EtherCAT®

TwinCAT 3 – Function blocks for 6th generation drive controllers
Manual

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STÖBER

Table of contents

07/2023 | ID 443371.00

1 Foreword

STOBER function blocks are small, functional software units that support you during commissioning of your drive controllers and in case of service. You can reuse them in TwinCAT 3 in different projects.

- STOBER_BoxName makes the assignment to the drive controllers configured in the controller easier for you when configuring the drive controllers in DriveControlSuite.
- STOBER_Backup_Restore enables you to back up and restore configurations of your drive controllers with the aid of the controller in the EtherCAT network.
- STOBER_MC_Home controls the drive controller-guided referencing of the CiA 402 application.

The available function blocks can be found in packed form at http://www.stoeber.de/en/downloads/.
Enter `TwinCAT 3 blocks` into the search field.

07/2023 | ID 443371.00

2 User information

To make efficient use of the function blocks provided by STOBER, you should be familiar with the EtherCAT network technology and the associated Beckhoff automation systems, particularly programming with TwinCAT 3 as well as creating and editing the hardware configuration.

2.1 Timeliness

Check whether this document is the latest version of the documentation. We make the latest document versions for our products available for download on our website:
http://www.stoeber.de/en/downloads/.

2.2 Original language

The original language of this documentation is German; all other language versions are derived from the original language.

2.3 Described product

This documentation is binding for:

6th generation STOBER drive controllers.

2.4 Applicable documentation

This documentation supplements the EtherCAT for SD6 or EtherCAT for SC6 and SI6 manuals as well as the related manual for the CiA 402 application. You may use the documentation at hand only in combination with the listed manuals (see Further information [▶ 20]).

2.5 Legal disclaimer

The library provided in the STOBER download center and the function blocks it contains for TwinCAT 3 are a free service.

STOBER assumes no liability for their content, function and applicability in a real-world machine or application.

07/2023 | ID 443371.00

2.6 Markup of text elements

Certain elements of the continuous text are distinguished as follows.

Important information	Words or expressions with a special meaning
Interpolated position mode	Optional: File or product name or other name
Detailed information	Internal cross-reference
http://www.samplelink.com	External cross-reference

Software and other displays

The following formatting is used to identify the various information content of elements referenced by the software interface or a drive controller display, as well as any user entries.

Main menu Settings	Window names, dialog box names, page names or buttons, combined proper nouns, functions referenced by the interface
Select `Referencing method A`	Predefined entry
Save your `<own IP address>`	User-defined entry
EVENT 52: COMMUNICATION	Displays (status, messages, warnings, faults)

Keyboard shortcuts and command sequences or paths are represented as follows.

[Ctrl], [Ctrl] + [S]	Key, shortcut
Table > Insert table	Navigation to menus/submenus (path specification)

2.7 Trademarks

The following names used in connection with the device, its optional equipment and its accessories are trademarks or registered trademarks of other companies:

CANopen®, CiA®	CANopen® and CiA® are registered European Union trademarks of CAN in AUTOMATION e.V., Nuremberg, Germany.
EtherCAT®, Safety over EtherCAT®, TwinCAT®	EtherCAT®, Safety over EtherCAT® and TwinCAT® are registered trademarks of patented technologies licensed by Beckhoff Automation GmbH, Verl, Germany.
Windows®, Windows® 7, Windows® 10, Windows® 11	Windows®, the Windows® logo, Windows® XP, Windows® 7, Windows® 10, and Windows® 11 are registered trademarks of Microsoft Corporation in the United States and/or other countries.

All other trademarks not listed here are the property of their respective owners.

Products that are registered as trademarks are not specially indicated in this documentation. Existing property rights (patents, trademarks, protection of utility models) are to be observed.

07/2023 | ID 443371.00

3 General safety instructions

⚠ WARNING!

Risk of fatal injury if safety instructions and residual risks are not observed!

Failure to observe the safety instructions and residual risks in the drive controller documentation may result in accidents causing serious injury or death.

- Observe the safety instructions in the drive controller documentation.
- Consider the residual risks in the risk assessment for the machine or system.

⚠ WARNING!

Malfunction of the machine due to incorrect or modified parameterization!

In the event of incorrect or modified parameterization, malfunctions can occur on machines or systems which can lead to serious injuries or death.

- Observe the security notes in the drive controller documentation.
- Protect the parameterization, e.g. from unauthorized access.
- Take appropriate measures for possible malfunctions (e.g. emergency off or emergency stop).

