BECKHOFF New Automation Technology

Manual | EN

TwinCAT 3 | XTS Extension



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1	Documentation notes	
		This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.
		It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.
		The responsible staff is always obliged to use the currently valid documentation.
		The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.
1.1	Disclaimer	
		Beckhoff products are subject to continuous further development. We reserve the right to revise the documentation at any time and without notice. No claims for the modification of products that have already been supplied may be made on the basis of the data, dia- grams, and descriptions in this documentation.
1.1.	1 Trademarks	
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		The use by third parties of other brand names or trademarks con- tained in this documentation may lead to an infringement of the rights of the respective trademark owner.
1.1.	2 Patents	
		The EtherCAT technology is protected by patent rights through the following registrations and patents with corresponding applications and registrations in various other countries:
		• EP1590927
		• EP1789857
		• EP2137893
		• DE102015105702



EtherCAT[®] is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH.

1.1.3 Limitation of liability

The software described in this operating manual is combined with a specific configuration of hardware components depending on the application requirements. Modifications and changes to the hardware or software configuration that go beyond the documented options are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

The following is excluded from the liability:

- · Failure to observe this operating manual
- Improper use
- Use of untrained personnel
- · Use of unauthorized spare parts

1.1.4 Copyright

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The copying, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the payment of damages.

We reserve all rights in the event of registration of patents, utility models and designs.

1.2 Version numbers



Provision of revision levels

On request we can send you a list of revision levels for changes to the documentation.

· Send your request to: motion-documentation@beckhoff.de

Origin of the document

This documentation was originally written in German. All other languages are derived from the German original.

Product features

The valid product features are always those specified in the current documentation. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

1.3 Scope of the documentation

In addition to this documentation, the following documents are part of the complete documentation:

Manual | TF5410

Description of the optional package for collision avoidance when operating multiple axes.

Direct link to the documentation TF5410 | TwinCAT 3 Motion Collision Avoidance

Translation of the original manual | XTS

Description of the mechanical and electrical parameters as well as all necessary information for the assembly of the XTS system.

1.4 Explanation of symbols

Various symbols are used for a clear arrangement:

- ▶ The triangle indicates instructions that you should execute
- The bullet point indicates an enumeration

1.4.1 Pictograms

NOTICE

Notes

Notes are used for important information on the product. The possible consequences of failure to observe these include:

- Malfunctions of the product
- Damage to the product
- Damage to the environment



Information

This sign indicates information, tips and notes for dealing with the product or the software.



Examples

This symbol shows examples of how to use the product or software.

1.5	Beckhoff Services		
		Beckhoff and its sive support and	s international partner companies offer comprehen- d service.
1.5.1	Support		
		The Beckhoff S ual Beckhoff pro you in the prog mation systems	upport offers technical advice on the use of individ- oducts and system planning. The employees support ramming and commissioning of sophisticated auto-
		Hotline:	+49(0)5246/963-157
		Fax:	+49(0)5246/963-199
		E-mail:	support@beckhoff.com
		Web:	www.beckhoff.de/support
1.5.2	Training		
		Training in Gerr hoff headquarte the customer's p	many takes place in our training center at the Beckers in Verl, at branch offices or, by arrangement, at premises.
		Hotline:	+49(0)5246/963-5000
		Fax:	+49(0)5246/963-95000
		e-mail:	training@beckhoff.com
		Web:	www.beckhoff.de/training
1.5.3	Service		
		The Beckhoff S such as on-site	ervice Center supports you with after-sales services service, repair service or spare parts service.
		Hotline:	+49(0)5246/963-460
		Fax:	+49(0)5246/963-479
		E-mail:	service@beckhoff.com
		Web:	www.beckhoff.de/service
1.5.4	Download area		
		In the download dates, the Twin(l area you will find product information, software up- CAT software, documentation and much more.
		Web:	www.beckhoff.de/download
1.5.5	Headquarters		
		Beckhoff Autom Hülshorstweg 20 33415 Verl Germany	ation GmbH & Co. KG 0
		Phone:	+49(0)5246/963-0
		Fax:	+49(0)5246/963-198
		E-mail:	info@beckhoff.com
		Web:	www.beckhoff.de
		The addresses on the Beckhoff	of the international Beckhoff branches can be found website: <u>http://www.beckhoff.de</u>

2 For your safety

Read this chapter containing general safety information. In all cases observe the safety instructions for your own safety, the safety of other persons and the safety of the product.

When working with control and automation products, many dangers can result from careless or incorrect use. Work particularly thoroughly, not under time pressure and responsibly towards other people.

2.1 General safety instructions

This chapter contains information on safety relating to the software and the associated products. Please also read the original operating manual for the hardware components you are using.

