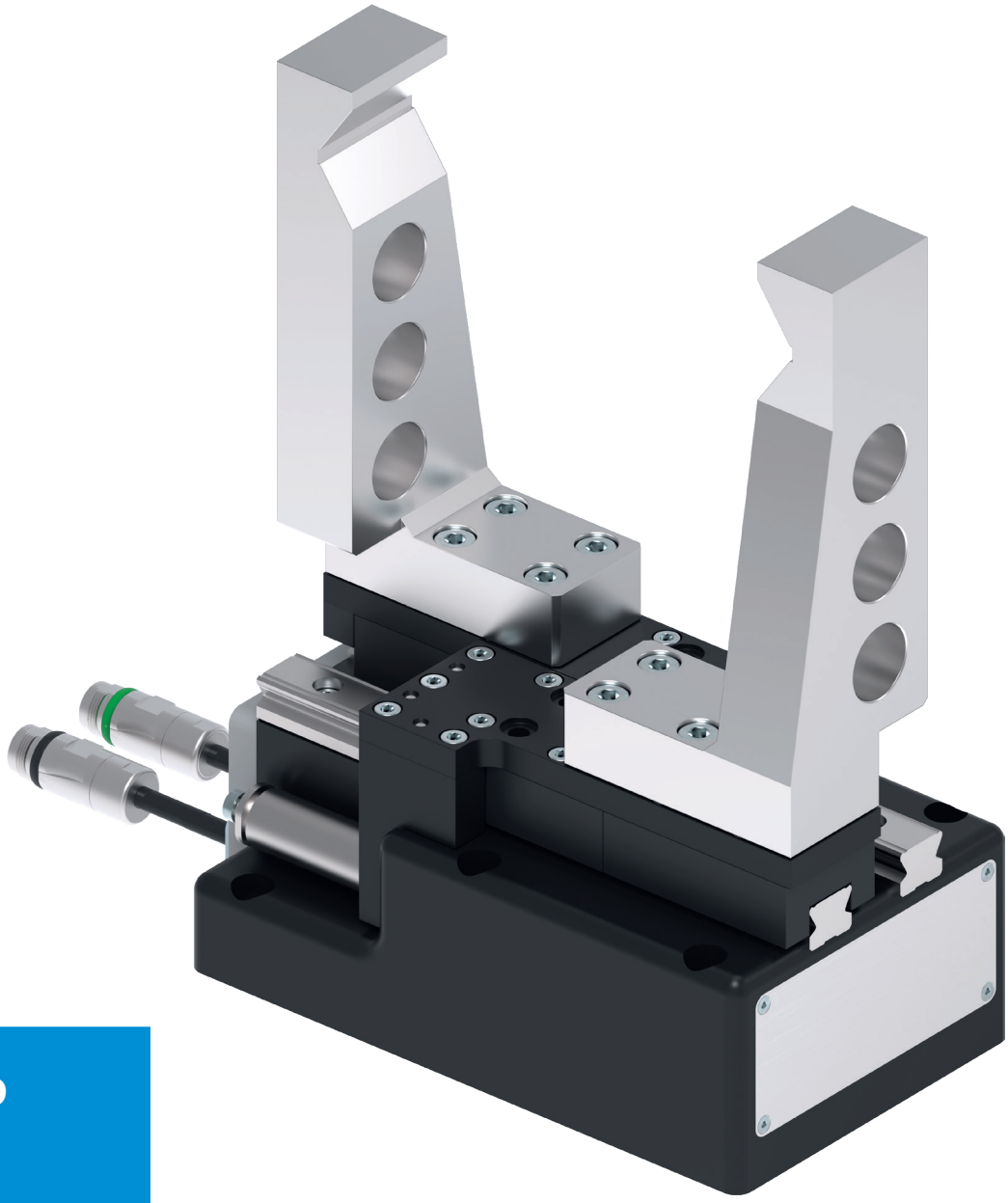

INSTALLATION AND OPERATING INSTRUCTIONS

2-jaw parallel gripper with long stroke, electric

GEH8000 series

DDOC00262

THE KNOW-HOW FACTORY

Parameter explanation (glossary)

Parameter	Explanation
ActualPosition	Value of the current position of the product [1/100 mm]
BasePosition	Home position of the product, specified via parameters
ControlWord	Activation of the product Only one bit is permitted to be active in the word. The value "0" is also permitted.
Diagnosis	If an error occurs, outputs a diagnostic code that can be compared with the error list.
Error	Error
GND	Abbreviation for ground connection
Offset	Correction value
PositionTolerance	Tolerance range for TeachPosition, BasePosition and WorkPosition The value of the parameter acts in both directions.
StatusWord	In its bits, returns the most important information about the status of the product to the control system.
Traversing routine	Defined procedure for movement of the product
Travel path	Distance the product covers.
WorkPosition	Work position of the product, specified via parameters

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1 Supporting documents

NOTICE

Read through the installation and operating instructions before installing or working with the product.

The installation and operating instructions contain important notes for your personal safety. They must be read and understood by all persons who work with or handle the product during any phase of the product lifetime.

The documents listed below are available for download on our website www.zimmer-group.com.

- Installation and operating instructions
- Catalogs, drawings, CAD data, performance data
- Information on accessories
- Technical data sheets
- General Terms and Conditions, including warranty information.

⇨ Only those documents currently available on the website are valid.

In these installation and operating instructions, "product" refers to the product designation on the title page!

1.1 Notices and graphics in the installation and operating instructions

DANGER

This notice warns of an imminent danger to the life and health of people. Ignoring these notices can lead to serious injury or even death.

► You absolutely must comply with the described measures for avoiding these dangers!

⇨ The warning symbols are assigned according to the type of danger.

WARNING

This notice warns of a situation that is potentially hazardous to personal health. Ignoring these notices can cause serious injury or damage to health.

► You absolutely must comply with the described measures for avoiding these dangers!

⇨ The warning symbols are assigned according to the type of danger.

CAUTION

This notice warns of a situation that is potentially hazardous for people or that may result in material or environmental damage. Ignoring these notices may result in slight, temporary injuries or damage to the product or to the environment.

► You absolutely must comply with the described measures for avoiding these dangers!

⇨ The warning symbols are assigned according to the type of danger.

NOTICE

General notices contain usage tips and valuable information, but no warnings of dangers to health.

INFORMATION

This category contains useful tips for handling the product efficiently. Failure to observe these tips will not result in damage to the product. This information does not include any information relevant to health or workplace safety.

2 Safety notices

CAUTION

Risk of injury and material damage in case of non-compliance

Installation, commissioning, maintenance and repairs may only be performed by qualified specialists in accordance with these installation and operating instructions.

The product is state-of-the-art.

The following are examples of situations in which the product may cause a hazard:

- The product is not properly installed, used or maintained.
- The product is not used for its designated purpose.
- The locally applicable regulations, laws, directives or guidelines are not observed.

► The product may only be used in accordance with these installation and operating instructions and the product's technical data. Any changes or additions to the intended use of the product, as well as modifications to the product, such as those in the following examples, require the written permission of the manufacturer:

- Use of the product under extreme conditions, such as aggressive fluids or abrasive dusts
- Additional drilled holes or threads

⇨ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

► Make sure that the power supply is disconnected before you mount, adjust, modify, maintain or repair the product.

► Whenever work is carried out on the product, make sure that the product cannot be actuated by mistake.

► Perform maintenance tasks, renovation work or attachment work outside of the machine's danger zone when possible.

► Do not reach into the operational range of the product.

► Observe the specified maintenance intervals and specifications regarding the quality of the operating material.

► When using the product under extreme conditions, adjust the maintenance interval according to the degree of contamination.

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CAUTION

Notes and handling regulations for electrostatically sensitive components

Electrostatically sensitive components are individual components, integrated circuits or assemblies that can be damaged by electrostatic fields or electrostatic discharge.

- ▶ When handling electrostatic components, make sure that persons, the work area and packaging are all fully grounded.
- ▶ Touch electronic components only in appropriately identified areas with conductive flooring and only if:
  - You are grounded by means of special bracelets.
  - You wear shoes that are suitable and approved for the discharge of electrostatic charges.
- ▶ Do not bring electronic assemblies into contact with plastics and parts of clothing that have plastic content.
- ▶ Store electronic assemblies on conductive underlays only.
- ▶ Do not install electronic assemblies in the vicinity of data back-up devices or monitors (monitor distance > 100 mm).
- ▶ Perform measurements on electronic assemblies only if:
  - The measuring instrument is grounded (e.g. via a ground conductor).
  - The measuring head is momentarily discharged before measuring with a floating measuring instrument.

WARNING

Risk of injury caused by suspended loads

Improper handling of suspended loads can cause serious injury.

- ▶ Always keep an adequate safety distance from suspended loads.
- ▶ Never walk underneath a suspended load.

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3 Proper use

NOTICE

The product is only to be used in its original state with its original accessories, with no unauthorized changes and within the stipulated parameter limits and operating conditions.

Any other or secondary use is deemed improper.

- ▶ Operate the product only in compliance with the associated installation and operating instructions.
- ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇨ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

The product is designed exclusively for electric operation using a 110 - 230 V AC power supply.

The product is to be used as intended in enclosed rooms for temporary gripping, handling and holding.

The product is not suitable for clamping workpieces during a machining process.

Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

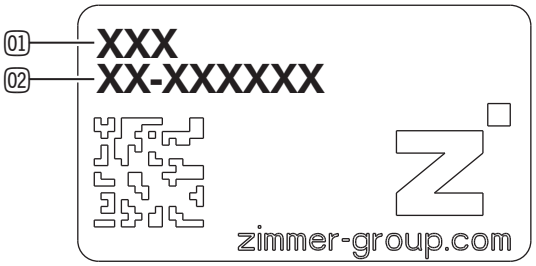
Installation, commissioning and maintenance may only be performed by trained specialists. These persons must have read and understood the installation and operating instructions in full.

5 Product description

5.1 Type plate

A type plate is attached to the housing of the product.

The article number and confirmation number are shown on the type plate.



01 Article number

02 Confirmation number

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6 Functional description

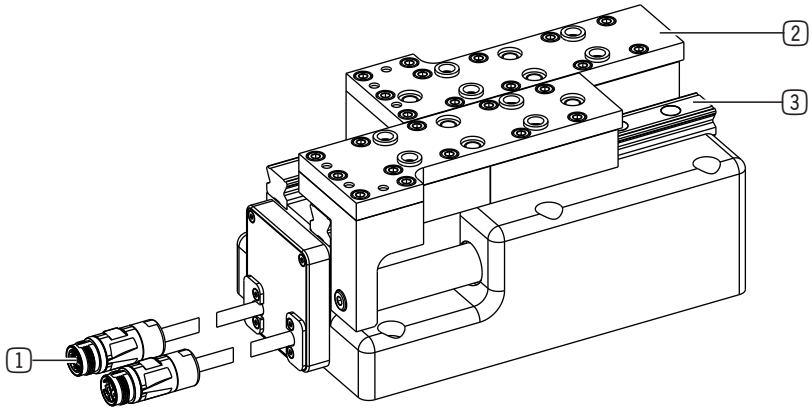
The product has very high gripping force to ensure the safe handling of heavy workpieces.

The servo drive governs the position, speed and force.

If the energy supply is lost, the workpiece is stopped by the self-locking mechanism of the product.

The gripper jaws of the product are arranged parallel to each other on two opposing guide rails and can be moved relative to each other.

You can individually equip the gripper jaws, which run parallel to one another.



1 Power supply

2 Gripper jaw

3 Guide rail

6.1 Position measuring system

The drive of the product has a motor with single-turn absolute encoder with 20-bit resolution.

The single-turn absolute encoder is used for absolute indirect position measurement within a motor revolution.

INFORMATION

When this single-turn absolute encoder variant is used, the absolute axis position is lost after the voltage is shut off.

To use this absolute encoder as a 20-bit multiturn absolute encoder, we recommend using the battery box contained in the scope of delivery of the converter.

INFORMATION

When this multiturn absolute encoder variant is used, the absolute axis position is maintained with the battery buffer even after the voltage is shut off.

The multiturn absolute encoder is used for absolute indirect position measurement within 66,536 motor revolutions. If the motor is disconnected from the battery box, the information about the absolute axis position is lost after about one minute. The multiturn absolute encoder replaces a separate absolute value at the motor.

INFORMATION

Using the multiturn absolute encoder requires buffer storage via an external battery. The following accessories must be used for this:

- Battery box SUP-E02-MSM-BATTERYBOX-xxx

7 Technical data

INFORMATION

► You can find the information in the technical data sheet on our website.

This data varies within the series, depending on the specific design.

► Please contact Zimmer Customer Service if you have any questions.

8 Accessories/scope of delivery

INFORMATION

If any accessories not sold or authorized by Zimmer GmbH are used, the function of the product cannot be guaranteed. Zimmer GmbH accessories are specifically tailored to the individual products.

► For optional accessories and those included in the scope of delivery, refer to our website.

9 Transportation/storage/preservation

► Transport and storage of the product must be done only with the original packaging.

► If the product has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unexpected movements can occur.

  ► Before commissioning the product and after transport, check all power and communication connections as well as all mechanical connections.

► If the product is stored for an extended period, the following points are to be observed:

  ► Keep the storage location as dust-free and dry as possible.

  ► Avoid temperature fluctuations.

  ► Avoid wind/drafts/water condensation formation.

  ► Pack the product and do not expose it to direct sunlight during storage.

► Clean all components. There must be no soiling left on the components.

► Visually inspect all components.

► Remove all foreign substances.

► Properly remove potential corrosion spots.

► Close electrical connections using suitable covers.

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10 Installation

WARNING

Risk of injury due to uncontrolled movements

Risk of injury in case of unexpected movement of the machine or system into which the product is to be installed.

- ► Switch off the energy supply of the machine before any work.
- ► Secure the power supply against being switched on unintentionally.
- ► Check the machine for any residual energy that may be present.

CAUTION

Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ► Switch off the power supply to the machine before carrying out any work.
- ► Secure the power supply against being switched on unintentionally.
- ► Check the machine for any residual energy that may be present.

CAUTION

Risk of injury due to objects being ejected

Spring-loaded components can jump out when installing or uninstalling the device.

NOTICE

- ► Installation may only be carried out by qualified personnel in accordance with these installation and operating instructions.
- ► Switch off the power supply before any assembly, installation or maintenance work.

INFORMATION

Requirements for the mounting surface:

- Permissible unevenness [mm]: 0.03

Further installation information:

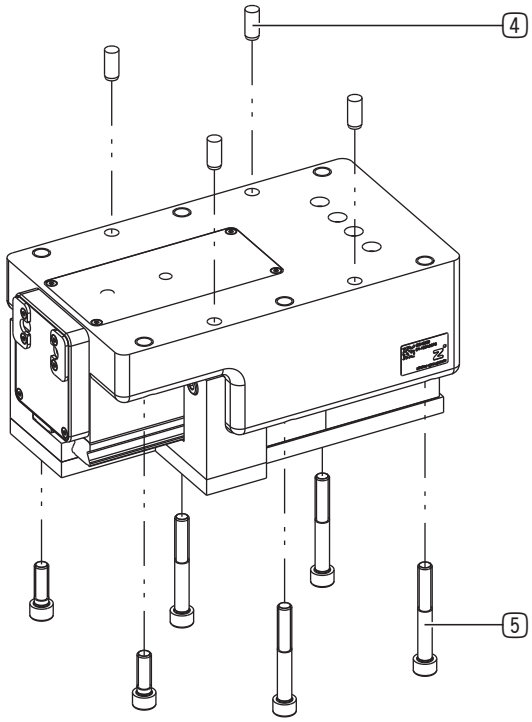
- The mounting screws are not included in the scope of delivery.
- Strength class of the mounting screws 8.8 (DIN EN ISO 4762)

- ► Make sure that the mounting piece is sufficiently rigid.
- ► Observe the tightening torque of the mounting screws.
- ► Verify the permitted load capacity of the required screw connections in accordance with VDI 2230.

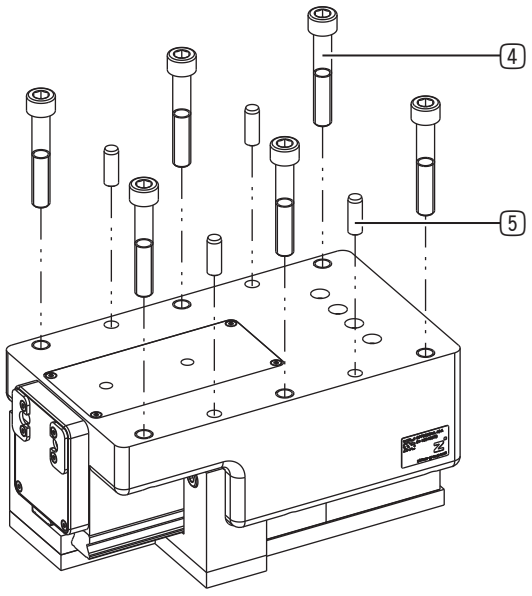
10.1 Installing the product

- ▶ Insert the straight pins into the designated fits on the product.
- ▶ Use the straight pins to position the product on the mounting piece.
- ▶ Mount the product on the mounting piece using the appropriate mounting screws.

Option 1



Option 2



4 Mounting screw

5 Straight pins

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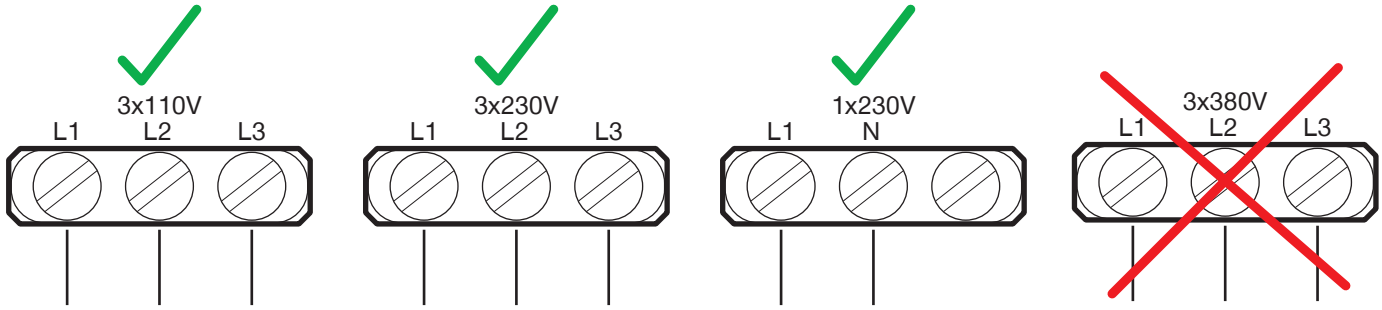
10.2 Installing the connection terminal

INFORMATION

- ▶ It is mandatory to comply with the clamping variants illustrated in the figures.
- ⇨ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.
- ▶ For more information about the drive control unit connection assignment, refer to the documentation of the manufacturer:
  - Bosch Rexroth HCS01 series



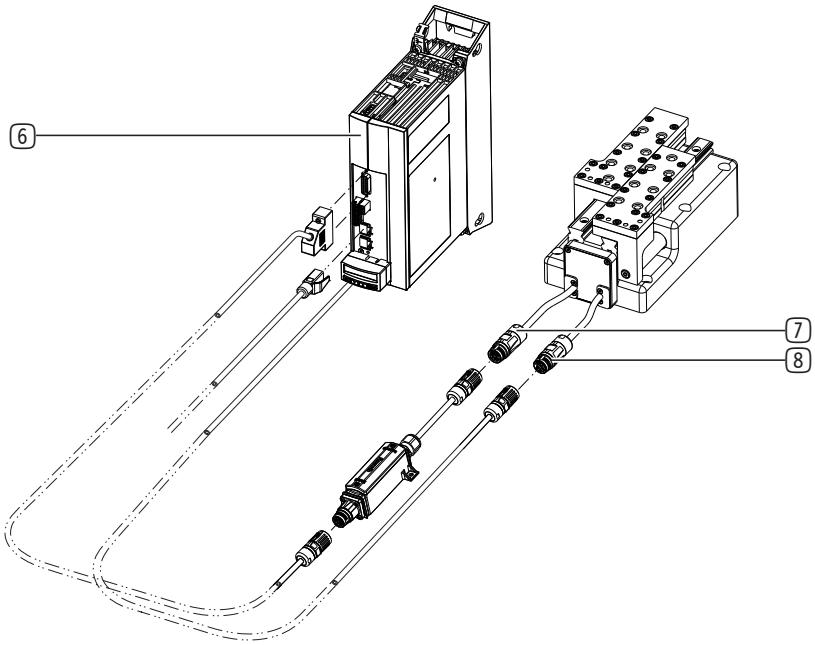
10.3 Installing the energy supply

NOTICE

The cables that are used by Zimmer GmbH feature a minimum bending radius of 10 x the outer diameter.
This bending radius must not be undershot!

