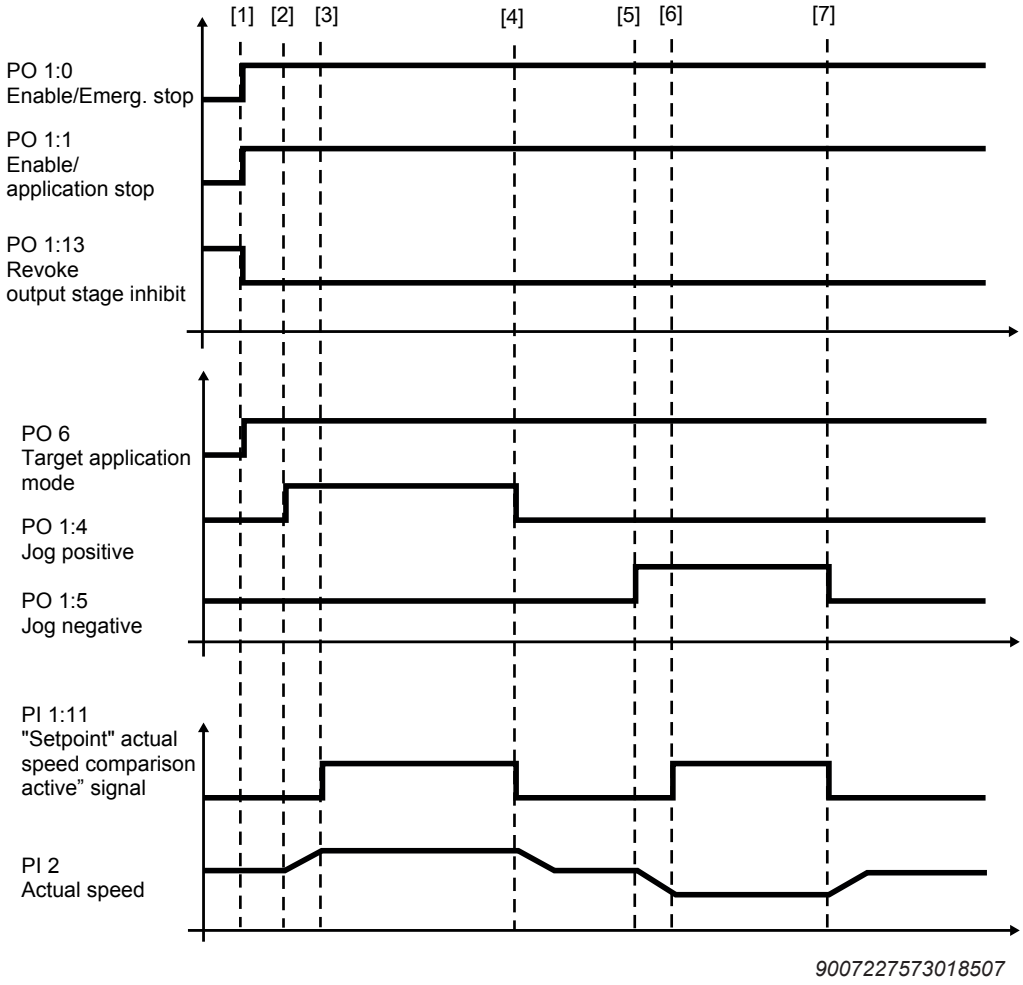
6.1.3 Jog mode

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



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied)
[1]	"Jog mode" activated	PO 6	100/101 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
[2] to [4]	Positive jog direction selected	PO 1:4	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": Deceleration with the value specified by PO 4. Operating mode 100: The motor is held at speed 0 subject to position control. Operating mode 101: The motor is held at speed 0 subject to speed control. For motors without encoder, the "Stop by setpoint function" (→ 🗎 24) must be used.

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No.	Sequence	PD	Signal states
[5] to [7]	Negative jog direction selected	PO 1:5	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": Deceleration with the value specified by PO 4. Operating mode 100: The motor is held at speed 0 subject to position control. Operating mode 101: The motor is held at speed 0 subject to speed control. For motors without encoder, the "Stop by setpoint function" (→ 🗎 24) must be used.
[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	• "1": "Setpoint/actual speed comparison active"

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6.1.4 Speed control

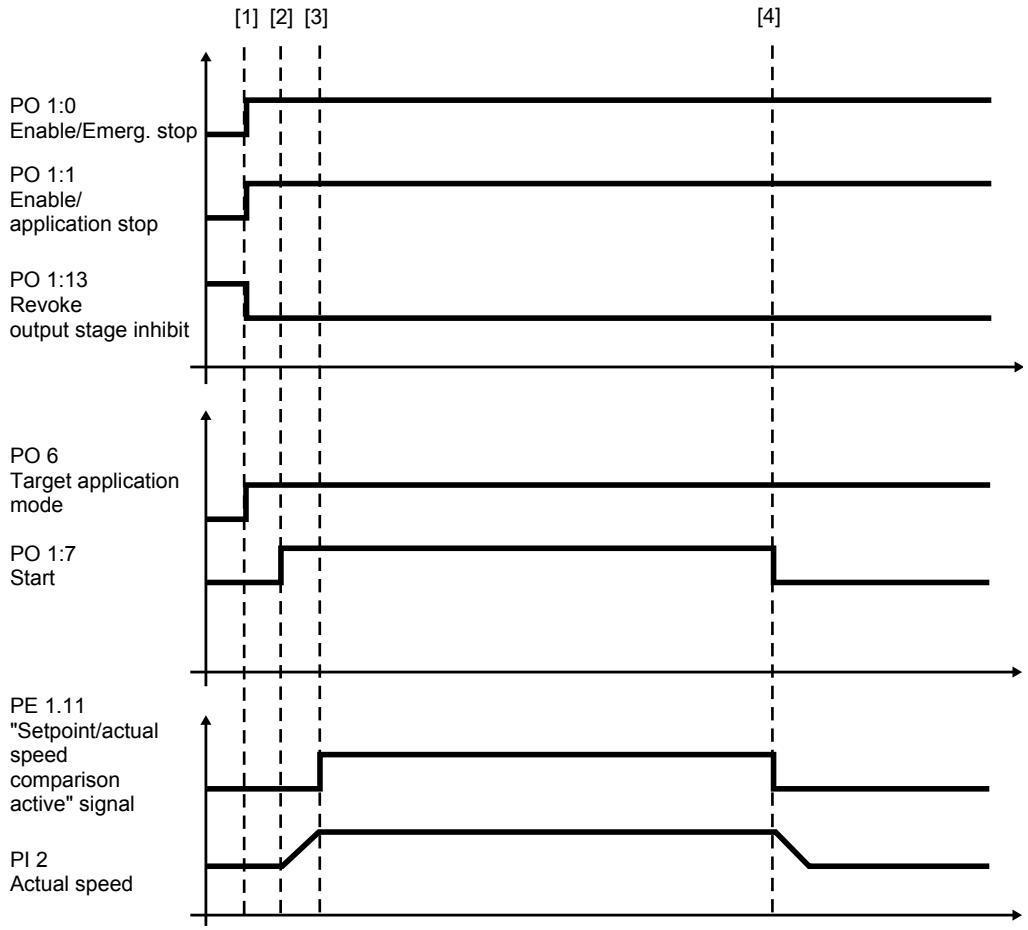
An axis is moved in a speed-controlled manner with or without encoder feedback. The direction depends on the sign of the speed setpoint. A positive setpoint corresponds to a positive motor direction of rotation.

INFORMATION

Monitoring of the software limit switches is disabled in operation without encoder.

Use hardware limit switches to monitor the travel range.