2.1.1 Before operation

Danger from magnetic fields

The magnetic fields of some of the components of the XTS are dangerous to:

- people fitted with cardiac pacemakers
- · persons with magnetically conducting implants
- implanted and external defibrillators
- magnetic data storage devices, chip cards with magnetic strips and other electronic devices

Maintain a safety distance to all magnetic parts and prevent direct contact between magnetic parts and parts that are sensitive to interference.

Observe the requirements of BGV B 11 for electromagnetic fields (Germany) and applicable national regulations in other countries.

Use output voltages SELV / PELV

Operate all electronic modules and components in the drive system only with a SELV (Safety Extra Low Voltage) or PELV (Protective Extra Low Voltage) output voltage.

Keep the immediate environment clean

Keep your workplace and the surrounding area clean. Ensure safe working.

Shut down and secure the machine or plant

Shut down the machine or plant. Secure the machine or plant against being inadvertently started up.

Do not use damaged components

Adhere to the specifications from the technical data for storage, transport and operation. Do not use damaged components.

Risk of injury when handling cutting tools

You can sustain cutting or puncturing injuries through careless working with cutting tools.

Ensure safe working. Wear protective gloves if necessary.

Risk of injury when handling adhesives

Adhesive can irritate the eyes, the respiratory organs and the skin. Do not inhale the vapor. Avoid contact of the adhesive with the eyes and skin. If adhesive should get into your eyes, immediately rinse out your eyes thoroughly with water and consult a doctor.

Refer to the manufacturer's documentation when handling adhesives. Wear protective gloves and safety glasses if necessary.

Check safety pictograms

Check whether the designated pictograms are on the product. Replace missing or illegible stickers.

Observe tightening torques

Mount and repeatedly check connections and components, complying with the prescribed tightening torques.

Correctly ground electrical components or modules

Avoid electric shocks due to improper grounding of electrical components or modules. Ground all conductive components according to the specifications in the chapters "Electrical Installation" and "Mechanical Installation".

Use the original packaging only

When shipping, transporting, storing and packing, use the original packaging or non-conductive materials.

2.1.2 During operation

Observe the GND concept

Special conditions need to be observed for the grounding of the XTS. Be sure to read the chapter "Grounding of the supply".

Do not work on live electrical parts

Ensure proper connection of the protective conductor. Never loosen electrical connections when live. Only work on the XTS when the voltage has dropped to < 10 V. Disconnect all components from the mains and secure them against being switched on again.

Do not touch hot surfaces

Check the cooling of the surfaces with a thermometer. Do not touch the components during and immediately after operation. Allow the components to cool sufficiently after switching off.

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Avoid overheating

Operate the components according to the technical specifications. Refer here to the chapter: "Technical data". Provide for sufficient cooling. Switch the components off immediately if the temperature is too high.

Do not touch any moving or rotating components

Do not touch any moving or rotating components. Fasten all parts or components on the machine or plant.

2.1.3 After operation

De-energize and switch off components before working on them

Check the functionality of all safety-relevant devices. Secure the working environment. Secure the machine or plant against being inadvertently started up. Observe the chapter: "Decommissioning".

3 Notes on information security

The products from Beckhoff Automation GmbH & Co. KG – if they are reachable online – are equipped with Security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

Beckhoff recommends the following protective measures for information security and industrial security:

www.infosys.beckhoff.com

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats. Subscribe to the RSS feed to stay informed about information security for Beckhoff products. For more information, see:

www.infosys.beckhoff.com

4 General Information

These operating manual will help you to commission and program an XTS system.

The following chapters will guide you through the basic configuration of the XTS hardware components in *TwinCAT 3*, so that you can move the XTS movers via the basic NC interface and program them in the PLC. The aim is to move the XTS Mover for the first time and to verify the system concept. You will also receive an initial overview of all XTS functionalities of the *TF5850 TC3 XTS Extension*.



The documentation for the *TF5850 TC3 XTS Extension* is currently still under construction and will be continuously expanded. The current version of these operating manual can be found at:

www.beckhoff.com/de-de/support/downloadfinder/

4.1 Compatibility

This documentation refers to the following software versions of *TF5850 TC3 XTS Extension*, *TF5400 TC3 Advanced Motion Pack Extension* and *TwinCAT 3*:

Software	Version
TF5850	3.21.703.0 or higher
TF5400	3.1.10.52 or higher
TC3	3.1.4024.22 or higher



This documentation is only suitable to a limited extent for commissioning XTS systems with older software versions. If you have any questions, please contact the product specialist responsible for your region.

4.2 Presentation of the screenshots

The language setting *English* in TwinCAT was used for this documentation. All screenshots in this documentation are shown as examples in English. The terms from the screenshots are used in the corresponding instructions.

All functions and settings can be found in the same place in the software, regardless of the language set on your PC.