- ▶ Freely suspended cables must be secured to prevent excessive motion loads or pinching.
- ▶ The contacts of the energy supply must be dry, clean and undamaged at all times.
- ⇨ Damage to the contacts can result in malfunction of the product.

- ▶ Connect downstream cables for connection to a drive control unit to the product using screw couplings.



6 Drive control unit
7 Rotary encoder cable
8 Motor cable

10.3.1 Connecting the battery box

INFORMATION

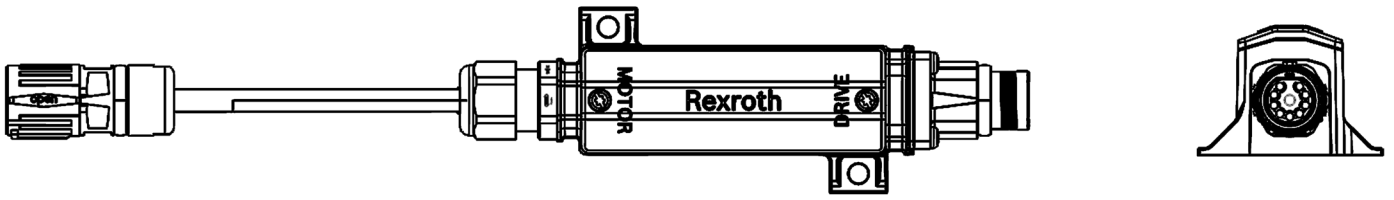
The delivery of the battery box includes a battery.
The battery box is delivered ready to operate.

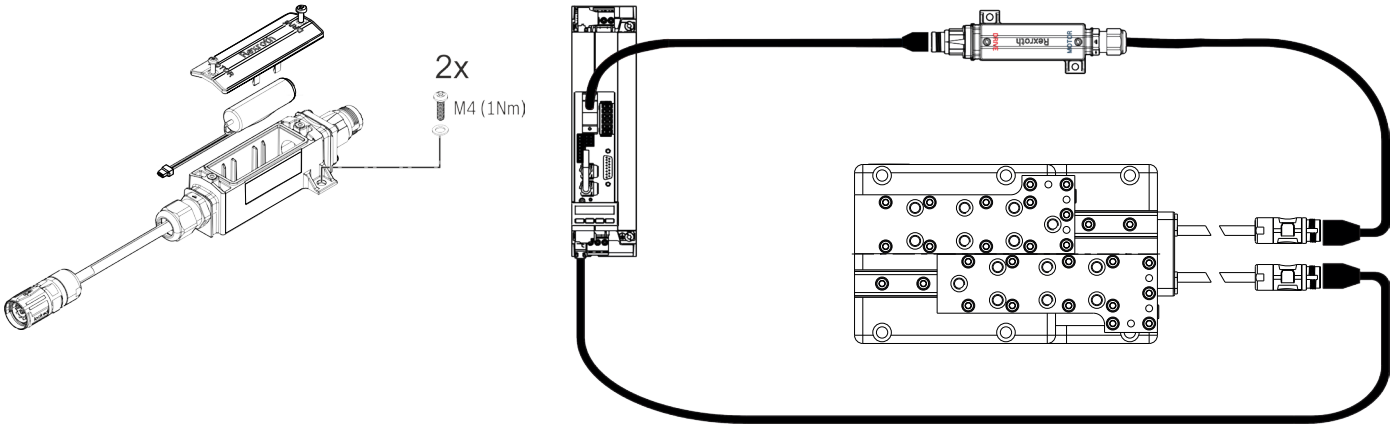
The battery box *SUP-E02-MSM-BATTERYBOX* is an accessory set for operating MSM motors with absolute encoder (M5) and is used for buffering encoder data when the voltage is shut off.

INFORMATION

- ▶ Do not replace the battery when the control voltage is shut off.
- ⇨ Otherwise, the absolute encoder position and thus the position reference of the axis will be lost.

Version	PRM1-03V6-2600C-D2-LITH-ZNR-50
Voltage [V]	3.6
Output [mAh]	2600
Life-endurance	Up to 10 years, depending on the load and ambient temperature
Spare battery	R911369925 (SUP-E02-MSM-BATTERY)



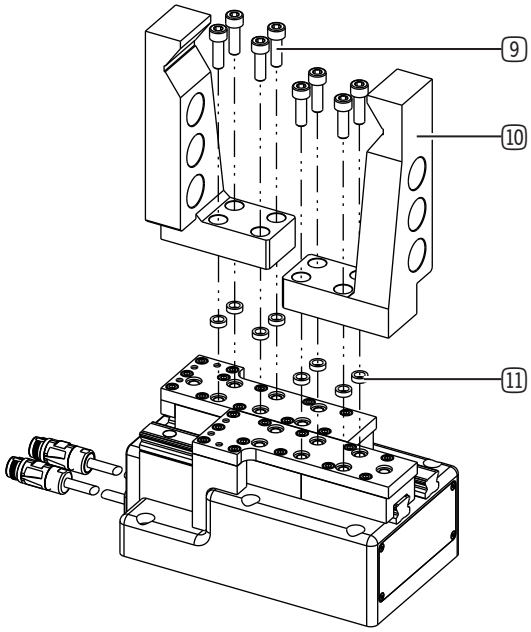


10.4 Installing the gripper fingers

INFORMATION

► Please contact Zimmer Customer Service if you have any questions.

The figure shows an example of the installation of a customer-specific gripper finger.



9 Mounting screw

10 Customer-specific gripper finger

11 Centering Disc

10.5 Heat dissipation

In the event of high ambient temperatures, the product must be installed on heat-dissipating materials.

If the product is operated under very high ambient temperatures and with fast clock cycles on an ongoing basis, this might reduce its service life.

INFORMATION

► The cycle time must therefore be reduced as the temperature increases.

10.6 Installing accessories

NOTICE

► Before installing an accessory, make sure it is suitable for use with the selected variant.

► You can find information on our website.

► Please contact Zimmer Customer Service if you have any questions.

11 Commissioning

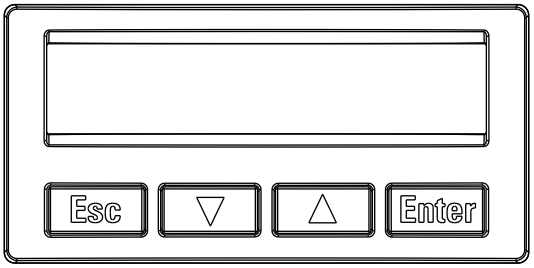
11.1 Checking operational readiness

▶ Check the energy supply.
▶ Check all mounting screws for the prescribed tightening torque.

11.2 Easy Startup

11.2.1 Setting the IP address

▶ Define the IP address for the drive control unit.
  • Standard: 192.168.0.1
▶ Enable the IP range on your computer for the entry of the IP address in the drive control unit via the control panel.



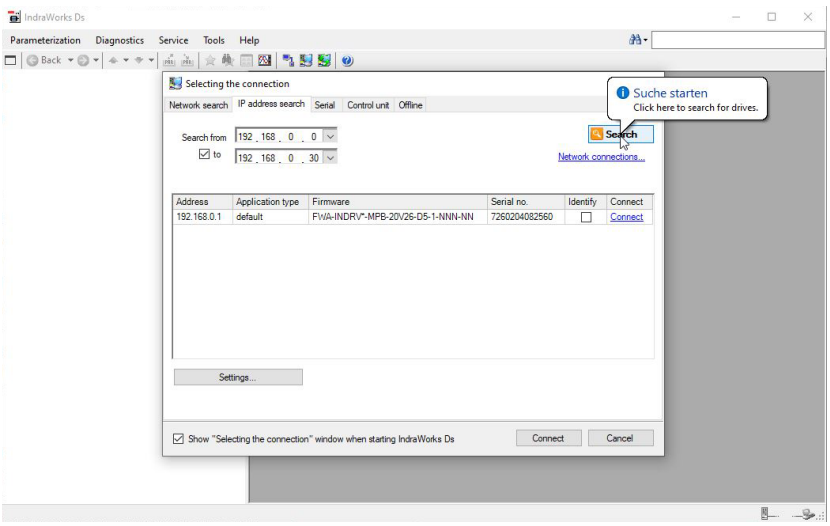
▶ Press the *Enter* button.
▶ Navigate by pressing the ▼▲ buttons.
▶ Navigate to the *Ethernet* entry.
▶ Press the *Enter* button.
⇨ The selection has been confirmed.
▶ Press the *Enter* button.
⇨ The *IP-Addr* entry is shown.
▶ Set the IP address by pressing the ▼▲ button.
▶ Press the *Enter* button.
⇨ The input has been confirmed.

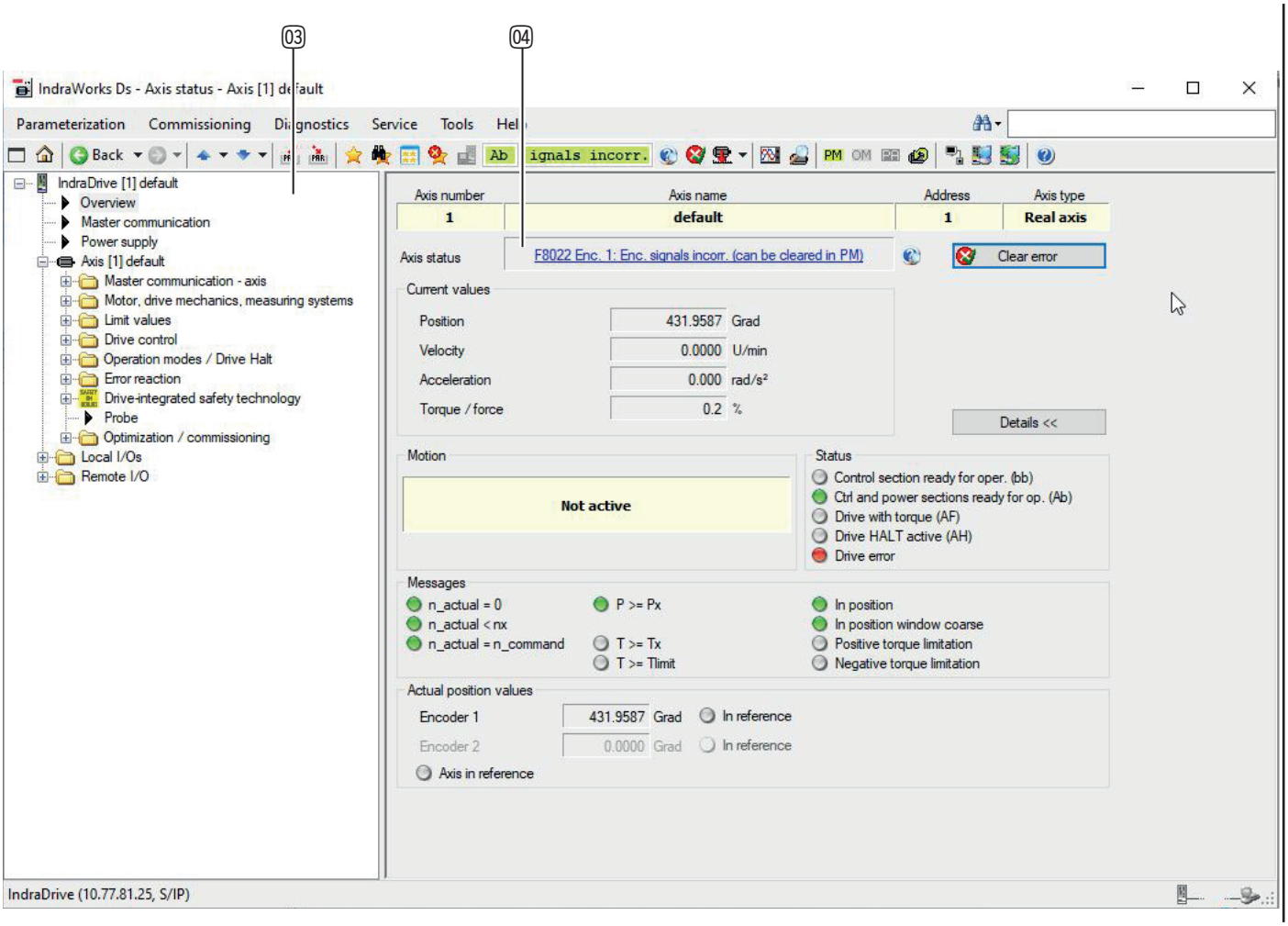
▶ Restart the drive control unit.

INFORMATION

The software *IndraWorks Ds* or *IndraWorks Engineering* is required for initial commissioning.
This setting can vary in other software versions.
▶ Please consult the software manufacturer to learn how to use the software version available to you.
⇨ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

▶ Start the *IndraWorks Ds* software.
▶ Enter the IP address in the *IndraWorks Ds* software and the computer.
▶ Click the *Search* button.
⇨ Found drive control units are shown in the *Connection Selection* window.
▶ In the *Connect* column, enable the option field of the desired drive control unit.
  • The IP address of the drive control unit must match.
▶ Click the *OK* button.
⇨ The connection to the drive control unit is established.
⇨ The main window of the *IndraWorks Ds* software opens after successful connection.





03 Navigation pane for displaying and editing various functions

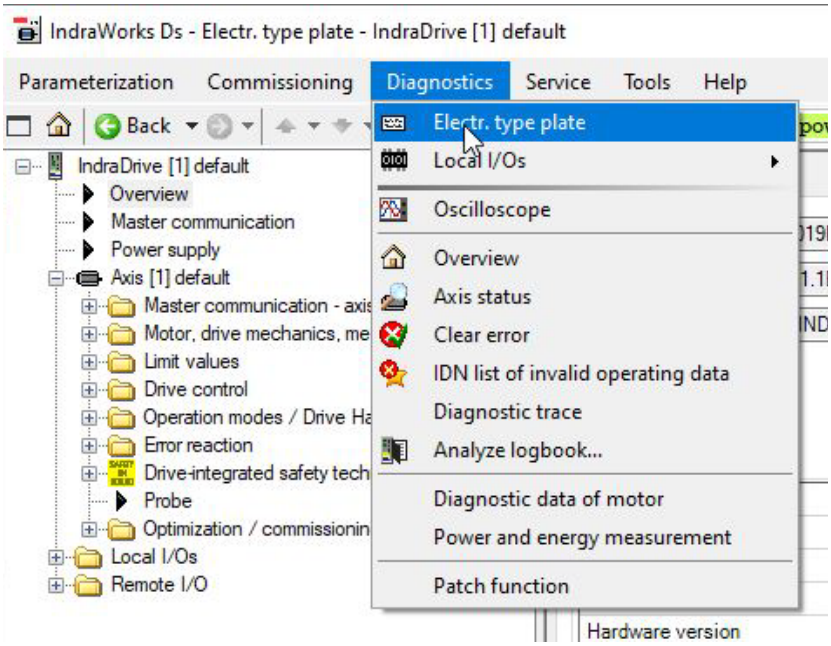
04 Error messages are shown in the *Axis Status* area

11.2.2 Reading out the firmware status

NOTICE

The firmware of the drive control unit and the parameter set must match.

- ▶ In the *Diagnostics* menu, click *Electr. Type Plate*.
- ⇨ The firmware status is displayed.



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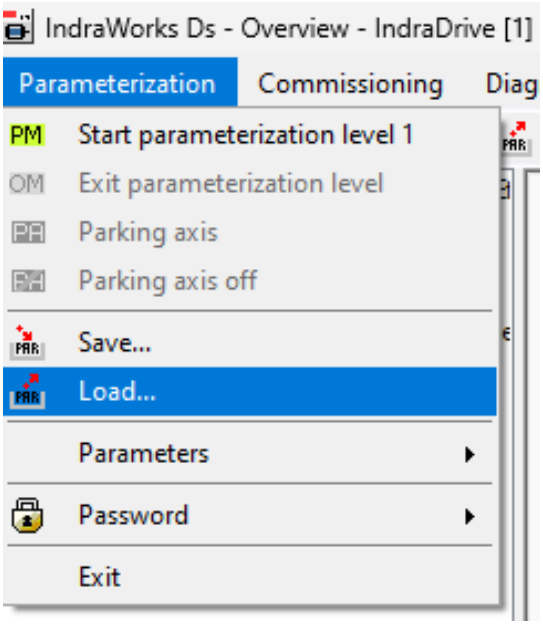
11.2.3 Loading axis-specific parameter sets

► In the *Configuration* menu, click *Load*.

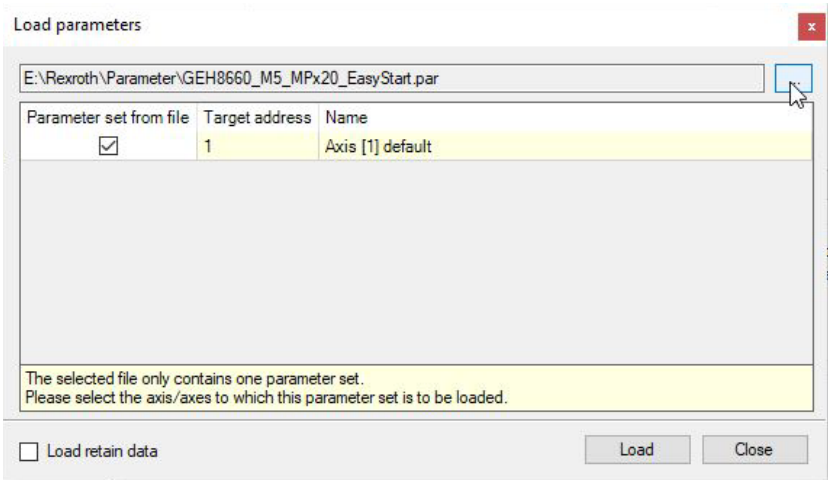
⇨ The *Load Parameters* window opens.



► Enable the option field of the desired parameter set.

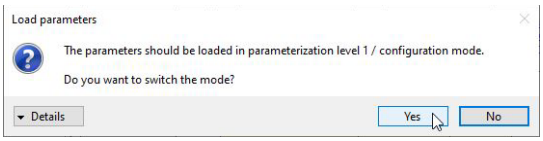
► Click the *Load* button.

⇨ The *Load Parameters* window closes.



The software notifies you before transmitting that the drive control unit must be in configuration mode.

If the drive control unit is already in configuration mode, this message will not appear.



► Follow the instructions in the message.