Cycle diagram



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied)
[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	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": Deceleration with the value specified by PO 4. Standstill behavior: The motor is held at speed 0 subject to speed control. For motors without encoder, the ""Stop by setpoint function" (→ 🗎 24)" must be used.
[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	• "1": "Setpoint/actual speed comparison active"

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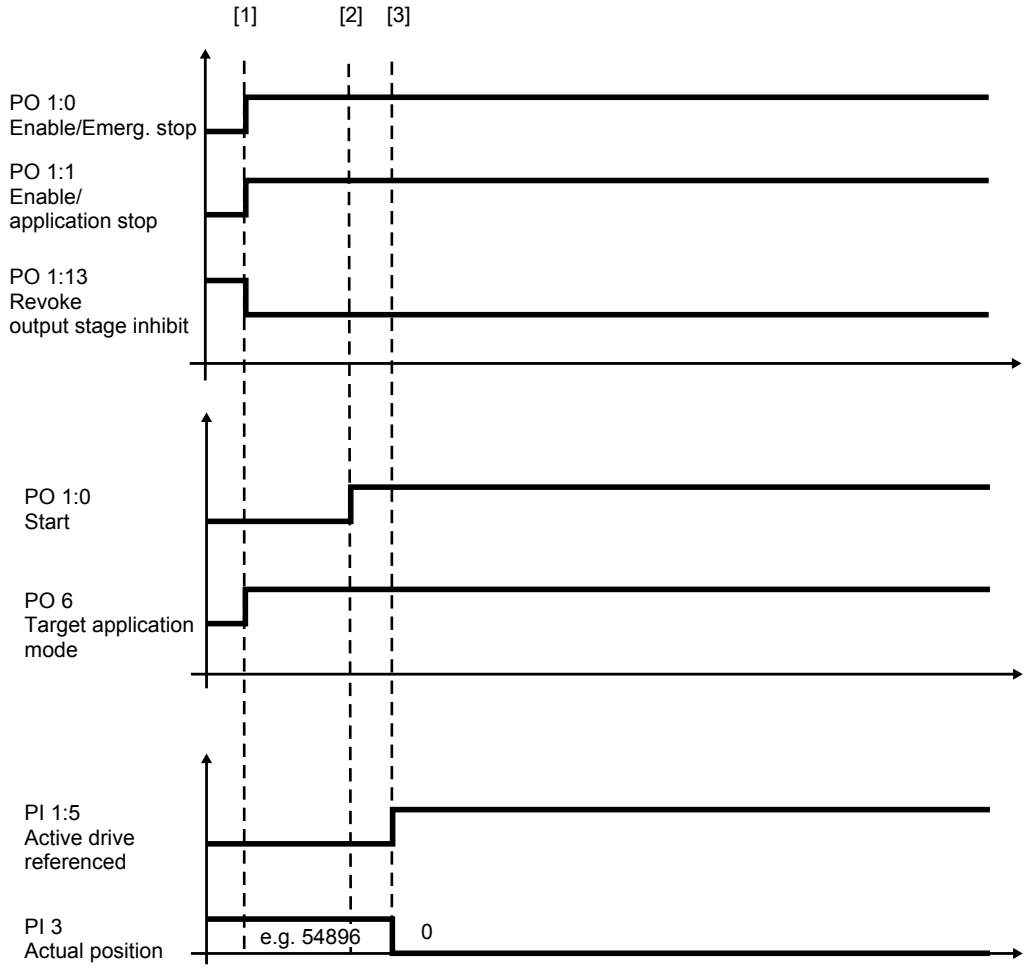
6.1.5 Referencing mode

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)



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied)
[1]	"Referencing mode" is activated	PO 6	300/301 (decimal)
[2]	Start/stop of reference travel	PO 1:7	• "1": Reference travel start • "0": Stop with drive function FCB 26 (Stop at user-defined limits). Deceleration with the value specified by PO 4.
[3]	Message "Active drive referenced"	PI 1:5	• "1": "Active drive referenced"

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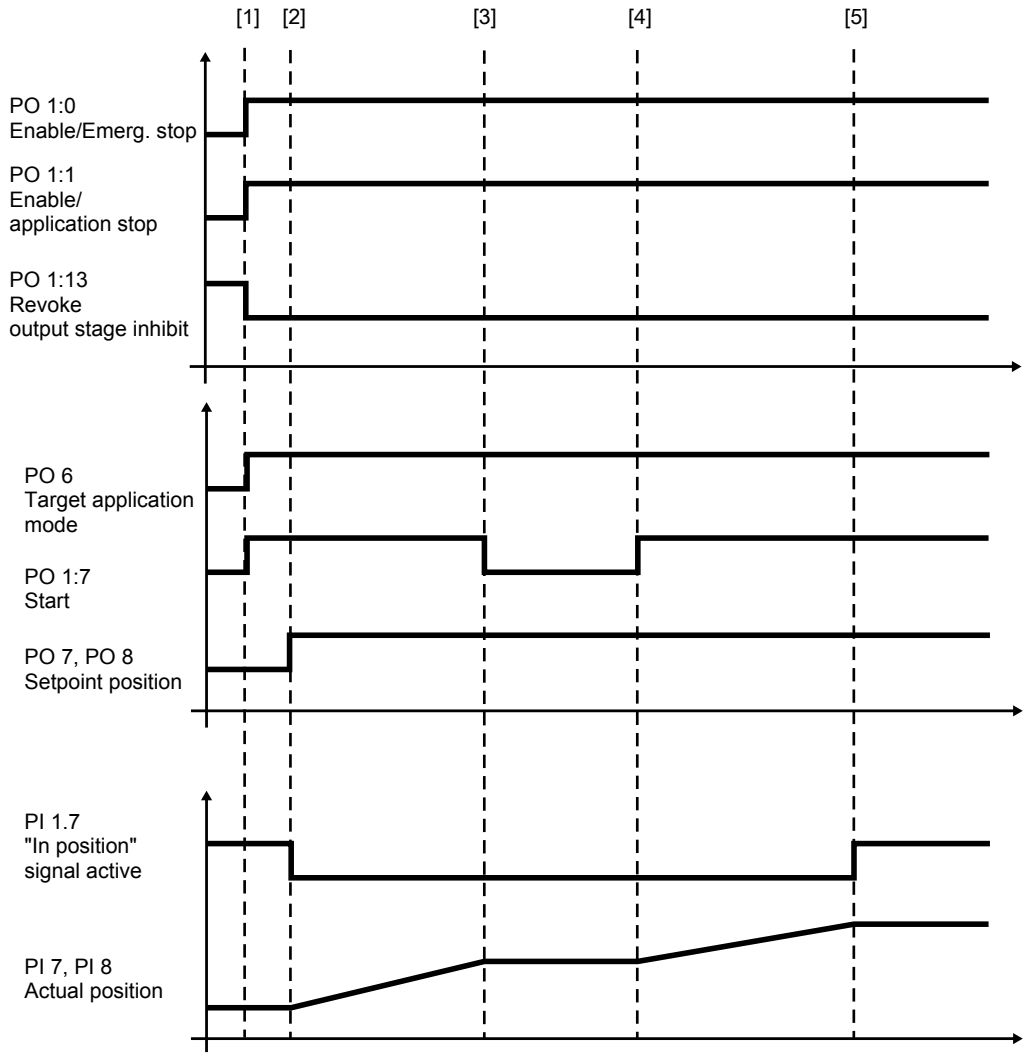
6.1.6 Absolute positioning mode

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 = modulo min. ≤ target position < modulo max.

NOTICE!
The specified setpoint position should be smaller than modulo max.

Cycle diagram (type of application – linear axis)



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[1]	"Absolute positioning mode" is activated	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	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": The motor is held at speed 0 subject to position control.
[2]	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] 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	• "1": "In position" signal active.

