SEW EURODRIVE

Manual

MOVIKIT®
Gearing

Edition 03/2020

29181453/EN

Table of contents

29181453/EN – 03/2020

29181453/EN – 03/2020

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.

29181453/EN – 03/2020

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.

1.6.1 Trademark of Beckhoff Automation GmbH

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

1.7 Copyright notice

29181453/EN – 03/2020

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® Gearing	Software module

29181453/EN – 03/2020

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

MOVIKIT® Gearing is a software module for implementing rotational speed, positioning and synchronous operation applications and provides a predefined fieldbus interface.

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.

Observe the documentation for the components used.

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

29181453/EN – 03/2020

3 System description

3.1 Module description

MOVIKIT® Gearing is a software module for implementing rotational speed, positioning and synchronous operation applications and provides a predefined fieldbus interface.

The operating modes of the software module are based (except reference travel) on central profile generation. The application inverter is operated in the FCB 10. Encoder feedback is mandatory.

In addition to the basic functions, the software module can be extended by additional functions (e.g. variable jerk, touchprobe).

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

3.1.1 Areas of application

The software module is, among others, suited for the following areas of application:

Materials handling technology

- Horizontal drives
- Vertical drives
- Rail vehicles

Logistics

- Storage/retrieval systems, specially synchronized load handling devices
- Pallet transfer shuttles
- Rotary tables

3.2 Functions

Overview of functions:

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

29181453/EN – 03/2020

3.3 Scope of functions of the process data profiles

Profile	Range of functions
8 PD	Basic version The basic version requires 8 process data words for direct operation on the fieldbus and includes the following operating modes: • Jog • Speed control • Referencing • Positioning (linear and modulo) • Synchronous operation For further information, refer to chapter "Operating modes" (→ 🗎 48).
+1 PD	Additional function – Extended gearing functions This additional function extends the range of functions by the functions listed below. The additional function extends the process data length by one process data word. • Extended synchronous operation status • Adjust function (in preparation) • Automatic offset For further information, refer to chapter "Extended gearing" (→ 🗎 73).
+1 PD	Additional function – Variable jerk This additional function extends the range of functions by providing the ability to specify the jerk. The additional function extends the process data length by one process data word. For further information, refer to chapter "Variable jerk" (→ 🗎 75).
+4 PD	Additional function – Touchprobe 1 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" (→ 🗎 76).

29181453/EN – 03/2020

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.

29181453/EN – 03/2020

4.4 Licensing

The following licenses are available and are required:

- MOVIRUN® flexible

  License for the MOVIRUN® flexible software platform
- MOVIKIT® Gearing

  License for MOVIKIT® Gearing software module

The MOVIKIT® Gearing license is also covered by the MOVIKIT® MultiMotion Gearing and MOVIKIT® MultiMotion Camming licenses.

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.

If you do not have a valid license for the software module, you can first use a 7-day trial license to test the functionality.

INFORMATION

If there is no license for MOVIKIT® Gearing on the memory card, two licenses (MOVIKIT® Gearing and MOVIKIT® MultiMotion Gearing) are reported as missing in the MOVISUITE® License Manager when the software is started for the first time. In this case, use the context menu of the entry in the MOVISUITE® License Manager to delete the MOVIKIT® MultiMotion Gearing license and then continue to activate the MOVIKIT® Gearing license.

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).

29181453/EN – 03/2020

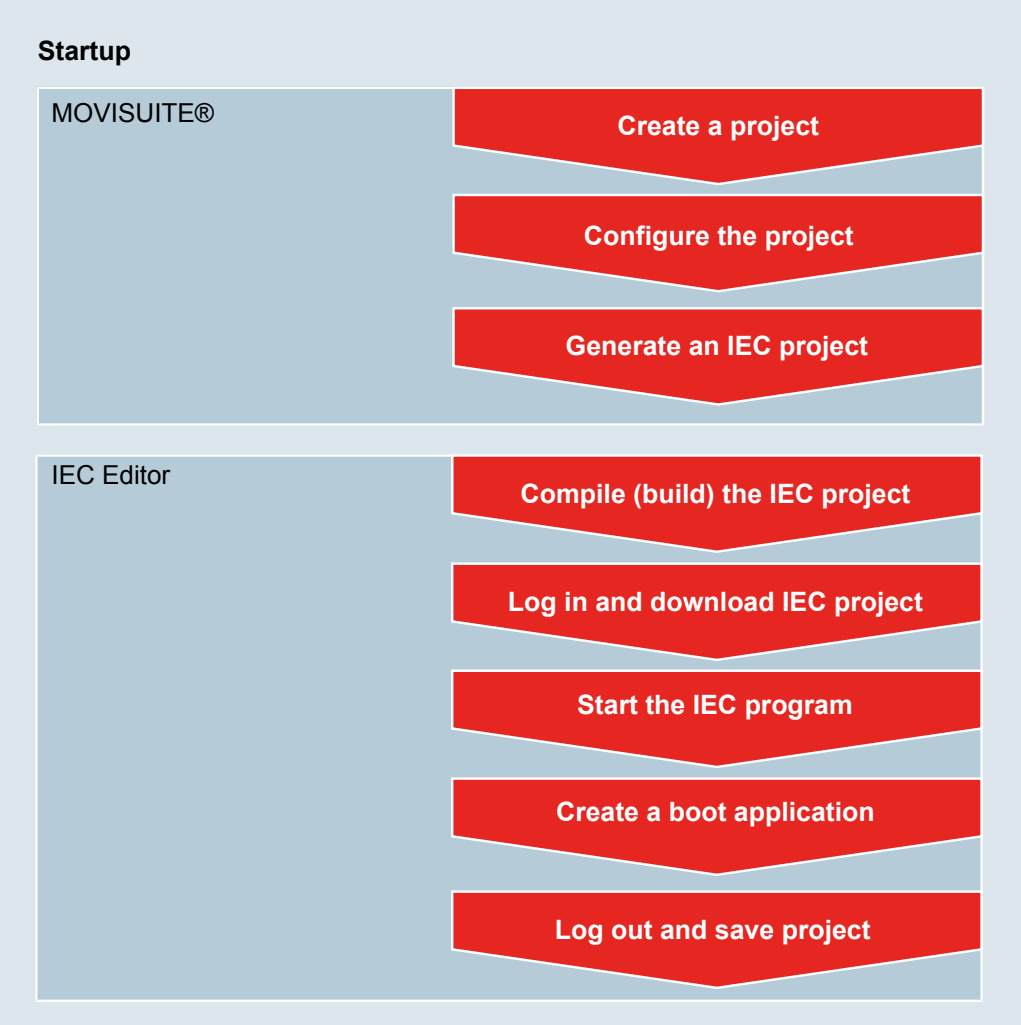
5 Startup

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.

29181453/EN – 03/2020

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.

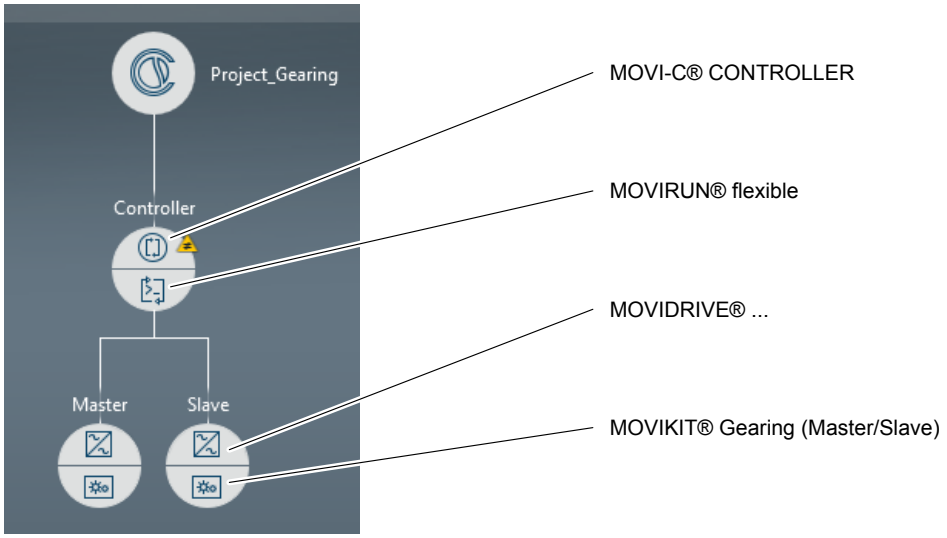
1. Add required device nodes, software nodes (MOVI-C® SoftwareNode) and software modules to the project.

   ⇨ 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® Gearing. 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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29181453/EN – 03/2020

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.

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".

29181453/EN – 03/2020

5.3.3 Adding MOVIKIT® Gearing

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

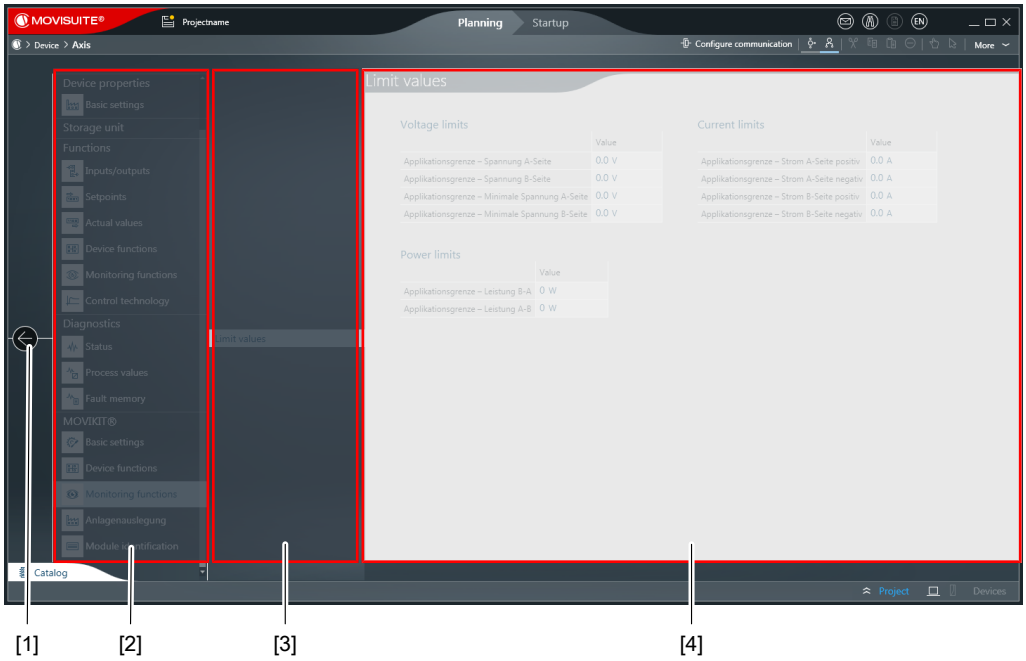
29181453/EN – 03/2020

5.3.4 Configuring MOVIKIT® Gearing

INFORMATION

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

1. In MOVISUITE®, click on MOVIKIT® Gearing.
   ⇨ 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.

Basic settings

Parameter name	Description
General	
Activate simulation	• Yes – Simulate axis functions • **No – Do not simulate axis functions**
	Index: 50000.2
	IEC name: Inverter.In.xSimulation
Functions used	
Position controller **Information:** "Configuration menu" (→ 🗎 33) becomes visible upon activation.	Extend the software module with the ability to perform central positioning control and encoder evaluation. • On • **Off**
	Index: 50000.102
	IEC name: _fbController._stConfig.stOptionalModes.xAddonPositionController
Anti-sway control **Information:** "Configuration menu" (→ 🗎 36) becomes visible upon activation.	Activate or deactivate the option to configure vibration-suppression measures. • On • **Off**
	Index: 50010.108
	IEC name: _fbController._stConfig.stOptionalModes.xAddonAntiSway
Combined encoder evaluation **Information:** "Configuration menu" (→ 🗎 34) becomes visible upon activation.	Extend the software module with the ability to perform combined encoder evaluation. • On • **Off**
	Index: 50010.107
	IEC name: _fbController._stConfig.stOptionalModes.xAddonAdvancedEncoderEvaluation
Extended gearing function **Information:** "Configuration menu" (→ 🗎 28) extended upon activation.	• **Off** Synchronize/desynchronize directly to the master. Synchronization/desychronization only makes sense when in idle state. • Extended gearing Activate additional synchronization and desynchronization modes, automatic offset, adjust function and extended status information. An additional process data word is added for fieldbus operation.
	Index: 50041.2
	IEC name: -

29181453/EN – 03/2020

Parameter name	Description
Variable jerk	• **Off** • On This additional function extends the range of functions by providing the ability to specify the jerk. The additional function extends the process data length by one process data word. **INFORMATION:** When using the additional function, refer to the more detailed information in chapter "Variable jerk" (→ 🗎 75).
	Index: 50040.100
	IEC name: -
Touchprobe 1 **Information:** "Configuration menu" (→ 🗎 32) becomes visible upon activation.	• **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 4 process data words. For further information, refer to chapter "Touchprobe 1" (→ 🗎 76).
	Index: 50000.20
	IEC name: -
“Update configuration data” button	Button for updating the configuration data.
	Index: -
	IEC name: -

29181453/EN – 03/2020

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

29181453/EN – 03/2020

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

29181453/EN – 03/2020

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 drive. (in user units)
	Index: 8357.10
	IEC name: ConfigHandling._stAxisConfig.IrAppLim-itVelocityPositive
Negative speed	Limits the maximum negative speed permitted for moving the drive. (in user units)
	Index: 8357.11
	IEC name: ConfigHandling._stAxisConfig.IrAppLim-itVelocityNegative

