

BECKHOFF

AX5000 Servo drive

Information Gantry Brake | EN



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Available from firmware v2.10

The Gantry Brake function is available from Firmware v2.10.

This documentation applies to the AX5000 servo drive. In the chapters you will find information on how to parameterize a Gantry Brake via the corresponding IDNs.

You then have the option of interpreting answers and reading out errors. Finally, information is provided about different IDNs that are important for the function.

Function



Preventing a delay in the Gantry System

With the configuration in the Gantry Brake you can prevent or reduce the delay in case of an error.

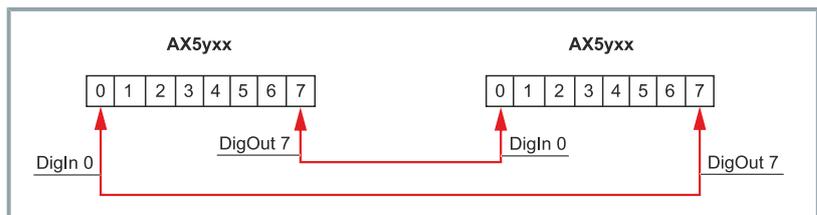
A delay due to mechanical stress in the Gantry System can lead to damage to the axes used.

A Gantry System is an axis with two or more rigidly coupled motors.

The function of the Gantry Brake enables the servo drive to react to an error without a time delay due to the NC or the CNC.

The Gantry Brake function is parameterized via the parameter P-0-0340 "Error propagation configuration".

The figure below shows two AX5yxx servo drives that are wired to each other via the digital inputs and outputs on connection X06.



Possibilities for error coupling:

- Internal coupling with a delay time of $< 100 \mu\text{s}$
- External coupling via jumper on connection X06 of the servo drive. The delay time is $< 100 \mu\text{s}$.
- External coupling via NC or CNC. The delay time is equal to four EtherCAT cycles.

Parameter description

In the following you will find information about which P-parameters are involved in the function. The commissioning scenarios serve as examples. The configuration is always dependent on the application and various environmental and operational conditions.

Parameter	Name	Description
P-0-0340	Error propagation configuration	Reports an error
P-0-0341	Gantry brake configuration	Switches the Gantry Brake function on and off

Gantry Brake

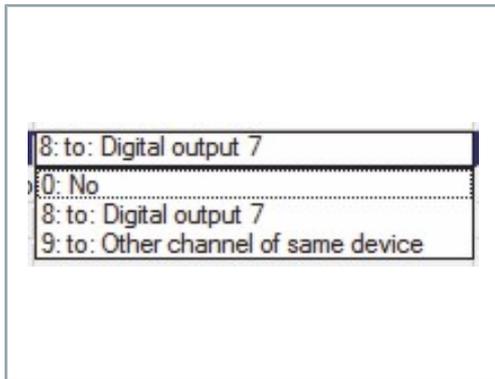
P-0-0340

With the help of the parameter "Error propagation configuration", you can set which error is to be sent to other "Gantry axis". You obtain the corresponding error via the "Yes" command.

IDN	Name	ActValue	SetValue
P-0-0322	Device component hardware lds		
P-0-0323	Memory usage		
P-0-0324	ProductCode/RevisionNo	AX5106-0000-0210	
P-0-0325	Compile time and date	Jul 20 2016 , 16:25:12	
P-0-0326	Release notes		
P-0-0340	Error propagation configuration		
	Propagate error types		
	Torque off	1: Yes	1: Yes
	Shorted coils brake	1: Yes	1: Yes
	Open loop ramp	1: Yes	1: Yes
	Closed loop ramp	1: Yes	1: Yes
	Nc handling	1: Yes	1: Yes
	Lost feedback	1: Yes	1: Yes
	Propagate errors	8: to: Digital output 7	8: to: Digital output 7
	React on propagated error	4: with: Closed loop ramp	4: with: Closed loop ramp
	Receive propagated errors	7: from: Digital input 6	7: from: Digital input 6

Propagate errors

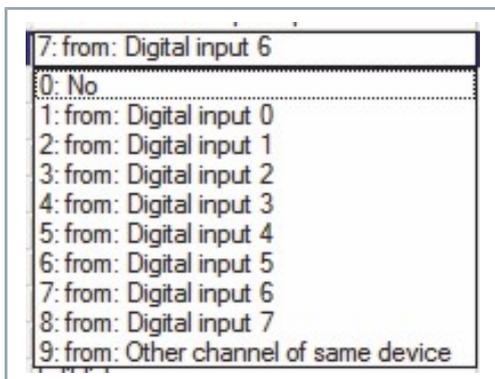
The selection of the error transmission is defined by this parameter.



Value	Description
8: to: Digital output 7	Error transmission takes place via another servo drive; connection by wire
9: to: Other channel of same device	Error transmission takes internal place from channel A to channel B of the same AX52xx servo drive

Receive propagated errors

The receiving channel of an error is defined with this parameter. You can choose between the digital inputs 0 to 6.



Value	Description
8: from: Digital input 7	Connection usable as input and output; do not select!
9: from: Other channel of same device	Error transmission takes internal place from channel A to channel B of the same AX52xx servo drive

P-0-0341

The "Gantry Brake" function is activated via the parameter "Gantry brake configuration". The force set in parameter P-0-0341 "Gantry brake configuration" is then used for each braking procedure instead of the "Emergency stop deceleration" in parameter S-0-0429.



Error state "Torque Off"

If an axis switches to the error state "Torque Off", the Gantry Brake can only be moved with the second axis. On account of the mechanical construction, the force usually has to be limited.

The restoring effect of the controller is interrupted by switching off the I-portion of the speed controller, so that a braking force is limited and remains proportional to the speed.

IDN	Name	ActValue	SetValue
P-0-0325	Compile time and date	Jul 20 2016 , 16:25:12	
P-0-0326	Release notes		
⊕ P-0-0340	Error propagation configuration		
⊖ P-0-0341	Gantry brake configuration		
	Use 'Gantry-Brake' instead of the 'closed loop ramp'	0: No	0: No
	Brake torque	20.0	20.0

The "Gantry Brake" is activated if the device or the channel of an AX52xx receives an error.

Reaction of the servo drive

Reaction to the error < 100 µs:

- Switch to speed control
- Set the speed setpoint to 0 rpm
- Switch off the I-portion of the speed controller
- Limit the torque setpoint to P-0-0341
Example: 20 % of P-0-0094 "Configured channel peak torque / force"

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