4.3 User interface overview

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The TwinCAT user interface is divided into the following areas:

Position	Explanation
1	Solution Explorer
2	Menu bar
3	Project window
4	Toolbar
5	XTS Tool Window
6	Toolbox or Properties Window
7	Message window Error List and Output
8	Information bar and status bar

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5 Installation and software update



Installation and software update





5.1 Check version



Programs and Features						- 🗆	×
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► Check the version of Beckhoff TF5850 TC3 XTS Technology

5.2 Reload TcCom objects

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If you have updated the *TF5850* | *TwinCAT 3 XTS Extension*, you must reload the TcCom objects.

- ► Expand Solution Explorer > TwinCAT Project > SYSTEM
- ► Double click on TcCOM Objects

- ► In the project window click on the Project Objects tab
- Select all objects
- Right-click the selected objects to open the context menu
- Click on Reload TMI/TMC Description(s) in the context menu

6 Functions of the driver

6.1 XTS Configuration

The XTS system consists of hardware components and software components that must communicate and function together. To make the system behave as expected, you need to understand the general processes and communication paths between software and hardware.

An XTS system consists of the modules, guide rails and movers as well as some software components running on an IPC.



Communication levels

* Optional

The basis for communication is the hardware, consisting of the modules. The modules transmit sensor values to the driver.

The driver uses the sensor values of the modules to determine the position of the movers and transmits the position values of each individual mover to the respective SoftDrive.

The SoftDrive transmits the current position values and velocity values to the NC axes. The NC axes generate motion profiles based on the values received and transmit setpoints for the position and velocity back to the SoftDrive.

The SoftDrive interpolates the values and performs a set/actual value comparison and transmits the current values of the mover resulting from the control structure back to the driver. The driver calculates and transmits the current setpoints to the 15 coils of the modules.

If the NC axes are included in a Collision Avoidance group, the NC axes receive external setpoints back that represent the motion profile of each individual mover.

Motion commands and administrative commands are transferred by the user from the PLC application via libraries directly to the NC axes or the Collision Avoidance group.

The communication of the XTS is based on and takes place via the CANopen communication structure. Additional data is transferred between objects to calculate coil current, commutation, dynamics, and motion profiles.

For more information on the individual objects, please refer to the respective documentation.

6.1.1 Integration of the XTS driver

On the software side, the XTS system consists of several components that are inserted into a TwinCAT project as a TwinCAT Component object, or TcCom object for short. Each module and each mover requires a corresponding driver TcCom object, via whose interfaces data is exchanged with other components:

- The TcCom object *Module* has Data Pointers. These Data Pointers are interfaces that are linked to the process data of the XTS IO modules. The TcCom object *Module* receives the sensor values of the module via the Data Pointers.
- The TcCom object *Mover* has Data Areas. These Data Areas are interfaces to the corresponding SoftDrive object that is created under each NC axis. Via the Data Areas, the TcCom object *Mover* receives new current setpoints and supplies the current position to the NC axis via the SoftDrive.

In addition to the TcCom objects *Module* and *Mover*, the system requires other TcCom objects to perform general system calculations and to manage basic system parameters. For more information, see the chapters "Configuration setup", [Page 29] and "Create new XTS system manually", [Page 39].

6.1.2 **Basic principles**

The new user interface of the XTS software simplifies the work and handling of the ever larger and more sophisticated systems implemented with XTS. The simple pictorial structure makes a decisive contribution to fast commissioning and intuitive operation. A large number of XTS systems can now be set up very easily, regardless of length, shape or variant.

A main goal of the XTS software is to support the various software functionalities such as Track Management or Leave and Arrive:

- Using the Track Management function, you can split the XTS system into individual sections, which you then join together to form continuous tracks. This gives you the possibility to mechanically align individual sections in different ways and thus use the movers more flexibly on the system.
- Using the Leave and Arrive function, you can remove movers or add more movers while the system is running.

6.1.2.1 Example configurations for XTS systems

The two example configurations show how differently an XTS system can be set up.

Closed XTS system



A closed system with 180° turns and ten movers, corresponding to the configuration of a 3 m XTS starter kit.

Further information can be found in chapter "System configuration", [Page 261].

XTS system with Track Management



XTS Track Management with four XTS Parts and six movers. This setup is usually referred to as switch or elevator.

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The difference between these two system configurations is that in a closed XTS system the order of modules and movers always remains constant. The movers thus have only one possible XTS Track on which they can move.

In an XTS system with Track Management, modules can change their position and align with other modules. Thus, the order of modules and movers can be changed, as new tracks can be formed. To be able to keep the overview of these new functions, the XTS Parts and XTS Tracks functions have been introduced.



The XTS Part is the physical hardware component on which the mover travels, comparable to a road section for a car. The XTS Track, on the other hand, is the actual track of the mover. The track is created by assembling the individual hardware components. In comparison with the car, a possible track with different road sections is created.