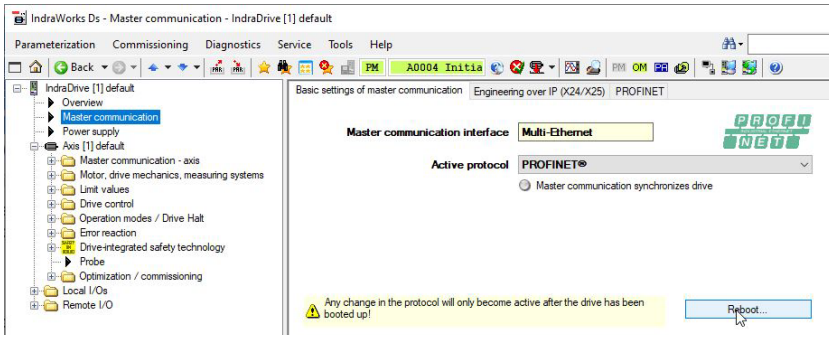
► Click the *Yes* button.

⇨ The transfer of the parameter set to the drive control unit starts.

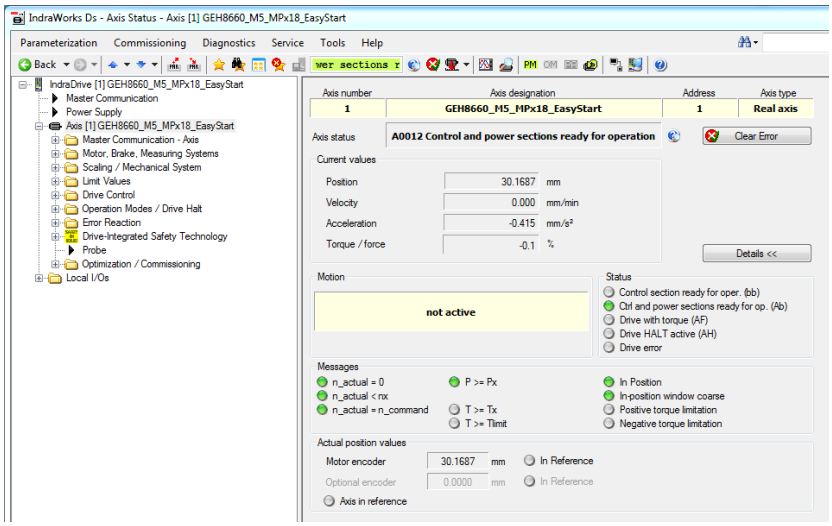
INFORMATION

After the parameter set has been successfully transmitted to the drive control unit, it must be restarted. To do this, you can either briefly disconnect the drive control unit's power supply or use the *IndraWorks Ds* software to reboot.

- ▶ In the navigation pane, click *Master Communication*.
- ⇨ The *Master Communication Basic Settings* tab is displayed in the window.
- ▶ Click the *Reboot* button.
- ⇨ The reboot of the drive control unit starts.



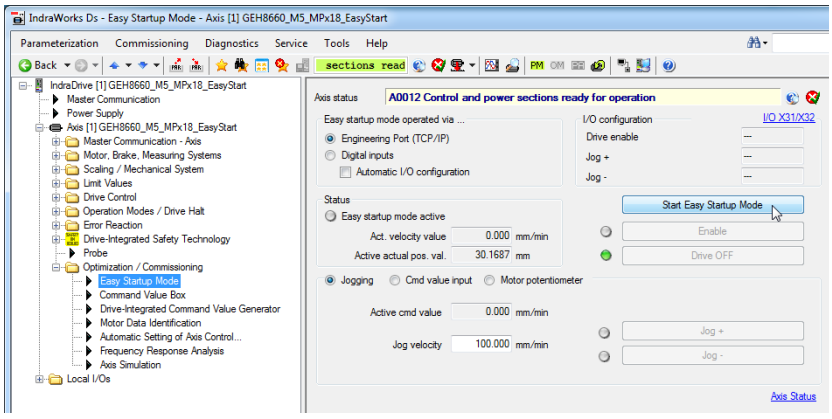
- ⇨ The name of the parameter set is displayed in the navigation pane after the parameter set has been transmitted successfully.
- ▶ Eliminate all errors so that the product can be moved.
- ▶ In the *Diagnostics* menu, click *Axis status*.
- ⇨ Status messages are displayed in the window.
- ▶ Click the *Clear Error* button to acknowledge the error messages.



11.2.4 Moving the product in Easy Startup mode

The product can be moved in Easy Startup mode as soon as it is ready to be operated.

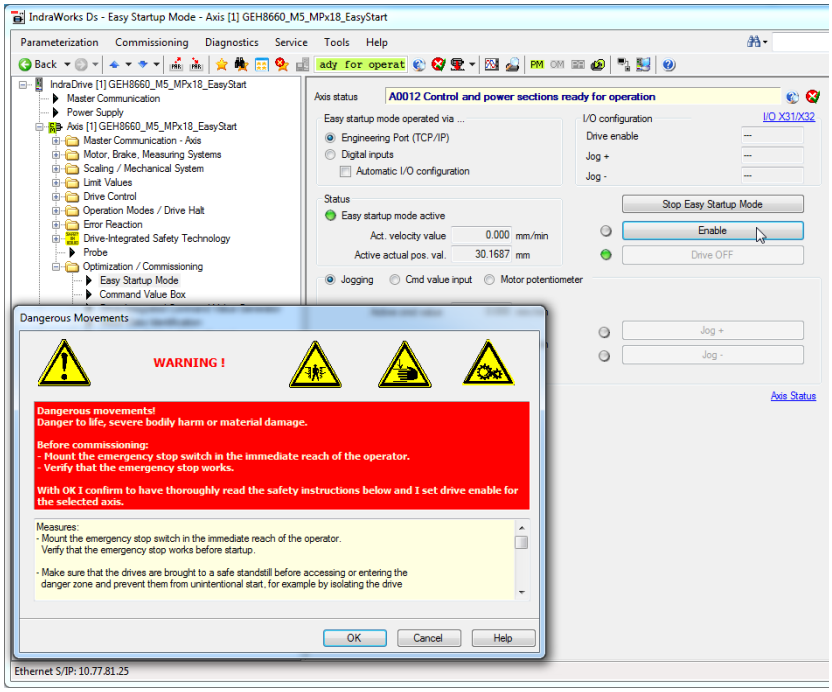
- ▶ In the navigation pane, click *Optimization/ Commissioning*.
- ▶ Click *Easy Startup Mode*.
- ⇨ The *Easy Startup Mode* area is displayed.
- ▶ Click the *Start Easy Startup Mode* button.
- ⇨ Easy Startup mode has been started.
- ⇨ The status pane of Easy Startup mode is enabled.



► Click the *Enable* button.

⇨ The window with warning notices is displayed.

► Please read all notices carefully and follow each of these notices.



DANGER

Risk of death and material damage in case of non-compliance

► Always comply with the notices displayed by the software.

- You can reach all notices by scrolling.

⇨ Zimmer GmbH shall accept no liability for any damage caused by failure to observe these notices. The operator bears sole responsibility.

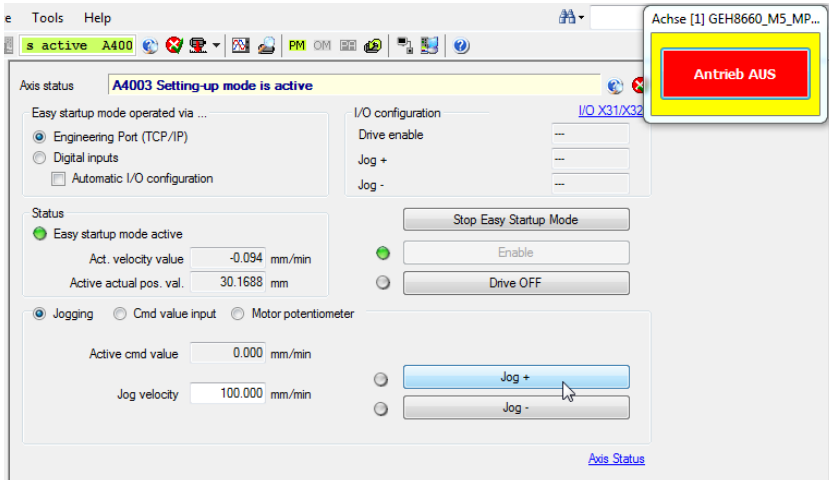
► Click the *OK* button.

⇨ The window with the notices closes.

⇨ The *Jog +* and *Jog -* buttons for manual movement of the product are displayed.

⇨ The window with the *Drive OFF* button for disabling the drive control unit is displayed.

⇨ The drive comes to a standstill when the drive control unit disables the release.



INFORMATION

At initial commissioning, an actual speed value of 150 [mm/min] is recommended.

This ensures adequate speed for being able to detect a movement and rule out any danger.

11.2.5 Referencing the motor encoder

Referencing is used to determine the reference position of the gripper fingers.

The reference measurement is determined without gripper jaws installed. If you want to determine a reference position of the product with installed gripper jaws, you have to determine the reference position and enter it on your own.

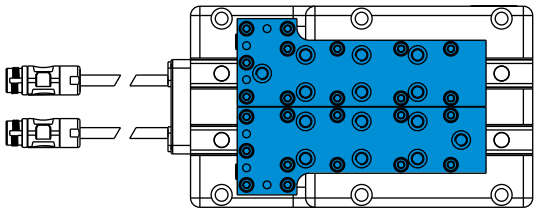
NOTICE

An approach over the end stop can result in jamming of the gripper fingers.

From the middle position, the product can be moved 30 mm in each direction.

- ► Do not exceed the permitted operating parameters while extending.
- ⇨ The product can only be opened mechanically and by Zimmer Customer Service.

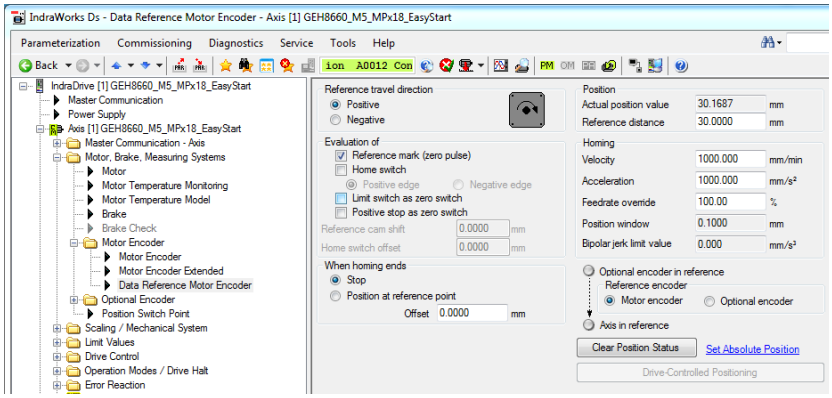
- ► Move the product to the middle position in jog mode via the *IndraWorks Ds* software.
- ⇨ The middle position is reached if both outer edges of the gripper fingers close flush.
- ► Disable the release for the drive control unit.
- ► Reference the product in the middle position.



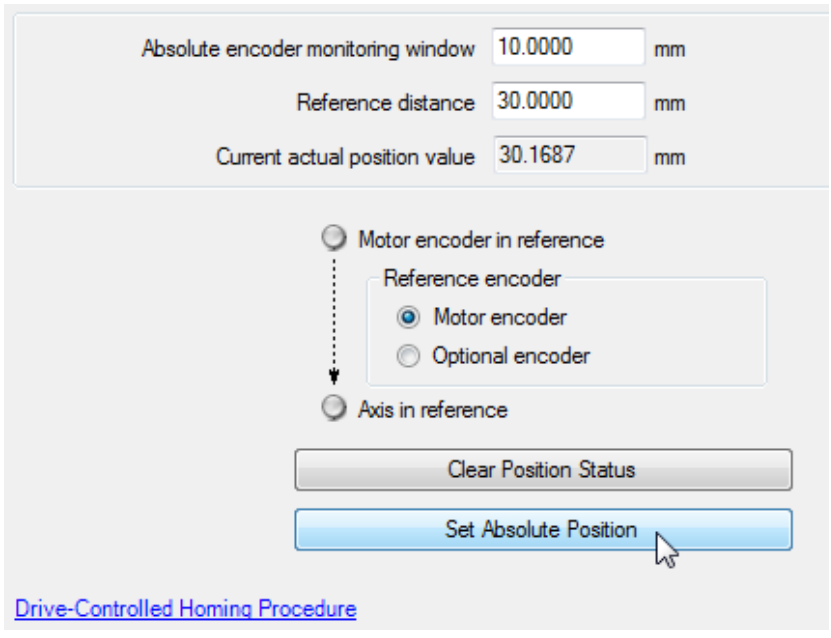
INFORMATION

The travel range can be limited in mm via the *IndraWorks Ds* software.

- ► In the navigation pane, click *Motor, Brake, Measurement Systems*.
- ► Click *Motor encoder*.
- ► Click *Motor Encoder Position reference*.
- ► Enter the middel position in the *Reference* measurement field: 30 mm



- ► Click the *Set Absolute Position* button.
- ⇨ The product references itself to the entered reference measurement.
- ► Move the product in Easy Startup mode after the reference position has been adopted.



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11.3 EtherCAT

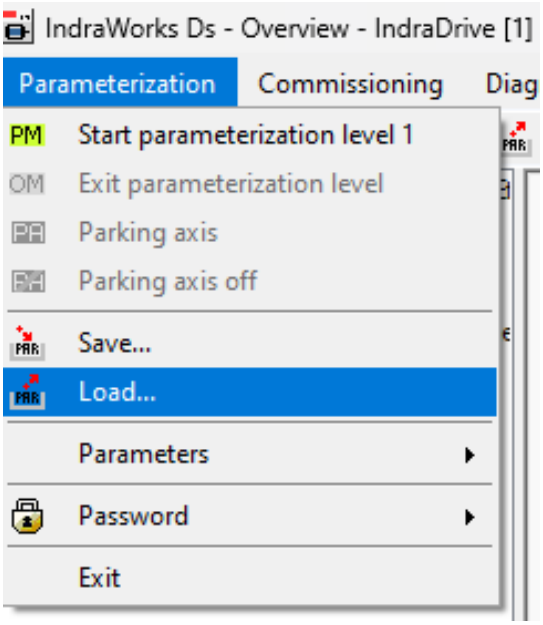
NOTICE

Commissioning the product depends on the configuration of the drive control unit and can therefore vary.
This section uses the commissioning of the product of the GEH8660-B installation size as an example.

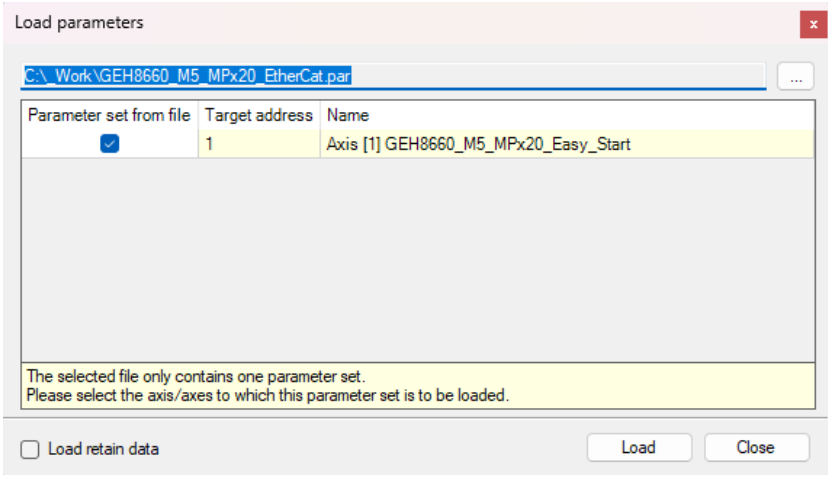
- ▶ Do not use the example as a programming template.
- ▶ For more information, refer to the "Function of the function block" section.

11.3.1 Configuring the drive control unit

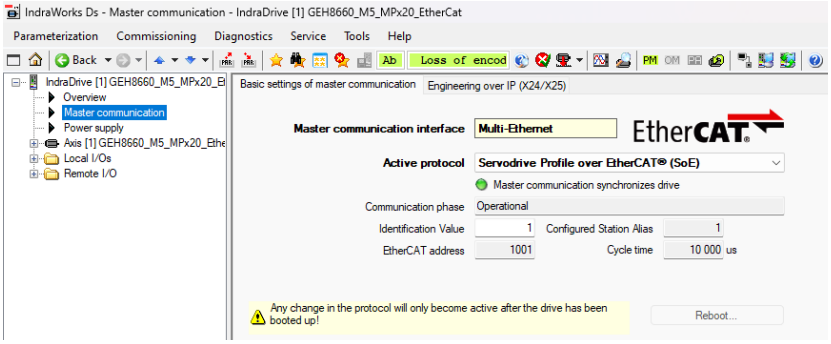
- ▶ Connect the drive control unit to the computer using its network interface.
- ▶ Search for the correct drive control unit using the *IndraWorks Ds* software, see section "Setting the IP address".
- ▶ In the *Configuration* menu, click *Load*.
- ⇨ The *Load Parameters* window opens.



- ▶ Enable the option field of the desired parameter set.
- ▶ Click the *Load* button.
- ⇨ The *Load Parameters* window closes.



- ▶ In the navigation pane, click *Master Communication*.
- ⇨ The *Master Communication Basic Settings* tab is displayed in the window.
- ▶ In the *Active Protocol* drop-down menu, select the communication type for the control system.



INFORMATION

After an EtherCAT protocol is activated, the direct IP connection to the drive control unit is no longer possible.

INFORMATION

Zimmer GmbH recommends setting up the listed configuration in its entirety and configuring it in the EtherCAT PLC.

All parameters can be loaded to the drive control unit using the attached parameter set and re-enabled via a restart.

► For more information refer to the “Transferring axis output parameters to PLC” section.

► For more information, refer to the product-specific instructions from Bosch Rexroth.

11.3.2 Installing the device description

The EtherCAT master needs the device description files of the devices being used in order to create the configuration in online and offline mode. These device descriptions are the XML files with EtherCAT Slave Information (ESI). One XML file can contain multiple device descriptions. The XML files can be requested from the respective manufacturer and/or are available for download.

INFORMATION

For the Bosch Rexroth IndraDrive Cs in the example project *HCS01.1E-W0009-A-02-B-ET-EC-NN-L4_NN-FW*, the device description *BoschRexroth_IndraDrive_ECAT_SoE_01V27.xml* is required.

► Store the device description files in the installation directory of TwinCAT.
- Standard*: C:\TwinCAT\3.1\Config\Io\EtherCAT*

► Start TwinCAT.

► In the *TWINCAT* menu, click *EtherCATDevices*.

► Click *Update Device Description (via ETG Website)*.