29181453/EN – 03/2020

Parameter name	Value
Acceleration	Limits the maximum acceleration permitted for accelerating the drive. (in user units)
	Index: 8357.12
	IEC name: ConfigHandling._stAxisConfig.lrAppLimitAcceleration
Deceleration	Limits the maximum deceleration permitted for braking the drive. (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 drive 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 limits for handling process data. This limit is required for handling process data with a limited range of values (in user units).
	Index: 8357.30
	IEC name: ConfigHandling._stAxisConfig.lrModuloMin
Modulo maximum	Upper modulo limits for handling process data. This limit is required for handling process data with a limited range of values (in user units).
	Index: 8357.31
	IEC name: ConfigHandling._stAxisConfig.lrModuloMax

29181453/EN – 03/2020

Parameter name	Value
Lag error	
Lag error window DT1	Lag error from which drive train 1 signals a fault (in user units).
	Index: 8510.4
	IEC name: -
Limit values from startup	
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: -
Configured jerk for controller functions	
Jerk	Jerk in user units Fixed configured jerk for the operating modes "jog", "speed control", "positioning", "synchronous operation offset travel" and "adjust function". When using the additional function "variable jerk", the preset jerk is limited by this value. **Default value: 0**
	Index: 50040.19
	IEC name: -
Limit values	
Lag error window	Lag error from which an error is reported (in user units)
	Index: 50012.13
	IEC name: Controller.PositionController.Config.lrLagErrorWindow

29181453/EN – 03/2020

Control functions

Parameter name	Value
Master stop if slave error occurs	
Master stop if slave error occurs	Activation of slave monitoring for a master axis • **Off** No response by the master axis during a slave error • On Master axis is stopped or does not start at all if one of the slave axes reports an error or is not in “FCB 10 Interpolated Positioning Control”. The master axis remains in the selected operating mode and is stopped via the ramp set under “Master stop fault response”.
	Index: 50040.50
	IEC name: -
Master stop fault response	• **Application stop** If one of the slave axes reports a fault or is not in "FCB 10 Interpolated Positioning Control", the axis is stopped via the application limit "Deceleration".
	Index: 50040.51
	IEC name: -

Drive functions

Scaling

Parameter name	Value
Encoder	
Actual position source	Encoder that acts as a source for generating the actual position.
	Index: 8565.3
	IEC name: -
Inverter scaling	
Display of the inverter scaling	
Index: 8554.1-4 (position), 8557.1-4 (speed), 8560.1-4 (acceleration)	
IEC name: -	

29181453/EN – 03/2020

FCB 10 Interpolated position control

Parameter name	Value
FCB 10 Interpolated position control	
Mean value filter time	For setting the filter time constant for interpolating positioning control.
	Index: 8510.3

FCB 12 reference travel

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

29181453/EN – 03/2020

Parameter name	Value
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
Jerk time	Homing jerk time
	Index: 8552.13
Speed changeover before fixed stop	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

Controller functions

Basic settings

Parameter name	Description
Basic settings	
Fault response	Behavior of profile generation in the event of a fault in the axis assigned to it: • Stop without ramps The profile generator abruptly freezes at the current target position. • Stop at application limit The profile generator creates a stop profile with the deceleration specified in the application limits. • Stop with emergency stop deceleration The profile generator creates a stop profile with the specified emergency stop deceleration. • Following the axis The profile generator creates a stop profile based on the course of the actual position of the axis.
	Index: 50000.11
	IEC name: ProfileGeneration.Config.eErrorReaction

29181453/EN – 03/2020

Synchronous operation (gearing)

Parameter name	Value
Synchronous operation (gearing)	
Master source	• User program (in preparation) Depending on this setting, the automatic code generation creates a master-slave connection in the action *SEW_PRG.LinkInterfaces*. The structure *MasterUserProgram* from the global variable *Interface_AxisName* is used as master source. The user must supply the master values to this structure in the cyclic task. • Configured axis The setpoints of the slave axis are adopted from the axis selected under "Master axis name". • EncoderInterface The setpoints of the slave axis are taken from the encoder interface selected under “EncoderInterface name”. • None
	Index: 50009.5
	IEC name: -
Master axis name **Information:** Visible with “Configured axis” master source.	Selects the master axis
	Index: 50009.1
	IEC name: -
EncoderInterface name **Information:** Visible with “EncoderInterface” master source.	Selects the EncoderInterface
	Index: 50009.11
	IEC name: -
Settings of the master source	
Modulo minimum	Modulo minimum
	Index: 50009.4
	IEC name: ProfileGeneration.Gearing.Config.lrMasterModuloMin
Modulo maximum	Modulo maximum
	Index: 50009.3
	IEC name: ProfileGeneration.Gearing.Config.lrMasterModuloMax
Number of decimal places	Number of decimal places
	Index: 50009.28
	IEC name: ProfileGeneration.Gearing.Config.uiMasterResolution

29181453/EN – 03/2020

Parameter name	Value
Time factor for speed	Time factor for speed
	Index: 50009.29
	IEC name: ProfileGeneration.Gearing.Config.stTimeBaseFactor.eVelocity
Time factor for acceleration	Time factor for acceleration
	Index: 50009.30
	IEC name: ProfileGeneration.Gearing.Config.stTimeBaseFactor.eAcceleration
Master/slave gear ratio	
Numerator	Numerator factor of the synchronous operation in user units of the slave axis
	Index: 50009.6
	IEC name: ProfileGeneration.Gearing.In.dGearingNumerator
Denominator	Denominator factor of the synchronous operation in user units of the master axis
	Index: 50009.7
	IEC name: ProfileGeneration.Gearing.In.dGearingDenominator
Synchronizing	
Synchronization behavior	• Direct with master in positive direction of movement • Direct with master in negative direction of movement • Direct with master in positive or negative direction of movement • With reference position and master in positive direction of movement • With reference position and master in negative direction of movement • With reference position and master in positive or negative direction of movement • With point of synchronism
	Index: 50009.13
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.eStartMode
Synchronization transition	• None • Master-based • Time-based
	Index: 50009.22
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.eStartTransition

29181453/EN – 03/2020

Parameter name	Value
Synchronization distance	Synchronization distance in user units (master)
	Index: 50009.8
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.lrGearInDistance
Synchronization time	Synchronization time in [s]
	Index: 50009.20
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.lrGearInTime
Synchronization offset	Offset in user units (master)
	Index: 50009.9
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.lrGearInOffset
Reference position during synchronization	Reference position during synchronization
	Index: 50009.10
	IEC name: ProfileGeneration.Gearing.CONFIG.Start.lrGearInReferencePosition
Desynchronizing	
Desynchronization behavior	• Direct with master in positive direction of movement • Direct with master in negative direction of movement • Direct with master in positive or negative direction of movement • With stop position of external master and positive direction of movement • With stop position of external master and negative direction of movement • With stop position of external master and positive or negative direction of movement
	Index: 50009.14
	IEC name: ProfileGeneration.Gearing.CONFIG.Stop.eStopMode
Desynchronization transition	• None • Master-based • Time-based
	Index: 50009.23
	IEC name: ProfileGeneration.Gearing.CONFIG.Stop.eStopTransition
Desynchronization distance	Desynchronization distance in user units (master)
	Index: 50009.11
	IEC name: ProfileGeneration.Gearing.CONFIG.Stop.lrGearOutDistance

29181453/EN – 03/2020

Parameter name	Value
Desynchronization time	Desynchronization time in [s]
	Index: 50009.20
	IEC name: ProfileGeneration.Gearing.CONFIG.Stop.lrGearOutTime
Stop position after desynchronization	Stop position after desynchronization
	Index: 50009.12
	IEC name: ProfileGeneration.Gearing.CONFIG.Stop.lrGearOutStopPosition
X offset correction	
Mode	• Absolute – Interpret the transferred value as absolute • Relative – Interpret the transferred value as relative
	Index: 50009.31
	IEC name: ProfileGeneration.Gearing.XOffsetCorrection.eOffsetCorrectionMode
Transition	Type of travel profile: • Master-based • Profile-based
	Index: 50009.32
	IEC name: ProfileGeneration.Gearing.XOffsetCorrection.eTransitionType
Master path	Path of the master axis within which a master-based offset correction is performed.
	Index: 50009.33
	IEC name: ProfileGeneration.Gearing.XOffsetCorrection.lrMasterDistance
Y offset correction	
Mode	• Absolute – Interpret the transferred value as absolute • Relative – Interpret the transferred value as relative
	Index: 50009.34
	IEC name: ProfileGeneration.Gearing.YOffsetCorrection.eOffsetCorrectionMode
Transition	Type of travel profile: • Master-based • Profile-based
	Index: 50009.35
	IEC name: ProfileGeneration.Gearing.YOffsetCorrection.eTransitionType

29181453/EN – 03/2020

Parameter name	Value
Master path	Path of the master axis within which a master-based offset correction is performed.
	Index: 50009.36
	IEC name: ProfileGeneration.Gearing.YOffsetCorrection.lrMasterDistance

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
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	

29181453/EN – 03/2020

Parameter name	Value
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

Position controller

Parameter name	Description
Position controller	
Position controller	Switching the position controller on/off
	Index: 50012.1
	IEC name: Controller.PositionController.Config.xDisable

29181453/EN – 03/2020

Parameter name	Description
P gain	Position controller gain for minimizing lag errors
	Index: 50012.2
	IEC name: Controller.PositionController.Config.lrP-Gain

Encoder evaluation

INFORMATION

Please note that the modulo reference may be lost when acknowledging an encoder fault.

Parameter name	Description
Encoder evaluation	
Encoder type	Encoder type selection: • **Motor encoder** • External encoder • Motor encoder and external encoder • Motor encoder and low-resolution EtherCAT® encoder • High-resolution EtherCAT® encoder • Low-resolution EtherCAT® encoder • High and low-resolution EtherCAT® encoders
	Index: 50013.1
	IEC name: Controller.EncoderEvaluation.Config.eActPos_EncSelector
New initialization of encoder when changing encoder source	Turn on encoder re-initialization when changing encoder source • **Yes** • No
	Index: 50013.6
	IEC name: Controller.EncoderEvaluation.Config.xDontInitializeAtEncSelectorChange
Time constant	Integral time for encoder adjustment in [s] **Default value: 0.1**
	Index: 50013.3
	IEC name: Controller.EncoderEvaluation.Config.lrInputFilterTime_ExtEnc

29181453/EN – 03/2020

Parameter name	Description
Dead time	Delay of the external encoder in [s] Contact SEW-EURODRIVE or the manufacturer of the external encoder to obtain the relevant value. **Default value: 0**
	Index: 50013.4
	IEC name: Controller.EncoderEvaluation.Config.lrDeadtime_ExtEnc
Filter of the low-resolution EtherCAT® encoder	Switching on/off of the low-resolution EtherCAT® encoder
	Index: 50013.5
	IEC name: Controller.EncoderEvaluation.Config.xInterpolationFilterOn
Advanced settings	
P gain Option only visible with combined encoder evaluation.	Factor of the amplification of the encoder evaluation
	Index: 50013.2
	IEC name: _fbController._fbEncoderEvaluation.stConfig.lrActPos_EncSelector

Anti-sway control

INFORMATION

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

Anti-sway control

Parameter name	Value
Anti-sway control	
Application type	Selection of the application type • No sway • Tower sway • Pendulum sway (in preparation) • Belly sway (in preparation) • Fluid sway (in preparation) • Spring sway (in preparation)
	Index: 50014.1
	IEC name: Controller.AntiSway.Config.eApplicationType
Conversion factor for user units in meters	Position relationship between the user unit from the drive train and one meter. If the value “0” is set, the user unit corresponds to one meter. For all other values, one meter is the product of the user unit and the specified value.
	Index: 50014.2
	IEC name: Controller.AntiSway.Config.lrUserUnitToMeter
Setpoint correction selection	• Off • Anti-pendulum • Band-suppression filter • Tension build-up time filter
	Index: 50014.30
	IEC name: Controller.AntiSway.Config.SetpointCorrection.eSelector
Source of lifting height	• **No master** Use “Distance between lifting and traveling trolley” as source • Axis group • Axis
	Index: 50014.13
	IEC name: -
Basic settings (setting fields visible depending on application type)	

29181453/EN – 03/2020

Parameter name	Value
Height of the tower	Height of the tower in [m]
	Index: 50014.10
	IEC name: Controller.AntiSway.Config.DriveTrain.lrHeightTower
Distance between lifting and traveling trolley	Distance from lifting axis to travel axis in [m]
	Index: 50014.11
	IEC name: Controller.AntiSway.Config.DriveTrain.lrDistanceHoistToCar
Mass of the lifting trolley	Mass of the vertical drive without payload mass and without shuttle in [kg]
	Index: 50014.13
	IEC name: Controller.AntiSway.Config.DriveTrain.lrMassHoist
Mass of the payload	Mass of the load in [kg] Shuttle is counted towards the payload.
	Index: 50014.14
	IEC name: Controller.AntiSway.Config.DriveTrain.lrMassPayload
Mass of the tower	Mass of the tower without trolley, vertical drive, load mass and shuttle in [kg]
	Index: 50014.15
	*IEC name: Controller.AntiSway.Config.DriveTrain.*lrMassTower
Support for parameter determination See "Configuration menu" (→ 🗎 38)	Activation of the support to determine the "Spring stiffness between tower and trolley" and "Damping between tower and trolley" parameters. If support is enabled, the additional configuration menu, “Support for parameter detection”, is displayed. • **Not active** • Active Information: The calculations in the "Support for parameter determination" (→ 🗎 38) configuration menu are based, among other things, on the values entered in this configuration menu.
	Index: 50014.250
	IEC name: -
Spring stiffness between tower and trolley	Spring constant between tower and horizontal drive in [Nm/wheel]
	Index: 50014.16
	*IEC name: Controller.AntiSway.Config.DriveTrain.*lrSpringTowerToCar

29181453/EN – 03/2020

Parameter name	Value
Damping between tower and trolley	Damping constant between tower and horizontal drive in [Nm/(wheel/s)]
	Index: 50014.17
	IEC name: Controller.AntiSway.Config.DriveTrain.lrDampTowerToCar
Time window	
Jerk time tension build-up	Jerk time for the mechanical tension build-up in [s] Maximum ≤ 2000 * cycle time of the PLC
	Index: 50014.40
	IEC name: Controller.AntiSway.Config.SetpointCorrection.TensionTimes.lrJerkTime
Ramp time tension build-up	Ramp time for the mechanical tension build-up in [s] Maximum ≤ 2000 * cycle time of the PLC
	Index: 50014.41
	IEC name: Controller.AntiSway.Config.SetpointCorrection.TensionTimes.lrRampTime

Support for parameter determination

INFORMATION

Only included if "Support for parameter determination" is activated in the "Anti-sway control" configuration menu.