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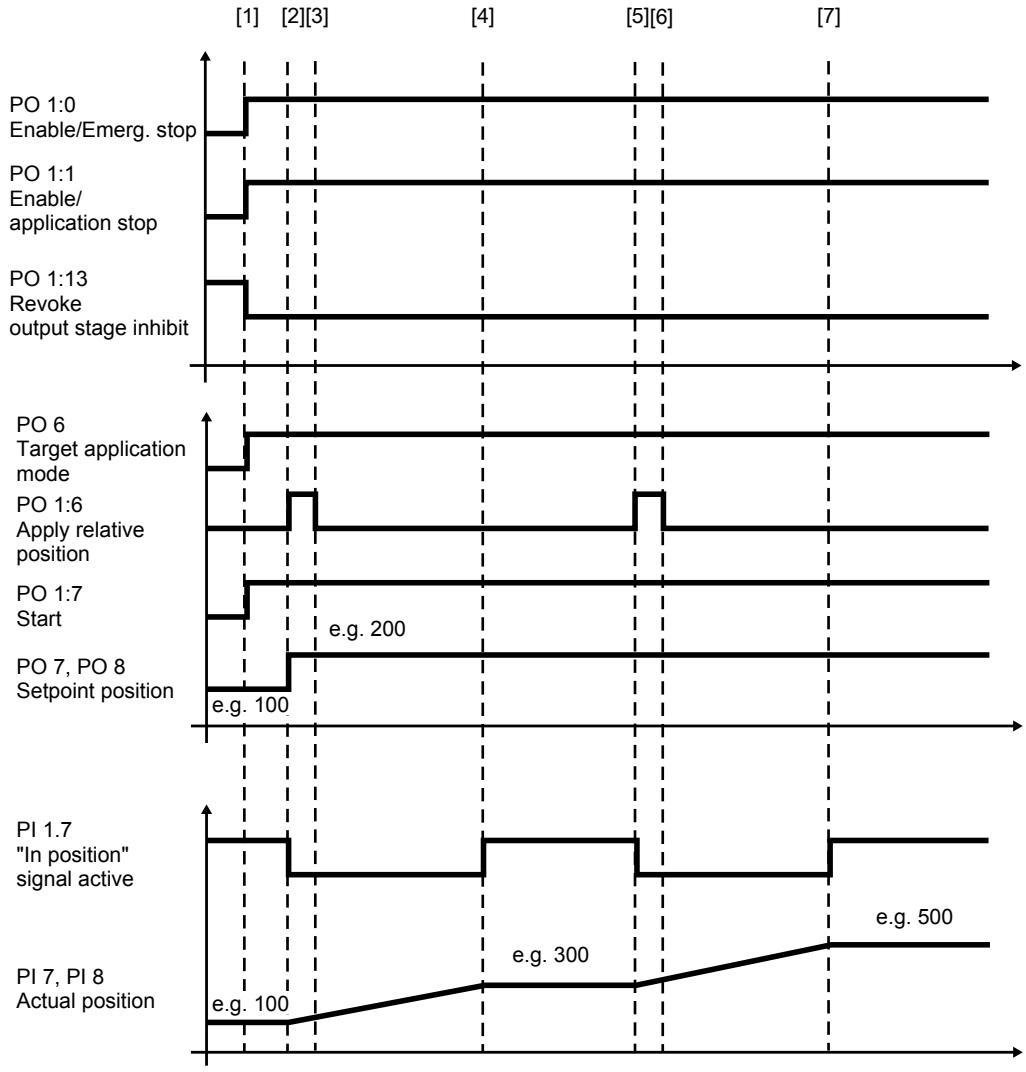
6.1.7 Relative positioning mode

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

Example: Cycle mode at a conveyor belt.

- "Linear" axis type: Setpoint position with processing of signs
- "Modulo" axis type: Setpoint position = modulo min. ≤ target position < modulo max.

Cycle diagram (type of application – linear axis)



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Procedure	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[1]	"Relative positioning mode" operating 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	• "1": The drive accelerates to the setpoint speed specified via PO 2 using the value specified via PO 3. • "0": The motor is held at speed 0 subject to position control.
[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 **Information:** 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 section can be extended or shortened by the specified relative position.	PO 1:6	• "1": Accept relative position

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No.	Procedure	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	• "1": "In position" signal active

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 recalculated and saved, i.e. the drive moves to a different target position than originally desired. If the movement is not to be aborted but only interrupted (while retaining the original target position), the drive can be stopped by removing the PO 1:7 “Start/Stop” signal.

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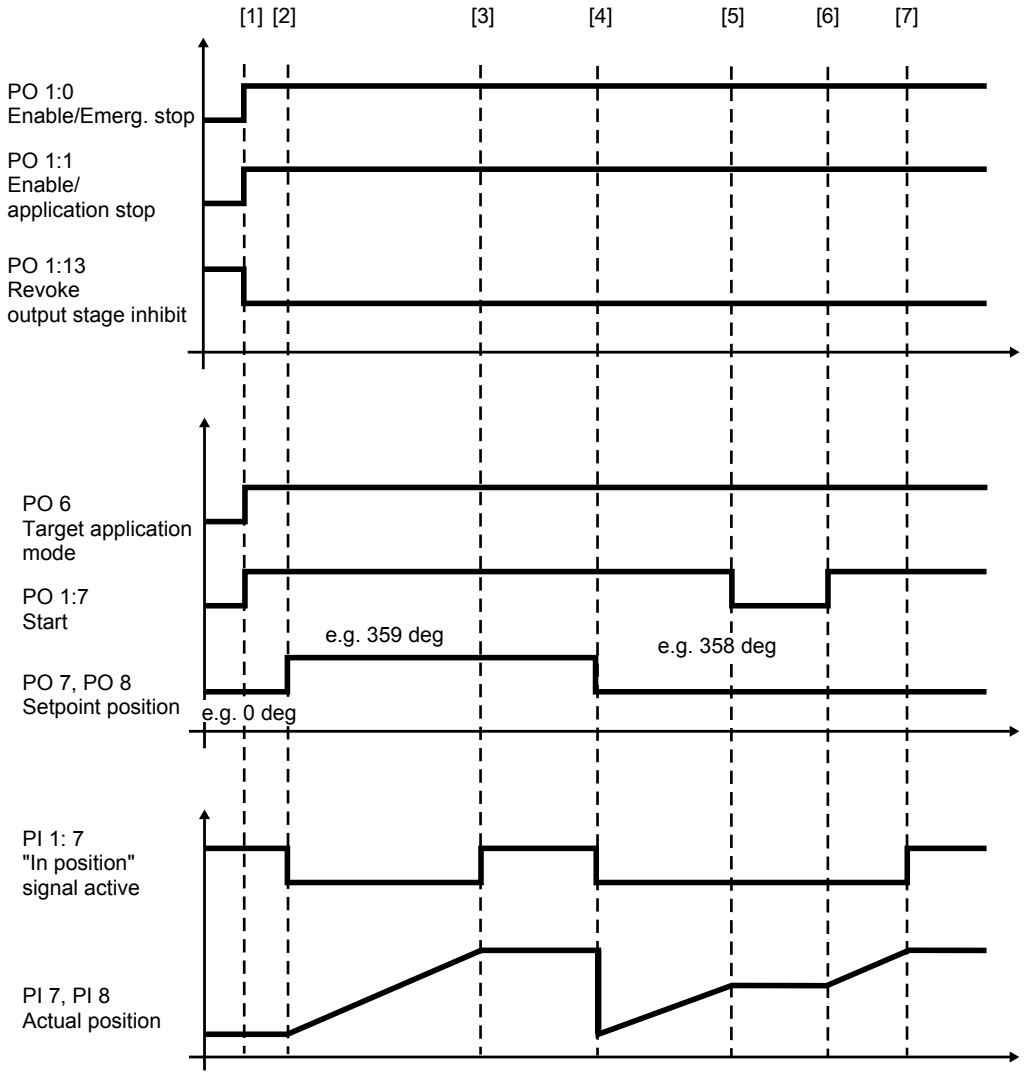
6.1.8 Modulo positive positioning mode

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

"Modulo" axis type: Setpoint position = modulo min. ≤ target position < modulo max.

NOTICE!
The specified setpoint position should be smaller than modulo max.

Cycle diagram



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[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	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": The motor is held at speed 0 subject to position control.
[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	• "1": "In position" signal active