XTS Parts and XTS Tracks are objects that can be created in the TwinCAT project using the *XTS Configurator*. A simple XTS system can be created with only one XTS Part and one XTS Track for all movers.



More sophisticated XTS systems can consist of several XTS Parts that are joined together to form different XTS Tracks. In comparison with the car, a car ferry is used between two possible tracks.

Functions of the driver



With the Leave and Arrive function, it is possible for single movers to be taken off the system or for additional movers to be brought onto the system. In comparison with the car, the additional road section serves as an entrance and exit. Outside the XTS Parts there are parking lots for unused cars, new car dealers with additional cars and workshops for broken cars.

Transferred to the XTS system, it means that you can, for example:

- · Be able to remove the mover for maintenance
- · Be able to add new movers if needed
- Be able to remove movers that are no longer needed

6.1.3 Configuration setup



Manual creation or use of TwinCAT Tools

You have the option of creating the hardware components and the I/ O components manually or quickly and easily via the TwinCAT tools *XTS Configurator* and *XTS Simulation Builder*. Further information about the TwinCAT Tools can be found in chapters "XTS Configurator", [Page 258] and "XTS Simulation Builder", [Page 229].

Configurator replaces the XTS Manager

The Configurator replaces the XTS Manager, which was integrated in the XTS IO Driver object in the software versions up to version 3.18.715.0. Further information can be found in chapter "Compatibility mode", [Page 71].

Before you can use an XTS system, it must first be fully configured with all I/O components and all Real Time and Distributed Clock settings.

The main steps in configuring a system are as follows:

- XTS Processing Units
- XTS Parts
- XTS Modules
- XTS Tracks
- XTS Movers
- XTS Stations
- NC axis
- SoftDrive
- I/O Terminal

6.1.3.1 XTS Processing Units



The Processing Unit is the center of an XTS system. All the necessary objects converge in the Processing Unit and are logically linked to each other.

1

The XTS Processing Unit replaces the XTS IO Driver object of the previous software version.

You can create one or more Processing Units, depending on the number of individual systems used in the machine. Each Processing Unit requires at least one Task that is not used in other Processing Units.



Required settings:

- Task
- OperationMode
- MoverType
- MagnetPlateType
- IdDetectionMode
- IsTeachingEnabled

Optional settings:

- MoverSortOrder
- MinMechanicalMoverDistance
- · all other parameters

6.1.3.2 XTS Parts



A part is the minimum required component of an XTS system. The smallest possible part is a single module. Normally, a part consists of one infeed line, but multiple supplies within a part are also possible.

During manual creation in the correct order, it is determined which ${\rm I}/{\rm O}$ Devices are included and to which Processing Unit the part belongs.

The optional settings are used to display the view in the XTS System View as realistically as possible.



Required settings:

none

Optional settings:

- TaskOID
- ModuleSide
- OriginTransform

Functions of the driver

6.1.3.3 XTS Modules



A module corresponds to a physical module AT2xxx-0xxx and is always a subordinate object of a part.

A task must be assigned to each Module in the *Context* tab in order to be able to perform active calculations. Only modules with feed and modules with connector have EtherCAT communication interfaces. Connector cards are used to establish the EtherCAT communication to other modules.

Simulation mode or machine mode

No hardware is required for the simulation mode of the driver. For real machine operation, a physical AT2xxx-0xxx module must be

assigned to each module.

Each module must be assigned a corresponding hardware component.



Required settings:

Task

i

- PositionIndex
- MotorTerminalOid
- SensorTerminalOid
- · Linking with I/O objects

Optional settings:

- Gap
- Offset
- ScalingFactor

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6.1.3.4 XTS Tracks



A track is a route that can be used by movers and consists of one or more parts. A part can also occur more than once in a particular XTS Track or be inserted in several different tracks. You can create as many tracks as you like.

To create a track, you must define which parts are contained in this track and in which order the parts occur.

An important setting option is whether the track is closed. With this specification you determine whether the movers have the possibility to drive endlessly in a circle or whether the system has endpoints.

NOTICE

Avoid damage to the product and functional errors

Be sure to correctly specify whether you are configuring a closed system or a system with defined endpoints.

If the specification is incorrect, the movers may leave the system if it is open. In the case of a closed system with incorrect specification, the movers cannot travel in a circle as usual.

To determine the correct number of movers when the system starts, you must define which tracks perform the detection. It is important that each part within a track only occurs once in the detection process, otherwise too many movers may be displayed. It is best to use all tracks to detect the movers that are active in your current hardware configuration. You can also set the detection parameters via the PLC.