Parameter name	Value
Damping	
Oscillation amplitude	First peak of the oscillation amplitude
	Index: 50014.110
	IEC name: -
Oscillation amplitude	Second peak of the oscillation amplitude
	Index: 50014.111
	IEC name: -
Oscillation period	Time between first and second oscillation amplitude
	Index: 50014.112
	IEC name: -
Degree of damping between tower and trolley	Damping behavior of oscillation in [Nm/(wheel/s)]
	Index: 50014.20
	IEC name: Controller.AntiSway.Config.DriveTrain.lrDampRatioTowerToCar
Basic settings (setting fields visible depending on application type)	

29181453/EN – 03/2020

Parameter name	Value
Spring stiffness between tower and trolley	Spring constant between tower and horizontal drive in [Nm/wheel]
	Index: 50014.16
	*IEC name: Controller.AntiSway.Config.DriveTrain.*lrSpringTowerToCar
Resonant frequency	
Resonant frequency	Frequency at which the oscillating system can oscillate with maximum amplitude
	Index: 50014.55
	IEC name: -
General data	
Maximum acceleration	Acceleration for the deflection calculation in [m/s]
	Index: 50014.113
	IEC name: -
Auxiliary tower mass	Value resulting from all other frame parameters in [kg]
	Index: 50014.127
	IEC name: -
Auxiliary tower height	Value resulting from all other frame parameters in [m]
	Index: 50014.126
	IEC name: -
Auxiliary deflection	Value resulting from all other frame parameters in [rad]
	Index: 50014.128
	IEC name: -
Deflection at lifting height	Deflection at lifting height calculated from the parameterization in [m]. This value is used for the plausibility check against reality and design calculations. If the deflection is not plausible, an incorrect parameterization can be assumed.
	Index: 50014.114
	IEC name: -

29181453/EN – 03/2020

Inputs/outputs

INFORMATION

For more information on this topic, refer to chapter "Digital inputs/outputs" (→ 🗎 87).

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

29181453/EN – 03/2020

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	
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: -

29181453/EN – 03/2020

Advanced settings

Parameter setting

Parameter name	Value
Delivery state	
Factory setting	Initialize the software module with default values or suggested values. Any configured readjustment will be overwritten. All additional configurations of the "controller functions" (→ 🗎 27) remain unchanged.
Suggested values	
Apply all suggested values	Overwrite all values in the configuration of the software module, to which a default value is assigned, with the corresponding default value.

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.

29181453/EN – 03/2020

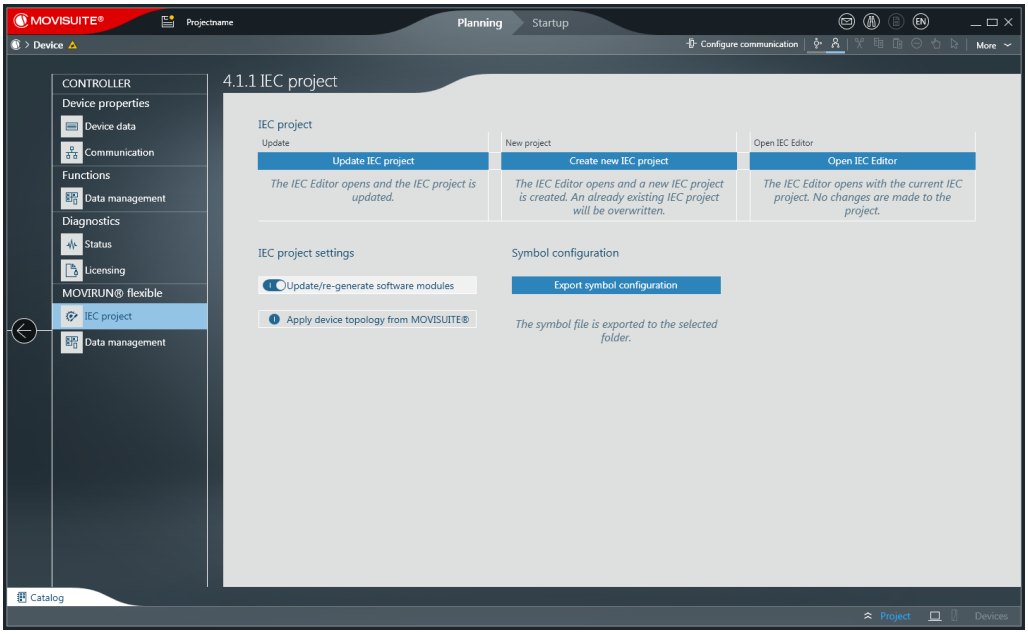
5.4 Generating an IEC project

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.



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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].

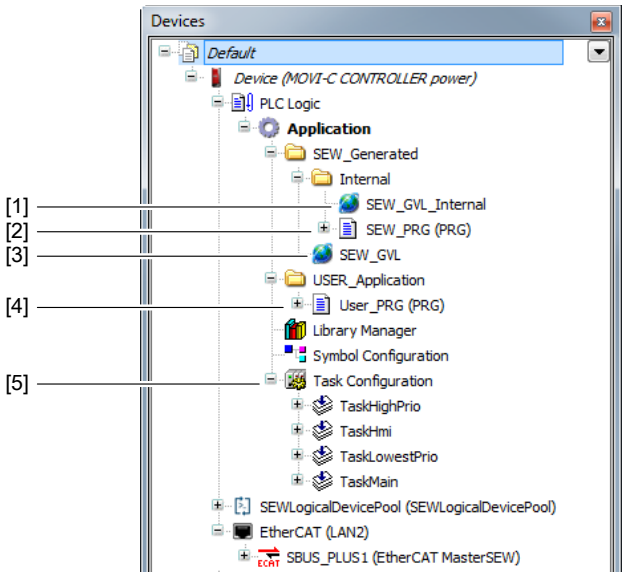
   ⇨ The IEC Editor opens and a new IEC project is created.

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.

29181453/EN – 03/2020

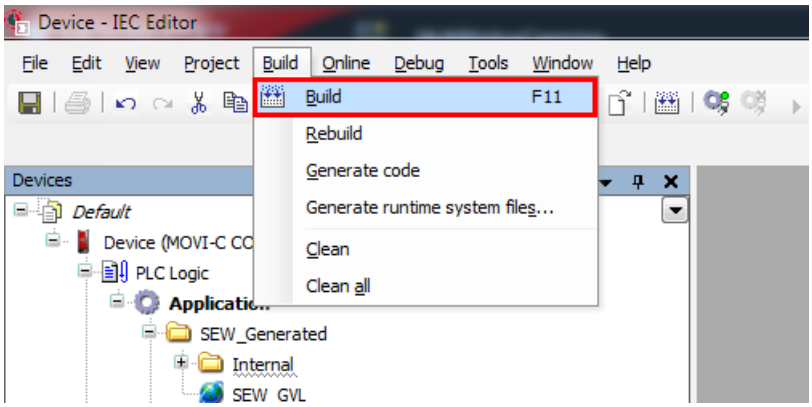
5.5 Importing the MOVIKIT® fieldbus monitor

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" (→ 🗎 89).

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>.



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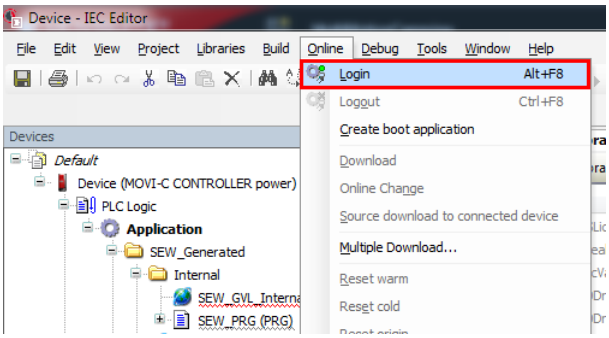
⇨ The result is displayed.

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>.



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⇨ 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"

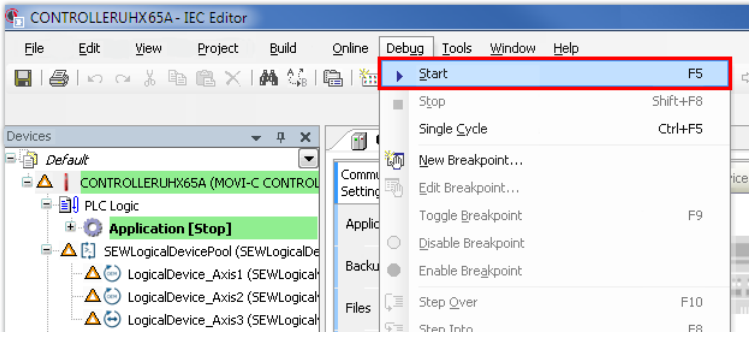
INFORMATION

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" (→ 🗎 47).

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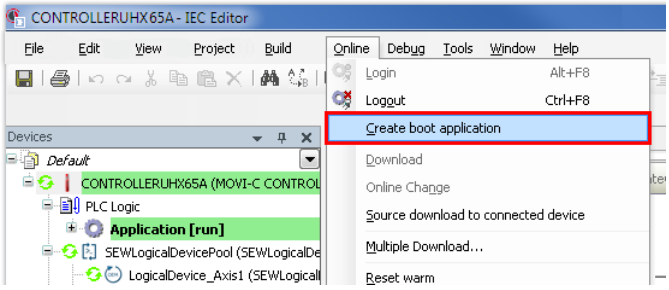
⇨ The IEC program on the MOVI-C® CONTROLLER starts.

29181453/EN – 03/2020

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

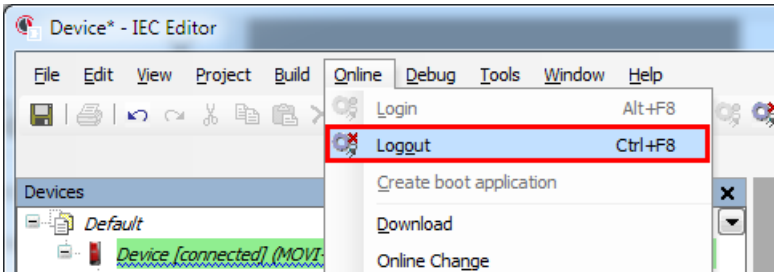
The fault-free boot application is always switched to "Run" state after having activated the MOVI-C® CONTROLLER.

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

6.1.1 Overview of operating modes

Operating mode	Decimal	Description
Jog mode	100	Position-controlled jogging (FCB 10)
	101	Speed-controlled jogging (FCB 10)
Speed control	200	Speed control (FCB 10)
Referencing mode	300	Reference travel – offset via parameter (FCB 12) **Information:** Only available when used on a real axis.
	301	Reference travel – variable offset (FCB 12) **Information:** Only available when used on a real axis.
	310	Central reference travel – offset via parameter (FCB 10) **Information:** Only available when used on a virtual axis.
	311	Central reference travel – offset via parameter (FCB 10) **Information:** Only available when used on a virtual axis.
Positioning mode	400	Absolute position control (FCB 10)
	401	Relative position control (FCB 10)
	402	Modulo position control – positive (FCB 10)
	403	Modulo position control – negative (FCB 10)
	404	Modulo position control – short distance (FCB 10)
	420	Absolute positioning touchprobe (FCB 10)
Synchronous operation	1000	Synchronous operation control (FCB 10)

INFORMATION

For operating function block FCB 12, the configuration settings made in the MOVISUITE® configuration apply. The modulo operating modes can be used only if a cycle limit is set in the "Limit values" (→ 🗎 22) configuration menu.

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.

