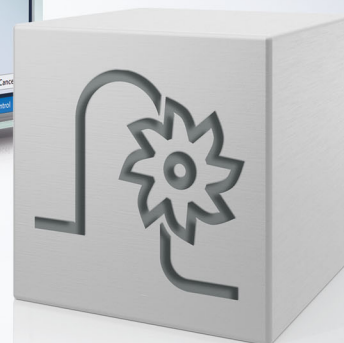
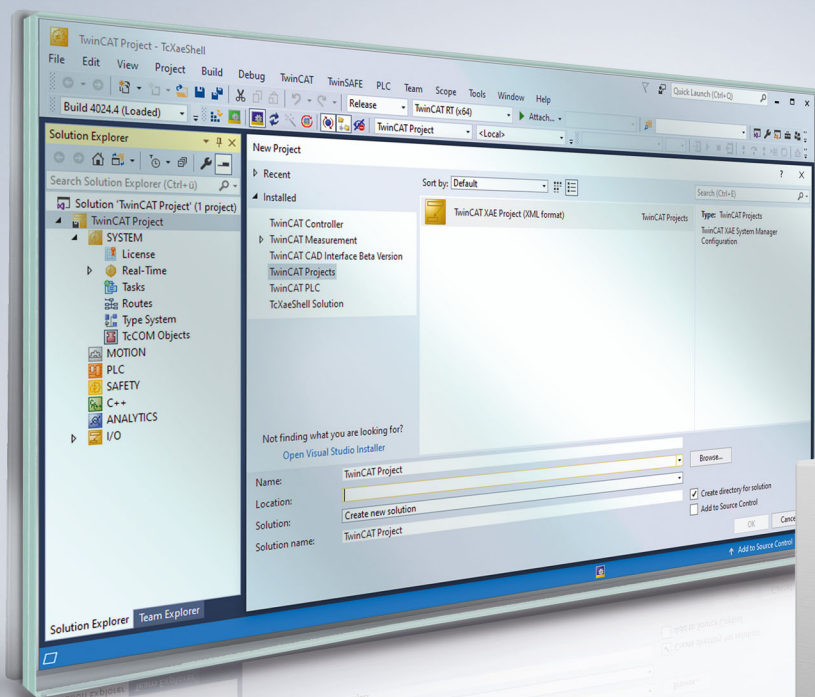


Functional description | EN

TF5200 | TwinCAT 3 CNC

Axis position monitoring



Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement.

No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

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EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702

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General and safety instructions

Icons used and their meanings

This documentation uses the following icons next to the safety instruction and the associated text. Please read the (safety) instructions carefully and comply with them at all times.

Icons in explanatory text

1. Indicates an action.

⇒ Indicates an action statement.

DANGER

Acute danger to life!

If you fail to comply with the safety instruction next to this icon, there is immediate danger to human life and health.

CAUTION

Personal injury and damage to machines!


If you fail to comply with the safety instruction next to this icon, it may result in personal injury or damage to machines.

NOTICE

Restriction or error

This icon describes restrictions or warns of errors.

Tips and other notes

 This icon indicates information to assist in general understanding or to provide additional information.

General example

Example that clarifies the text.

NC programming example

Programming example (complete NC program or program sequence) of the described function or NC command.

Specific version information


 Optional or restricted function. The availability of this function depends on the configuration and the scope of the version.

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1 Overview

Task

When a target position is approached, the position monitoring function monitors whether the actual position reaches an exact stop window (tolerance range) within a specific time.

If a configurable limit is exceeded, the CNC generates an error message and the axis is stopped.

Characteristics

The position lag monitor checks the correct functioning of the position controller.

For example, this can identify the following problems:

- Mechanical changes to axes, e.g. increased friction due to damaged bearings or guides
- Errors in the axis position measuring systems

Parametrisation

The position monitor is configured for each individual axis in the axis parameter list.

Mandatory note on references to other documents

For the sake of clarity, links to other documents and parameters are abbreviated, e.g. [PROG] for the Programming Manual or P-AXIS-00001 for an axis parameter.

For technical reasons, these links only function in the Online Help (HTML5, CHM) but not in pdf files since pdfs do not support cross-linking.

2 Description

Process

Position monitoring consists of the following steps:

1. When the axis command position reaches the programmed target position, the timeout is started (time t_1).
2. Timeout is deactivated when the actual position of the axis is located within the exact stop window (time t_2). The exact stop window is configured by P-AXIS-00236.
3. The actual position must be located within the time t configured in P-AXIS-00532 in t_3 the exact stop window.

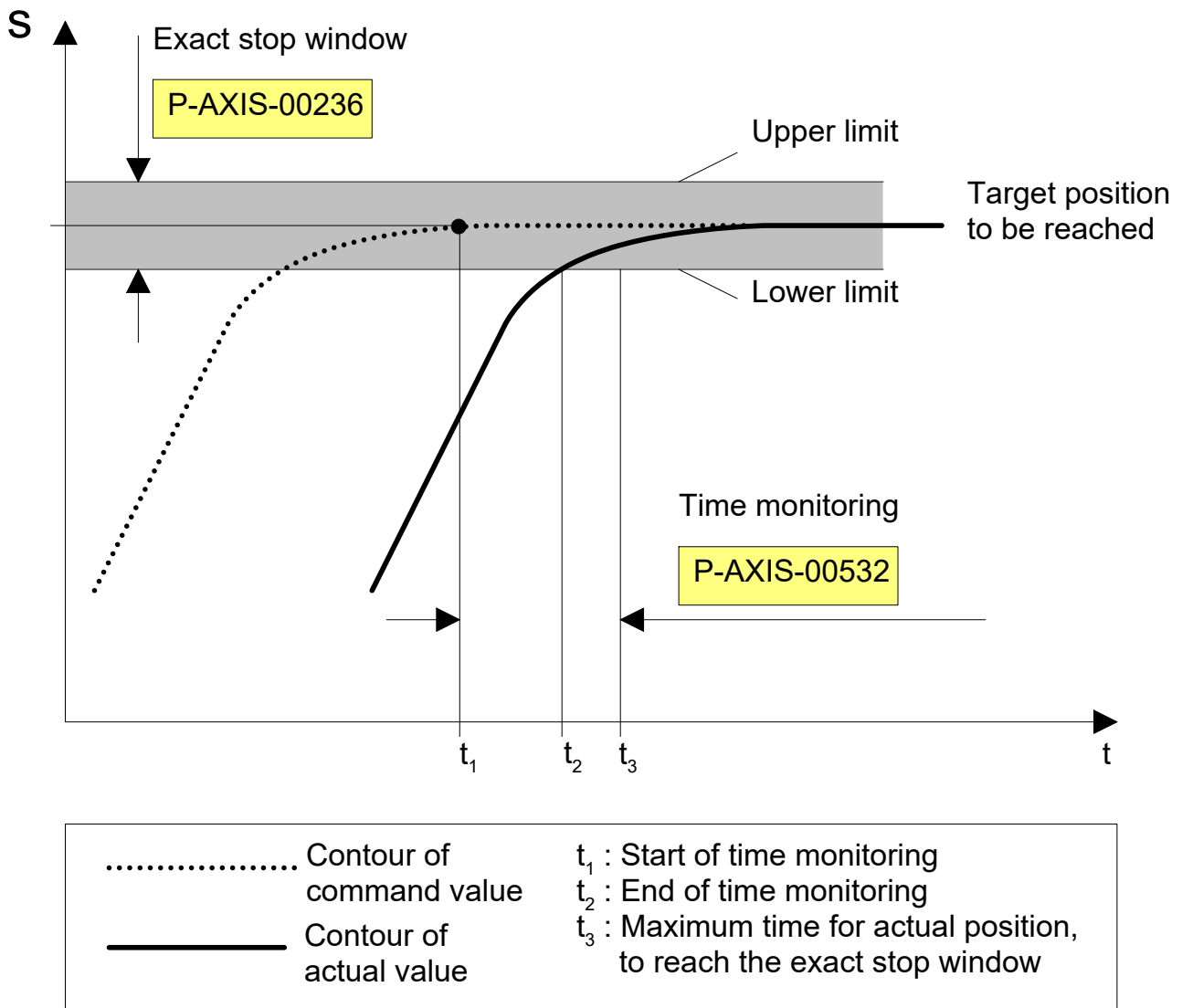


Fig. 1: Position monitoring process

Warnings, errors and reactions

Error message P-ERR-70082. The axis failed within the set time P-AXIS-00532 to reach the exact stop window P-AXIS-00236.

1. Immediately stop the affected axis.
 2. Stop all axes that are interpolated with the affected axis in the path compound.
- ⇒ Check the cause of the error message and rectify
 - ⇒ Resetting the controller

i **Recommended parameterisation**

Position settling time: P-AXIS-00532 = 10000 to 200000 μ s

Exact stop window: P-AXIS-00236 $\geq 3 \cdot \Delta s_{\text{Standstill}}$;

$\Delta S_{\text{Standstill}}$: real position lag at standstill

i When exact stop (G60) is programmed, an axis reaches the target position when the actual position is located within the same exact stop window.

3 Parameter

3.1 Overview of parameters

ID	Description
P-AXIS-00236	Position window for exact stop
P-AXIS-00532	Maximum permissible time until the exact stop window is reached

3.2 Axis parameters

P-AXIS-00236		Position window for exact stop	
Description	A range is defined for the function 'Exact Stop' and contains the axis 'in Position' ($ \text{window} \geq \text{position lag} $). (The related NC command G60 is described in [PROG]. This monitoring is done in position controller if the axis is not interpolated.		
Parameter	getriebe[i].window		
Data type	SGN32		
Data range	$0 \leq \text{window} \leq \text{MAX}(\text{SGN32})$		
Axis types	T, R, S		
Dimension	T: 0.1µm	R,S:	0.0001 °
Default value	500		
drive types.	----		
Remarks			

P-AXIS-00532		Maximum permissible position settling time for exact stop window	
Description	The parameter defines the maximum permissible settling time. If the window for accuracy stop for not interpolated axes has not been reached within this time an error message will be output. If the parameter is 0, the time monitoring is disabled. With a negative value for this parameter the value of P-AXIS-00151 is used for transient time monitoring (backward compatibility).		
Parameter	getriebe[i].position_settling_time		
Data type	SGN32		
Data range	$\text{MIN}(\text{SGN32}) \leq \text{position_settling_time} \leq \text{MAX}(\text{SGN32})$		
Axis types	T, R, S		
Dimension	T: µs	R,S:	µs
Default value	-1		
drive types.	----		
Remarks	This parameter replaces P-AXIS-00151.		

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Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG

Huelshorstweg 20
33415 Verl
Germany

Phone: +49 5246 963-0
e-mail: info@beckhoff.com
web: www.beckhoff.com

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More Information:
www.beckhoff.com/TF5200

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com