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11.3.3 Establishing a connection to the drive control unit

For configuration and monitoring with active EtherCAT master communication using the *IndraDrive Ds* software, you have several options for connecting the drive control unit directly:

- ADS interface
- PC network card as EtherCAT master
- EoE

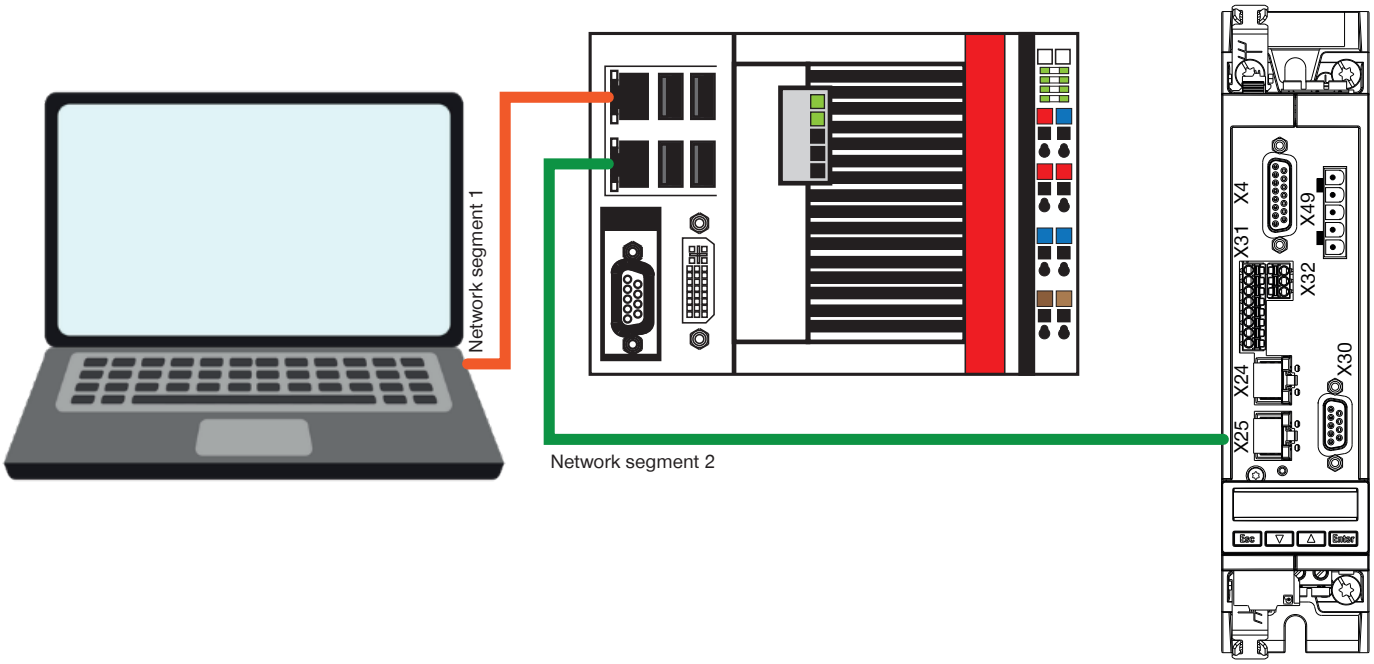
INFORMATION

► For more information about connecting the drive control unit, refer to the product-specific instructions of the manufacturer.

- Bosch Rexroth: *DE_Indradrive_EtherCAT_TwinCAT_Inbetriebnahmeanleitung_V04*

11.3.3.1 Establishing an EoE connection

Example representation of establishing a connection via EoE to the drive control unit:



Computer Network port IP: 192.168.0.125 SNM 255.255.255.0	Beckhoff CX-5130 Port X000 - Ethernet IP: 192.168.0.101 SNM 255.255.255.0	Beckhoff CX-5130 Port X001 - EtherCAT IP: 192.168.9.3 SNM 255.255.0.0	IndraDrive HSC01- 1E X25 P1 IP: 192.168.9.5 SNM 255.255.255.0

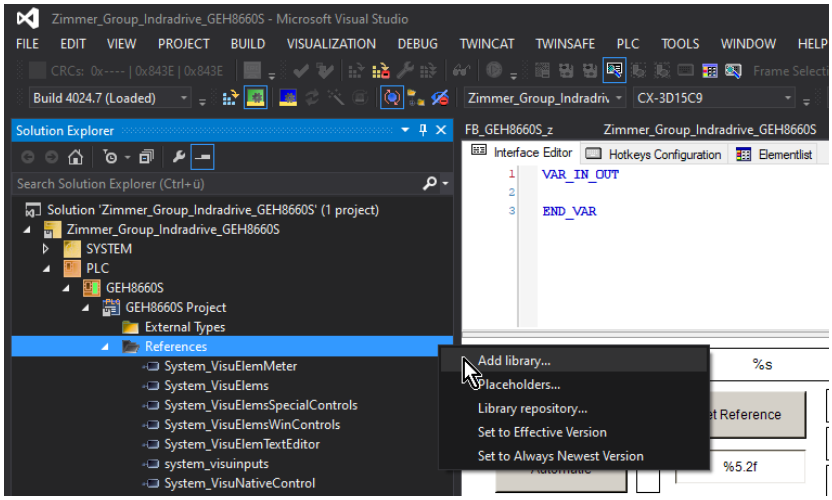
► Check the following points before establishing the connection for the first time:

- The IP address of the CX control system and the PC are in the same network segment.
- The IP addresses of the drives are in a separate network segment.
- The EtherCAT port of the CX control system is in the same network segment as the drives will be later.
- The subnet masks of the CX control system are set to 255.255.0.0.

► Set the IP addresses of both ports of the CX control system and the computer.

► Set an IP address in the computer in the range of network segment 1.

To start the setup, you need a started PLC project on the CX control system.



► Open the included TwinCAT project.

⇨ The project opens in *Microsoft Visual Studio*.

► Click the example project in the *Solution Explorer*.

► Click *PLC*.

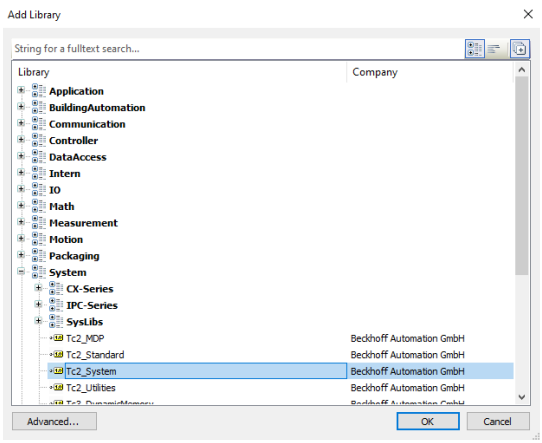
► Click *GEH8660*.

► Click *GEH8660 Project*.

► Right-click *References*.

► In the context menu, click *Add Library*.

⇨ The *Add Library* window opens.



► Click *System*.

► Click *SysLibs*.

► Click the *Tc2_Utilities.Lib* library.

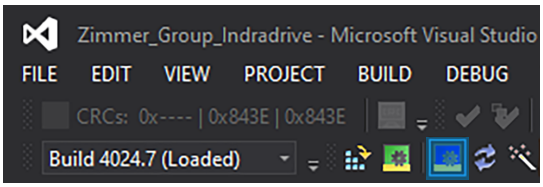
- The *Tc2_Utilities.Lib* library is required for the function *WORD_TO_HEXSTR()*.

► Click the *OK* button.

⇨ The *Add Library* window closes.

⇨ The *Tc2_Utilities.Lib* library has been installed.

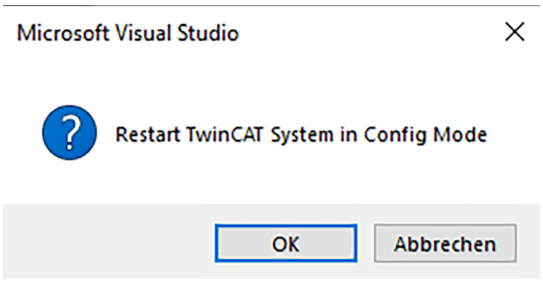
► Switch to configuration mode to find the currently connected hardware.



► Click the *OK* button.

⇨ The message closes.

⇨ TwinCAT is started in configuration mode.



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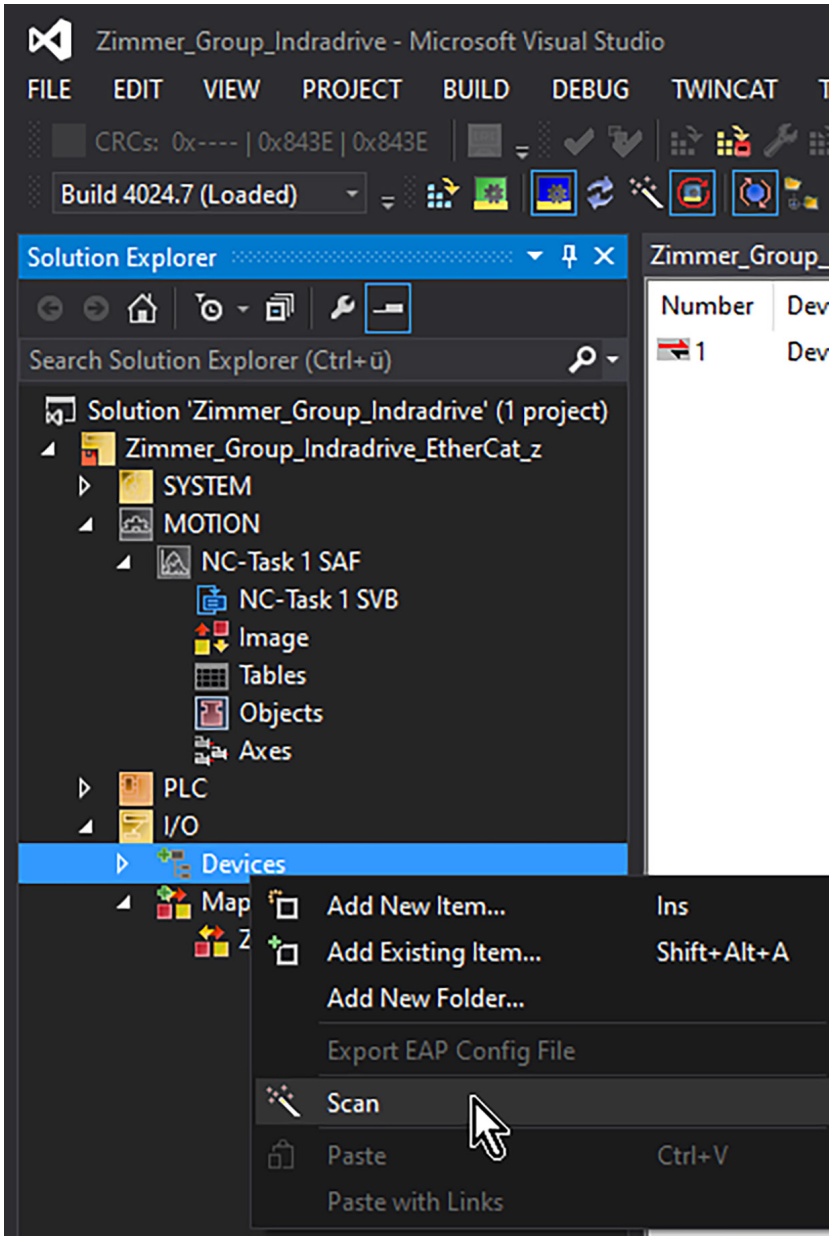
- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click the *Zimmer_Group_Indradrive_EtherCat_z* project.
- ▶ Click *I/O*.
- ▶ Right-click *Devices*.
- ▶ In the context menu, click *Scan*.



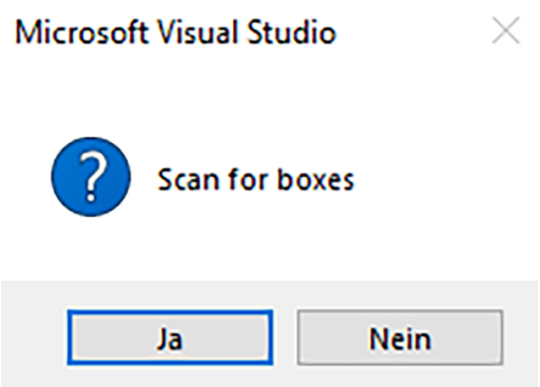
⇨ A message opens.

- ▶ Click the *Yes* button.

⇨ The message closes.

⇨ Drive control units are scanned for in *Devices*.

⇨ After the drive control unit has been detected, TwinCAT creates a new axis automatically.

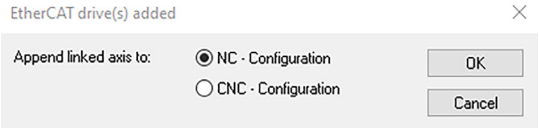


INFORMATION

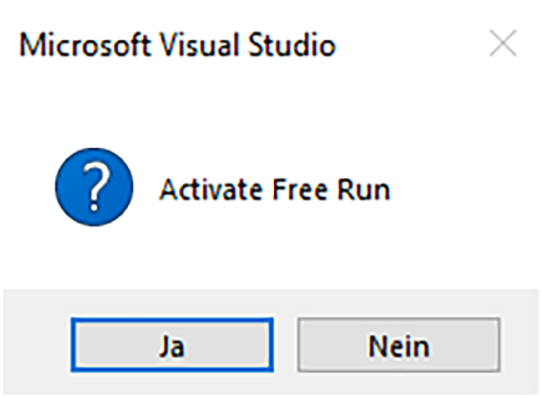
In the example, the target value positioning takes place in the drive control unit, which means that neither an NC nor a CNC axis is needed in TwinCAT motion.

⇨ The *EtherCAT drive(s) added* window opens.

- ▶ Click the *Cancel* button.



⇨ A message opens.



► Click the *Yes* button.

⇨ The message closes.

⇨ The configuration mode with Free Run has been activated.

► Click the example project in the *Solution Explorer*.

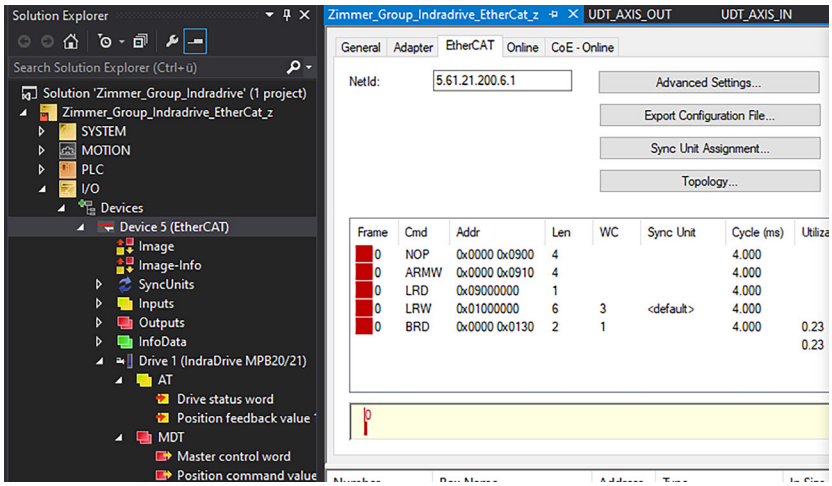
► Click the *Zimmer_Group_Indradrive_EtherCat_z* project.

► Click *I/O*.

► Click *Devices*.

► Click *Device 5 (EtherCAT)*.

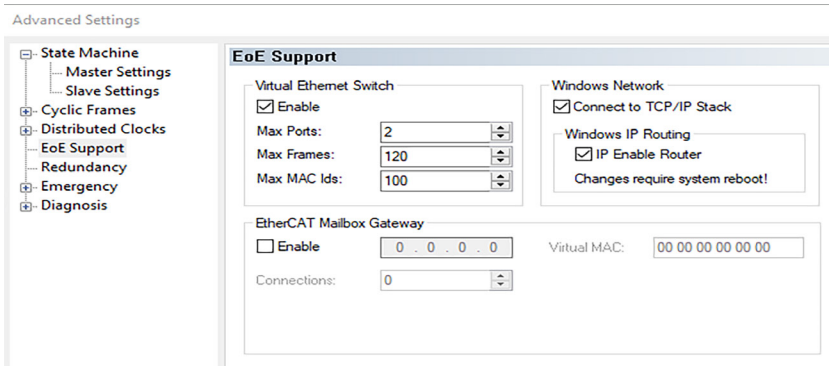
⇨ The window of the example project opens.



► Click the *EtherCAT* tab.

► Click the *Advanced Settings* button.

⇨ The *Advanced Settings* window opens.



► Click *EOE Support*.

► Activate the *Enable* option field.

► Activate the *IP Enable Router* option field.

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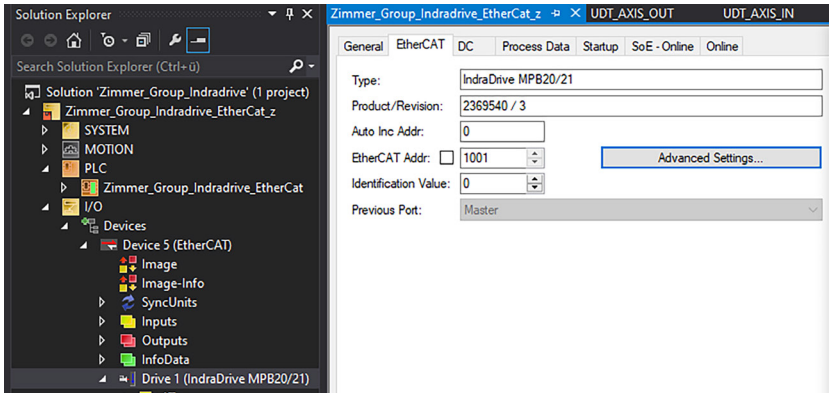
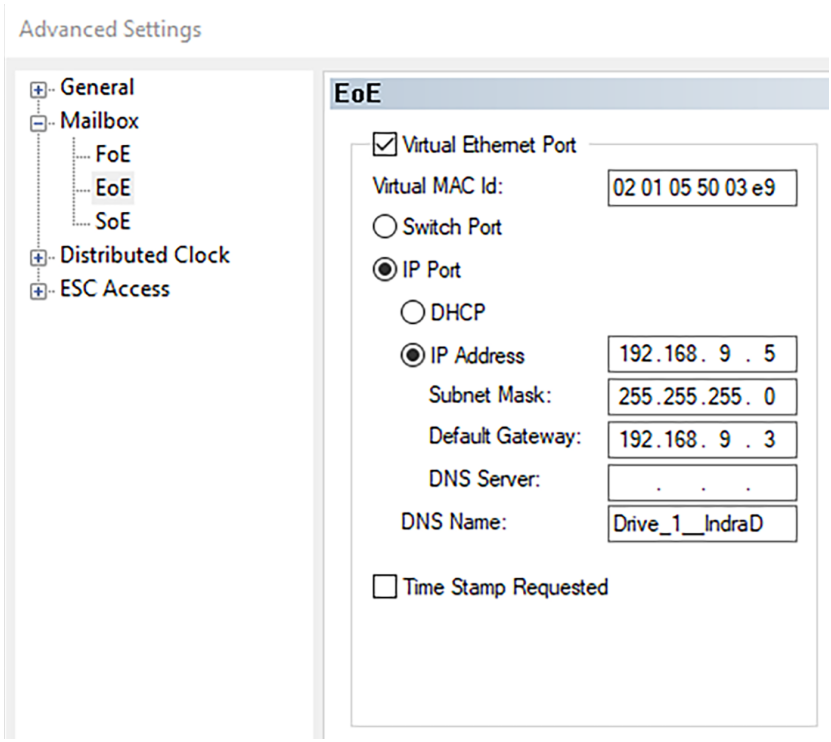
11.3.3.2 Setting the drive control unit

- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *I/O*.
- ▶ Click *Devices*.
- ▶ Click *Device 5 (EtherCAT)*.
- ▶ Click *Device 1 (IndraDrive)*.
- ⇨ The window of the example project opens.
- ▶ Click the *EtherCAT* tab.
- ▶ Click the *Advanced Settings* button.
- ⇨ The *Advanced Settings* window opens.



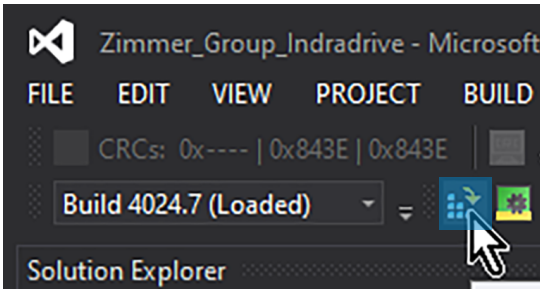
- ▶ Click *Mailbox*.
- ▶ Click *EOE*.
- ▶ Activate the *Visual Ethernet Port* option field.
- ▶ Activate the *IP Address* option field.
- ▶ Enter the desired IP address in the *IP Address* field.
- ▶ Enter the desired subnet mask in the *Subnet Mask* field.
  - Example: 255.255.255.0
- ▶ Enter the IP address of the EtherCAT master in the *Default Gateway* field.
- ▶ Enter the desired DNS name in the *DNS Name* field.
  - The DNS name can be selected as desired.