29181453/EN – 03/2020

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)		

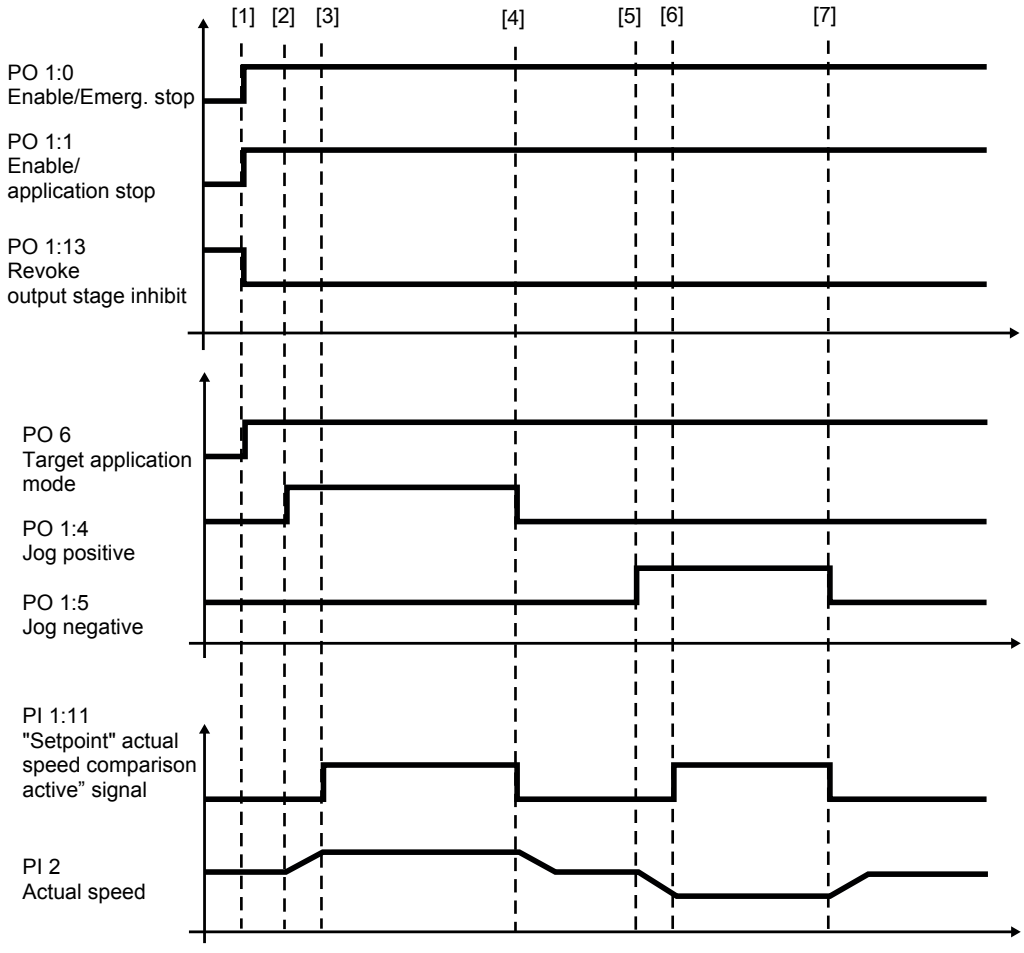
29181453/EN – 03/2020

6.1.3 Jog mode

A single axis is moved position-controlled (100) or speed-controlled (101) with activation of the direction of rotation. Activating both directions of rotation or not activating a direction of rotation at all will stop an ongoing movement.

The two operating modes differ in MOVIKIT® Gearing due to the different behavior of configured software limit switches. On configured software limit switches in the "Position-controlled jogging (100)" operating mode, positioning is performed directly on the software limit switch, and a frequency inverter fault appears at the end of positioning. In the "Speed-controlled jog mode (101)" operating mode, a configured software limit switch is approached and only then is the deceleration initiated. The drive stops after the software limit switch.

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" (→ 🗎 25) under "Stop functions".

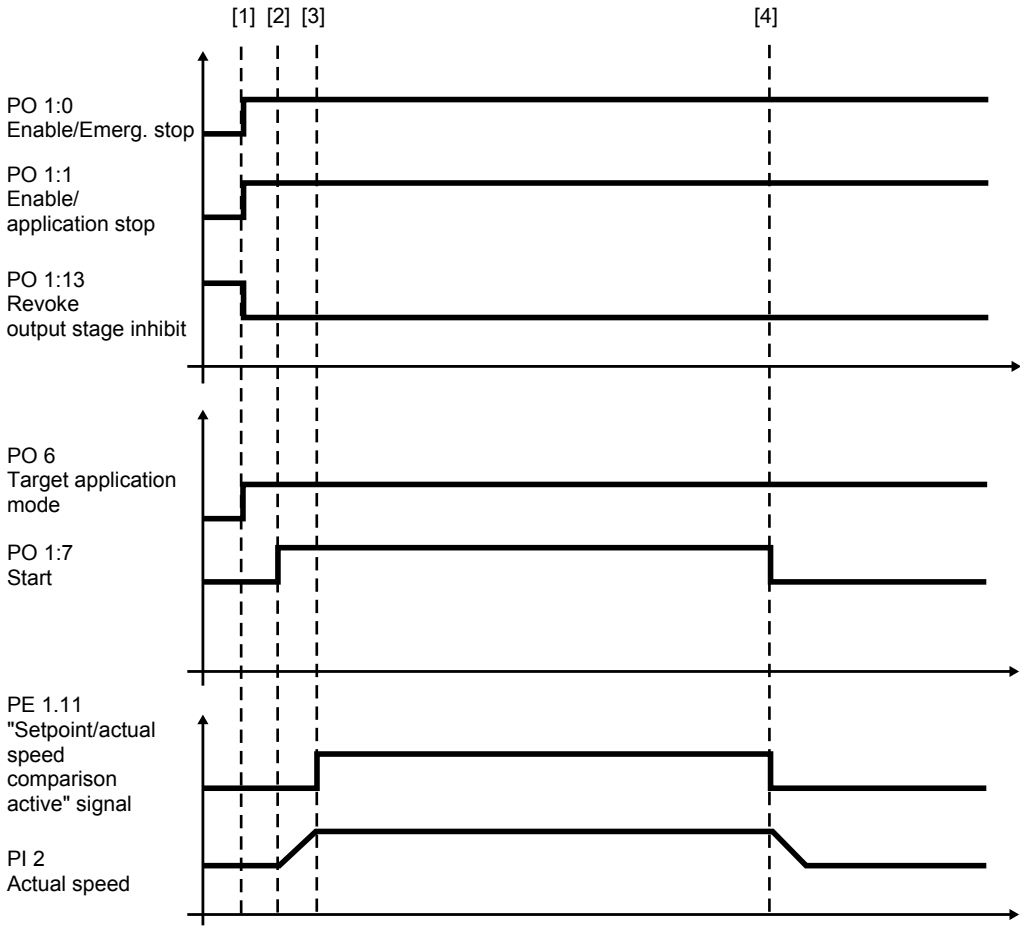
No.	Procedure	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (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]	"Jog mode" operating mode is 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 via PO 2 using the value specified via PO 3. • "0": Deceleration with the value specified by PO 4. For motors without encoder, the "Stop by setpoint" function must be used.
[5] to [7]	Negative jog direction selected	PO 1:5	• "1": The drive accelerates to the setpoint speed specified via PO 2 using the value specified via PO 3. • "0": Deceleration with the value specified by PO 4. For motors without encoder, the "Stop by setpoint" function 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"

29181453/EN – 03/2020

6.1.4 Speed control

The direction depends on the sign of the speed setpoint. A positive setpoint corresponds to a positive motor direction of rotation.

Cycle diagram



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29181453/EN – 03/2020

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" (→ 🗎 25) under "Stop functions".

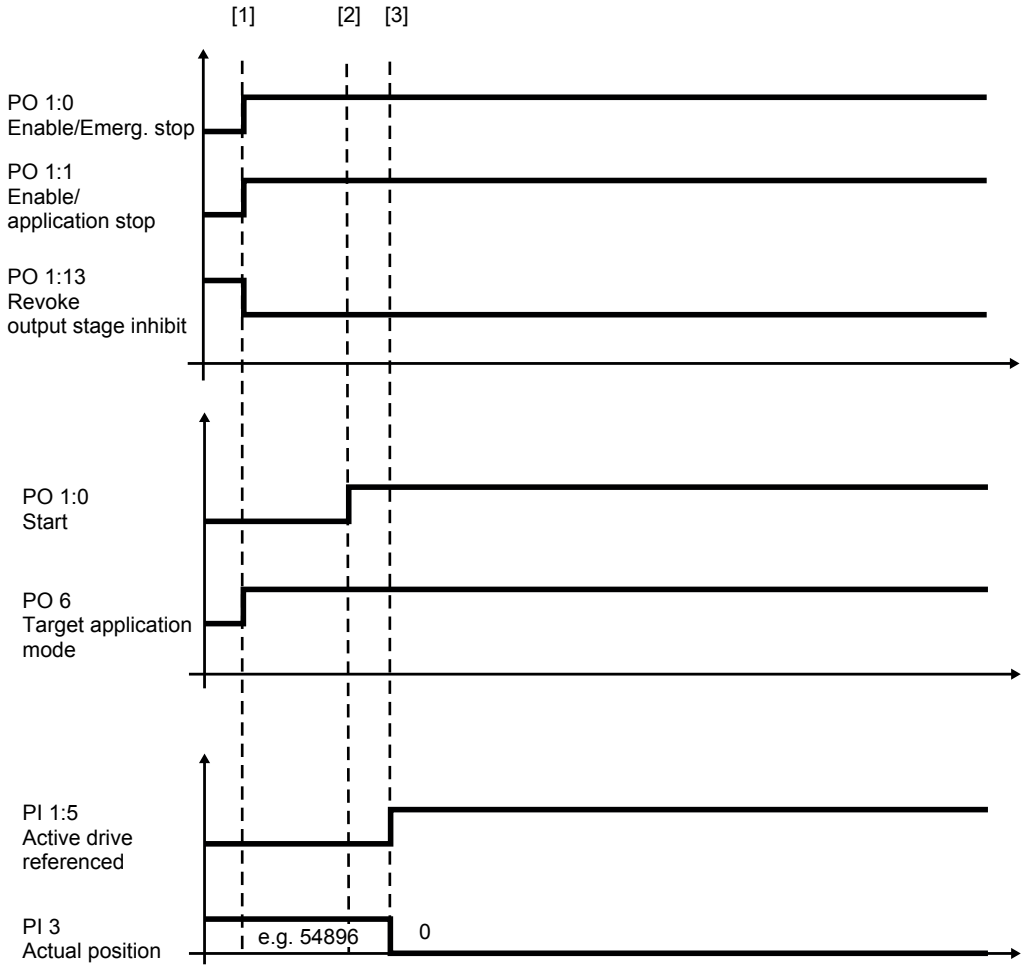
No.	Sequence	PD	Signal states
[1] General enable	• PO 1:0 = "1" Enable/emergency stop	PO 1:0	• "1": Enable • "0": Deceleration with emergency stop ramp
	• PO 1:1 = "1" Enable/application stop	PO 1:1	• "1": Enable • "0": Deceleration according to application limit
	• PO 1:13 = "0" Output stage inhibit (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" 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"

29181453/EN – 03/2020

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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29181453/EN – 03/2020

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" (→ 🗎 25) 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"

29181453/EN – 03/2020

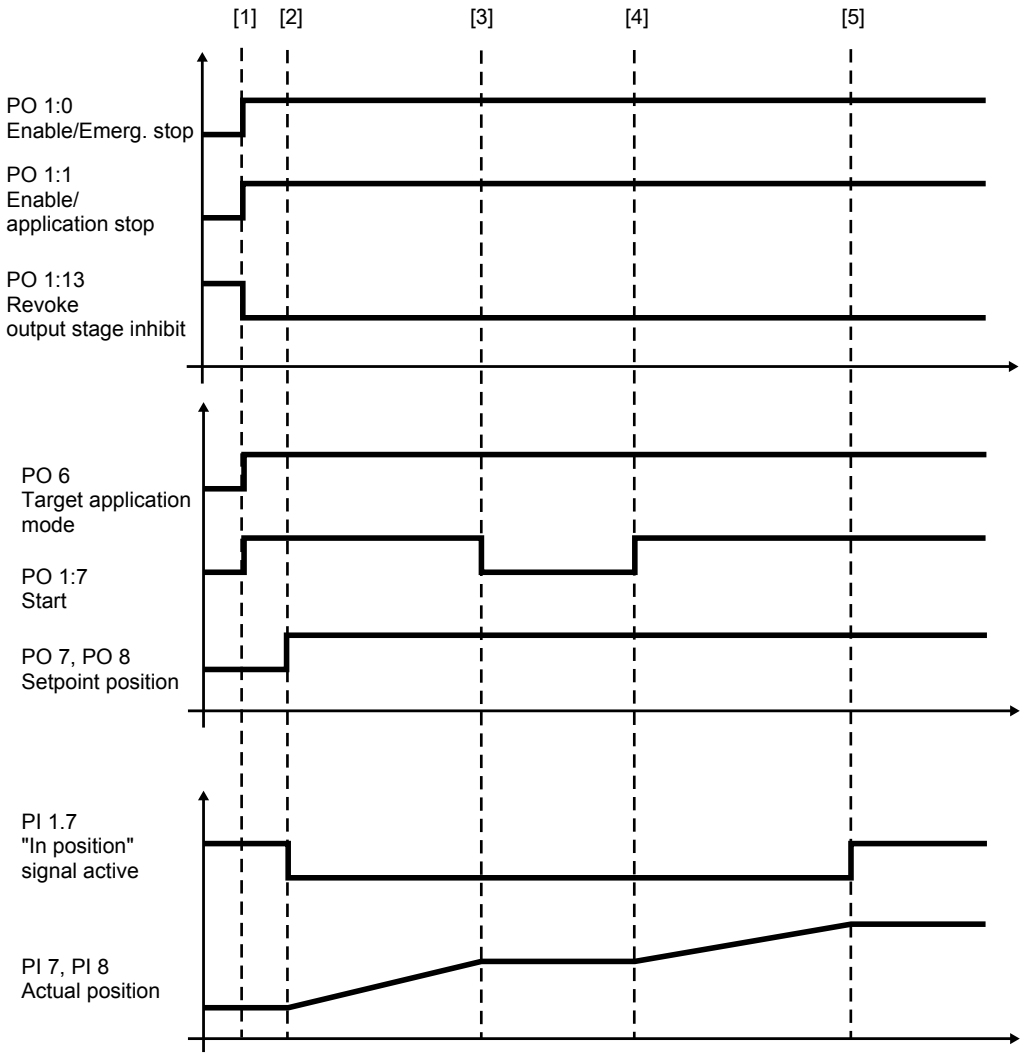
6.1.6 Absolute positioning mode

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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29181453/EN – 03/2020

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" (→ 🗎 25) 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.