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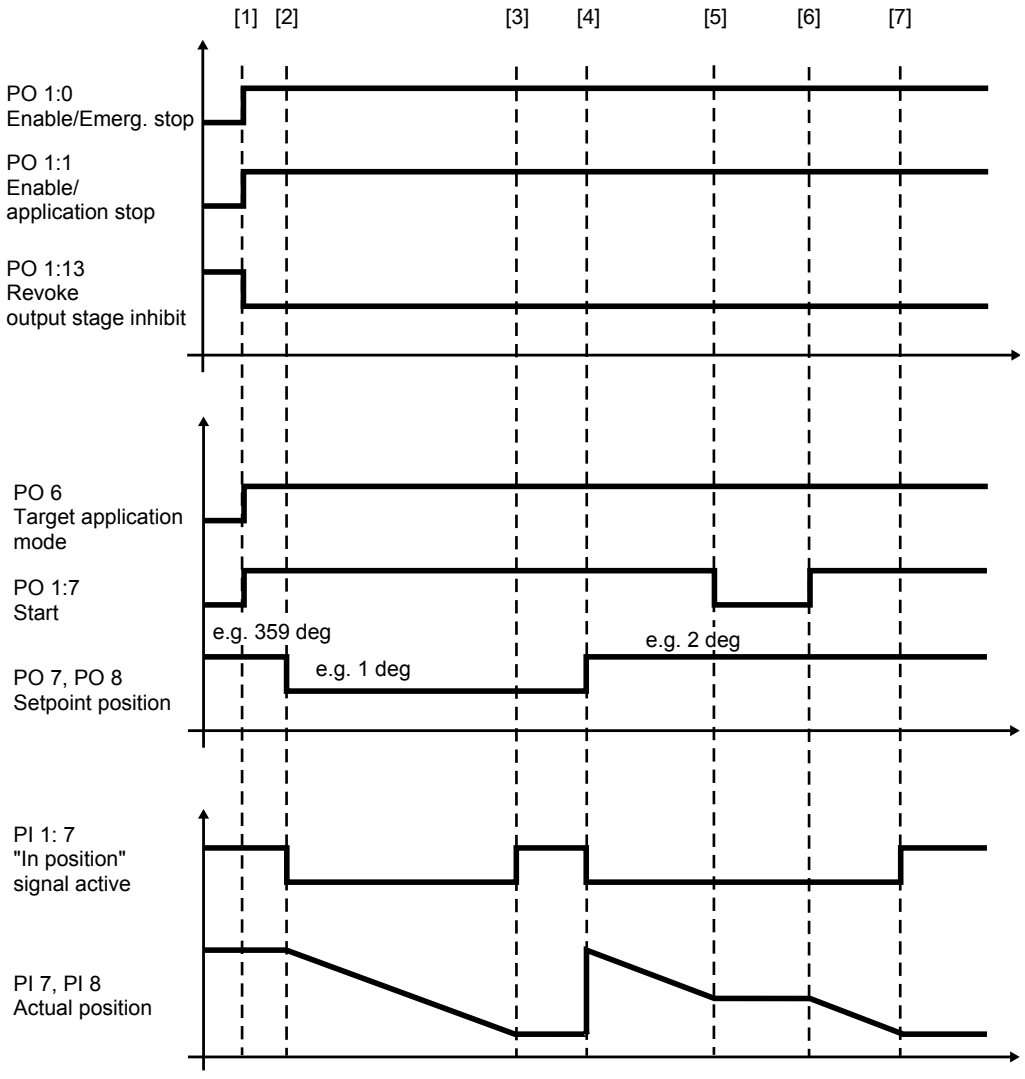
6.1.9 Modulo negative positioning mode

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

"Modulo" axis type: Setpoint position = modulo min. ≤ target position < modulo max.

NOTICE!
The specified setpoint position should be smaller than modulo max.

Cycle diagram



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[1]	"Modulo negative positioning mode" is activated.	PO 6	403 (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	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": The motor is held at speed 0 subject to position control.
[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	• "1": "In position" signal active

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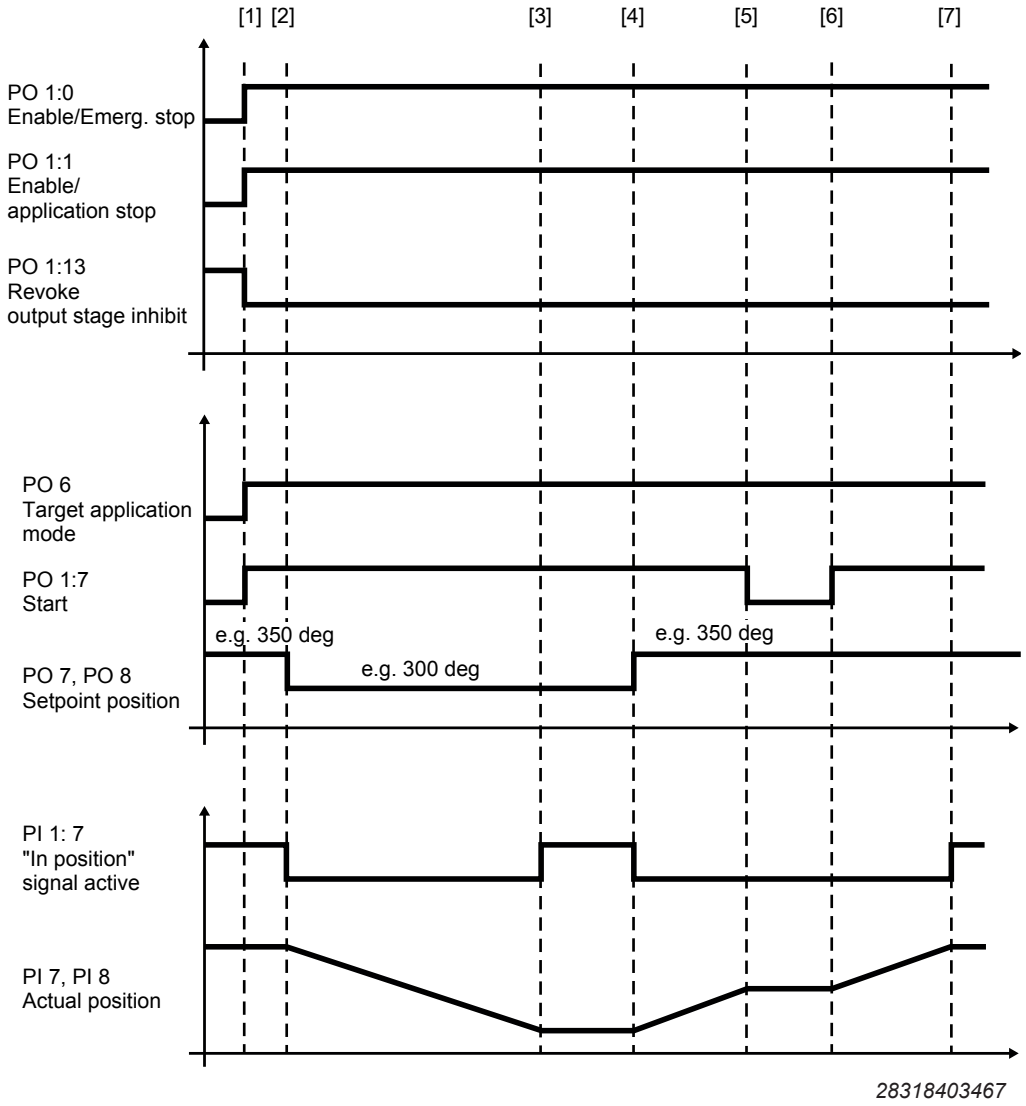
6.1.10 Modulo positioning mode – optimized direction

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 = modulo min. ≤ target position < 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 an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) 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	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[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	• "1": The drive accelerates to the setpoint speed specified by means of PO 2 using the value specified by means of PO 3. • "0": The motor is held at speed 0 subject to position control.
[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	• "1": "In position" signal active