07/2023 | ID 443371.00

4 Function blocks

The following table provides an overview of the available function blocks.

Function block	Description	Software version	Library version
STOBER_Backup_Restore	Loading project configurations from TwinCAT 3 into the drive controllers	V 3.1.4022.22 and later	V 3.1.1.0 and later
STOBER_BoxName	Write the name of the EtherCAT slave into parameter A251 of the drive controller	V 3.1.4022.22 and later	V 3.1.0.0 and later
STOBER_MC_Home	Control drive controller-guided referencing of the CiA 402 application	V 3.1.4022.22 and later	V 3.1.0.0 and later

Tab. 1: Function blocks for TwinCAT 3

4.1 Installing a library and adding to a project

If you would like to use STOBER function blocks, you must install them in TwinCAT 3 as a library and add them to your project.

Installing a library

1. Navigate to your PLC project > References in the solution explorer.
2. Click on Add library in the main window.
   ⇨ The Add library window opens.
3. Click on Advanced....
   ⇨ Another Add library window opens.
4. Click on Library Repository….
5. The Library Repository window opens.
6. Click on Install..., navigate to the library to be installed and click on Open.

⇨ The selected library is installed in the library repository.

Adding a library to a project

1. Navigate to your PLC project > References in the solution explorer.
2. Click on Add library in the main window.
   ⇨ The Add library window opens.
3. Under Application > STÖBER Antriebstechnik GmbH + Co. KG, select the library that you would like to add and confirm with OK.

⇨ The library is added to your PLC project under References in the solution explorer.

07/2023 | ID 443371.00

4.2 STOBER_BoxName

By adding the STOBER_BoxName function block to your TwinCAT project, the name of the EtherCAT slave assigned in TwinCAT 3 is automatically written to parameter A251 of the drive controller. This makes the assignment to the drive controllers configured in TwinCAT 3 easier for you when configuring the drive controllers in DriveControlSuite. The name is transmitted to the EtherCAT slave via SDO data exchange.

Prerequisites

- TwinCAT3 version 3.1.4022.22 and later
- Library version 3.1.0.0 and later

Parameter

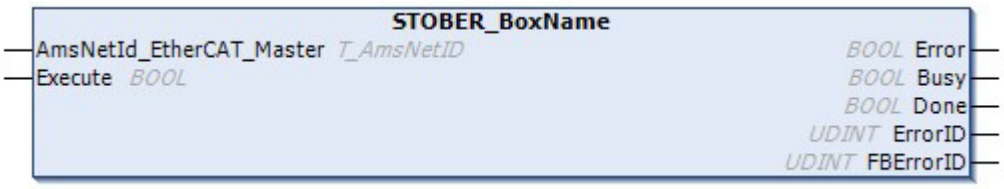

Fig. 1: STOBER_BoxName function block: Input and output parameters

Parameter	Data type	Declaration	Description
AmsNetId_EtherCAT_Master	T_AmsNetID	IN	AMS NetID of the EtherCAT master
Execute	BOOL	IN	Activating the function block with rising edge
Error	BOOL	OUT	State of the function block (Error = 1: faulty)
Busy	BOOL	OUT	State of the function block (Busy = 1: writing not yet finished)
Done	BOOL	OUT	State of the function block (Done = 1: writing successfully completed)
ErrorID	UDINT	OUT	TwinCAT-specific ADS error code of the function blocks used internally
FBErrorID	UDINT	OUT	Block-specific error; see Diagnostics [▶ 9]

Tab. 2: STOBER_BoxName function block: Parameter

For information on the data types, refer to the TwinCAT 3 documentation at https://infosys.beckhoff.com/content/1033/tc3_plc_intro/2529388939.html.

Information

When using the block, be aware that the hardware actually used must match the topology configured in TwinCAT 3 during commissioning. If the hardware and network topology in TwinCAT 3 do not match, this causes the function block to malfunction.

07/2023 | ID 443371.00

4.2.1 Diagnostics

For diagnostics in case of error (Error = 1), the STOBER_BoxName block will output one of the block-specific errors listed below via the FBErrorID output.

If the error is within the TwinCAT-specific function blocks, the ADS error code is output at the ErrorID output. These error codes can be referenced using the documentation of Beckhoff Automation GmbH & Co. KG.