29181453/EN – 03/2020

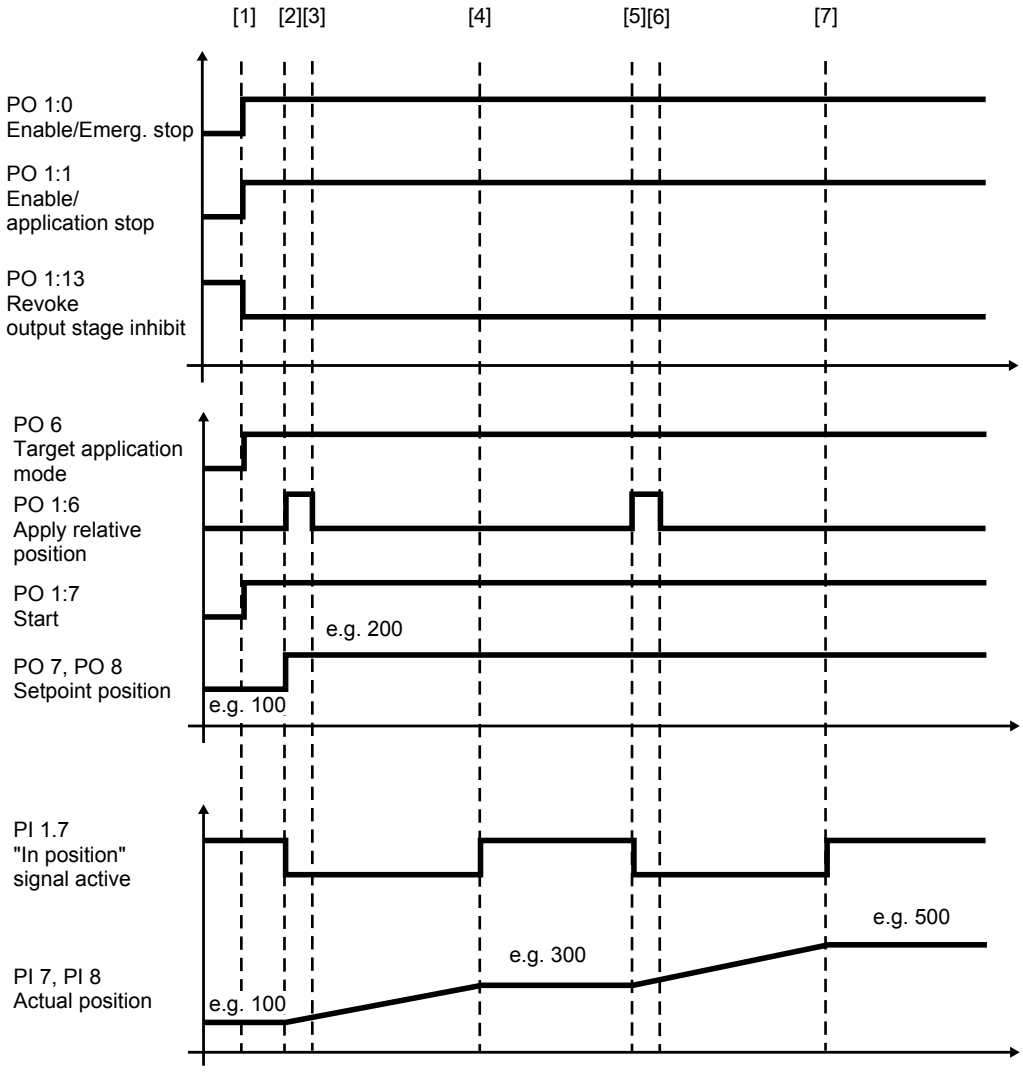
6.1.7 Relative positioning mode

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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29181453/EN – 03/2020

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" (→ 🗎 25) 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

29181453/EN – 03/2020

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.

29181453/EN – 03/2020

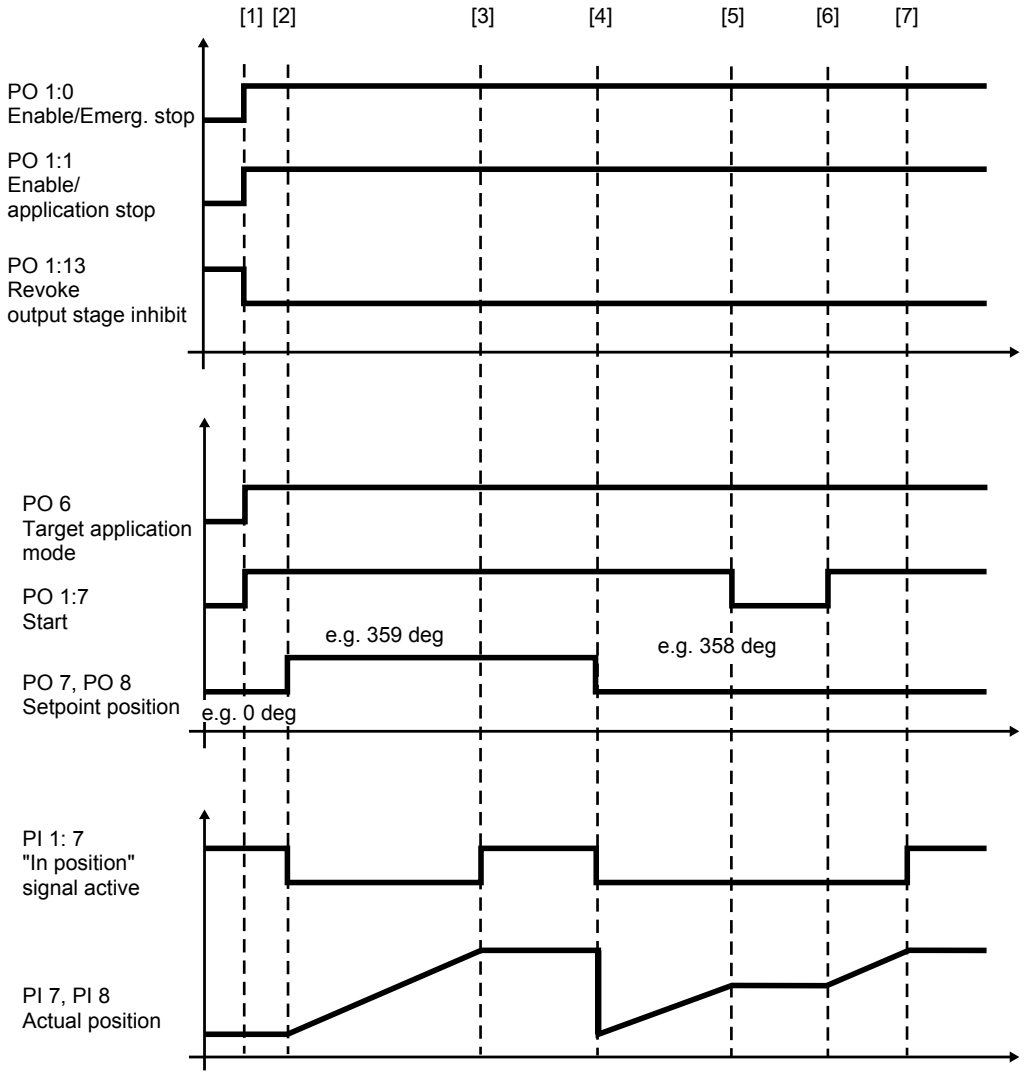
6.1.8 Modulo positive positioning mode

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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29181453/EN – 03/2020

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" (→ 🗎 25) 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

29181453/EN – 03/2020

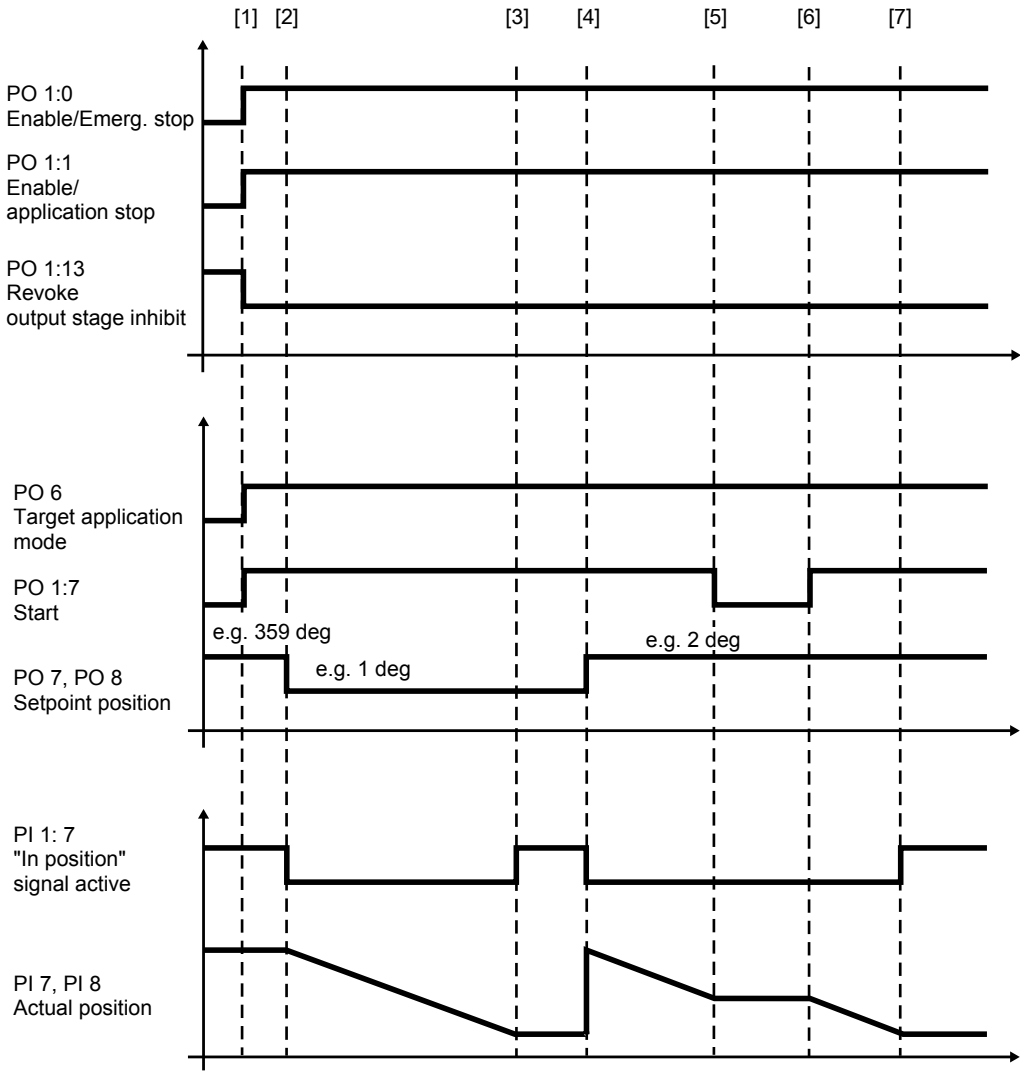
6.1.9 Modulo negative positioning mode

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" (→ 🗎 25) 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