INFORMATION

In the example, the network card of Port X001 of the CX control system is entered under Windows.

- ▶ Start and activate the project.

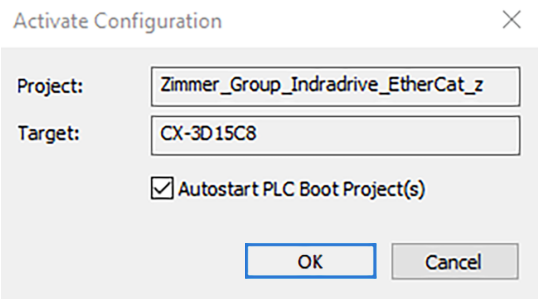


⇨ The *Activate Configuration* window opens.

► Activate the *Autostart PLC Boot Project(s)* option field.

► Click the *OK* button.

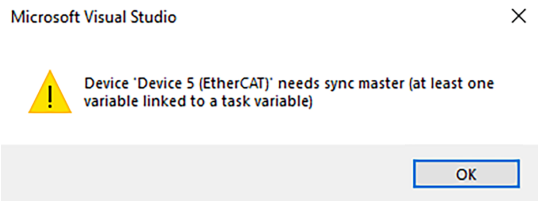
⇨ The *Activate Configuration* window closes.



⇨ A message opens if there are still no variables linked between the drive control unit and the PLC.

► Click the *OK* button.

⇨ The message closes.



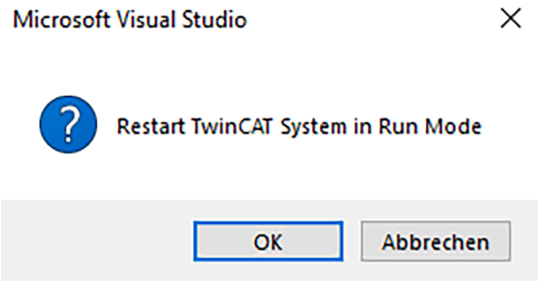
⇨ After the activation, the CX control system is set to Run Mode.

⇨ A message opens.

► Click the *OK* button.

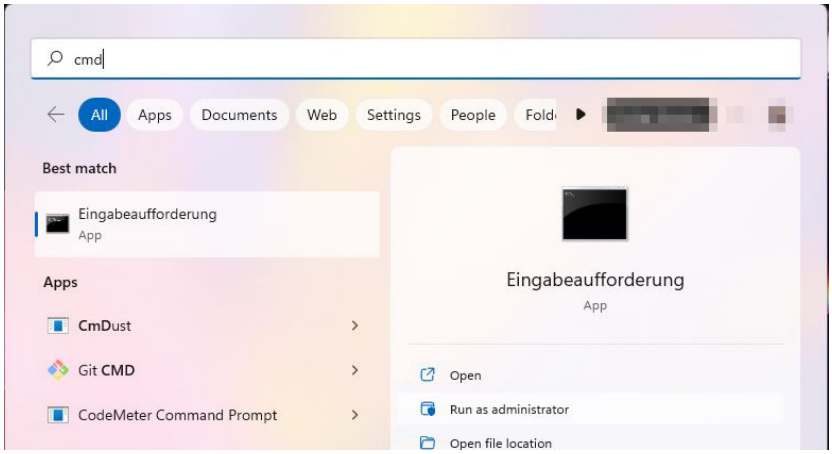
⇨ The message closes.

⇨ TwinCAT is restarted.



11.3.3.3 Establishing an Ethernet connection

► Run the command prompt on the computer as administrator.



INFORMATION

The *route PRINT* command shows you the newly configured route.

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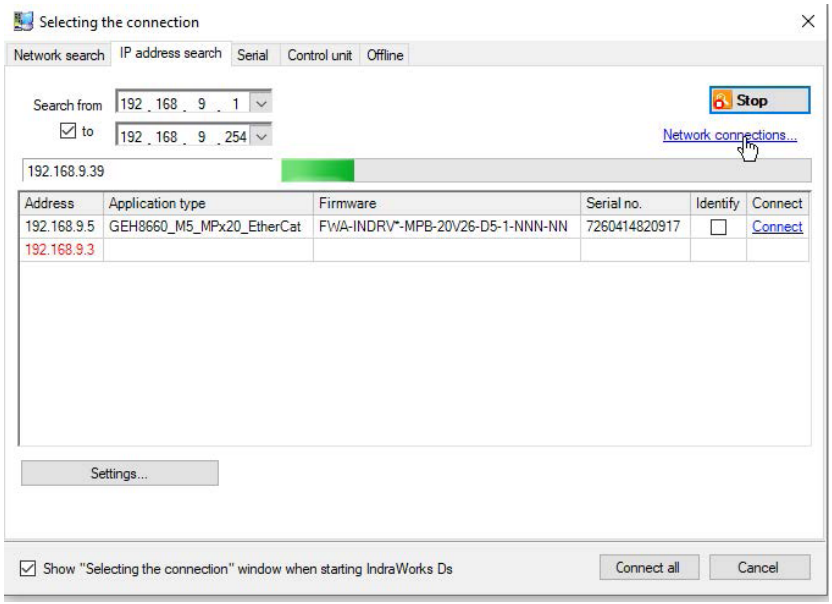
- ▶ Create a route from Port X000 to Port X001 of the CX control system with the command:
  - route -p ADD 192.168.9.0 MASK 255.255.255.0 192.168.0.101
  - Target network (PortX001 of the CX end number = 0)/mask/gateway(PortX001 of the CX control system)
- ▶ Restart the drive control unit.
- ⇨ The new IP address is adopted from the TwinCAT project.
- ▶ Use the *Ping 192.168.9.5* command to check whether an Ethernet connection to the drive control unit is possible.

```
IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0    192.168.178.1  192.168.178.78      25
        127.0.0.0        255.0.0.0         On-link         127.0.0.1     331
        127.0.0.1  255.255.255.255         On-link         127.0.0.1     331
  127.255.255.255  255.255.255.255         On-link         127.0.0.1     331
      169.254.0.0      255.255.0.0         On-link  192.168.178.78      26
  169.254.255.255  255.255.255.255         On-link  192.168.178.78     281
      192.168.9.0    255.255.255.0    192.168.0.101  192.168.178.78      26
    192.168.178.0    255.255.255.0         On-link  192.168.178.78     281
   192.168.178.78  255.255.255.255         On-link  192.168.178.78     281
  192.168.178.255  255.255.255.255         On-link  192.168.178.78     281
        224.0.0.0        240.0.0.0         On-link         127.0.0.1     331
        224.0.0.0        240.0.0.0         On-link  192.168.178.78     281
  255.255.255.255  255.255.255.255         On-link         127.0.0.1     331
  255.255.255.255  255.255.255.255         On-link  192.168.178.78     281
===========================================================================
Persistent Routes:
  Network Address          Netmask  Gateway Address  Metric
      169.254.0.0    255.255.0.0     172.16.10.16       1
      169.254.0.0    255.255.0.0   192.168.178.78       1
      192.168.9.0  255.255.255.0    192.168.0.101       1
===========================================================================
```

- ▶ Start the *IndraWorks Ds* software.
- ▶ Enter the IP address in the *IndraWorks Ds* software and the computer.
- ▶ Click the *Search* button.
- ⇨ Found drive control units are shown in the *Connection Selection* window.
- ▶ In the *Connect* column, enable the option field of the desired drive control unit.
  - The IP address of the drive control unit must match.
- ▶ Click the *Link All* button.



11.3.4 Configuring the interface from TwinCAT 3

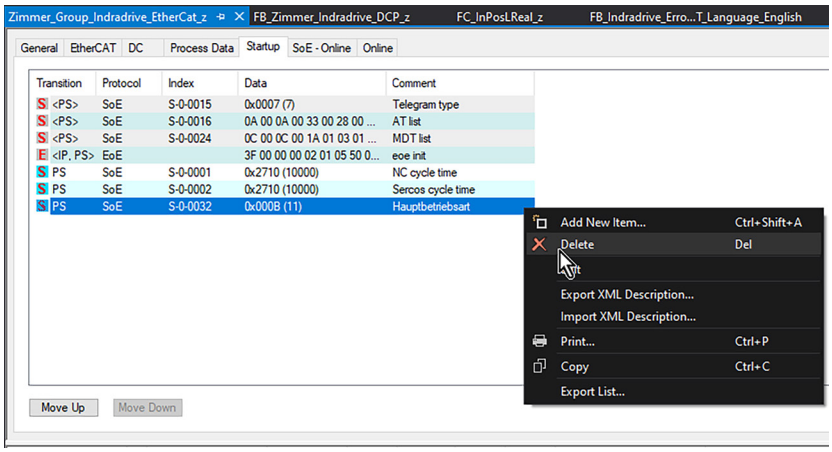
When connecting the drive control unit via EtherCAT, the interface configuration takes place on the EtherCAT side, e.g. TwinCAT 3.

- ▶ Activate the TwinCAT project.
- ▶ Restart the drive control unit.
- ⇨ The interface parameters are adopted from the drive control unit.
- ▶ Check the interface parameters using *IndraDrive Ds* software.

11.3.4.1 Checking the startup parameters

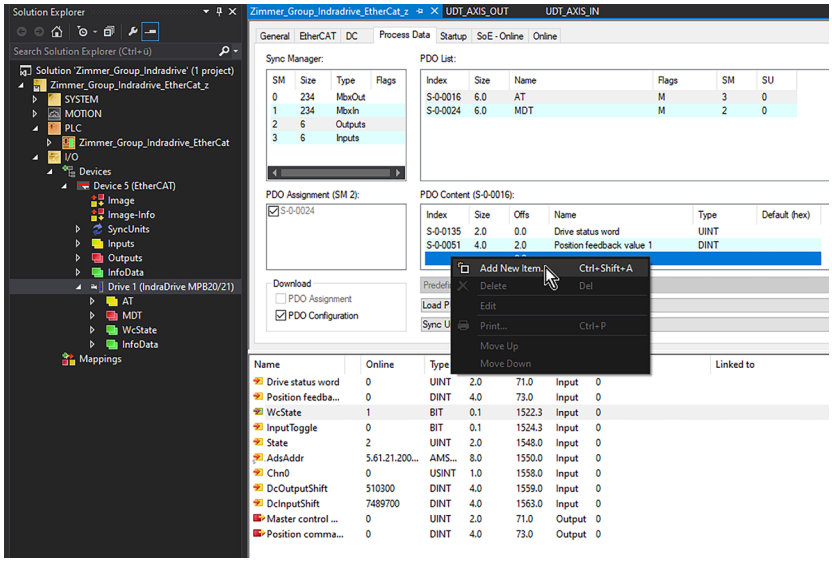
The default parameters that TwinCAT 3 reads from the XML file describe the *main operating mode S-0-0032* during startup.

- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *I/O*.
- ▶ Click *Devices*.
- ▶ Click *Device 5 (EtherCAT)*.
- ▶ Click *Device 1 (IndraDrive)*.
- ⇨ The window of the example project opens.
- ▶ Click the *Startup* tab.
- ▶ Right-click the main operating mode that you want to delete from the parameter set.
- ▶ In the context menu, click *Delete*.



11.3.4.2 Transferring axis output parameters in PLC

- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *I/O*.
- ▶ Click *Devices*.
- ▶ Click *Device 5 (EtherCAT)*.
- ▶ Click *Device 1 (IndraDrive)*.
- ⇨ The window of the example project opens.
- ▶ Click the *Process Data* tab.
- ▶ Right-click the *PDO Content* area.
- ▶ In the context menu, click *Add New Item*.
- ⇨ The *Edit PDO Entry* window opens.



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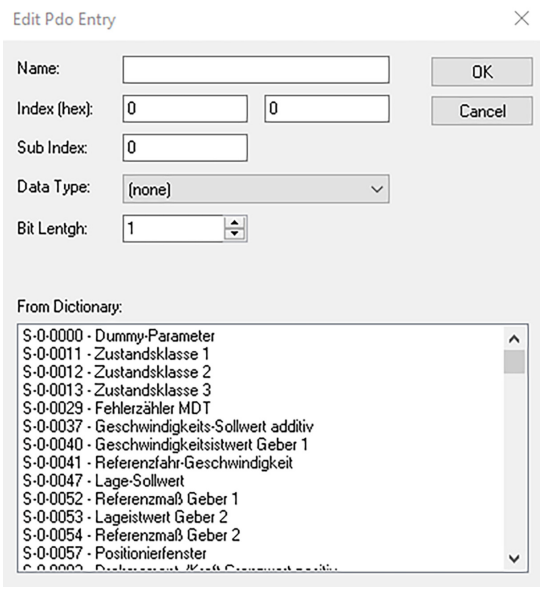
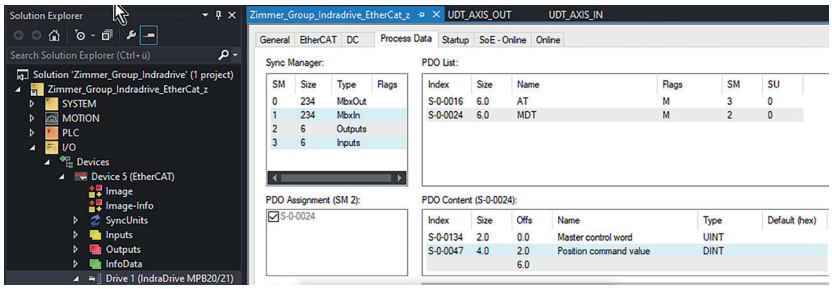
- ▶ Select the output parameter in the parameter *category S-0-0016 AT*.
  - The output parameter *S-0-0135 Drive status word* is already preset in the predefinition.
  - The output parameter *S-0-0051 Position feedback value 1* is already preset in the predefinition.
- ▶ Click the desired parameters.
- ▶ Click the *OK* button.
- ⇨ The *Edit PDO Entry* window closes.
- ⇨ The selected parameters have been added.



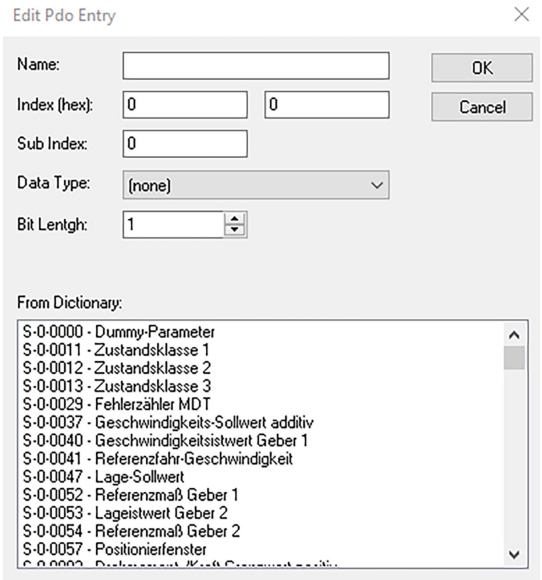
11.3.4.3 Transmitting PLC input parameters to axis

- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *I/O*.
- ▶ Click *Devices*.
- ▶ Click *Device 5 (EtherCAT)*.
- ▶ Click *Device 1 (IndraDrive)*.
- ⇨ The window of the example project opens.

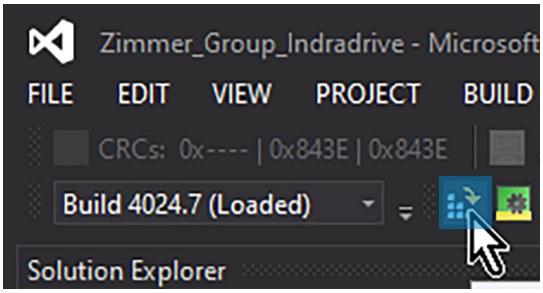


- ▶ Click the *Process Data* tab.
- ▶ Right-click the *PDO Content* area.
- ▶ In the context menu, click *Add New Item*.
- ⇨ The *Edit PDO Entry* window opens.

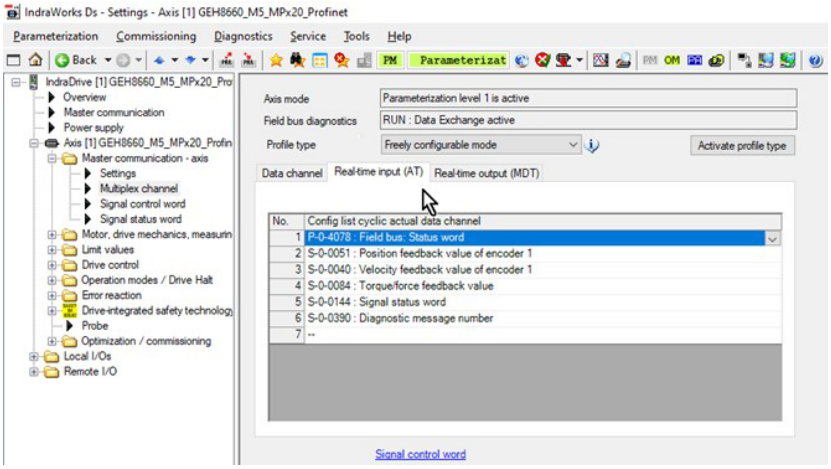
- ▶ Select the input parameter in the parameter *category S-0-0024 AT*.
  - The input parameter *S-0-0134 Master control word* is already present in the predefinition.
  - The input parameter *S-0-0047 Position Command Value* is already preset in the predefinition.
- ▶ Delete the parameter *S-0-0047 Position Command Value*.
- ▶ Select the parameter *S-0-0082 Positioning Target Value*.
- ▶ Click the desired parameters.
- ▶ Click the *OK* button.
- ⇨ The *Edit PDO Entry* window closes.
- ⇨ The selected parameters have been added.



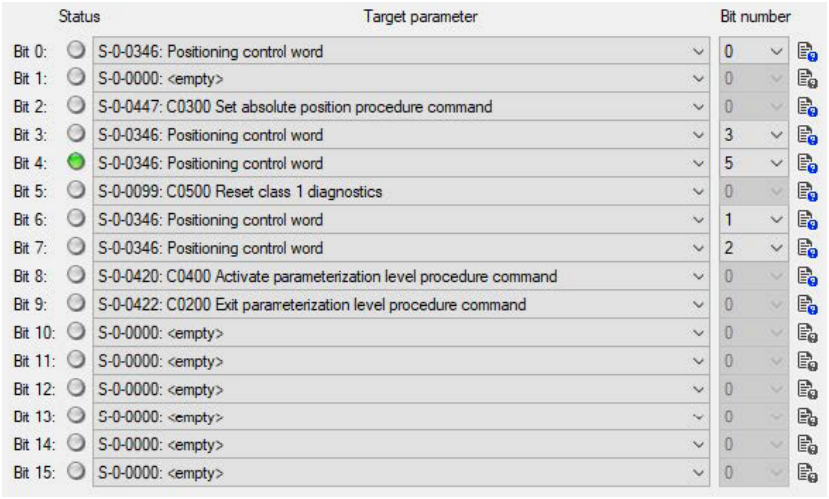
- ▶ Activate the example project.
- ⇨ The changed parameters have been applied to the drive control unit.
- ⇨ The connection between the *IndraWorks Ds* software and the drive control unit is canceled.