Error (FBErrorID)	Cause	Check and actions
WRONG_AMS_NETID	Incorrect AMS NetID	Check and correct the AMS NetID of the EtherCAT master.
MAX_SLAVES_NUMBER_REACHED	Maximum number of connected EtherCAT slaves exceeded	Reduce the number of EtherCAT slaves connected to the function block to max. 1000.
ALL_SLAVES_NOT_IN_OPERATIONAL_MODE	Enable input is set (Execute = 1) while the state of a slave switches to a different state	Make sure that all EtherCAT slaves are in the Operational state; error remains active until all slaves are operational.

Tab. 3: STOBER_BoxName function block: Error

4.2.2 Example code

The following example is for implementation in Structured Text (ST).

```
PROGRAM MAIN
VAR
	fbBoxname:STOBER_BoxName;
	bExecuteBox: BOOL;
	bError: BOOL;
	bBusy: BOOL;
	bDone: BOOL;
	uiErrorID: UDINT;
	uiFbErrorID: UDINT;
END_VAR

fbBoxname(
	AmsNetId_EtherCAT_Master:='172.18.132.104.2.1' ,
	Execute:=bExecuteBox ,
	Error=>bError ,
	Busy=>bBusy ,
	Done=>bDone ,
	ErrorID=>uiErrorID ,
	FBErrorID=>uiFbErrorID );
```

07/2023 | ID 443371.00

4.3 STOBER_Backup_Restore

The STOBER_Backup_Restore function block enables selected DriveControlSuite configurations to be sent from the EtherCAT controller to the drive controller via TwinCAT 3 or to be read out from the drive controller. For the correct assignment of the drive controllers configured in DriveControlSuite to the configured EtherCAT slaves in TwinCAT 3, you also need the STOBER_BoxName function block.

The STOBER_Backup_Restore function block accesses the script mode of the DriveControlSuite. A back up or restore of the project in the drive controller is run as soon as the DriveControlSuite is started and an online connection is established.

Prerequisites

- TwinCAT3 version 3.1.4022.22 and later
- Library version 3.1.1.0 and later
- Target platform: PC or CX with Windows Embedded Standard (WES) 7, Windows 7 or Windows 10 operating system
- Engineering PC with TwinCAT 3 engineering environment (XAE) and external EtherCAT controller with TwinCAT 3 runtime environment (XAR)
- DriveControlSuite from version 6.5-F and later, installed on the EtherCAT controller

Parameter

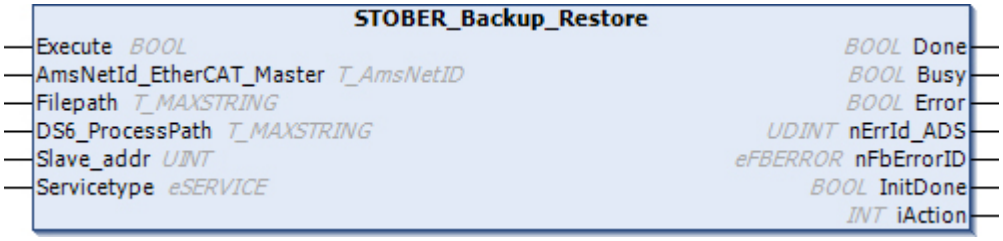

Fig. 2: STOBER_Backup_Restore function block: Input and output parameters

07/2023 | ID 443371.00

Parameter	Data type	Declaration	Description
Execute	BOOL	IN	Activating the function block with rising edge
AmsNetId_EtherCAT_Master	T_AmsNetId	IN	AMS NetID of the EtherCAT master
File path	T_MAXSTRING	IN	File path to the directory of the project file (*.ds6) on the EtherCAT controller
DS6_ProcessPath	T_MAXSTRING	IN	File path to DriveControlSuite (*.exe) on the EtherCAT controller, e.g.: C:\Program Files (x86)\STOBER\DriveControlSuite (6.X-X)\bin
Slave_addr	UINT	IN	EtherCAT slave address of the drive controller
Service type	eSERVICE	IN	Requested Service: ▪ Backup ▪ Backup_RevDocu (backup with reverse documentation) ▪ Restore
Busy	BOOL	OUT	State of the function block (BUSY = 1: Service not yet finished)
Done	BOOL	OUT	State of the function block (DONE = 1: Service successfully completed)
Error	BOOL	OUT	State of the function block (ERROR = 1: faulty)
nErrID_ADS	UDINT	OUT	TwinCAT-specific ADS error code of the function blocks used internally
nFBErrID	eFBERROR	OUT	Block-specific error; see Diagnostics [▶ 14]
InitDone	BOOL	OUT	Initialization completed
iAction	INT	OUT	Action that is requested by the function block as a service type after initialization: ▪ iAction = 0 (backup) ▪ iAction = 1 (backup with reverse documentation) ▪ iAction = 2 (Restore)