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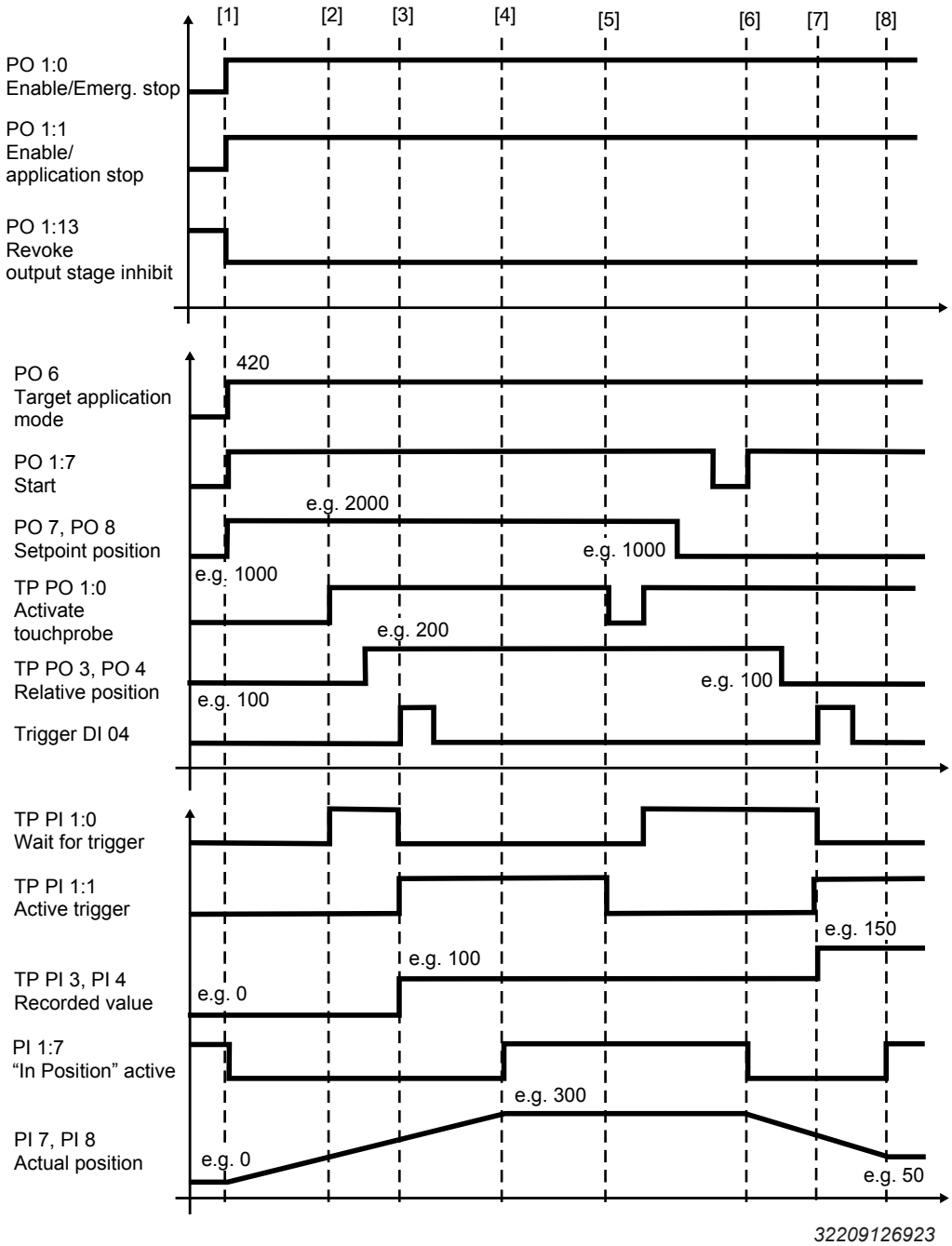
6.1.11 Absolute positioning touchprobe

INFORMATION

Only included if the function is activated in the "Basic settings" configuration menu under "Functions used".

Absolute positioning of an axis to machine zero or relative positioning of an axis to the actual position (420). The relative position is processed as an amount and accepted when the additional function "Touchprobe 1" (→ 🗎 60) and a trigger event are activated.

Cycle diagram



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Process sequence and signal states

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22) under "Stop functions".

No.	Procedure	PD	Signal states
[1] General enable	PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	PO 1:13 = "0" Output stage inhibit (signal with highest priority)	PO 1:13	• "0": Output stage enabled • "1": Output stage inhibited (the drive coasts to a stop or the brake is applied).
[1]	"Positioning mode Touchprobe" operating mode is activated	PO 6	420 (decimal)
	Dynamics parameters are accepted (also during ongoing movement)	PO 2 PO 3 PO 4	Setpoint speed Acceleration Deceleration
[1]	Start/stop of the axis Depending on whether the additional function “Touchprobe” is activated and whether a trigger is detected, there are different case distinctions. See also "Case distinction" (→ 🗎 59).	PO 1:7	• "1": The drive accelerates to the setpoint speed specified via PO 2 using the value specified via PO 3. • "0": The motor is held at speed “0” subject to position control.
[2]	Activate touchprobe Upon activation, the acknowledgment “Wait for trigger” (TP PI 0:0) is set.	TP PO 1:0	• "0": No trigger event is evaluated • "1": The system waits for a trigger event.
[2] to [3]	Setpoint relative position Acceptance also during travel and after reaching the target position	TP PO 3 PO 4	"Relative position" (high word) "Relative position" (low word)

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No.	Procedure	PD	Signal states
[3] to [4] and from [7]	Trigger When the trigger has occurred, the new target position results from the actual position at the trigger time (recorded value) and the relative position specified via TP PO 3, PO 4. The amount of the relative position is added if the direction of travel is positive and subtracted if the direction of travel is negative. The feedback “Trigger active” (TP PI 1:1) is set, and the trigger counter is increased by 1 (TP PI 2). The detected relative position is output via TP PI 3, PI 4.		The acquisition of the trigger signal is set in the configuration.
[5] to [6]	To move to a new setpoint position after a trigger event has occurred, "Activate Touchprobe" must first be set to "0" and then back to "1" and then "Start" must have a rising edge.		
Up to [1], [4] to [6] and from [8]	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	• "1": "In position" signal active

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Case distinction

Prerequisite: "Absolute positioning touchprobe (420)" operating mode is selected.

Case 1: Touchprobe not activated (TP PO 0:0)

If the "Start" signal (PO 1:7) is canceled during travel to the destination, the drive is stopped and continues to travel to the setpoint position (PO 7, PO8) when this signal is set again.

Case 2: Touchprobe activated (TP PO 1:0), no trigger detected (TP PI 1:2)

If the "Start" signal (PO 1:7) is canceled during travel to the destination, the drive is stopped and continues to travel to the setpoint position (PO 7, PO8) when this signal is set again. When the setpoint position is reached, the feedback “No trigger detected” (TP PI 1:2) is set.

Case 3: Touchprobe activated (TP PO 1:0), trigger active (TP PI 1:1)

If the "Start" signal (PO 1:7) is canceled during travel to the destination, the drive is stopped and continues to travel to the setpoint position (PO 7, PO8) when this signal is set again. When the trigger has occurred, the new target position results from the actual position at the trigger time (recorded value) and the relative position specified (TP PO 3, PO 4). The amount of the relative position (TP PO 3, PO 4) is added if the direction of travel is positive and subtracted if the direction of travel is negative. The acknowledgment “Trigger active” (TP PI 1:1) is set.

6.2 Additional functions

The additional functions are activated in the "Basic settings" (→ 🗎 17) configuration menu in the “Functions used” section.

6.2.1 Variable jerk time

The additional function allows you to set the jerk time. For fieldbus operation, the process data length is extended by one process data word.

⚠ WARNING

Unexpected system behavior by changing the jerk time during deceleration. If the jerk is reduced (increase jerk time) during deceleration, the target position might be overrun.

Death, severe injuries or damage to property can occur.

- Change the jerk or jerk time only when the machine is at a standstill.

For the states listed below, the preset jerk time has no effect. In these cases, the **"Jerk time" of the inverter** configured under "Application limits" in the "Limit values" (→ 🗎 20) submenu of the "Monitoring functions" configuration menu is effective.

- When selecting the default mode (value “0”)
- When the “Enable/application stop” signal is removed (FCB 13)
- When the “Enable/emergency stop” signal is removed (FCB 14)
- With an active fault response (FCB 13 or FCB 14)

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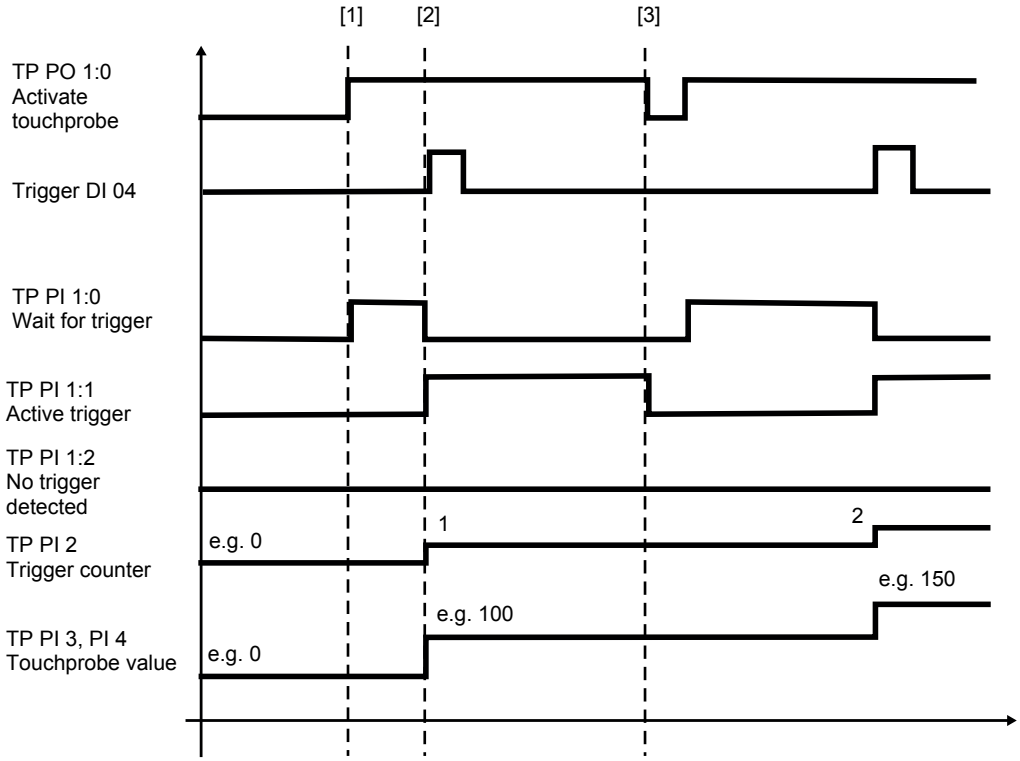
6.2.2 Touchprobe 1

The additional function “Touchprobe 1” enables the evaluation of a trigger event independent of the operating mode. If the additional function is activated, it is possible in the "Absolute positioning touchprobe" (→ 🗎 56) operating mode to position a target relative to the actual position during a trigger event. For fieldbus operation, the process data length is extended by four process data words.