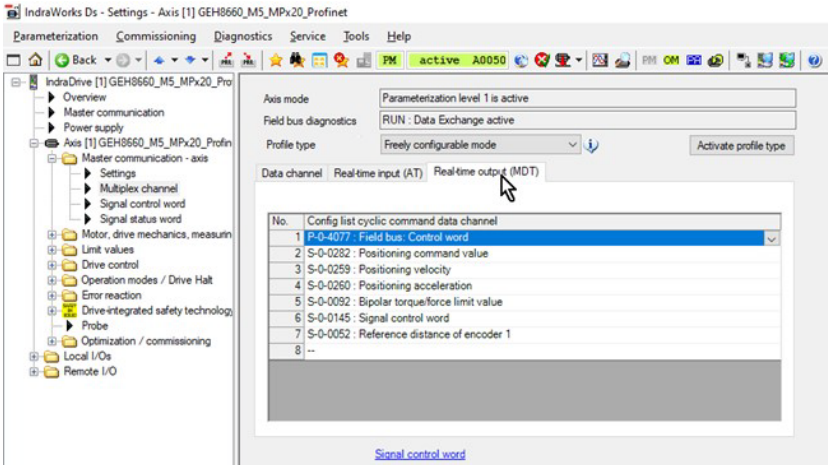
- ▶ Start the *IndraWorks Ds* software.
- ▶ In the navigation pane, click *Axis [1]*.
- ▶ Click *Master Communication Axis [1]*.
- ▶ Click *Settings*.
- ▶ Click the *Process Data In (AT)* tab.
- ⇨ The input parameters are displayed in the *Process Data In (AT)* tab.
- ▶ Check the input parameters by clicking the links *Signal Status Word* and *Signal Control Word*.



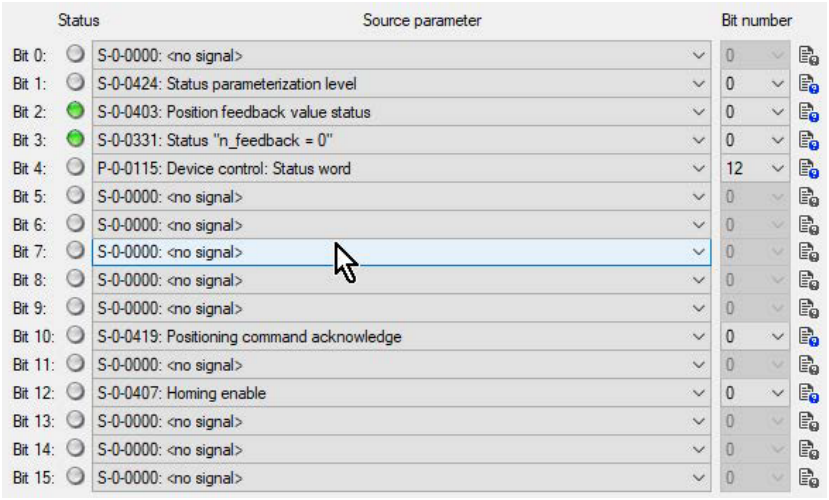
The default bits *signal status word* and *signal control word* are already stored in the included parameter set.



- ▶ Click the *Process Data Out (AT)* tab.
- ⇨ The output parameters are displayed in the *Process Data Out (AT)* tab.
- ▶ Check the input parameters by clicking the links *Signal Status Word* and *Signal Control Word*.



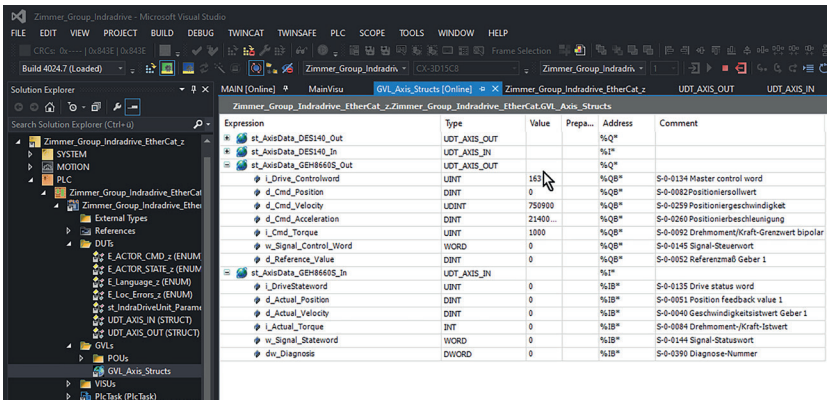
The default bits *signal status word* and *signal control word* are already stored in the included parameter set.



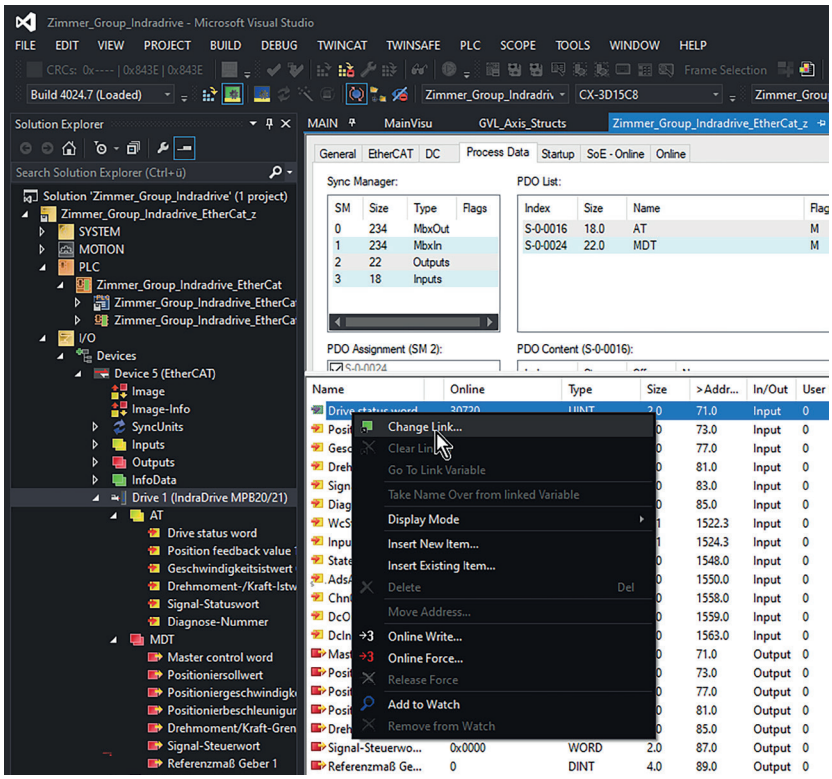
11.3.4.4 Linking the interface with PLC

In *GVL_Axis_Structs* there is an input structure *st_AxisData_GEH8660_In* and an output structure *st_AxisData_GEH8660_Out* available for the product.

- ▶ Link the interface variables with the *GVL_Axis_Structs* of the example project.
- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *PLC*.
- ▶ Click *Zimmer_Group_Indradrive_EtherCat*.
- ▶ Click *Zimmer_Group_Indradrive_EtherCat-Project*.
- ▶ Click *GVLs*.
- ▶ Click *GVL_Axis_Structs*.
- ⇨ The *GVL_Axis_Structs [Online]* window opens.



- ▶ Click the example project in the *Solution Explorer*.
- ▶ Click *I/O*.
- ▶ Click *Devices*.
- ▶ Click *Device 5 (EtherCAT)*.
- ▶ Click *Device 1 (IndraDrive)*.
- ⇨ The window of the example project opens.
- ▶ Click the *Process Data* tab.
- ▶ Right-click *Drive status word*.
- ▶ In the context menu, click *Change Link*.
- ⇨ The *Attach Variable Drive status word (Input)* window opens.



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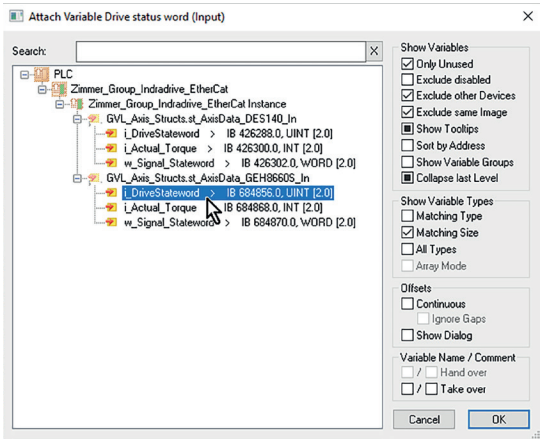
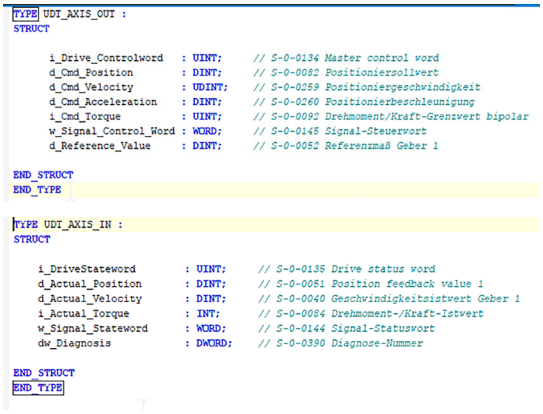
- ▶ Right-click the instances.
- ▶ Link the input structure to *GVL_Axis_Structs*.
- ▶ Link the output structure to *GVL_Axis_Structs*.
- ▶ Click the *OK* button.
- ⇨ The *Attach Variable Drive status word (Input)* window closes.

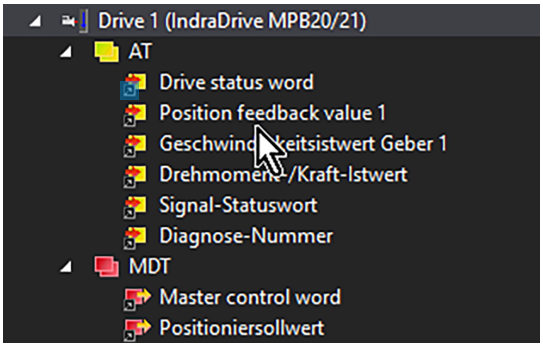




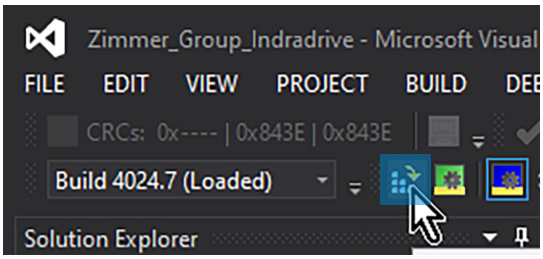
```
TYPE UDT_AXIS_OUT :
STRUCT

    i_Drive_Controlword   : UINT;    // S-0-0134 Master control word
    d_Cmd_Position        : DINT;    // S-0-0082 Positioniersollwert
    d_Cmd_Velocity        : UDINT;   // S-0-0259 Positioniergeschwindigkeit
    d_Cmd_Acceleration    : DINT;    // S-0-0260 Positionierbeschleunigung
    i_Cmd_Torque          : UINT;    // S-0-0092 Drehmoment/Kraft-Grenzwert bipolar
    w_Signal_Control_Word : WORD;    // S-0-0145 Signal-Steuerwort
    d_Reference_Value     : DINT;    // S-0-0052 Referenzmaß Geber 1

END_STRUCT
END_TYPE
```

```
TYPE UDT_AXIS_IN :
STRUCT

    i_DriveStateword      : UINT;    // S-0-0135 Drive status word
    d_Actual_Position     : DINT;    // S-0-0051 Position feedback value 1
    d_Actual_Velocity     : DINT;    // S-0-0040 Geschwindigkeitsistwert Geber 1
    i_Actual_Torque       : INT;     // S-0-0084 Drehmoment-/Kraft-Istwert
    w_Signal_Stateword    : WORD;    // S-0-0144 Signal-Statuswort
    dw_Diagnosis          : DWORD;   // S-0-0390 Diagnose-Nummer

END_STRUCT
END_TYPE
```

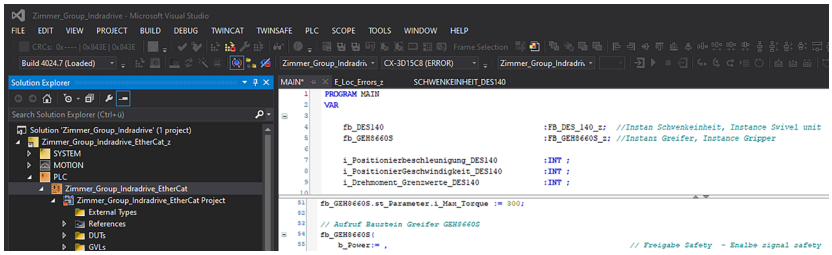
⇨ The arrow at the bottom in the icon tells you that variable linking was successful.



- ▶ Activate the PLC.
- ▶ Restart the drive control unit.
- ⇨ The changed parameters have been applied to the drive control unit.



11.3.5 Integrating function blocks



- ► Click the example project in the *Solution Explorer*.
- ► Click *PLC*.
- ► Click *Zimmer_Group_Indradrive_EtherCat*.
- ► Click *Zimmer_Group_Indradrive_EtherCat-Project*.
- ► Click *POUs*.
- ► Click *MAIN (PRG)*.
- ⇨ The *MAIN* window opens.

The variable declaration includes the instantiation of the function block *FB_GEH8660_z*. The program section includes the call-up of the instance *fb_GEH8660*.

- ► Link the hardware to the instance *fb_GEH8660*.
- ► Connect the input and output structures from *GVL_Axis_Structs* to instance *fb_GEH8660*.

```
// Aufruf Baustein Greifer GEH8660S
fb_GEH8660S(
    b_Power:= ,                                     // Freigabe Safety  - Enalbe signal safety
    b_Automatic:= ,                                 // Betriebsart Automatik (0= Manuell 1=  Automatik),  OpMode Auto (0= manual 1=  automatic)
    b_TorqueMode:= ,                                // Position Momentgesteuert anfahren,  Position Torque-controlled approach
    b_MoveToWorkPos:= ,                             // Arbeitsstellung anfahren,  move to Work Position
    b_MoveToWorkPos_2:= ,                           // Alternative Arbeitsstellung anfahren,  move to alternativ Work Position
    b_MoveToBasePos:= ,                             // Grundstellung anfahren,  move to Base Position
    b_SetReferencePos:= ,                           // Referenziern,  get new reference Position
    b_Halt:= ,                                      // Achse in Halt setzen 0 = Run 1= Halt , set axis to Halt 0 = Run 1= Halt
    b_Reset:= Fehler_Reset,                         // Stoerung quittieren, Reset Error
    b_JogPlus:= ,                                   // Tippen vorwaerts, Jog forward*)
    b_JogMinus:= ,                                  // Tippen rueckwaerts, Jog backward'
    st_AxisData_In:= GVL_Axis_Structs.st_AxisData_GEH8660S_In,  // Eingangsdaten, input data
    st_Parameter:= ,                                // Parameterstruktur, Struct of parameters
    i_Velocity:= i_PositionierGeschwindigkeit_GEH8660S,  // Geschwindigkeit(%), velocity(%)
    i_AccDec:= i_Positionierbeschleunigung_GEH8660S,  // Beschleunigung/Verzögerung(%),  Acceleration/Deccelaration(%)
    i_Torque:= i_Drehmoment_Grenzwerte_GEH8660S,    // Drehmoment in(%),Torque(%)
    b_StandStill=> ,                                // Greifer in Stillstand, gripper not moving
    b_Enabled=> ,                                   // Greifer bereit für Verfahrbefehle (AF), gripper ready for motion commands (A
    b_BasePosition=> ,                              // Greifer in Grundstellung, gripper in base position
    b_WorkPosition=> ,                              // Greifer in Arbeitsstellung, gripper  in work position
    b_WorkPosition_2=> ,                            // Greifer in alternativer Arbeitsstellung, gripper in alternativ work position
    b_TeachPosition=> ,                             // Greifer in Teachposition , gripper  in teach position
    b_Homed=> ,                                     // Referenziert, In_Reference
    b_Error=> ,                                     // Achsfehler , Axis Error
    i_Torque_Loc=> ,                                // Internes Soll-Drehmoment in %,internal command torque (%)
    f_ActPos=> ,                                    // Aktuelle Position, actual position
    f_ActVel=> ,                                    // Aktuelle Geschwindigkeit, actual velocity
    f_ActTorque=> ,                                 // Aktuelles Drehmoment, actual torque
    s_AxisInfo=> ,                                  // Fehler Klartext,  Error Description
    st_AxisData_Out=> GVL_Axis_Structs.st_AxisData_GEH8660S_Out);  // Ausgangsdaten , output data
```

11.4 TIA Portal

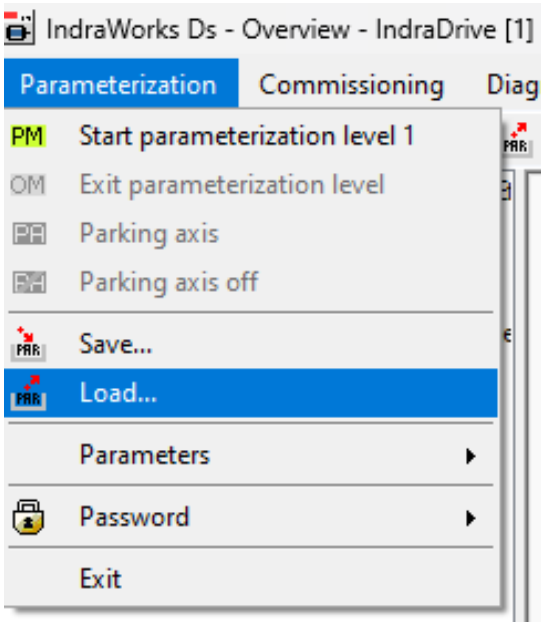
NOTICE

This section uses the commissioning of the product of the GEH8660-B installation size as an example project.
The example project is intended as an aid and must not be used as a programming template.
Commissioning the product depends on the configuration of the drive control unit and can therefore vary.

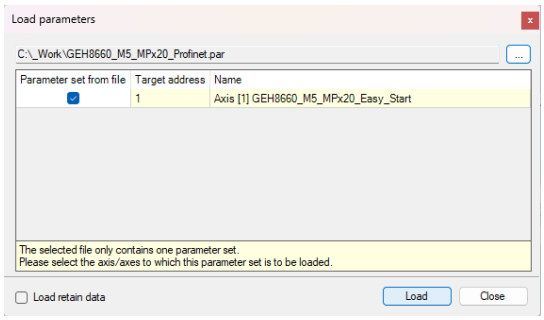
11.4.1 Configuring the drive control unit

- ► Connect the drive control unit to the computer using its network interface.
- ► Search for the correct drive control unit using the *IndraWorks Ds* software, see section “Setting the IP address”.
- ⇨ The connection to the drive control unit is established.

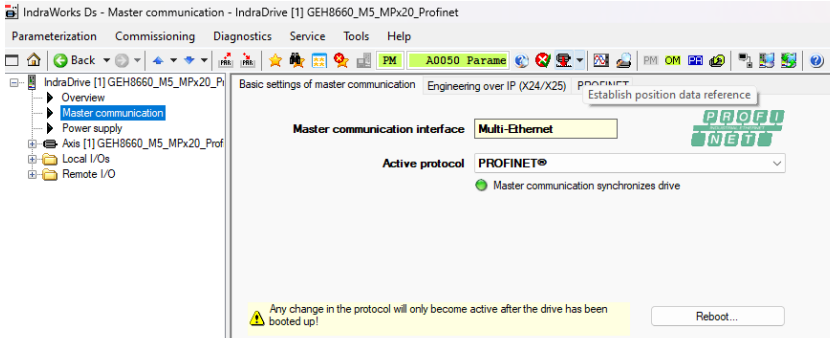
- ► In the *Configuration* menu, click *Load*.
- ⇨ The *Load Parameters* window opens.



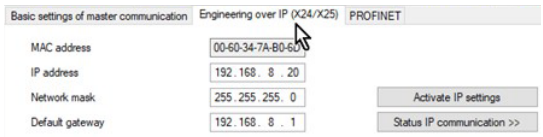
- ► Enable the option field of the desired parameter set.
- ► Click the *Load* button.
- ⇨ The *Load Parameters* window closes.



- ► In the navigation pane, click *Master Communication*.
- ⇨ The *Master Communication Basic Settings* tab is displayed in the window.