29181453/EN – 03/2020

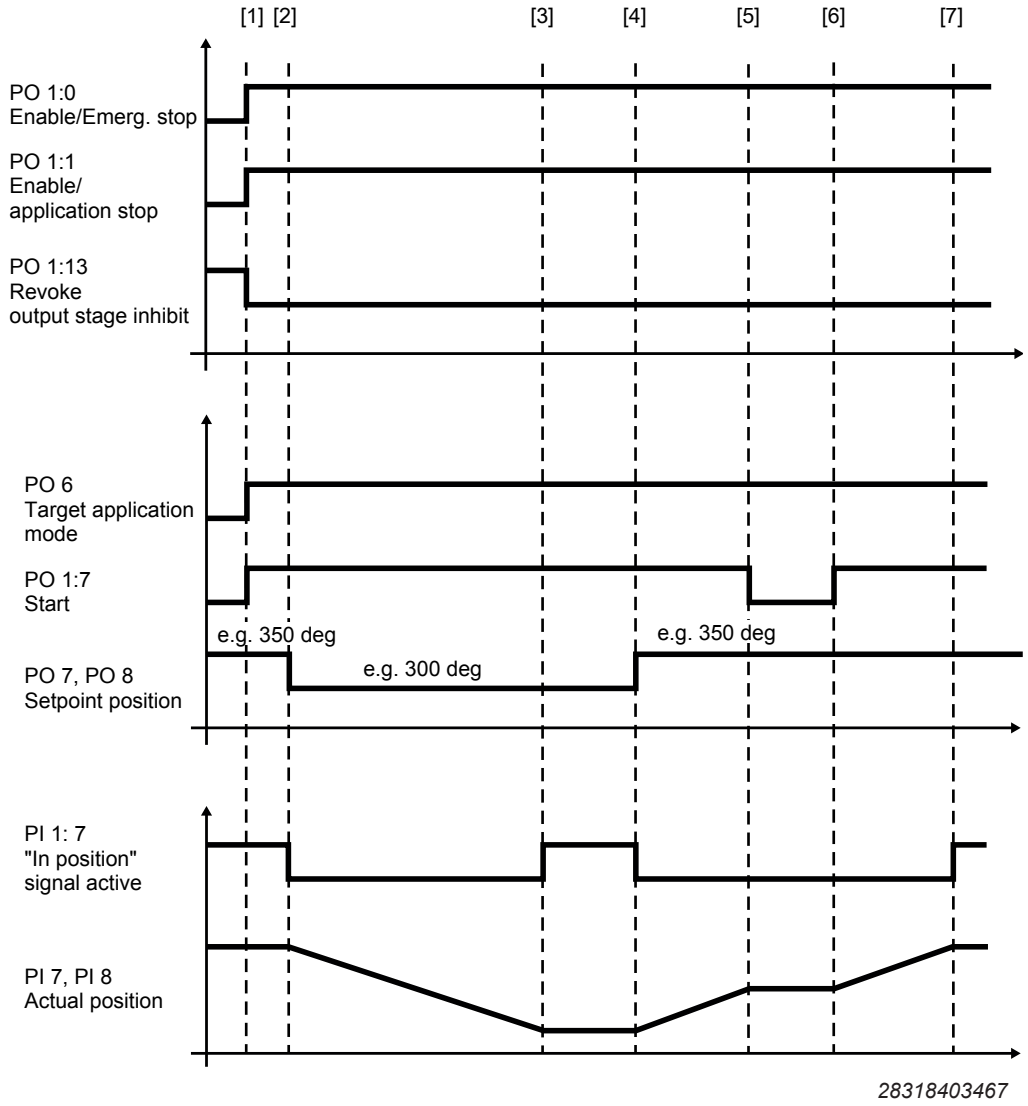
6.1.10 Modulo positioning mode – optimized direction

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" (→ 🗎 25) 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

29181453/EN – 03/2020

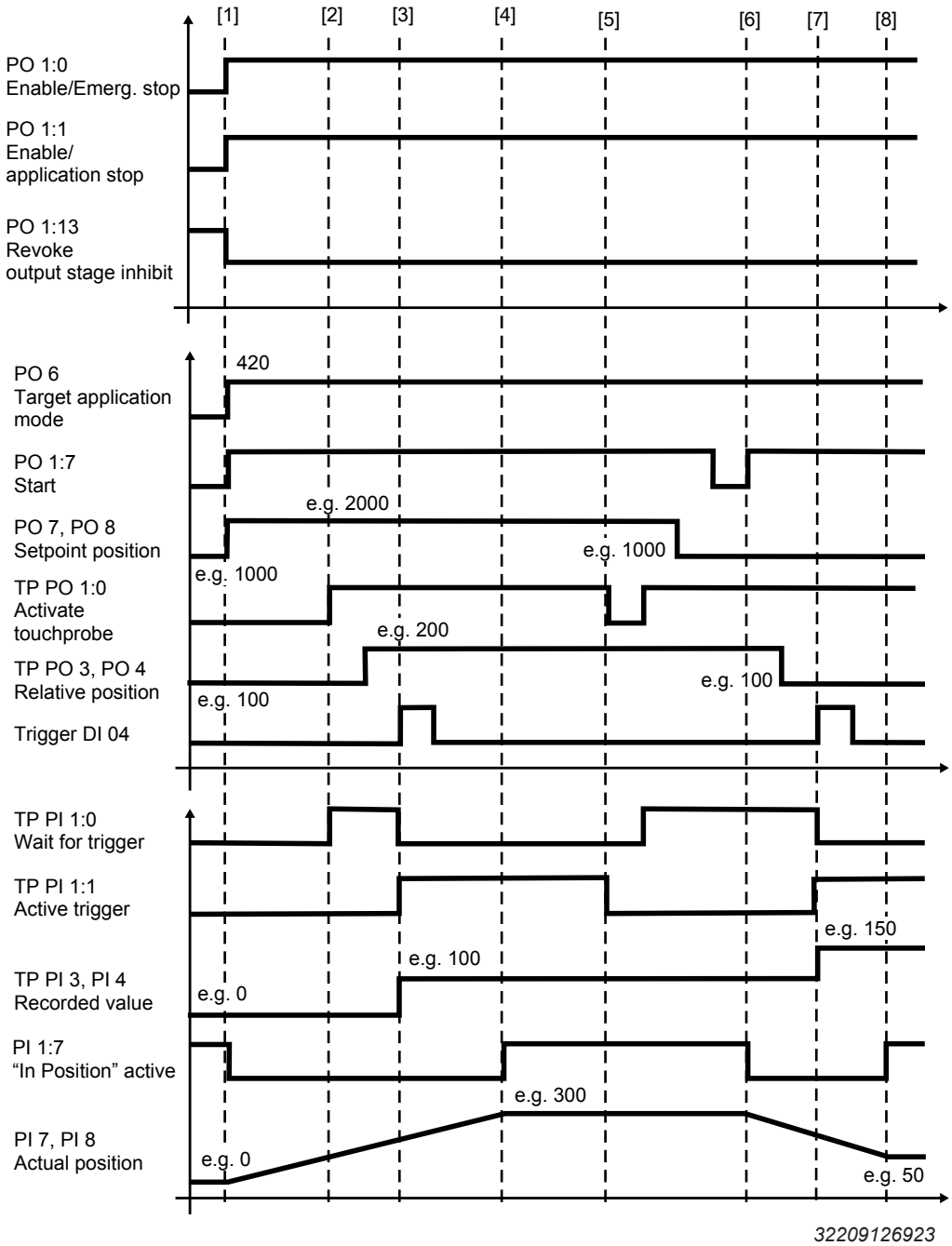
6.1.11 Absolute positioning touchprobe

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" (→ 🗎 76) and a trigger event are activated.

Cycle diagram



29181453/EN – 03/2020

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" (→ 🗎 25) 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" (→ 🗎 70).	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)

29181453/EN – 03/2020

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

29181453/EN – 03/2020

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.

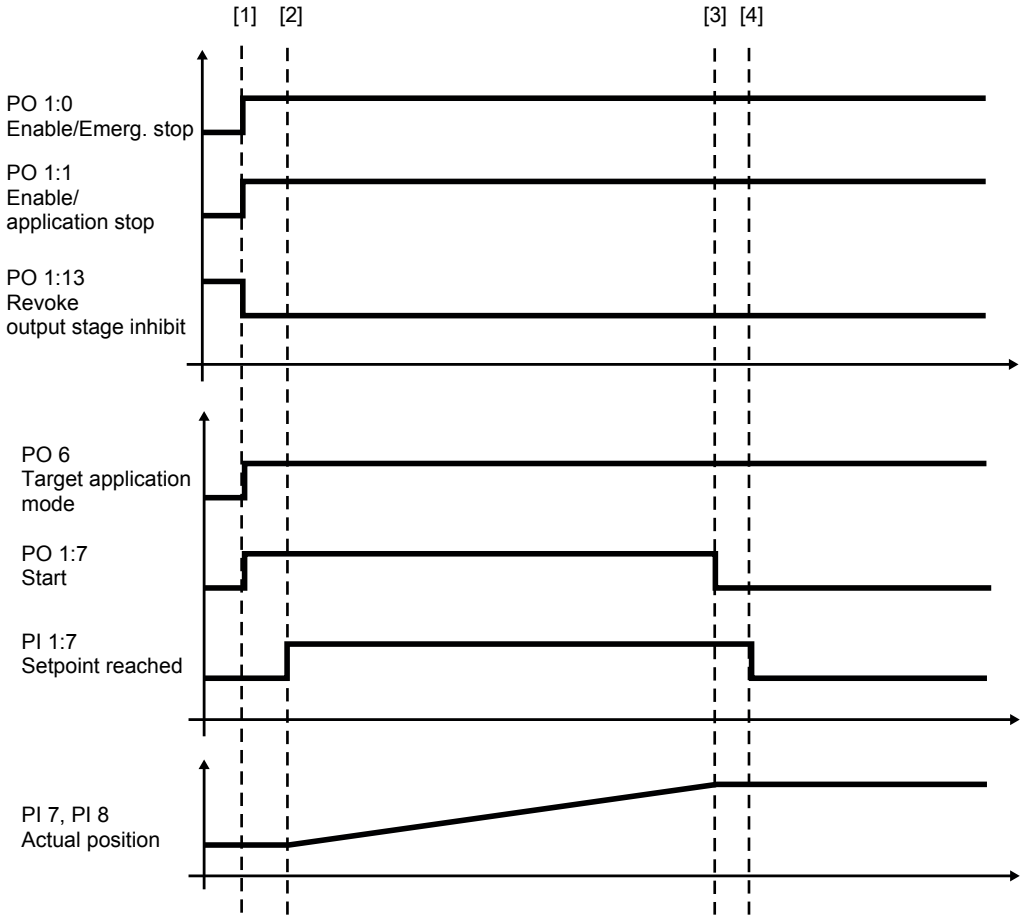
Case 3: Touchprobe activated (TP PO 1:0), trigger active (TP PI 1:1)

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.

29181453/EN – 03/2020

6.1.12 Synchronous operation

Cycle diagram



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29181453/EN – 03/2020

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" (→ 🗎 25) 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]	Selected operating mode "Synchronous operation"	PO 6	1000 (decimal)
[1] to [2]	Start/stop of the axis	PO 1:7	• "1": Drive synchronizes to the master signal. The synchronization behavior can be defined via the configuration. • "0": The drive desynchronizes. The desynchronization behavior can be defined via the configuration.
[2]	Setpoint reached	PI 1:7 PI 7	• "1": The slave axis is synchronized and the change of the actual position is synchronous to the master axis.
[4]	Setpoint reached	PI 1:7	• "0": The slave axis is desynchronized.

29181453/EN – 03/2020

6.2 Additional functions

The additional functions are activated in the "Basic settings" (→ 🗎 18) configuration menu in the “Functions used” section.

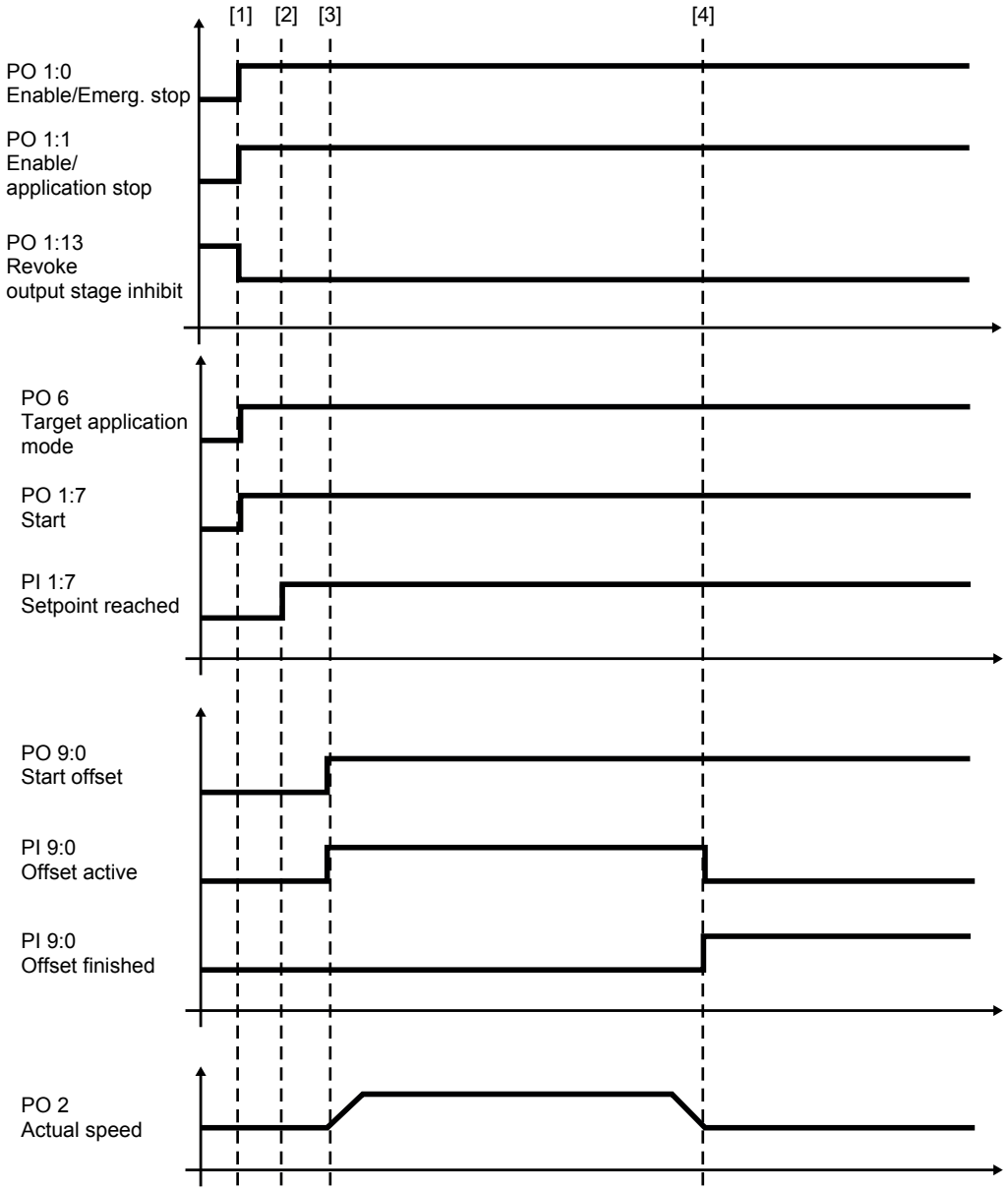
6.2.1 Extended gearing

By activating the “Extended gearing functions”, the range of functions of the "Synchronous operation" (→ 🗎 71) operating mode is extended by the functions described in this chapter.