Tab. 4: STOBER_Backup_Restore function block: Parameters

For information on the data types, refer to the TwinCAT 3 documentation at https://infosys.beckhoff.com/content/1033/tc3_plc_intro/2529388939.html.

Service type	Description
Backup	The project is read out from the drive controller and stored in the directory on the EtherCAT controller.
Backup_RevDocu	The project is read out from the drive controller with reverse documentation and stored in the directory on the EtherCAT controller.
Restore	The project in the directory on the EtherCAT controller is transmitted to the drive controller and saved there.

Tab. 5: STOBER_Backup_Restore function block: Service type

Information

If a backup service is run and a project already exists in the directory on the EtherCAT controller, it is moved to the SaveOriginals subdirectory and provided with the date and time. The subdirectory is created automatically when a backup service is run for the first time.

4.3.1 Use function block

For the correct assignment of the drive controllers configured in DriveControlSuite to the configured EtherCAT slaves in TwinCAT 3, you need the STOBER_BoxName function block in addition to the STOBER_Backup_Restore function block. First configure both blocks before performing the following steps.

Information

For each drive controller in your EtherCAT network, you need one instance of the STOBER_Backup_Restore function block.

DS6-Create project and save project configuration on the drive controllers

1. Create a new project directory on your EtherCAT controller.
2. Start the DriveControlSuite on the EtherCAT controller.
3. Create a project and configure all drive controllers in your EtherCAT network.
4. Transmit the project to the drive controllers and save it to their non-volatile memory.

Information

Alternatively you can create a separate project for each drive controller in your EtherCAT network.

Enter PLC device name and save DS6 project to EtherCAT controller

1. Switch to TwinCAT XAE and navigate to an EtherCAT slave in the solution explorer.
2. Double click the EtherCAT slave to open it.
3. Main window > General tab > Field Name:
   Copy the name of the EtherCAT slave to the clipboard.
4. Switch to DriveControlSuite on your EtherCAT controller.
5. Select the corresponding drive controller in the project tree and click the first projected axis in the Project menu > Parameter list area.
6. Group A > Parameters A251 PLC-Devicename:
   Paste the copied name from the clipboard.
7. Repeat the steps for all other drive controllers in your project.
8. Save the project to the directory previously created on the EtherCAT controller.
9. Close the DriveControlSuite on the EtherCAT controller.

Information

Do not save the project until you have connected to the drive controllers online. Make sure that the production number of the corresponding drive controller has been entered in parameter E52[2] when establishing the connection.

07/2023 | ID 443371.00

Run function blocks

1. Switch to TwinCAT XAE.
2. Make sure that all drive controllers in your EtherCAT network are in the Operational state.
3. First run the STOBER_BoxName function block.
   ⇨ If the function block has written the names of all EtherCAT slaves to the drive controllers, the output Done is set to True.
4. Next, call up the instances of the STOBER_Backup_Restore function block one after the other:
   When using the function block for the first time, run a restore to transfer the project to the drive controllers.
   Otherwise the nFBErrorID output will return the WrongServiceTypeInput error.

07/2023 | ID 443371.00

4.3.2 Diagnostics

For diagnostics in case of an error (Error = 1), the STOBER_Backup_Restore block will output one of the block specific errors listed below via the nFBErrorID output.

If the error is within the TwinCAT-specific function blocks, the ADS error code is output at the nErrID_ADS output. These error codes can be referenced using the documentation of Beckhoff Automation GmbH & Co. KG.