Required settings:

- IsClosed
- IsIncludedInDetection
- PartConfigItems
- ObjectID

Optional settings:

- · Polarity
- Offset

6.1.3.5 XTS Movers



The movers, together with the modules, are the main components of the XTS system. The movers travel on the parts in the system by activating the corresponding tracks using NC functionalities of Twin-CAT 3. Currently, 250 movers with collision avoidance function can be controlled simultaneously within a project.

Each mover is connected to an NC axis via the SoftDrive and has its own SoftDrive object to communicate with the NC and establish compatibility with the basic control commands. The SoftDrive is a software controller for the axes that controls the movers of the lowest level. This means that the SoftDrive can adapt the control of the movers to different loads.



Required settings:

- Task
- · Linking with the SoftDrive of the NC axes
- SimulatedStartUpPart
- SimulatedStartUpPosition
- SimulatedStartUpId

Optional settings:

• none

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6.1.3.6 XTS Stations, Beta



The XTS Stations function is currently still in beta phase. In the future, even more functions and information will be available and the current interface may also change.

The Stations are very useful to manage the system and related applications. A station provides information about where individual processes take place within the system to illustrate the structure of the entire application. The information can also be read out using the XTS Utility in the PLC.

Each station has its own identification data: ID, color, name and description. Regardless of the *Is Enabled* selection box, each station has a defined start position and end position. These positions form the frame of the station and can extend over several parts.

Within the station, you can configure stop positions that indicate where the movers should stop or where a specific task is completed.



Required settings:

- Part
- · Start position
- · End position

Optional settings:

• all other parameters

Functions of the driver

6.1.3.7 NC axis



Each mover is connected to an NC axis that generates the setpoint profile for the movement of the respective mover. The NC axis is created in the project under *MOTION* and linked to a mover via a SoftDrive object.

The NC axes can be operated directly via the TwinCAT NC interface or via the PLC using libraries with PLC-open-compliant function blocks.



Required settings:

- Link to I/O
- · Axis type
- · Maximum dynamics and default dynamics
- Modulo Factor
- Tolerance Window for Modulo Start

Optional settings:

- Inversion of drive running direction and encoder running direction
- Following error monitoring

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6.1.3.8 SoftDrive



The SoftDrive connects each mover to an NC axis. The SoftDrive uses the NC setpoint profile to control the position, velocity and current for moving the movers and generates the required current and current direction.

The SoftDrive provides the NC axis with the actual data required to generate the NC profiles. The connection between the SoftDrive and the respective Mover is made via DataPointer.





For more information on SoftDrive, refer to the XTS Soft Drive documentation or contact the product specialist responsible for your region.

Required settings:

- Task
- Linking with TcCom object Mover
- · Hardware modulo

Optional settings:

- · Control parameters for velocity controller and position controller
- · Control parameters for acceleration pre-control
- Filter
- · Settings for the behavior of the encoder
- Switching control modes

6.1.3.9 I/O-Terminal



Each module is connected to the IPC via EtherCAT, this connection is represented by the I/O terminal. A physical module of an infeed line is assigned to each I/O terminal. Each infeed line is displayed as EtherCAT master in the I/O overview.

After scanning, the status of the EtherCAT connection and the individual sensor data and status data of the hardware can be called in the I/O overview. The connection of the I/O terminal with the module of the driver is done via DataPointer.



Required settings:

• Link to TcCom objects XTS modules

Optional settings:

· Access to CoE data

6.1.4 Create new XTS system manually



Manual creation or use of TwinCAT Tools

You have the option of creating the hardware components and the TcCom objects manually or quickly and easily via the TwinCAT tools *XTS Configurator* and *XTS Simulation Builder*.

For more information, see the chapters "XTS Configurator", [Page 258] and "XTS Simulation Builder", [Page 229].

This chapter describes how to create hardware components and Tc-Com objects manually and without the help of XTS Tools.

6.1.4.1 Add TcCom objects

The TcCom objects must be created in the following order:

- Processing Unit
- Part
- Modules
- Track
- Mover



Example configuration

The creation of the XTS TcCom objects is shown once for each object as an example. Repeat the corresponding steps until you have created the configuration you want.

Make sure that you always add all other TcCom objects to each Processing Unit you create.

Processing Unit



- Expand Solution Explorer > TwinCAT Project > SYSTEM
- ▶ Right-click on TcCOM Objects to open the context menu
- Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- ► Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsProcessingUnit [Module]
- Double click on the selection or confirm with OK
- A Processing Unit is added to the TcCom objects.

Part



Insert Instance...

Reload

- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-Com Objects
- Right-click on Object (XtsProcessingUnit) to open the context menu
- Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- ► Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsPart [Module]
- Enter the number of parts required in the input field Multiple
- ► Double click on the selection or confirm with **OK**

One or more parts are added to the Processing Unit.