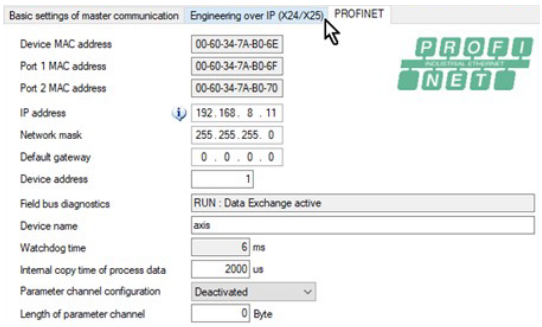
- ► Click the *Engineering via IP (X24/X25)* tab.
- ► Enter the IP address for configuring the drive control unit.



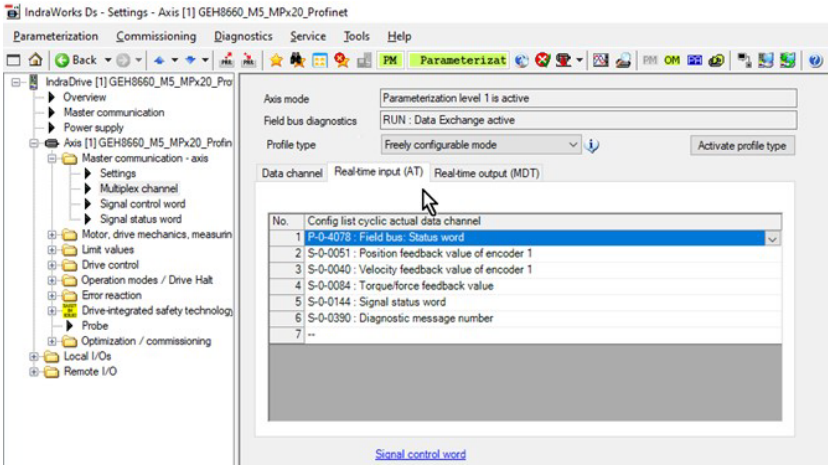
INFORMATION

The Profinet interface needs its own network address.
A network connection therefore has two separate IP addresses that can be addressed in different ways.

- ► Click the *PROFINET* tab.
- ► Enter the IP address of the Profinet interface on the Profinet tab.



- ► In the navigation pane, click *Axis [1]*.
- ► Click *Master Communication Axis [1]*.
- ► Click *Settings*.
- ► Click the *Process Data In (AT)* tab.
- ► In the drop-down menus of the fields, select the desired files for communication between the PLC and the drive control unit.
- ⇨ The actual value data channel is comprised of the following parameters on the *Process Data In (AT)* tab.
- ⇨ The target value data channel is comprised of the following parameters on the *Process Data Out (MDT)* tab.

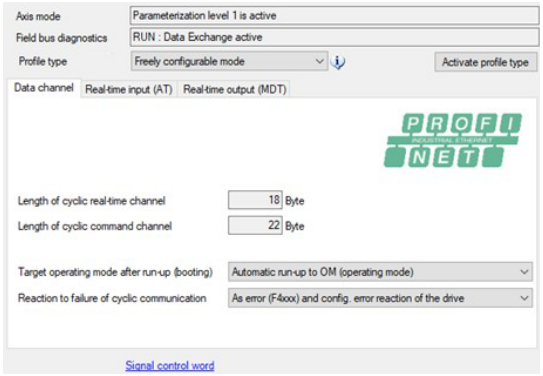


For successful communication between the PLC and the drive control unit, it is important that the data length of the process input map and process output map be configured correctly.

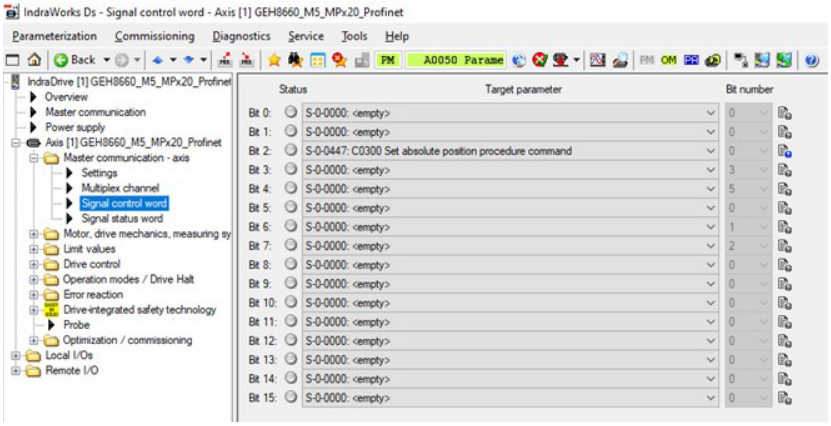
In this example project, 18-byte inputs (actual value data channel) and 22-byte outputs (target value data channel) are needed. This data length is generated automatically from the previously configured settings.

The *IndraWorks Ds* software specifies the data length in bytes, the hardware configuration from Siemens specifies the data length in words.

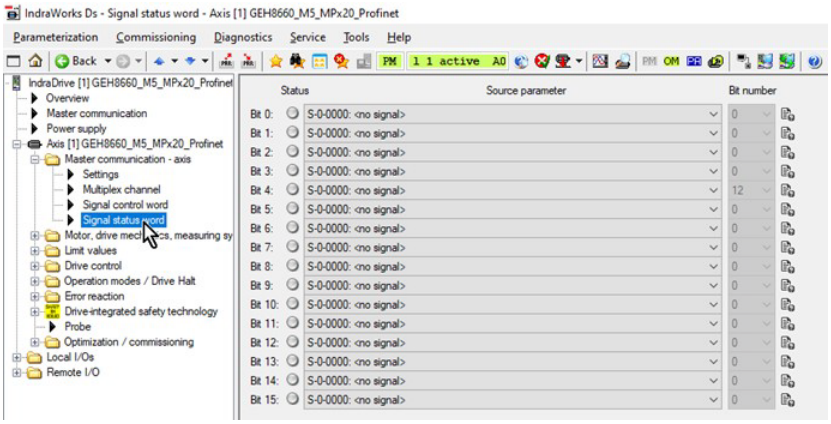
- ► Click the *Data Channel* tab.



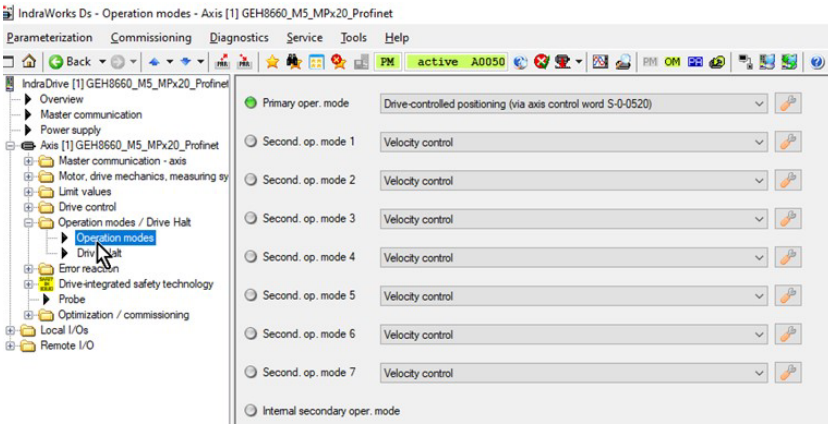
- ► In the navigation pane, click *Axis [1]*.
- ► Click *Master Communication Axis [1]*.
- ► Click *Signal Control Word*.
- ► In the drop-down menus, select the target parameters for the individual bits.
- ⇨ The switching enables communication between the PLC and the drive control unit.



- ► In the navigation pane, click *Axis [1]*.
- ► Click *Master Communication Axis [1]*.
- ► Click *Signal Status Word*.
- ► In the drop-down menus, select the source parameters for the individual bits.
- ⇨ The switching enables communication between the PLC and the drive control unit.

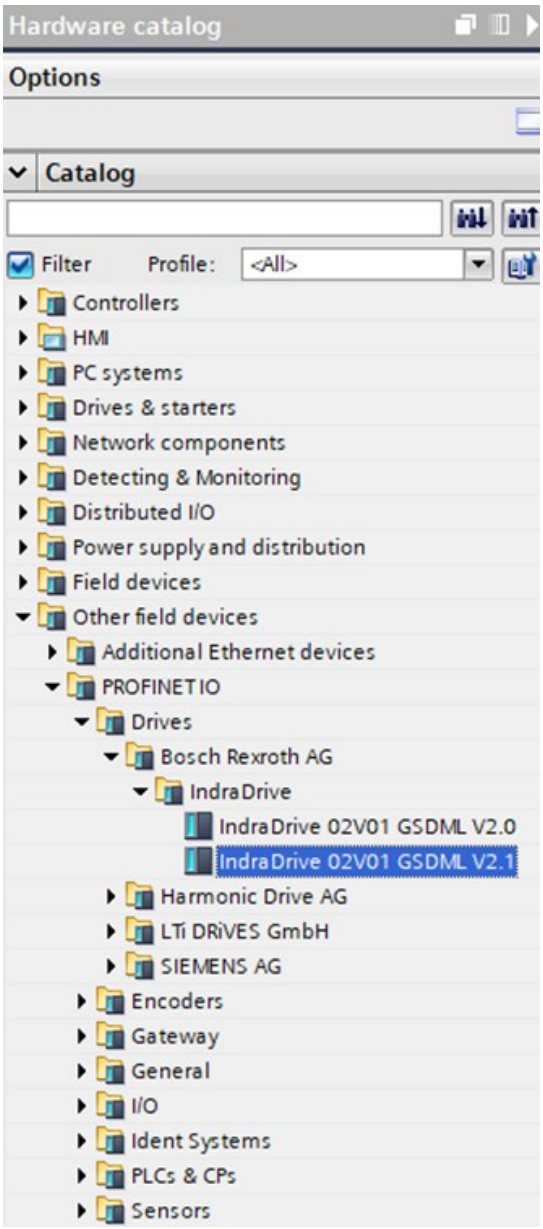


- ► In the navigation pane, click *Axis [1]*.
- ► Click *Operating Modes/Drive Stop*.
- ► Click *Operating Modes*.
- ► In the drop-down menus, select the operating modes.
  - ► In the drop-down menu *Main Operating Mode*, select the *Drive-controlled positioning (via axis controller word S-0-0520)* option.
  - • The example project uses only one operation mode because this is sufficient for all functions (jog, positioning and referencing).



11.4.2 Configuring the hardware

► Select the drive control unit being used in the hardware catalog.



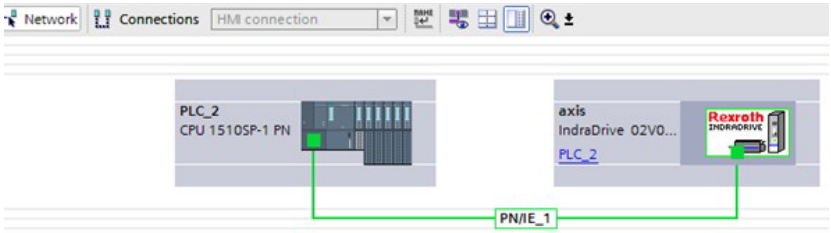
INFORMATION

The axis *IndraDrive 02V01 GSDML V2.1* is required for the example project: *Other Field Devices* > *PROFINET IO* > *Bosch Rexroth AG* > *IndraDrive* > *Top Module*

► Connect the drive control unit to the PLC.

► Assign the drive control unit the IP address from the configuration.

  ► To do this, use the provided GSDML files or download the current Bosch Rexroth version.



INFORMATION

In the example project in the *Module* tab in the hardware catalog, the modules *Input 9 Words_1* and *Output 11 Word_1* are moved to the configuration.

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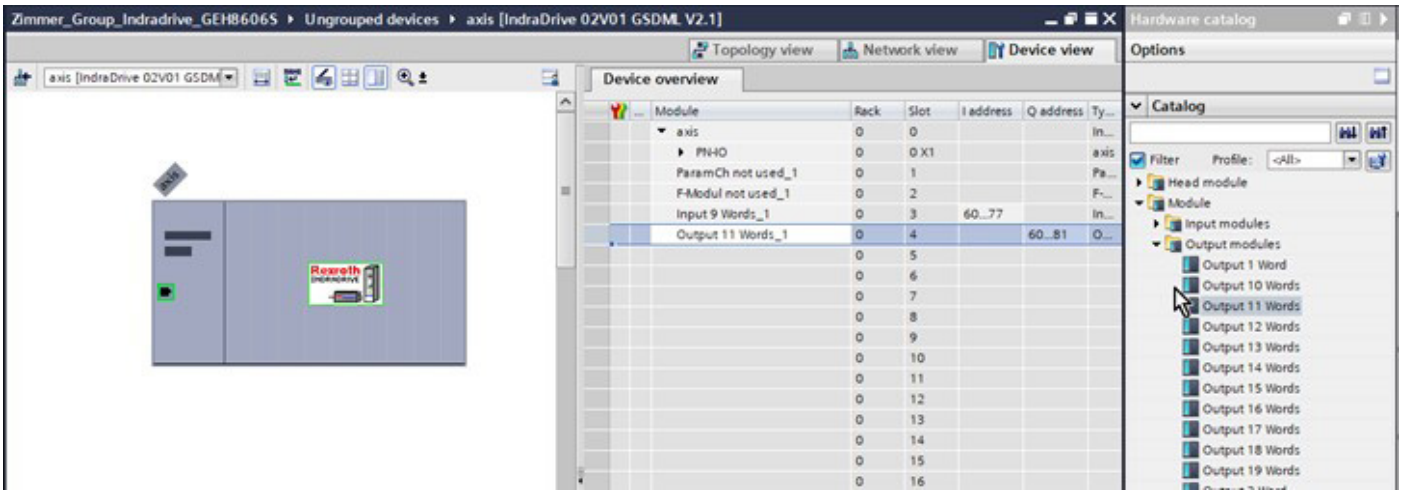
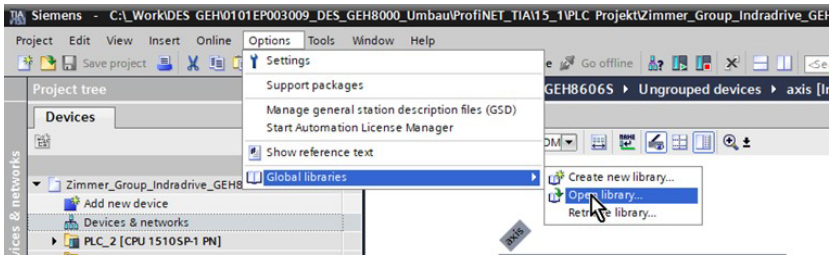
- ► Configure the data length set in the drive control unit configuration.
- ► Delete the input and output words entered by default.
- ► After successful transmission and transfer of the configuration, there is a connection between the drive control unit and the PLC.

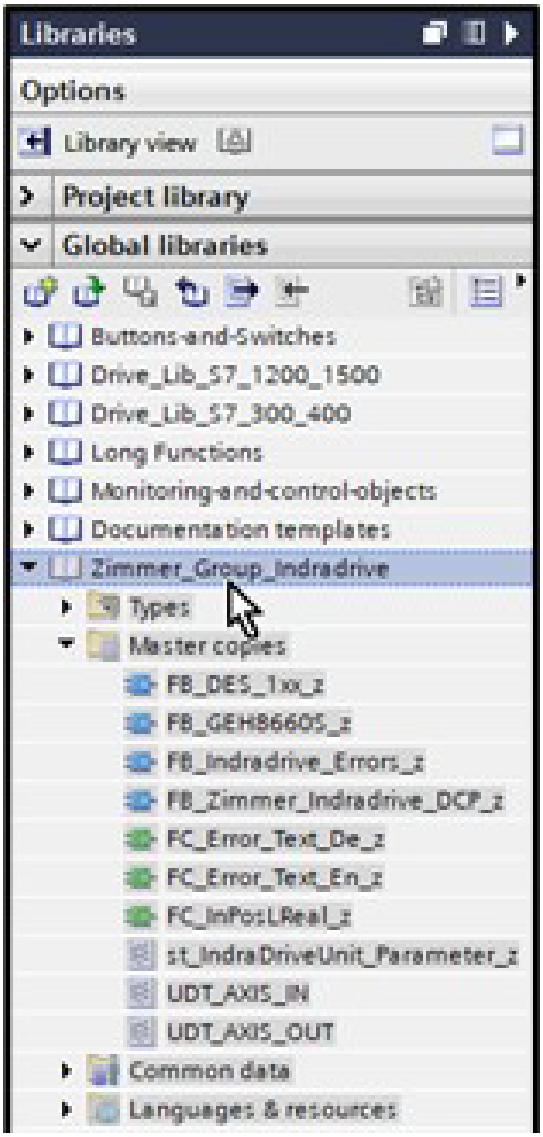


11.4.3 Integrating the library

- ▶ In the *Options* menu, click *Global Libraries*.
- ▶ Click *Open Library*.
- ⇨ The *Libraries* window opens.

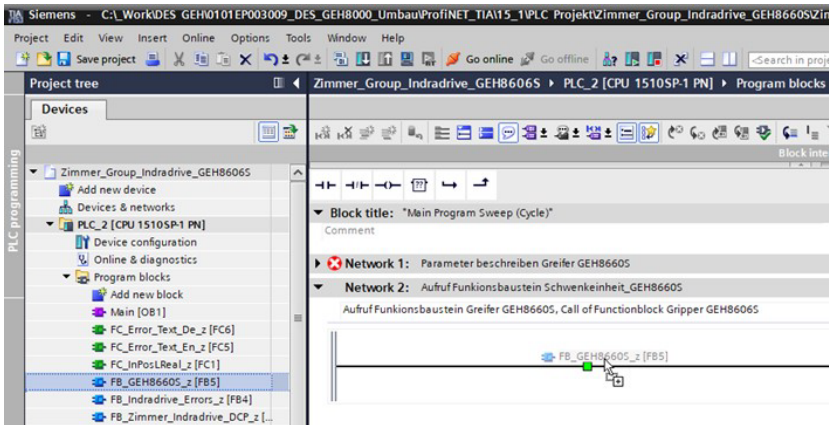


- ▶ Click the *Zimmer_Group_Indradrive* global library.
- ▶ Click the *Templates* folder.
- ▶ Go to the *Templates* folder and copy the data types *UDT_AXIS_IN*, *UDT_AXIS_OUT* and the variable *st_IndraDriveUnit_Parameter_z*.
- ▶ In *Project navigation* in the *Devices* tab, click *PLC_2*.
- ▶ Click the *PLC Data Types* folder.
- ▶ Paste the copied data types and variable to the *PLC Data Types* folder.
- ▶ Go to the *Templates* folder and copy the function blocks *FB_GEH8660_z*, *FB_Zimmer_Indradrive_DCP_z* and *FC_InPosReal_z*.
- ▶ Click the *Program Modules* folder.
- ▶ Paste the copied function blocks to the *Program Modules* folder.
- ⇨ The function blocks are required for activation.
- ▶ Using drag & drop with the mouse, move the function block file *FB_IndraDrive_Errors_z* from the *Errorhandling English* or *Errorhandling German* folder to the PLC project depending on the desired language to be used.