Error (nFbErrorID)	Cause	Check and actions
WrongFilePath	Project file directory does not exist	Check and correct the file path to the project file directory on the EtherCAT controller.
WrongDS6_ProcessPath	Directory of DriveControlSuite does not exist	Check and correct the file path to the directory of the DriveControlSuite on the EtherCAT controller.
WrongEtherCATRevision	EtherCAT revision number < 6000	The revision number of the drive controller corresponds to the Revision Number communication object in accordance with CiA 301; object 1018 hex, subindex 3 hex. Create a DS6 project with a current EtherCAT template.
InvalidBoxname	Parameter A251 does not contain a valid value	Run the STOBER_BoxName function block.
WrongServiceTypeInput	The requested service does not match the service requested by the function block	For Service type, select the correct service according to the iAction output. When the function block is used for the first time, the Service Restore (iAction = 2) must always be selected.
TimeoutExceed	Script mode could not be executed completely in the specified time	Make sure that DriveControlSuite is not open on the EtherCAT controller while you are running the function block. Make sure not to run multiple instances of the function block at the same time. Instead, run the instances one after the other.
NoStoberSlaveInConfiguration	No EtherCAT slave from STOBER could be found in the EtherCAT network	Check the configuration of your EtherCAT network and the physical connection to the EtherCAT slave from STOBER.
ProjectNotFound	The drive controller was not found in the project	Make sure that you have manually entered the PLC device name from your EtherCAT project into the DS6 project. Check the log files in your project directory for more information.
MoreThanOneProjectFound	The drive controller was found in several DS6 projects	Check the log files in your project folder for more information.
OpenProjectError	The project could not be opened or the project file is not correct	Make sure that the specified DS6 project is not already open. Check the log files in your project folder for more information.
ConnectionError	Connection error	Check the Ethernet cable connection between PC and drive controller (service interface).
OnlineError	Faulty project configuration	Make sure that firmware version, drive controller and option module are configured correctly in your DS6 project.

Tab. 6: STOBER_Backup_Restore function block: Error

07/2023 | ID 443371.00

Log files for advanced diagnostics

When the function block is executed, various log files are created in your project directory to be used for advanced diagnostics in case of an error.

File	Description
File in the log directory	The directory is created automatically as soon as the function block is run for the first time. Each time the function block is run, a log file is created in this directory. It contains the log information of the script mode
File Tc_Log.log	Block-specific log file with information for which EtherCAT slave and with which service type the function block was run, as well as information as to whether it was successfully run.
File DeviceInfo.txt	File with all slave addresses and production numbers of the drive controllers in the EtherCAT network. **ATTENTION! This file must not be modified or deleted.**
Files in the SaveOriginals directory	The directory is created automatically when a backup service is run for the first time. With each backup service, the current DS6 project file is moved to the SaveOriginals directory. The file is provided with the current date and time.

Tab. 7: STOBER_Backup_Restore function block: Log files in the project directory

4.3.3 Example code

The following sample project is for implementation in Structured Text (ST). It shows the serial execution of the STOBER_Backup_Restore function block for an EtherCAT network with three drive controllers.

```
PROGRAM MAIN
VAR
	fbBoxname:STOBER_BoxName;
	fbBackup1,fbBackup2,fbBackup3 :STOBER_Backup_Restore;
	bExecuteBox: BOOL;
	bExecute_BR: ARRAY [0..2] OF BOOL;
	done: ARRAY [0..2] OF BOOL;
	busy: ARRAY [0..2] OF BOOL;
	Error: ARRAY [0..2] OF BOOL;
	errorIDADS: ARRAY [0..2] OF UDINT;
	FbErrorID:ARRAY [0..2] OF STOBER_G6_Util.eFBERROR;
	initDOne: ARRAY [0..2] OF BOOL;
	iAction:ARRAY [0..2] OF INT;
	servicetype: eSERVICE:=2;
	bError: BOOL;
	bBusy: BOOL;
	bDone: BOOL;
	uiErrorID: UDINT;
	uiFbErrorID: UDINT;
END_VAR

fbBoxname(
	AmsNetId_EtherCAT_Master:='172.18.132.104.2.1' ,
	Execute:=bExecuteBox ,
	Error=>bError ,
	Busy=>bBusy ,
	Done=>bDone ,
	ErrorID=>uiErrorID ,
	FBErrorID=>uiFbErrorID );
```

```
fbBackup1(
      Execute:= bExecute_BR[0],
      AmsNetId_EtherCAT_Master:='172.18.132.104.2.1' ,
      Filepath:='C:\Projects_local\DS6-Projects' ,
      DS6_ProcessPath:='C:\Program Files\STOBER\DriveControlSuite\bin' ,
      Slave_addr:= 1004,
      Servicetype:=servicetype ,
      Done=> done[0],
      Busy=>busy[0] ,
      Error=>Error[0] ,
      nErrId_ADS=>errorIDADS[0] ,
      nFbErrorID=> FbErrorID[0],
      InitDone=> initDOne[0],
      iAction=> iAction[0]);

fbBackup2(
      Execute:=bExecute_BR[1] && done[0],
      AmsNetId_EtherCAT_Master:='172.18.132.104.2.1' ,
      Filepath:= 'C:\Projects_local\DS6-Projects',
      DS6_ProcessPath:='C:\Program Files\STOBER\DriveControlSuite\bin' ,
      Slave_addr:=1005 ,
      Servicetype:=servicetype ,
      Done=>done[1] ,
      Busy=> busy[1],
      Error=>Error[1] ,
      nErrId_ADS=>errorIDADS[1] ,
      nFbErrorID=>FbErrorID[1] ,
      InitDone=> initDOne[1],
      iAction=> iAction[1]);

fbBackup3(
      Execute:=bExecute_BR[2] && done[0],
      AmsNetId_EtherCAT_Master:='172.18.132.104.2.1' ,
      Filepath:= 'C:\Projects_local\DS6-Projects',
      DS6_ProcessPath:='C:\Program Files\STOBER\DriveControlSuite\bin' ,
      Slave_addr:=1006 ,
      Servicetype:= servicetype,
      Done=>done[2] ,
      Busy=>busy[2] ,
      Error=>Error[2] ,
      nErrId_ADS=>errorIDADS[2] ,
      nFbErrorID=> FbErrorID[2],
      InitDone=>initDOne[2] ,
      iAction=>iAction[2] );
```