Modules

File

C:\TwinCAT\3.1\Config\Modules\TcloXts



- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit)
- ► Right-click on **Object (XtsPart)** to open the context menu
- Click Add New Item... in the context menu



The Insert TcCOM Object dialog box opens.

- Expand Beckhoff Automation GmbH > XTS Modules
- Select AT2xxx-0xxx [Module]
- ▶ Enter the number of modules required in the input field *Multiple*
- ► Double click on the selection or confirm with **OK**

One or more modules are added to Object (XtsPart).

Track

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- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-Com Objects
- Right-click on Object (XtsProcessingUnit) to open the context menu
- Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- ► Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsTrack [Module]
- ► Enter the number of tracks required in the input field *Multiple*
- ► Double click on the selection or confirm with **OK**

One or more tracks are added to the Processing Unit.

Mover



- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-Com Objects
- Right-click on Object (XtsProcessingUnit) to open the context menu
- ► Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- ► Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsMover [Module]
- ► Enter the number of movers required in the input field *Multiple*
- Double-click on the selection

OR

► Confirm with **OK**

One or more movers are added to the Processing Unit.

InfoServer

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- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-Com Objects
- Right-click on Object (XtsProcessingUnit) to open the context menu
- Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsInfoServer [Module]
- Enter the number of InfoServers required in the input field Multiple

Double click on the selection or confirm with OK
 One or more InfoServers are added to the Processing Unit.

Stations



- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-Com Objects
- Right-click on Object (XtsProcessingUnit) to open the context menu
- ► Click Add New Item... in the context menu

The Insert TcCOM Object dialog box opens.

- ► Expand Beckhoff Automation GmbH > XTS Modules
- Select XtsStationInfo [Module]
- Enter the number of StationInfo required in the input field Multiple
- Double click on the selection or confirm with **OK**
- One or more StationInfos are added to the Processing Unit.

6.1.4.2 Add Motion objects

The Motion objects must be created in the following order:

- NC task
- NC axis
- SoftDrive



Example configuration

The creation of Motion objects is shown once for each object as an example. Repeat the corresponding steps until you have created the configuration you want.

NC task

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- Expand Solution-Explorer > TwinCAT Project
- Right-click on MOTION to open the context menu
- Click Add New Item... in the context menu

The Insert Motion Configuration dialog box opens.

- Select NC/PTP NCI Configuration
- ► Confirm with **OK**
- An NC task SAF is added.

NC axis

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- Expand Solution-Explorer > TwinCAT Project > MOTION > NC-Task 1 SAF
- ▶ Right-click on Axes to open the context menu
- Click Add New Item... in the context menu

The Insert NC Axis dialog box opens.

- Select Continuous Axis in the drop-down menu Type
- ► Confirm with **OK**
- An NC axis is added.

SoftDrive

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- Expand Solution-Explorer > TwinCAT Project > MOTION > NC-Task SAF > Axes
- Right-click on Axis to open the context menu
- Click Add in the context menu
- Click Add Object(s)... in the submenu

The Insert TcCom Object dialog box opens.

- Expand Beckhoff Automation GmbH > SoftDrive Modules
- Select CTcSoftDrive [Module]
- ► Confirm with **OK**
- A SoftDrive object is added.

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6.1.4.3 Add I/O objects

NOTICE

Scan existing XTS hardware

If you want to use your existing XTS hardware, use the scan function of TwinCAT to avoid configuration errors and to save time. Further information can be found in chapter "XTS Configurator", [Page 258].

Use XTS Simulation Builder

With the *XTS Simulation Builder* you have the possibility to create I/O objects to save time. Further information can be found in chapter "XTS Simulation Builder", [Page 229].

Manual configuration

If you want to configure the I/O objects manually, you must ensure that you create exactly those components that are installed in your XTS system.

The I/O objects must be created in the following order:

- Real-time Ethernet adapter
- EtherCAT Master
- CU2508 Ethernet Port
- XTS module
- XTS sensor channel

Real-time Ethernet adapter



Example CU2508 real-time Ethernet adapter

connection between the XTS Ethernet lines and the IPC.

The addition of a real-time Ethernet adapter is shown with a CU2508 adapter as an example. You can add four EtherCAT masters to the CU2508 adapter. Depending on the number of EtherCAT masters, a corresponding number of real-time Ethernet adapters must be added.

The Real-time Ethernet adapter is used to establish the physical

You have the possibility to add other adapters. Note that these adapters differ in the form of display and have fewer connectors.

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- Expand Solution Explorer > TwinCAT Project > I/O
- ► Right-click on **Devices** to open the context menu
- Click Add New Item... in the context menu

Functions of the driver



EtherCAT Master

Solution Explorer

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The Insert Device dialog box opens.

- Expand Ethernet
- Select Real-Time Ethernet Adapter (Multiple Protocol Handler)
- ▶ If required, enter a name for the Real-Time Ethernet adapter in the Name input field
- ► Confirm with **OK**

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Shift+Alt+A

A Device (RT-Ethernet Adapter) is added to the I/O Devices.