Offset correction

The “offset correction” function enables the slave axis to be offset from the master axis by a configured value in the synchronized state.

Cycle diagram



29181453/EN – 03/2020

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" (→ 🗎 25) 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]	Selected operating mode "Synchronous operation"	PO 6	1000 (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	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 each position control.
[2] to [3]	Setpoint reached	PI 1:7 PI 7	• "1": The slave axis is synchronized and the change of the actual position is synchronous to the master axis.
[3]	Start offset	PO 9:0	• "1": Offset correction starts.
[3] to [4]	Offset active	PI 9:1	• "1": The drive positions around the specified position with the specified dynamic values to the specified target position.
[4]	Offset finished	PI 9:2	• "1": The offset movement is finished and the drive is synchronous with the master axis again.
[4]	Actual speed	PI 2	The drive is synchronous with the master axis again.

29181453/EN – 03/2020

Synchronous operation status

INFORMATION

Only available if the "Extended gearing functions" are activated in the "Basic settings" configuration menu.

Value	Enumeration	Description
0	STOPPED	The axis is desynchronized.
1	WAITING_FOR_STARTPOSITION	The axis is waiting for the synchronization condition to be fulfilled.
2	GEAR_IN	The axis synchronizes.
3	ACTIVE	Axis is synchronous.
4	WAITING_FOR_STOPPOSITION	The axis is waiting for the desynchronization condition to be fulfilled.
5	GEAR_OUT	The axis desynchronizes.

6.2.2 Variable jerk

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

INFORMATION

The set jerk is accepted only when the axis is at an idle state (profile generation not active).

For the states listed below, the preset jerk does not work. In these cases, the **"Jerk time" of the inverter** configured under "Application limits" in the "Limit values" (→ 🗎 22) submenu of the "Monitoring functions" configuration menu is effective.

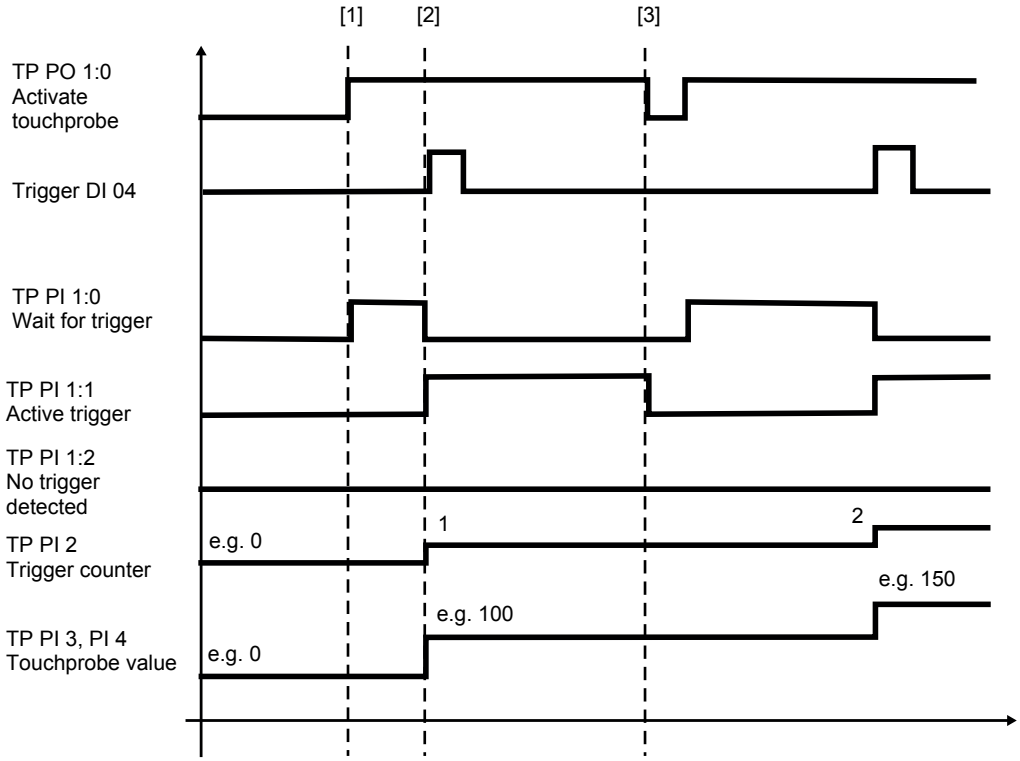
- When selecting the default mode (value “0”)
- When the “Enable/application stop” signal is removed (FCB 13)
- When the “Enable/emergency stop” signal is removed (FCB 14)
- With an active fault response (FCB 13 or FCB 14)

29181453/EN – 03/2020

6.2.3 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" (→ 🗎 67) 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	

29181453/EN – 03/2020

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.

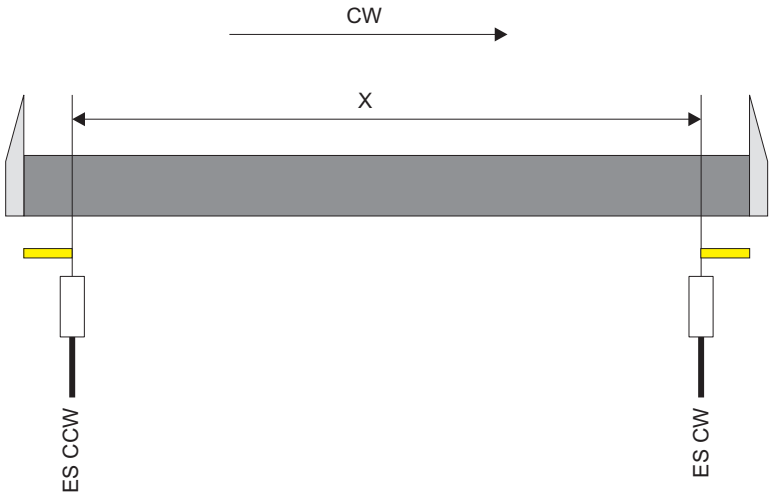
6.3.1 Hardware limit switches

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

No software limit switches must be configured for modulo axes (cycle limit not equal to “0”).

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" (→ 🗎 20). 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 positive or negative limit switch position 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 speed control (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 software limit switch, no travel order will be performed when the motor is at standstill. Otherwise, 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 wish 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.

29181453/EN – 03/2020

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.

Word		Bit	Function
PO 1	Control word	0	Enable/emergency stop
		1	Enable/application stop
		2	Reserved
		3	Brake release (without enable)
		4	Jog positive
		5	Jog negative
		6	Accept relative position
		7	Start/stop with fieldbus ramp
		8	Fault reset
		9	Reserved
		10	Activate drive train 2
		11	Reserved
		12	Deactivate software limit switches
		13	Activate output stage inhibit
		14	Activate standby mode
		15	MOVIKIT® Handshake In
PO 2	Setpoint speed	0 – 15	User unit
PO 3	Setpoint acceleration	0 – 15	User unit
PO 4	Setpoint deceleration	0 – 15	User unit
PO 5	Digital outputs For control via process data, see chapter "Digital inputs/outputs" (→ 🗎 87)	0	DO 00 / DIO 01 (output)
		1	DO 01 / DIO 02 (output)
		...	...
		3	DO 03
		...	...
PO 6	Target application mode	0 – 15	Operating mode. See chapter "Overview of operating modes" (→ 🗎 48).
PO 7	High-word target position	0 – 15	User unit
PO 8	Low-word target position	0 – 15	User unit

29181453/EN – 03/2020

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" (→ 🗎 25).

Bit	Function	PD	Description
0	Enable/emergency stop	PO 1.0	• "1": Enable • "0": Stop with drive function FCB 14 (emergency stop)
1	Enable/application stop	PO 1.1	• "1": Enable • "0": Stop with drive function FCB 13 (stop at application limits)
2	Reserved	PO 1.2	-
3	Release brake (without enable)	PO 1.3	If required, activate this function using parameter 8501.2 (Release brake/DynaStop® with FCB 01 – enable).
4	Jog positive	PO 1.4	Signal for moving the drive in positive direction in jog mode.
5	Jog negative	PO 1.5	Signal for moving the drive in negative direction in jog mode.
6	Accept relative position	PO 1.6	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	• "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 position control.
8	Fault reset	PO 1.8	Reset of fault messages with the positive edge of the signal.
9	Reserved	PO 1.9	-

29181453/EN – 03/2020

Bit	Function	PD	Description
10	Activate drive train 2	PO 1.10	• "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	-
12	Deactivate SW limit switches	PO 1.12	If SW limit switches have been activated and configured ... • "0": Monitoring of software limit switches enabled. • "1": Monitoring of software limit switches disabled.
13	Activate output stage inhibit	PO 1.13	• "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	• "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	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.

29181453/EN – 03/2020

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

INFORMATION

The set jerk is accepted only when the axis is at an idle state (profile generation not active).

Word		Bit	Function
PO 1	Setpoint jerk		Jerk in user unit

Touchprobe 1

Word		Bit	Function
PO 1	Control word	0	Activation of the touchprobe 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

Extended gearing

Word		Bit	Function
PO 9	Control word	0	Start offset
	Extended gearing	1	
		2	

29181453/EN – 03/2020

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 (can be assigned individually using status word 2, bit 13)
		14	"1": Standby mode active
		15	MOVIKIT® Handshake Out (for details, see MOVIKIT® Handshake In)
PI 2	Actual speed	0 – 15	User unit
PI 3	Status Fault subfault	0 – 15	• 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%)

29181453/EN – 03/2020

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 chapter "Overview of operating modes" (→ 🗎 48).
PI 7	Actual position (high word)	0 – 15	User unit
PI 8	Actual position (low word)	0 – 15	User unit

29181453/EN – 03/2020

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 one of the following conditions is met: • PO 1:12 is active and SW limit switches have been activated/configured. • Both SW limit switches have been set to the value "0".

29181453/EN – 03/2020

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

Word		Bit	Function
PI 1	Active jerk	0-15	User unit

Touchprobe 1

Word		Bit	Function
PI 1	Status word	0	Touchprobe function activated while waiting for a trigger event
		1	Trigger event detected
		2	No trigger event detected
PI 2	Trigger counter	0-15	Incremented by one for each trigger event
PI 3	High-word detected value	0-15	User unit
PI 4	Low-word detected value	0-15	User unit

Extended gearing

Word		Bit	Function
PI 9	Status word Extended gearing	0	Offset active
		1	Offset completed
		2	
		3	
		4	
		5	
		6	
		7	
		0 – 15	Synchronous operation status

29181453/EN – 03/2020

8 Digital inputs/outputs

The digital inputs/digital outputs are assigned in the configuration of the software module in the "Inputs/outputs" (→ 🗎 40) 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" (→ 🗎 88).

⚠ 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

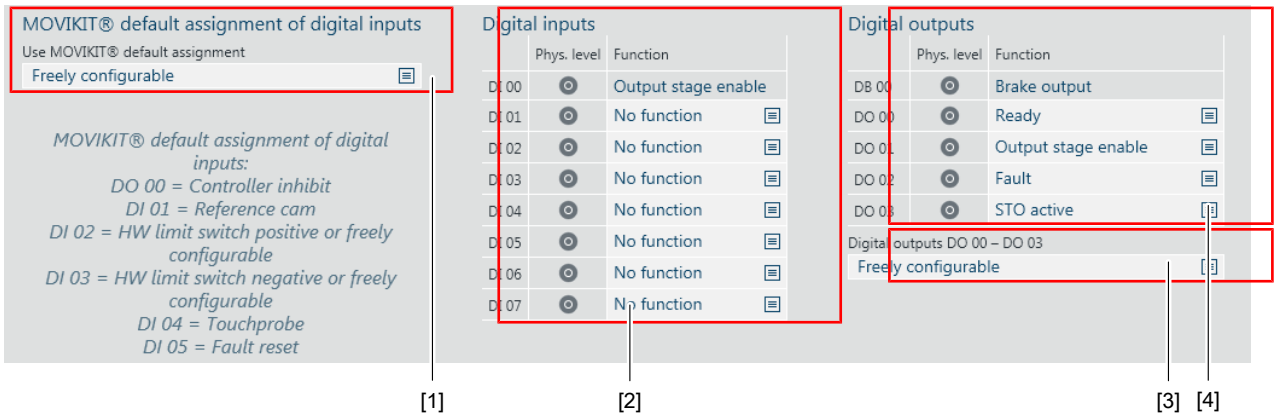
In the delivery state, the digital outputs are assigned the following functions by default:

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

29181453/EN – 03/2020

8.3 Configuring digital inputs/digital outputs

For configuring the digital inputs/digital outputs, the following fields are available in the "Inputs/outputs" (→ 🗎 40) 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" (→ 🗎 87).
[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.