07/2023 | ID 443371.00

4.4 STOBER_MC_HOME

The function block controls the drive controller-guided referencing of the CiA 402 application. Execution of the function block first activates the referencing method for referencing that is defined for the drive controller in parameter A586. After successful referencing, the operating mode defined in parameter A541 is activated.

Prerequisites

- TwinCAT3 version 3.1.4022.22 and later
- Library version 3.1.0.0 and later
- You have configured at least one NC axis in TwinCAT 3
- You are operating the drive controller with the CiA 402 application
- In addition to the library of STOBER, you have installed the Tc2_MC2 library from Beckhoff in TwinCAT 3

Parameter

Fig. 3: STOBER_MC_HOME function block: Input and output parameters

Parameter	Data type	Declaration	Description
Axis	AXIS_REF	IN/OUT	Axis data structure
Execute	BOOL	IN	Activating the function block with rising edge
SetModeOfOperation	SINT	IN	Set operating mode of the drive controller after referencing (A541)
Done	BOOL	OUT	State of the function block (Done = 1: referencing completed)
ModeOfOperation	SINT	OUT	Operating mode of the drive controller after referencing
Busy	BOOL	OUT	State of the function block (Busy = 1: referencing still not finished)
CommandAborted	BOOL	OUT	State of the action (CommandAborted = 1: referencing canceled)
Error	BOOL	OUT	State of the function block (Error = 1: faulty)
ErrorID	UDINT	OUT	TwinCAT-specific ADS error code of the function blocks used internally
FBErrorID	UDINT	OUT	Block-specific error code; see Diagnostics [▶ 19]

Tab. 8: STOBER_MC_HOME function block: Parameters

For information on the data types, refer to the TwinCAT 3 documentation at https://infosys.beckhoff.com/content/1033/tc3_plc_intro/2529388939.html.

4.4.1 Process of referencing

During execution of the STOBER_MC_Home function block, the following steps are performed:

1. Reading the axis data (ADS access data, e.g. AMS NetID, slave address, axis type, etc.)
2. Deleting the reference bit of the NC axis
3. Deactivating position lag monitoring in the NC axis
4. Setting the operating mode to Homing mode (parameter A541 = 6: Homing Mode)
5. Reading in the referencing method (A586) via CoE
6. Starting referencing
7. Waiting until referencing has ended
8. Activating position lag monitoring in the NC axis
9. Setting the reference for the NX axis
10. Setting the operating mode (A541) to the value defined in SetModeOfOperation

4.4.2 Creating links

To be able to perform the referencing of the device axes, a link must be created between the NC axis and PLC project.

Creating the variable

Define a variable of type AXIS_REF in your PLC project.

Linking the variable and NC axis

✓ You have activated Config mode.