For each infeed line an EtherCAT master is required among the I/O objects. You may use four EtherCAT masters under one Real-Time Ethernet adapter. If you use more than four EtherCAT masters, you have to add another Real-Time Ethernet adapter to the I/O objects.

- Expand Solution Explorer > TwinCAT Project > I/O
- Right-click on Devices to open the context menu
- Click Add New Item... in the context menu



The Insert Device dialog box opens.

- Expand EtherCAT
- Select EtherCAT Master
- If required, enter a name for the EtherCAT Master in the Name input field.
- ► Confirm with **OK**
- A Device (EtherCAT) is added to the I/O objects.

A CU2508 Ethernet port and the modules of an infeed line must be added to the EtherCAT master.

CU2508 Ethernet Port

A CU2508 Ethernet port must be added to the EtherCAT master before the modules are added.

Functions of the driver

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- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- Right-click on Device (EtherCAT) to open the context menu
- Click Add New Item... in the context menu

The Insert Device dialog box opens.

- Expand Beckhoff Automation GmbH & Co. KG > Ethernet Port Multiplier (CU25xx)
- Select CU2508 Ethernet Port
- If required, enter a name for the CU2508 Ethernet Port in the Name input field
- Confirm with OK

A Box (CU2508) is added to the EtherCAT master.

XTS module

After the CU2508 Ethernet port has been added to the EtherCAT master, the modules of the infeed line must be added.



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Example module with feed Since a module with feed has to be added to the EtherCAT master first, the addition of a module is shown with an *AT2001-0250* module with feed as an example.

Modules with feed are marked with with feed in the selection list.

- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- ► Right-click on **Device (EtherCAT)** to open the context menu
- Click Add New Item... in the context menu

The Insert Device dialog box opens.

- Expand Beckhoff Automation GmbH & Co. KG > XTS
- Select AT2001-0250 Motor module with feed 250 mm, 48 V
- ▶ If required, enter a name for the module in the input field Name
- ► Confirm with **OK**
- A *Term (AT2001-0250)* is added to the EtherCAT master.

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→ A1200/0230 → A1200/0230 → A1201/0250 → A1201/0250 → A1202/0250 → A1200/0250 →	Motor module with feed (B23Connector) (250 mm, 48V Motor module, = 257, 250 mm, 48V Motor module = 4157, 250 mm, 48V Motor module = 4167, 250 mm, 48V	B (Ethernet) C
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A 20004023 A 20040023 A 2004002 A	Motor module with level (B23C connectio) (250 nm, 48/ Motor module, 4:25, 250 nm, 48/ Motor module 4:25, 250 nm, 48/ Motor module, 4:25, 250 nm, 48/ Motor module 4:57, 250 nm, 48/ Motor module with level (4:57, 250 nm, 48/ Motor module with level (4:57, 250 nm, 48/ Motor module with level (8:23 Connectio), 4:47, 250 nm Motor module with level (8:23 Connectio), 4:49/ Motor module, 90° calinoid, EtherCAT II out, 489/ Lobal	● B (Ethernet) ○ C
A 20004023 A 2000402 A 2000402 A 2000402 A 20004023 A 2000402 A 2000402 A 2000402 A 2000402 A 2000402 A 200040 A 200400	Motor module with level (B23-Connector) 259 nm, 489 Motor module, 4::25, 250 nm, 489 Motor module with level, -225, 730 nm, 489 Motor module with level, 225, 730 nm, 489 Motor module with level, 235, 730 nm, 489 Motor module with level, 4:57, 250 nm, 489 Motor module with level, 4:57, 250 nm, 489 Motor module, 91° clothoid, ElherGAT In, 489 Kolor module, 91° clothoid, ElherGAT In, 489 Kolor module, 91° clothoid, ElherGAT In, 489 Kolor	E (Ethernet) C
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XTS sensor channel

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Solution Explore



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A sensor channel must be added to each module.

Example sensor channel for module with feed

The addition of a sensor channel is shown with an AT0250-5250 as an example. It belongs to an *AT2001-0250* module with feed.

- Expand Solution Explorer > TwinCAT Project > I/O > Devices > Device (EtherCAT)
- ▶ Right-click on Term (AT2001-0250) to open the context menu
- Click Add New Item... in the context menu

The Insert Device dialog box opens.

- ▶ Expand Beckhoff Automation GmbH & Co. KG > XTS
- Select AT2001-5250 Sensor line with feed
- If required, enter a name for the sensor channel in the input field Name
- ► Confirm with **Ok**

A *Term (AT2001-5250)* is added to the module *Term (AT2001-0250)*.

After the sensor channel has been added to the module with feed, all further modules of the infeed line can be added to the EtherCAT master.