29181453/EN – 03/2020

9 Diagnostics

9.1 MOVIKIT® fieldbus monitor

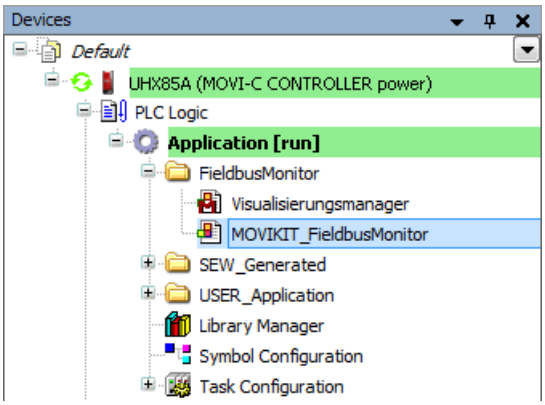
The MOVIKIT® fieldbus monitor is a tool in the IEC Editor for monitoring and controlling the fieldbus interface. The MOVIKIT® fieldbus monitor accesses solely the data of the fieldbus interface and represents the process input and process output data exchanged between the higher-level controller and 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" (→ 🗎 45).

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

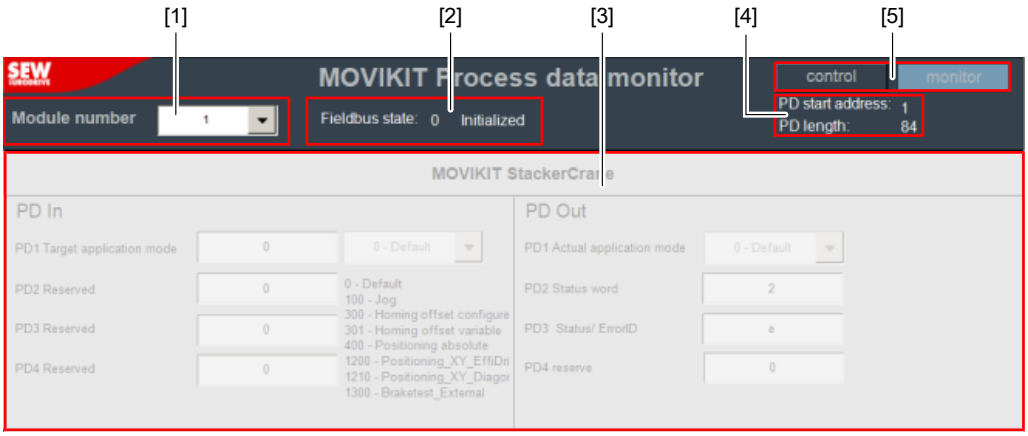
Unexpected system behavior if the communication between PC and MOVI-C® CONTROLLER is interrupted because the specified setpoints continue to take effect until the connection to the IEC Editor is interrupted automatically and the IEC Editor is logged off.

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.

29181453/EN – 03/2020

10 Fault management

10.1 Fault codes

Dec	Hex	Message	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

29181453/EN – 03/2020

Dec	Hex	Message	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
28672	0x7000	eSEW_FH_ASM_Result	FileHandler
28673	0x7001	eSEW_FH_TimeOut	FileHandler
28674	0x7002	eSEW_FH_FileNotHere	FileHandler
28675	0x7003	eSEW_FH_RTS_Result	FileHandler
28704	0x7020	eSEW_PLCGetInfo	Util
28705	0x7021	eSEW_DeltaValueTooLarge	Util
28706	0x7022	eSEW_VZ1Filter	Util
28707	0x7023	eSEW_AverageFilter	Util
28708	0x7024	eSEW_ModuloMax_ModuloMin	Util
28709	0x7025	eSEW_ValueOutOfLimits	Util
28710	0x7026	eSEW_NotInitialized	Util
29696	0x7400	CamSegmentParameterNotFound	Camming_Itfs
29697	0x7401	ReadConfigDataFailed	Camming_Itfs
29698	0x7402	NumberOfCamSegmentsInvalid	Camming_Itfs
29699	0x7403	ICurveFileList_NotLinked	Camming_Itfs
29700	0x7404	ICamSegment_NotLinked	Camming_Itfs
29701	0x7405	IAxisConfig_NotLinked	Camming_Itfs
29702	0x7406	ICammingProfile_NotLinked	Camming_Itfs
29703	0x7407	ICamDescription_NotLinked	Camming_Itfs
29704	0x7408	IUnitCalculation_NotLinked	Camming_Itfs
29705	0x7409	IConfigDataHandler_NotLinked	Camming_Itfs
29706	0x740a	IInterpolationModeSelection_NotLinked	Camming_Itfs
29707	0x740b	IMaster_NotLinked	Camming_Itfs
29708	0x740c	ICamDescriptionScheduler_NotLinked	Camming_Itfs
29709	0x740d	ICamDescriptionScheduler_and_ICamDescription_Not-Linked	Camming_Itfs
29710	0x740e	IConfigData_NotLinked	Camming_Itfs
29712	0x7410	IPointsListSpline_NotLinked	Camming_Itfs
29713	0x7411	IPointList_NotLinked	Camming_Itfs

29181453/EN – 03/2020

Dec	Hex	Message	Library SEW_MOS_...
30208	0x7600	SoftwareLimitSwitchNotValid	InterpolationModes_Itfs
30209	0x7601	ModuloLimitsNotValid	InterpolationModes_Itfs
30210	0x7602	PresetPositionNotValid	InterpolationModes_Itfs
30211	0x7603	ReferenceOffsetNotValid	InterpolationModes_Itfs
30212	0x7604	ReferenceOffsetOutOfModuloLimit	InterpolationModes_Itfs
30213	0x7605	HomingStartPositionNotValid	InterpolationModes_Itfs
30214	0x7606	ModuloModeNotSupported	InterpolationModes_Itfs
30215	0x7607	AxisNotReferenced	InterpolationModes_Itfs
30216	0x7608	TargetPositionNotValid	InterpolationModes_Itfs
30217	0x7609	TravelDistanceNotValid	InterpolationModes_Itfs
30218	0x760a	TargetPositionOutOfSoftwareLimitSwitch	InterpolationModes_Itfs
30219	0x760b	VelocityStopPositionNotValid	InterpolationModes_Itfs
30220	0x760c	MasterResolutionOutsideLimits	InterpolationModes_Itfs
30221	0x760d	MasterModuloOutsideLimits	InterpolationModes_Itfs
30222	0x760e	SlaveModuloOutsideLimits	InterpolationModes_Itfs
30223	0x760f	NumeratorDenominatorOutsideLimits	InterpolationModes_Itfs
30224	0x7610	MasterPositionOutsideLimits	InterpolationModes_Itfs
30225	0x7611	MasterTimeBaseOutsideLimits	InterpolationModes_Itfs
30226	0x7612	SlaveTimeBaseOutsideLimits	InterpolationModes_Itfs
30227	0x7613	SoftwareLimitPositive_Reached	InterpolationModes_Itfs
30228	0x7614	SoftwareLimitNegative_Reached	InterpolationModes_Itfs
30229	0x7615	ApplicationLimitDeceleration	InterpolationModes_Itfs
30230	0x7616	ApplicationLimitAcceleration	InterpolationModes_Itfs
30231	0x7617	ApplicationLimitVelocityPositive	InterpolationModes_Itfs
30232	0x7618	ApplicationLimitVelocityNegative	InterpolationModes_Itfs
30233	0x7619	InterfaceNotLinked	InterpolationModes_Itfs
30234	0x761a	ProfileGeneratorInternalError	InterpolationModes_Itfs
30235	0x761b	ReadConfigDataFailed	InterpolationModes_Itfs
30236	0x761c	InvalidLicence	InterpolationModes_Itfs
30721	0x7801	OutOfLagErrorWindow	Controller_Itfs
30722	0x7802	EC_EncoderIsNotConnected	Controller_Itfs
30723	0x7803	PositionNotValid	Controller_Itfs
30724	0x7804	InterfaceError	Controller_Itfs
30725	0x7805	QueryFailed	Controller_Itfs
30726	0x7806	GearRatioIsZero	Controller_Itfs
30727	0x7807	IndexOutOfBounds	Controller_Itfs
30728	0x7808	InvalidValueForControlloop	Controller_Itfs

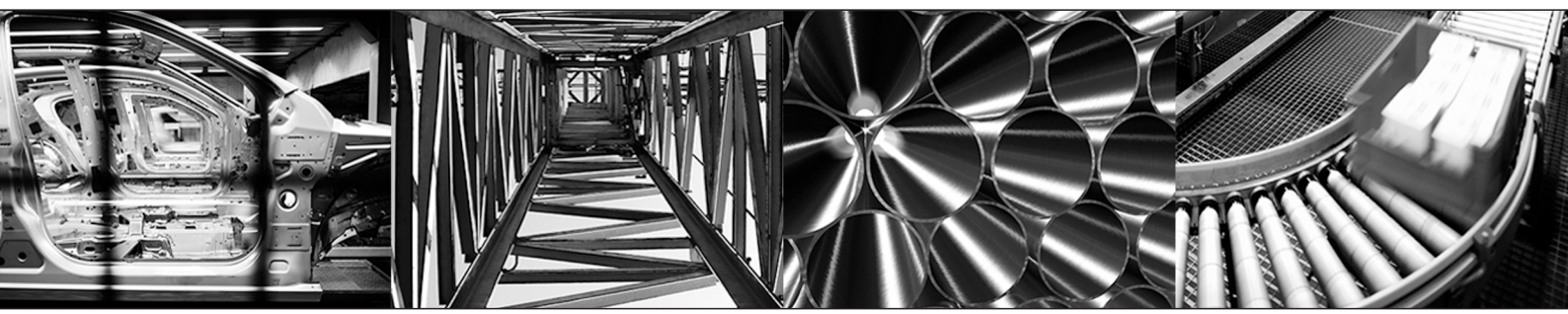
29181453/EN – 03/2020

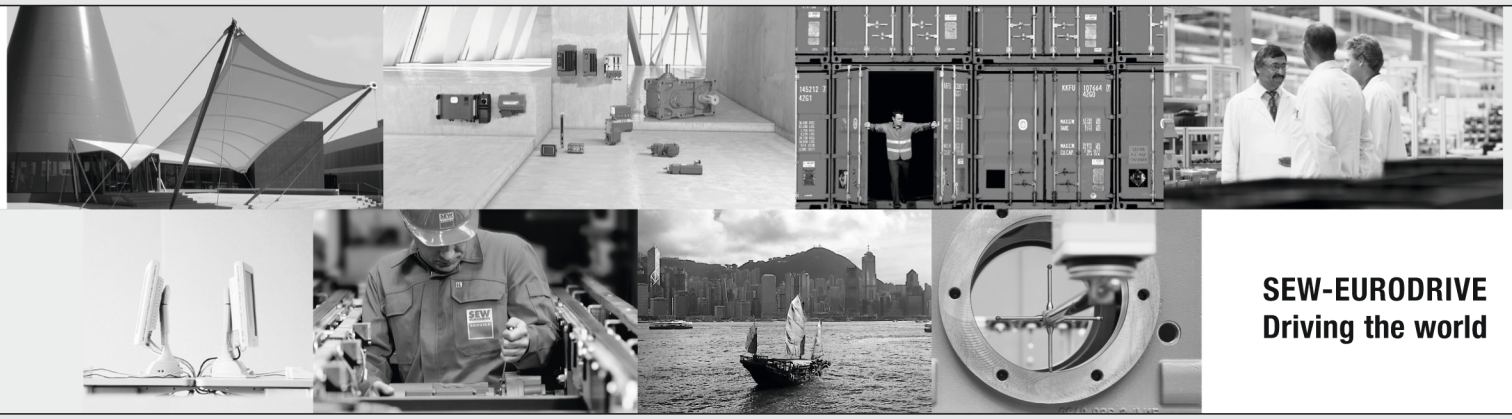
Dec	Hex	Message	Library SEW_MOS_...
30729	0x7809	InvalidValueForActValueEvaluation	Controller_Itfs
30730	0x780a	OutOfSkewErrorWindow	Controller_Itfs
30731	0x780b	WrongReferencedBitOnStatusWord	Controller_Itfs
30732	0x780c	WrongActualPositionSource	Controller_Itfs
30733	0x780d	ExternalEncoderActivatedOnMDD	Controller_Itfs
30734	0x780e	NoExternalEncoderSelected	Controller_Itfs
30735	0x780f	NoCombinedEncoderEvaluationSelected	Controller_Itfs
30736	0x7810	TorqueLevelingPGainMaxIsZero	Controller_Itfs
30737	0x7811	TooManyAssociatedAGMembers	Controller_Itfs
30738	0x7812	ConfirmTokenFailed	Controller_Itfs
30739	0x7813	InsufficientExternalEncoder	Controller_Itfs
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_CancelJobNotAllowed	FileHandler
103920	0x195f0	DynamicValueTooLarge	DeviceAdapter_Itfs
103921	0x195f1	DynamicValueTooSmall	DeviceAdapter_Itfs
103922	0x195f2	InverterWarning	DeviceAdapter_Itfs

29181453/EN – 03/2020

Index

29181453/EN – 03/20





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