1. In the solution explorer, navigate to Motion > NC-Task 1 SAF > Axes > Axis1.
2. In the main window, switch to the Settings tab.
3. Select Link To PLC ....
   ⇨ The Select Axis PLC Reference ('Axis 1') window opens.
4. Select the variable of type AXIS_REF previously created in the PLC project from the list and confirm with OK.

⇨ The variable and NC axis are linked.

Linking the operating mode with the output of the function block

Delete the linking of the NC axis and operating mode that was automatically created in the PDO mapping. Then, link the operating mode with the output ModeOfOperation.

1. In the solution explorer, navigate to the EtherCAT slave > Module 1 (CiA) > Axis A to Slave > A541 Modes of operation and select Clear Link(s) in the context menu
   ⇨ The automatic link is deleted.
2. Double-click on A541 Modes of operation.
   ⇨ In the main window, the window with the properties of the object opens.
3. In the main window, switch to the Variable tab and click on Linked to ....
   ⇨ The Attach Variable A541 Modes of operation (Output) window opens.
4. Select the output ModeOfOperation of the function block from the list and confirm with OK.

⇨ The operating mode and output ModeOfOperation are linked.

07/2023 | ID 443371.00

4.4.3 Diagnostics

For diagnostics in case of error (Error = 1), the STOBER_MC_Home block outputs one of the block-specific errors listed below via output FBErrorID.

If the error is within the TwinCAT-specific function blocks, the ADS error code is output at the ErrorID output. These error codes can be referenced using the documentation of Beckhoff Automation GmbH & Co. KG.

Error (FBErrorID)	Cause	Check and actions
HOMING_METHOD_INACTIVE	Parameter A586 = 0: Inactive	In parameter A586, select the referencing method that is to be run when the block is run.
AXIS_NOT_ENABLED	The axis is not enabled	Enable the axis of the drive controller (for cause of switch-on lockout, see parameter E47).
WRONG_MODE	Incorrect operating mode at input SetModeOfOperation	For the SetModeOfOperation input, define one of the following possible values: 8: Cyclic synchronous position mode, 9: Cyclic synchronous velocity mode or 10: Cyclic synchronous torque mode.
NO_DEVICE_LINK	Output variable ModeOfOperation was not linked	Link the ModeOfOperation variable.

Tab. 9: STOBER_MC_HOME function block: Error

5 Appendix

5.1 Further information

The documentation listed below provides you with further relevant information on the 6th STOBER drive controller generation. You can find the current status of the documentation in the STOBER download center at http://www.stoeber.de/en/downloads/, if you enter the ID of the documentation in the search.

SC6, SI6 drive controllers

Title	Documentation	Contents	ID
SC6 drive controller	Manual	System design, technical data, project configuration, storage, installation, connection, commissioning, operation, service, diagnostics	442790
Multi-axis drive system with SI6 and PS6	Manual	System design, technical data, project configuration, storage, installation, connection, commissioning, operation, service, diagnostics	442728
EtherCAT communication – SC6, SI6	Manual	Electrical installation, data transfer, commissioning, diagnostics, detailed information	443025
CiA 402 application – SC6, SI6	Manual	Project planning, configuration, parameterization, function test, detailed information	443080

SD6 drive controller

Title	Documentation	Contents	ID
SD6 drive controller	Manual	System design, technical data, project configuration, storage, installation, connection, commissioning, operation, service, diagnostics	442426
EtherCAT communication – SD6	Manual	Installation, electrical installation, data transfer, commissioning, diagnostics, detailed information	442516
CiA 402 application – SD6	Manual	Project planning, configuration, parameterization, function test, detailed information	443077

A free basic version of the TwinCAT 3 automation software is available at https://www.beckhoff.com/en-us/products/automation/twincat/te1xxx-twincat-3-engineering/te1000.html.

07/2023 | ID 443371.00

5.2 Abbreviations

Abbreviation	Meaning
ADS	Automation Device Specification
AMS	Automation Message Specification
CiA	CAN in Automation
CoE	CANopen over EtherCAT
EtherCAT	Ethernet for Control Automation Technology
IP	Internet Protocol
NC	Numerical Control
PDO	Process Data Objects
PLC	Programmable Logic Controller
SDO	Service Data Objects
PLC	Programmable Logic Controller
ST	Structured Text

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6 Contact

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07/2023 | ID 443371.00

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List of tables

07/2023 | ID 443371.00

443371.00

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