Cycle diagram



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Process sequence and signal states

No.	Procedure	PD	Signal states
[1]	Activate touchprobe Upon activation, the acknowledgment “Wait for trigger” (TP PI 1:0) is set.	TP PO 1:0	"0": No trigger event is evaluated "1": The system waits for a trigger event.
[2]	Trigger The feedback “Trigger active” (TP PI 1:1) is set and the trigger counter is increased by one (TP PI 2). The detected relative position is output via TP PI 3 and PI 4.		The acquisition of the trigger signal is set in the configuration.
[3]	With a positive edge at “Activate Touchprobe” TP PO 1:0, the Touchprobe function is prepared for a new trigger event.	TP PO 1:0	

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6.3 Other functions

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

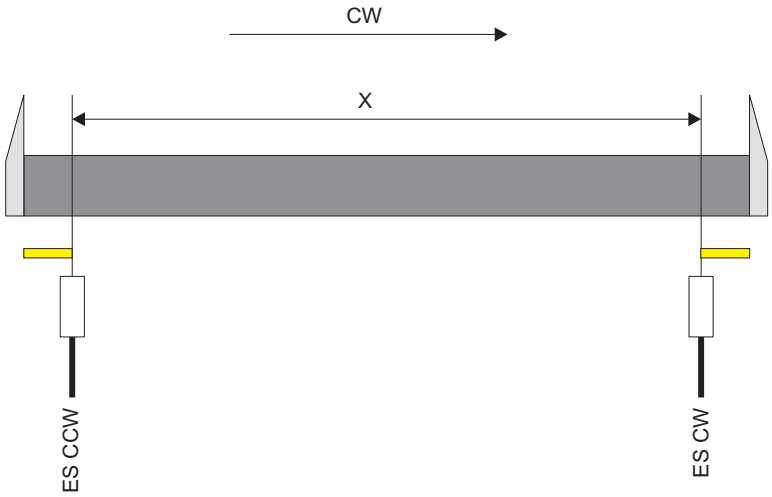
6.3.1 Hardware limit switches

The hardware limit switches are connected to the digital inputs 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 NC contacts (low-active).



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[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 rotation (CW) should be towards the clockwise hardware limit switch (LS CW) and counterclockwise rotation (CCW) should be towards the counterclockwise hardware limit switch (LS CCW).

6.3.2 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" (→ 🗎 18). 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.

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7 Process data assignment

7.1 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 For control via process data, see chapter "Digital inputs/outputs" (→ 🗎 71)	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 chapter "Overview of operating modes" (→ 🗎 36).
PO 7	Target position high word	0 – 15	P	User unit
PO 8	Target position low word	0 – 15	P	User unit

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7.1.1 Control word

INFORMATION

For the behavior of the drive at an idle state, refer to the information in the chapter "Control functions" (→ 🗎 22).

Bit	Function	PD	V/P	Description
0	Enable/emergency stop	PO 1.0	V/P	• "1": Enable • "0": Stop with drive function FCB 14 (emergency stop)
1	Enable/application stop	PO 1.1	V/P	• "1": Enable • "0": Stop with drive function FCB 13 (stop at application limits)
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	Apply relative position	PO 1.6	P	Apply relative target position in relative positioning mode (401). This signal is ineffective for all the other operating modes.
7	Start/stop with fieldbus ramp	PO 1.7	V/P	• "1": Start – movement enabled in all operating modes except for jog mode. In referencing mode, "Start" is also needed for referencing without reference travel. • "0": Referencing mode Stop with FCB 26 (stop at user-defined limits). Deceleration to speed 0 using the value specified via PO 4. "0": Other operating modes Deceleration to speed 0 using the value specified via 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" (→ 🗎 24) must be used.
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	-

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Bit	Function	PD	V/P	Description
10	Activate drive train 2	PO 1.10	V/P	• "0": Drive train 1 selected • "1": Drive train 2 selected **NOTICE!** 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 parameterized as in drive train 1.
11	Reserved	PO 1.11	V/P	-
12	Disable SW limit switches	PO 1.12	P	If software limit switches are activated and configured in the configuration ... • "0": Monitoring of software limit switches enabled. • "1": Monitoring of software limit switches disabled.
13	Activate output stage inhibit	PO 1.13	V/P	• "1" Output stage inhibit activated – the brake is applied or (if no brake is installed) the motor coasts to a stop. • "0" Output stage inhibit inactive – output stage can be enabled
14	Activate standby mode	PO 1.14	V/P	• "1" Standby mode activated. • "0" Standby mode not activated. Standby mode can be activated only when the output stage is inhibited.
15	MOVIKIT® Handshake In	PO 1.15	V/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.

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7.1.2 Additional functions

INFORMATION

The number of previously configured process data must be added to the specified process data word number.

Variable jerk time

⚠ WARNING

Unexpected system behavior by changing the jerk time during deceleration. If the jerk is reduced (increase jerk time) during deceleration, the target position might be overrun.

Death, severe injuries or damage to property can occur.

- Change the jerk or jerk time only when the machine is at a standstill.

Word		Bit	Function
PO 1	Setpoint jerk time		Specified jerk time in [ms]

Touchprobe 1

Word		Bit	Function
PO 1	Control word	0	Activating the function
PO 2	Reserved	0-15	
PO 3	High word relative position	0-15	User unit
PO 4	Low word relative position	0-15	User unit

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7.2 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 for operation
		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 a response for certain faults. If a warning is signaled, both bit PI 1.9 and the associated fault code are 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
		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	• No fault: Display of current FCB (low-byte) • Device fault: Display of device fault code • Fault in option: Display of option fault code (High byte: fault; Low byte: subfault) For more information, refer to the product manual of the respective device.
PI 4	Torque	0 – 15	• Current torque based on the nominal motor torque (unit: 0.1%)

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Word		Bit	Function
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" (→ 🗎 36).
PI 7	Actual position (high word)	0 – 15	User unit
PI 8	Actual position (low word)	0 – 15	User unit

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7.2.1 Status word

Bit	Function	Process data	Description
8	Fault	PI 1:8	• "1": Fault present • "0": No fault present Active faults can be reset by setting the signal PI 1:8 "Fault reset".
9	Warning	PI 1:9	• "1": Warning present • "0": No warning present 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 parameterized 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. For more information, refer to the product manual of the respective device.
...	...	...	...
12	SW limit switches Inactive	PI 1:12	This signal is active if software limit switches are activated and configured in the configuration and one of the following conditions is fulfilled: • PO 1:12 is active • Both software limit switches were set to the value "0".

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7.2.2 Additional functions

INFORMATION

The number of previously configured process data must be added to the specified process data word number.

Variable jerk time

Word		Bit	Function
PI 1	Active jerk time	0-15	Active jerk time in [ms]

Touchprobe 1

Word		Bit	Function
PI 1	Status word	0	Function activated Waiting for trigger event
		1	Trigger event detected
		2	Maximum position detected
PI 2	Trigger counter	0-15	Increase by 1 for each trigger event
PI 3	High word detected value	0-15	User unit
PI 4	Low word detected value	0-15	User unit

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8 Digital inputs/outputs

The digital inputs/digital outputs are assigned in the configuration of the software module in the "Inputs/outputs" (→ 🗎 28) menu. The assignment can be configured as required or the predefined default assignment can be used. The fields for making the settings are described in the chapter "Configuring digital inputs/digital outputs" (→ 🗎 72).