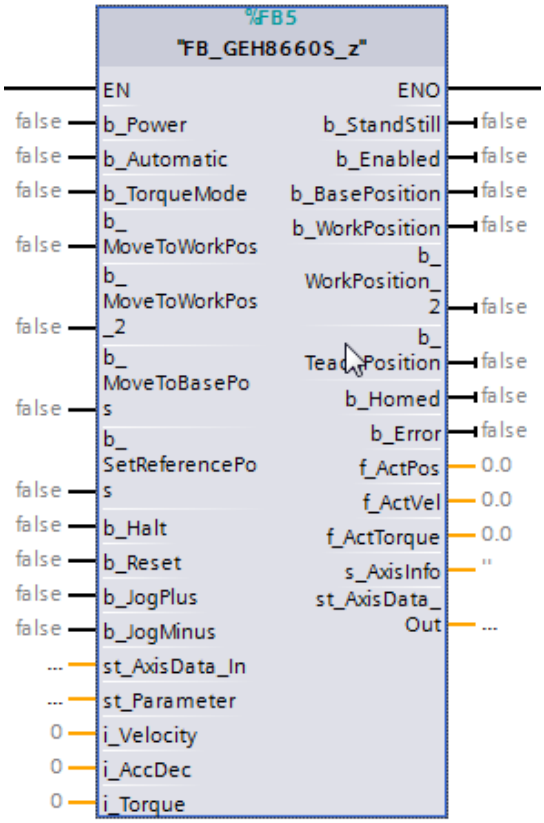


11.4.4 MAIN

- ▶ In *Project navigation* in the *Devices* tab, click *PLC_2*.
- ▶ Click the *Program Modules* folder.
- ▶ Click the *MAIN* organization block.
- ▶ Using drag & drop with the mouse, move the function block *FB_GEH8660_z* from the *Program Modules* folder to *Network 2*.
- ⇨ *Network 1* is used to describe the parameters of the function block.



- ⇨ The call options open when a single instance is generated.
- ▶ Edit the name of the instance so that it is recognized as an instance data block.
  - Variables with the suffix *b_* are binary command inputs/outputs. These can be controlled with a button, for example, and used for further signal processing.
- ▶ Create a suitable structure at the inputs *st_AxisData_In* and *st_Parameter*.
- ▶ Create a suitable structure at the outputs *st_AxisData_Out*.



INFORMATION

- The defaults for speed, acceleration and torque are created as integer variables.
- The outputs are created as floating point numbers (real).
- Current statuses, messages or errors of the axis are output via *s_AxisInfo*.

11.4.5 Variables

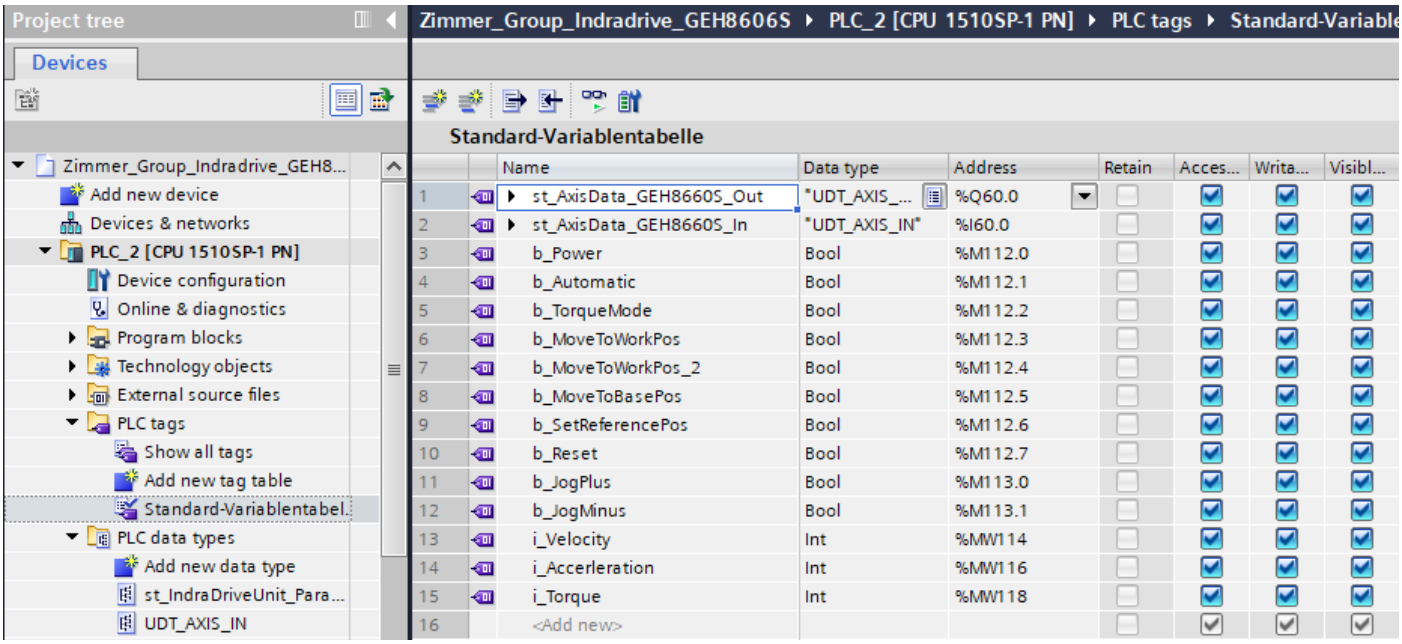
Direct links to the product are created in the *PLC Variables* folder.

► In *Project navigation* in the *Devices* tab, click *PLC_2*.

► Click the *PLC Variables* folder.

► Click *Standard Variable Table*.

⇨ The standard variable table opens.



► In the standard variable table, declare the two variables of the data type *UDT_AXIS_IN* and *UDT_AXIS_OUT*.

NOTICE

► Make sure that the respective IP address is correct in the *Address* field.
- The IP address was assigned previously during the hardware configuration.

► Enter only the first IP address.

⇨ The subsequent IP addresses are generated and assigned automatically.

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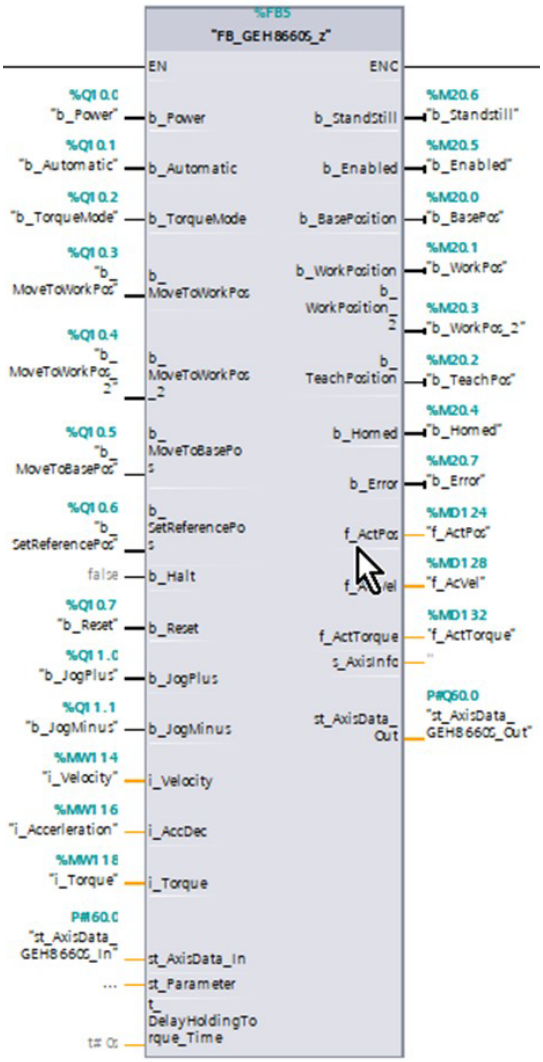
11.4.6 Using the function block

- ► On the function block added, switch multiple inputs and outputs.
- ► Connect the input structure *st_AxisData_In* found in the function block to the corresponding variable *st_AxisData_GEH8660_In*.
- ► Connect the output structure *st_AxisData_Out* found in the function block to the corresponding variable *st_AxisData_GEH8660_Out*.
- ⇨ The function block reads out the individual statuses and positions of the drive control unit and processes them.
- ⇨ The drive control unit can be configured by connecting outputs.
- ► Transfer the required data so that the drive control unit can activate the motor.



INFORMATION

In the example project, these standard values are stored in flag ranges and thus can be connected flexibly.

► These values can be found in the "Input values" section.

- ► Transfer the settings to the PLC control system.
  - ► Complete the steps necessary for Siemens:
    - Save/transmit
    - Load into the device

11.5 Functions of the function block

Depending on the switching of the function block, the following functions are carried out.

11.5.1 b_Power

If the variable is set to *true*, the drive control unit receives drive enable (AF) and the drive is permitted to move.

If the variable is set to *false*, the drive is shut down.

11.5.2 b_Automatic

Limits the automatic approach to the predefined positions.

If the variable is not set and *b_Power* is *true*, the product can be jogged continuously in the respective direction using *b_JogPlus* and *b_JogMinus*.

The operation mode in the drive control unit is not toggled for this. This bit only affects the logic of the instance *fb_GEH8660*.

11.5.3 b_MoveToWorkPos

A positive edge at this input causes the product to move to the work position *st_Parameter.f_WorkPos*.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and the function block is not currently processing any other commands.

11.5.4 b_MoveToWorkPos_2

A positive edge at this input causes the product to move to the alternative work position *st_Parameter.f_WorkPos_2*.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and the function block is not currently processing any other commands.

11.5.5 b_MoveToBasePos

A positive edge at this input causes the product to move to the home position *st_Parameter.f_BasePos*.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and the function block is not currently processing any other commands.

11.5.6 b_SetReferencePos

A positive edge at this input causes the product to move to the reference position *st_Parameter.f_HomePos*.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and the function block is not currently processing any other commands.

11.5.7 b_Halt

If this signal is set to *true* while the drive control unit is in drive enable (AF), the drive is stopped immediately (AH).

If the variable is set to *false*, the drive control unit again has drive enable (AF).

11.5.8 b_Fehler_Reset

Acknowledge all pending errors. If the error persists, it cannot be acknowledged.

11.5.9 b_JogPlus

The product moves in the positive direction (open) as long as this input is set.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and *b_Automatic* is set to *false* and the function block is not currently processing any other commands.

11.5.10 b_JogMinus

The product moves in the negative direction (close) as long as this input is set.

The prerequisite for this is that *b_Power*, *b_Automatic* and *b_Enabled* (AF) are set to *true* and *b_Automatic* is set to *false* and the function block is not currently processing any other commands.

INFORMATION

The parameters *i_Velocity*, *i_AccDec* and *i_Torque* are equal to 0 when starting the project.

The drive control unit triggers an error, if e.g. *i_Torque* = 0.

► Allocate values to the parameters *i_Velocity*, *i_AccDec* and *i_Torque*.

11.5.11 i_Velocity

The desired speed can be entered for *i_Velocity*. The value can be 0 - 100% of the maximum permitted speed of the product.

11.5.12 i_AccDec

The desired acceleration/deceleration of the product can be entered for *i_AccDec*. The value can be 0 - 100% of the maximum permitted acceleration/deceleration of the product.

11.5.13 i_Torque

The desired torque of the drive can be entered for *i_Torque*. The value can be 0 - 300% of the maximum permitted torque of the product.

NOTICE

The product gets jammed if it is moved together with the maximum torque (300%).

► Grip with a maximum of 100% torque of the motor.

- This corresponds to a torque of 0.32 Nm.

⇨ The product can only be opened mechanically and by Zimmer Customer Service.

11.5.14 st_Parameter

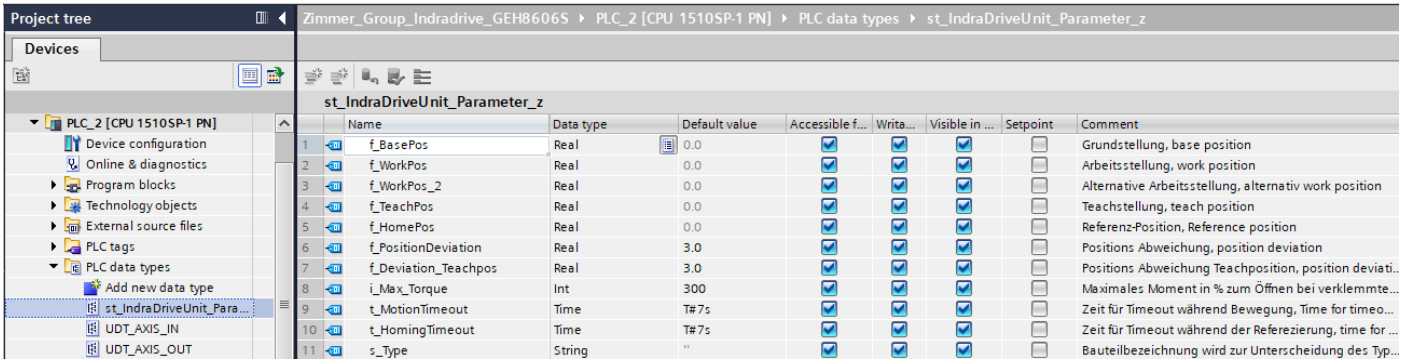
The positions and basic settings are compiled in the variable *st_IndraDriveUnit_Parameter_z*. These can be changed during runtime.

In the example, the parameters are partially defined in *Main(PRG)*.

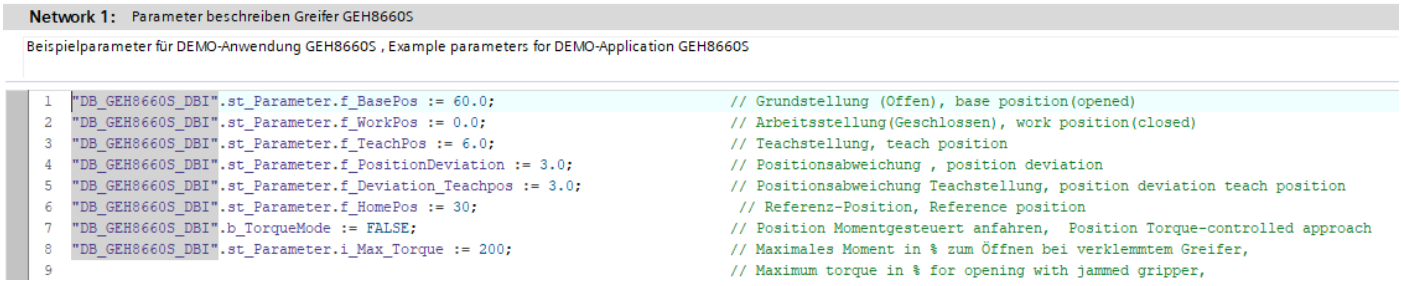
```
TYPE st_IndraDriveUnit_Parameter_z :
STRUCT

    f_BasePos               :LREAL ;              // Grundstellung, base position
    f_WorkPos               :LREAL ;              // Arbeitsstellung, work position
    f_WorkPos_2             :LREAL ;              // Alternative Arbeitsstellung, alternativ work position
    f_TeachPos              :LREAL ;              // Teachstellung, teach position
    f_HomePos               :LREAL ;              // Referenz-Position, Reference position
    f_PositionDeviation     :LREAL := 3.0;        // Positions Abweichung, position deviation
    f_Deviation_Teachpos    :LREAL := 3.0;        // Positions Abweichung Teachposition, position deviation teachpos
    i_Max_Torque            :INT   := 300;        // Maximales Moment in %,
                                                  // Maximum torque in %,

    t_MotionTimeout         :TIME  := T#3S;       // Zeit für Timeout während Bewegung, Time for timeout during movement
    t_HomingTimeout         :TIME  := T#7S;       // Zeit für Timeout während der Referezierung, time for Timeout during referencing

    e_Language              :E_Language_z;        // Sprache für Fehlerauswertung
    s_Type                  :STRING;              // Bauteilbezeichnung wird zur Unterscheidung des Typs verwendet,
                                                  // Component designation is used to differentiate the type

END_STRUCT
END_TYPE
```

11.5.15 st_Parameter (TIA)

The positions and basic settings are compiled in the variable *st_IndraDriveUnit_Parameter_z*. These can be changed during runtime.



In the example, the parameters are partially defined in *Main (OB1) Network 1*.



11.6 Input values

An entry of 0 -100% is possible for speed and acceleration. Entering 0 corresponds to the minimum value and 100 to the maximum value.

An entry of 0 - 300% for the torque is possible like in the drive control unit.

GEH8660 (gear ratio: 375:49 | feed constant 3.1415 mm)

Variable	Value range	Input value	Corresponding value
i_Velocity	0 - 2503	50	1251,5 mm/min
i_Acceleration	0 - 21400	50	10700 mm/s²
i_Torque	0 - 300	200	200 %

12 Maintenance

CAUTION

Material damage resulting from blowing out with compressed air

Blowing out the product with compressed air can cause malfunctions and pose a risk of accidents.

► Never purge the product with compressed air.

CAUTION

Material damage caused by liquid and solvent-based cleaners

Liquid and solvent-based cleaning agents can cause malfunctions and pose a risk of accidents.

► Do not clean the product with any cleaning agents that are liquid or contain solvents.

Maintenance-free operation of the product is guaranteed for up to 10 million cycles.

The maintenance interval may be shortened under the following circumstances:

- Dirty environment
- Improper use and use that does not comply with the power specifications.
- Ambient temperature is too high.

► Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any corrosion, damage or contamination.

► Have maintenance work be performed by Zimmer Customer Service whenever possible.

⇨ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer GmbH accepts no liability for any resulting malfunctions or damage.

13 Decommissioning/disposal

INFORMATION

When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

► Disconnect the product completely from the power supply.

► Dispose of the components properly according to the material groups.

► Comply with the locally applicable environmental and disposal regulations.

14 RoHS declaration

in terms of the EU Regulation 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH
Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: 2-jaw parallel gripper, electric

Type designation: GEH8000 series

conforms to the requirements of the directive in its design and the version we put on the market.

Michael Hoch	Rheinau, Germany, 2020-07-24	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner

15 REACH declaration

In terms of the EC Regulation 1907/2006

Name and address of the manufacturer:

Zimmer GmbH
Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

REACH stands for **R**egistration, **E**valuation, **A**uthorisation and Restriction of **Ch**emicals.

A full declaration of REACH can be obtained from the manufacturer due to the duty to notify in accordance with Art. 33 of the REACH regulation (“Duty to communicate information on substances in articles”).

Michael Hoch	Rheinau, Germany, 2020-07-24	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner

16 Declaration of Incorporation

In terms of the EU Machinery Directive 2006/42/EC (Annex II 1 B)

Name and address of the manufacturer:

Zimmer GmbH
Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: 2-jaw parallel gripper, electric

Type designation: GEH8000 series

conform to the requirements of the Machinery Directive, 2006/42/EC, Article 2g, Annex VII.b – Annex II.b, in its design and the version we put on the market.

Basic health and safety requirements:

No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.1, No. 1.3.2, No. 1.3.4, No. 1.3.7, No. 1.5.1, No. 1.5.3, No. 1.5.4, No. 1.6.4, No. 1.7.1, No. 1.7.3.

A full list of applied standards can be obtained from the manufacturer.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive. We undertake to provide the market supervisory bodies with electronic versions of special documents for the incomplete machine through our documentation department, should they have reason to request them.

The incomplete machine may only be commissioned if it has been ascertained, if applicable, that the machine or system in which the incomplete machine is to be installed satisfies the requirements of Directive 2006/42/EC on Machinery and an EC Declaration of Conformity has been drawn up in accordance with Annex II 1 A.

Kurt Ross	Rheinau, Germany, 2020-09-31	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner

DDOC00262 / e EN / 2023-03-06

17 Declaration of Conformity

As defined by the EC Directive 2014/30/EU on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer GmbH
Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the products described below

Product designation:	2-jaw parallel gripper, electric
Type designation:	GEH8000 series

conforms to the requirements of the 2006/42/EC directive in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 61000-6-3	EMC Generic standard, Emission standard for residential, commercial and light-in-dustrial
DIN EN 61000-6-2	EMC Generic standard, Emission standard for industrial environments
DIN EN 61000-6-4	EMC Generic standard, Immunity for industrial environments

A full list of applied standards can be obtained from the manufacturer.

Kurt Ross	Rheinau, Germany, 2020-09-31	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner