



# DOCUMENTATION ISG-kernel

## **Functional description Axis position monitoring**

Short Description:  
FCT-A3

# Preface

## Legal information

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This documentation was produced with utmost care. The products and scope of functions described are under continuous development. We reserve the right to revise and amend the documentation at any time and without prior notice.

No claims may be made for products which have already been delivered if such claims are based on the specifications, figures and descriptions contained in this documentation.

## Personnel qualifications

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This description is solely intended for skilled technicians who were trained in control, automation and drive systems and who are familiar with the applicable standards, the relevant documentation and the machining application.

It is absolutely vital to refer to this documentation, the instructions below and the explanations to carry out installation and commissioning work. Skilled technicians are under the obligation to use the documentation duly published for every installation and commissioning operation.

Skilled technicians must ensure that the application or use of the products described fulfil all safety requirements including all applicable laws, regulations, provisions and standards.

## Further information

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Links below (DE)

<https://www.isg-stuttgart.de/produkte/softwareprodukte/isg-kernel/dokumente-und-downloads>

or (EN)

<https://www.isg-stuttgart.de/en/products/softwareproducts/isg-kernel/documents-and-downloads>

contains further information on messages generated in the NC kernel, online help, PLC libraries, tools, etc. in addition to the current documentation.

## Disclaimer

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It is forbidden to make any changes to the software configuration which are not contained in the options described in this documentation.

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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

➤ 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.



### **Attention**

#### **Restriction or error**

This icon describes restrictions or warns of errors.



### **Notice**

#### **Tips and other notes**

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



### **Example**

#### **General example**

Example that clarifies the text.



### **Programing Example**

#### **NC programming example**

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



### **Release Note**

#### **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

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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

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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

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

## *Mandatory note on references to other documents*

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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.

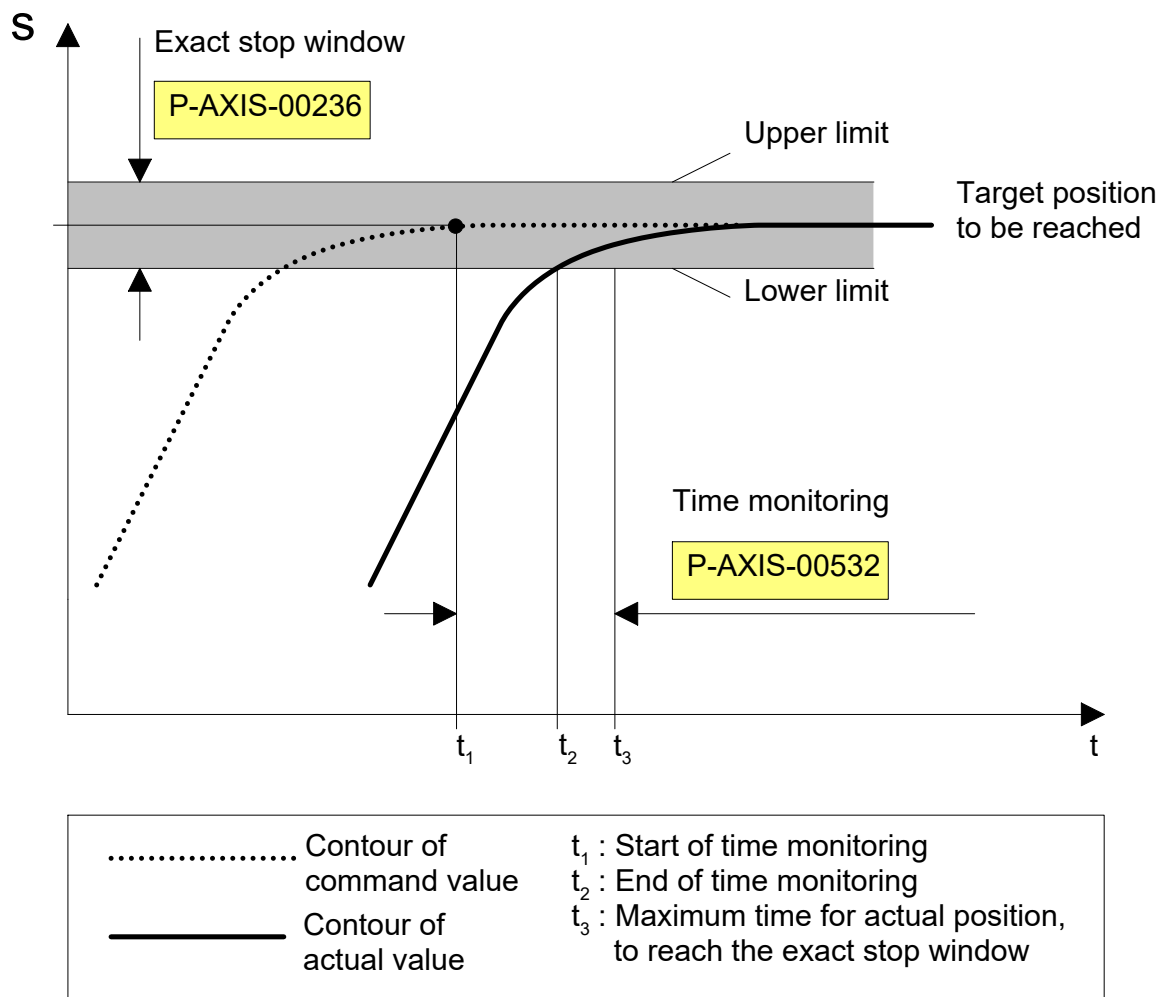


Fig. 1: Position monitoring process

### 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.

- Immediately stop the affected axis.
- 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

**Notice****Recommended parameterisation**

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

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

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

**Notice**

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

<b>P-AXIS-00236</b>	<b>Position window for exact stop</b>	
Description	A range is defined for the function 'Exact Stop' and contains the axis 'in Position' ( $ window  \geq  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	$0 \leq window \leq MAX(SGN32)$	
Axis types	T, R, S	
Dimension	T: 0.1µm	R,S: 0.0001 °
Default value	500	
drive types.	----	
Remarks		

<b>P-AXIS-00532</b>	<b>Maximum permissible position settling time for exact stop window</b>	
Description	<p>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.</p> <p>If the parameter is 0, the time monitoring is disabled.</p> <p>With a negative value for this parameter the value of P-AXIS-00151 is used for transient time monitoring (backward compatibility).</p>	
Parameter	getriebe[i].position_settling_time	
Data type	SGN32	
Data range	$MIN(SGN32) \leq position\_settling\_time \leq MAX(SGN32)$	
Axis types	T, R, S	
Dimension	T: µs	R,S: µs
Default value	-1	
drive types.	----	
Remarks	This parameter replaces P-AXIS-00151.	

## 4 Appendix

### 4.1 Suggestions, corrections and the latest documentation

Did you find any errors? Do you have any suggestions or constructive criticism? Then please contact us at [documentation@isg-stuttgart.de](mailto:documentation@isg-stuttgart.de). The latest documentation is posted in our Online Help (DE/EN):



QR code link: <https://www.isg-stuttgart.de/documentation-kernel/>

The link above forwards you to:

<https://www.isg-stuttgart.de/fileadmin/kernel/kernel-html/index.html>



#### Notice

##### Change options for favourite links in your browser;

Technical changes to the website layout concerning folder paths or a change in the HTML framework and therefore the link structure cannot be excluded.

We recommend you to save the above "QR code link" as your primary favourite link.

##### PDFs for download:

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**E-Mail:** [documentation@isg-stuttgart.de](mailto:documentation@isg-stuttgart.de)

# Keyword index

## P

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