⚠ WARNING

Unexpected system behavior in the event of interrupted communication with the higher-level controller.

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.

8.1 Standard assignment of digital inputs

When using the software module, the digital inputs are assigned the following functions by default:

Digital input	Function
DI 00	Output stage enable
DI 01	No function
DI 02	No function
DI 03	No function
DI 04	No function
DI 05	No function

8.2 Delivery state of digital outputs

In the delivery state, the digital outputs are assigned the following functions by default:

Digital output	Function
DB 00	Brake output
DO 00	Ready for operation
DO 01	Output stage enable
DO 02	Fault
DO 03	STO active

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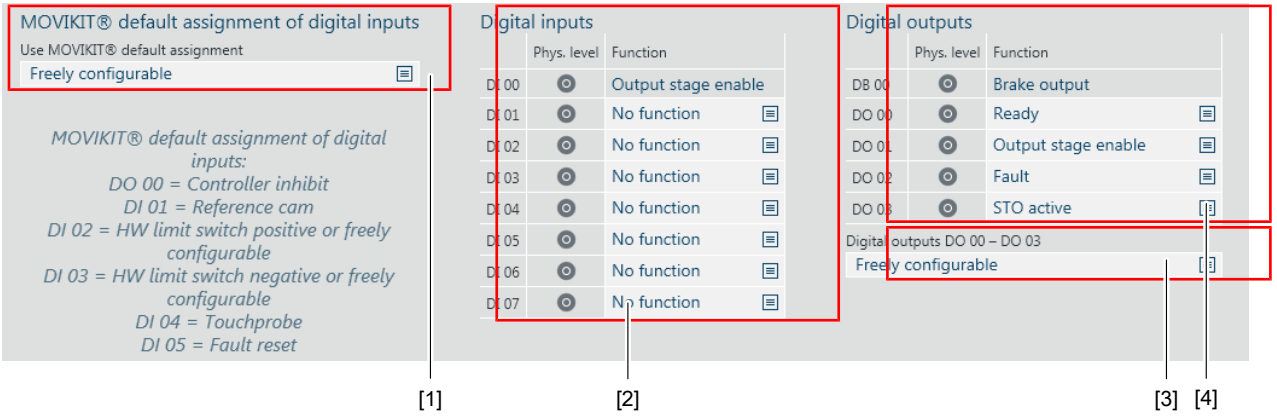
8.3 Configuring digital inputs/digital outputs

For configuring the digital inputs/digital outputs, the following fields are available in the "Inputs/outputs" (→ 🗎 28) menu of the configuration for the software module.



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No.	Description
[1]	Selection of a default assignment for the digital inputs. The digital inputs are the image of the input terminals of the connected inverter and are provided by process data word PI 5. • Freely configurable – Configure digital inputs as required using the drop-down lists under [2]. If you have already selected a standard assignment before, their functions will be maintained in the respective fields and the drop-down lists will be enabled to change the function. • Yes, without HW limit switches – Use default assignment for applications without HW limit switches • Yes, with HW limit switches – Use default assignment for applications with HW limit switches • No function – Do not assign any function to the digital inputs (DI 01 through DI 07)
[2]	List of digital inputs with drop-down lists for assigning a function and displaying the physical level. Digital input DI 00 is permanently assigned the "output stage enable" function.
[3]	Selection of a default assignment for the digital outputs. • Freely configurable – Configure digital outputs as required using the drop-down lists under [4]. If you have already selected a standard assignment before, their functions will be maintained in the respective fields and the drop-down lists will be enabled to change the function. • Control via fieldbus – Digital outputs are assigned in such a way that they can be controlled via process data word PO 5. • Digital outputs as in delivery state – Reset assignment of digital outputs to delivery state. See "Delivery state of digital outputs" (→ 🗎 71).
[4]	List of digital outputs with drop-down lists for assigning a function and displaying the physical level. Digital output DB 00 is permanently assigned the "brake output" function.

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9 Diagnostics

9.1 MOVIKIT® fieldbus monitor

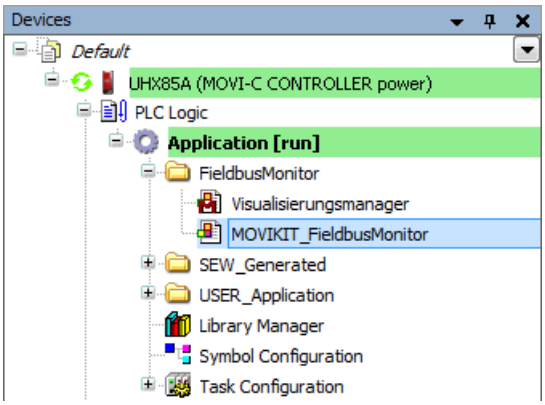
The MOVIKIT® fieldbus monitor is a tool in the IEC Editor for monitoring and controlling the fieldbus interface. The MOVIKIT® fieldbus monitor accesses solely the data of the fieldbus interface and represents the process input and process output data exchanged between the higher-level controller and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

INFORMATION

You have to import the MOVIKIT® fieldbus monitor to being able to monitor and control the fieldbus interface. For further information, refer to the chapter "Importing the MOVIKIT® fieldbus monitor" (→ 33).

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`)



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⇨ The MOVIKIT® fieldbus monitor is opened in a new tab.

⚠ WARNING

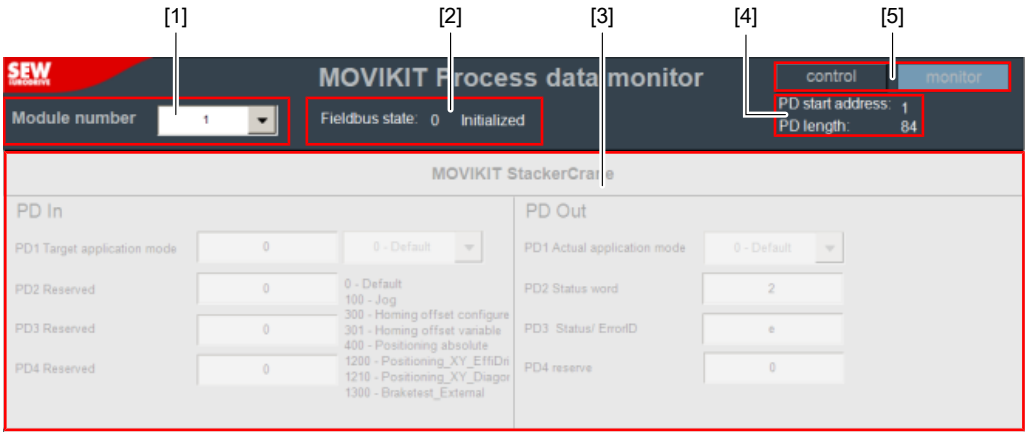
Unexpected system behavior if the communication between PC and MOVI-C® CONTROLLER is interrupted because the specified setpoints continue to take effect until the connection to the IEC Editor is interrupted automatically and the IEC Editor is logged off.

Death, severe injuries or damage to property

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

9.1.1 User interface

The user interface consists of the following sections:



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No.	Description
[1]	Number of the software module that is to be monitored or controlled. If several software modules are present, the sequence depends on the start address specified in the fieldbus configuration of the software module.
[2]	Status information of the fieldbus.
[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.

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10 Fault management

10.1 Fault codes

Dec	Hex	Fault	Library SEW_MOS_...
25664	0x6440	eSEW_LicMgr_GetInfo	IECLicenseManager
25665	0x6441	eSEW_LicMgr_GetInfo_PerfClass	IECLicenseManager
25666	0x6442	eSEW_LicMgr_CheckAndReportRuntime	IECLicenseManager
25667	0x6443	eSEW_LicMgr_SecretChallenge	IECLicenseManager
25668	0x6444	eSEW_LicMgr_NoRuntime	IECLicenseManager
25669	0x6445	eSEW_LicMgr_NoValidRuntime	IECLicenseManager
25670	0x6446	eSEW_LicMgr_CheckLicense	IECLicenseManager
25671	0x6447	eSEW_LicMgr_ConsumeLicense	IECLicenseManager
25672	0x6448	eSEW_LicMgr_ReportMissingLicense	IECLicenseManager
25673	0x6449	eSEW_LicMgr_FileReloadWatcher	IECLicenseManager
25674	0x644a	eSEW_LicMgr_ConfirmToken	IECLicenseManager
25696	0x6460	InterfaceNotValid	ErrorHandling_Itfs
25697	0x6461	SubordinatedFBArrayFull	ErrorHandling_Itfs
25698	0x6462	ErrorIDZero	ErrorHandling_Itfs
25699	0x6463	MessageIDZero	ErrorHandling_Itfs
25700	0x6464	FBHasAlreadyAnSuperordinatedFB	ErrorHandling_Itfs
25701	0x6465	SubordinatedFBAlreadyAdded	ErrorHandling_Itfs
25702	0x6466	MessageIDisEqualToErrorID	ErrorHandling_Itfs
25703	0x6467	MessageIDEqualvocal	ErrorHandling_Itfs
25704	0x6468	CompletionOfAdditionalTextFailed	ErrorHandling_Itfs
25728	0x6480	MessageBufferFull	LoggingAdapter_Itfs
26112	0x6600	ConfigFileNotFound	AxisConfig_Itfs
26113	0x6601	ConfigFileNotOpened	AxisConfig_Itfs
26114	0x6602	ConfigFileNotClosed	AxisConfig_Itfs
26115	0x6603	ConfigDataNotRead	AxisConfig_Itfs
26116	0x6604	ConfigParameterNotFound	AxisConfig_Itfs
26117	0x6605	ConfigParameterNotValid	AxisConfig_Itfs
26688	0x6840	ReadConfigDataFailed	SingleAxis
26689	0x6841	ModeNotsupported	SingleAxis
26690	0x6842	ParameterServiceError	SingleAxis
26691	0x6843	ReferenceOffsetTooBig	SingleAxis
26692	0x6844	ReferenceOffsetTooSmall	SingleAxis
26693	0x6845	MasterStopAtSlaveError	SingleAxis
26694	0x6846	InterfaceNotLinked	SingleAxis

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Dec	Hex	Fault	Library SEW_MOS_...
26695	0x6847	LinkMode	SingleAxis
26696	0x6848	SoftwareLimitSwitchPositive	SingleAxis
26697	0x6849	SoftwareLimitSwitchNegative	SingleAxis
27136	0x6a00	DeviceError	DeviceAdapter_Itfs
27137	0x6a01	DeviceHandlerError	DeviceAdapter_Itfs
28224	0x6e40	eSEW_ParamHandler_Request	ParameterHandler
28225	0x6e41	eSEW_ParamHandler_Response	ParameterHandler
28226	0x6e42	eSEW_ParamHandler_NoDeviceLink	ParameterHandler
36960	0x9060	ModeNotValid	ModeAdministrator
91200	0x16440	eSEW_LicMgr_RepMisSiLic	IECLicenseManager
91201	0x16441	eSEW_LicMgr_RepMisPerLic	IECLicenseManager
91202	0x16442	eSEW_LicMgr_RepMisRunLic	IECLicenseManager
91203	0x16443	eSEW_LicMgr_TrialLicenseActive	IECLicenseManager
91204	0x16444	eSEW_LicMgr_TrialLicenseExpired	IECLicenseManager
91205	0x16445	eSEW_LicMgr_LicenseActive	IECLicenseManager
91206	0x16446	eSEW_LicMgr_DualUseLicenseActive	IECLicenseManager
91207	0x16447	eSEW_LicMgr_NotTestableLicenseActive	IECLicenseManager
91208	0x16448	eSEW_LicMgr_RuntimeTrialLicenseActive	IECLicenseManager
91209	0x16449	eSEW_LicMgr_RuntimeTrialLicenseExpired	IECLicenseManager
91210	0x1644a	eSEW_LicMgr_TrialLicenseActivated	IECLicenseManager
91232	0x16460	InterfaceNotValid	ErrorHandling_Itfs
91233	0x16461	ErrorHandling_NotYetInitialized	ErrorHandling_Itfs
91264	0x16480	LoggingNotSuccessful	LoggingAdapter_Itfs
91265	0x16481	LogbookOpeningFailed	LoggingAdapter_Itfs
93248	0x16c40	eSEW_ExSourc_OffOnLimit	SyncExtSource_Itfs
94208	0x17000	eSEW_FH_BufferTooShort	FileHandler
94209	0x17001	eSEW_FH_CancleJobNotAllowed	FileHandler
103920	0x195f0	DynamicValueTooLarge	DeviceAdapter_Itfs
103921	0x195f1	DynamicValueTooSmall	DeviceAdapter_Itfs
103922	0x195f2	InverterWarning	DeviceAdapter_Itfs

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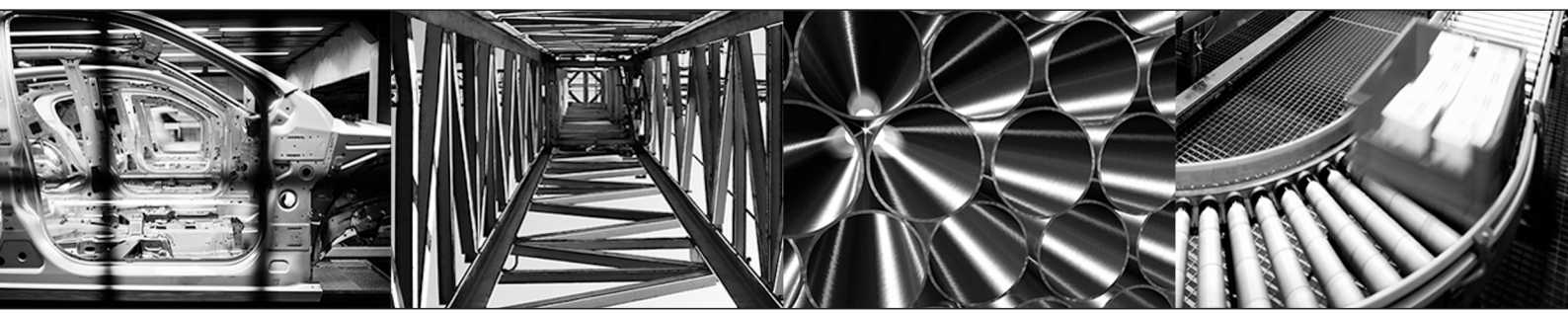

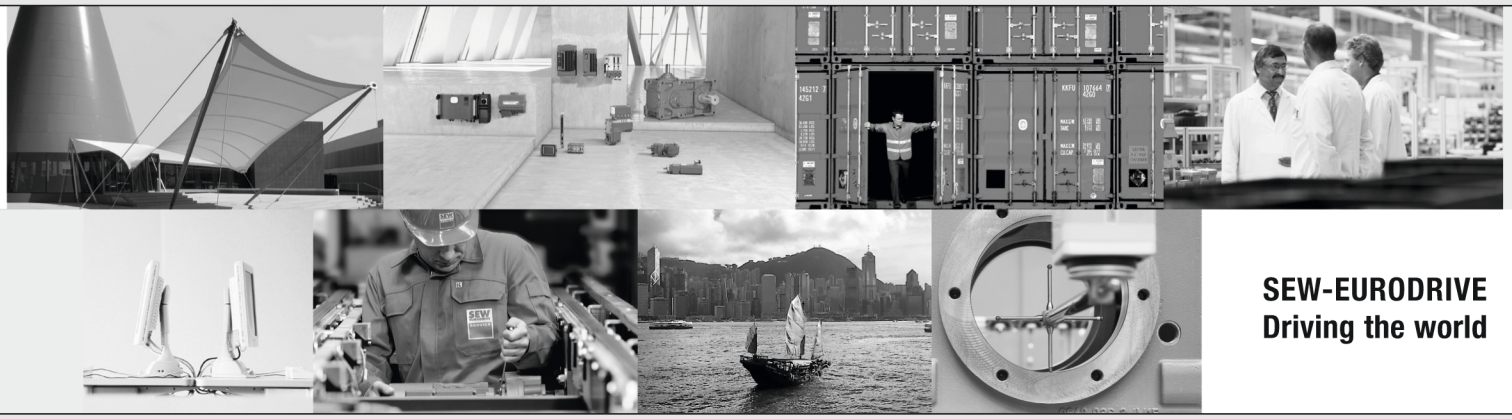

SEW-EURODRIVE
Driving the world

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**