Add all further modules of the infeed line with a corresponding sensor channel in the same way

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Link TcCom objects 6.1.4.4

Modules and I/O objects

Once all objects have been created, some links have to be created in order to be able to exchange data between the objects.

The modules must be linked to the corresponding I/O objects.

NOTICE

Careful linking

To ensure that the system can be started without problems, proceed carefully and in sequence when linking the modules to the I/ O objects.

Incorrect linking can cause problems when starting the system.

Control



Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsPart) > Object (AT2001-0250) > Data Pointer

- Right-click on Control to open the context menu
- Click on Change Link... in the context menu

The Attach Variable Control dialog box opens.

Expand Solution-Explorer > TwinCAT Project > I/O > Devices > Devices (EtherCAT) > Term 2 (AT2001-0250)

A gray arrow on the variable indicates successful linking.

Further information can be found in chapter "Linking details", [Page

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CurrentSetpointValues

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- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsPart) > Objekt (AT2001-0250) > Data Pointer
- Select CurrentSetpointValues[0] to CurrentSetpointValues[14] from top to bottom
- Right-click on the top variable of the selection to open the context menu
- ► Click Change Multi Link... in the context menu

The Attach Variable 30.0 Byte(s) dialog box opens.

- Expand Solution-Explorer > TwinCAT Project > I/O > Devices > Devices (EtherCAT) > Term 2 (AT2001-0250)
- Check checkbox at All Types
- Select Current setpoint value Ch.1 to Current setpoint value Ch.15
- ► Confirm with **OK**

A gray arrow on the variable indicates successful linking.

Further information can be found in chapter "Linking details", [Page 57].

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CurrentActualValues

- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsPart) > Objekt (AT2001-0250) > Data Pointer
- Select CurrentActualValues[0] to CurrentActualValues[14] from top to bottom
- Right-click on the top variable of the selection to open the context menu
- Click Change Multi Link... in the context menu

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Functions of the driver



The Attach Variable 30.0 Byte(s) dialog box opens.

- Expand Solution-Explorer > TwinCAT Project > I/O > Devices > Devices (EtherCAT) > Term 2 (AT2001-0250)
- Check checkbox at All Types
- Select Current actual value Ch.1 to Current actual value Ch.15
- ► Confirm with **OK**

A gray arrow on the variable indicates successful linking.

Further information can be found in chapter "Linking details", [Page 57].

RawPositionValues

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h mil Ohiert (AT2000 0250)	

- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsPart) > Objekt (AT2001-0250) > Data Pointer
- Select RawPositionValues[0] to RawPositionValues[31] from top to bottom
- Right-click on the top variable of the selection to open the context menu
- ► Click Change Multi Link... in the context menu

Attach Variable 64.0 Byte(s) × Show Variables Y Drhy Unused Exclude disabled Exclude other Devices X Exclude same Image Show Tooltips Show Variable Groups Collapse last Level Search Show Variable Types Matching Type All Types Continuous

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The corresponding Value Channels to the RawPositionValues are located in the added term of the XTS sensor channel. Be sure to select the correct term when linking.

The Attach Variable 64.0 Byte(s) dialog box opens.

- ▶ Expand Solution-Explorer > TwinCAT Project > I/O > Devices > Devices (EtherCAT) > Term 3 (AT2001-0250)
- Check checkbox at All Types
- ► Select Value Channel 01 to Value Channel 32
- ► Confirm with **OK**

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> A gray arrow on the variable indicates successful linking. Further information can be found in chapter "Linking details", [Page 57].



Linking details



After successful linking of the modules TcCom objects with the physical modules of the I/O, the linking is indicated by gray arrows at the individual Data Pointer variables of the TcCom objects. You now have the option to view more details about the linking.

Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsPart) > Objekt (AT2001-0250) > Data Pointer

► Double click on **Control**

Flags	Online			
Name:	Control			
Туре:	UINT			
Group:	Data Pointer	Size:	2.0	
Address:	0 (0x0)	User ID:	0	
Comment:				^
Comment:				^
Comment:				~
Comment: ADS Info:				

Click on the Variable tab in the project window Details of the linking are displayed at Linked to....

Solution Explorer	→ Ĥ
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Solution 'TwinCAT Project' (1 project)	
Control	
CurrentSetpointValues[0] CurrentSetpointValues[1]	

TcCom objects Mover and Motion

To be able to control the movers, the setpoints of the movers must be calculated. For this purpose, each TcCOM object *Mover* must be linked to an NC axis.

Create corresponding TcCom objects Mover with TC1250 and TF5020

To link the TcCom objects with the NC axes, corresponding XTS Mover software objects must be created with the software *TC1250* | *TwinCAT 3 PLC/NC PTP 10* and *TF5020* | *TwinCAT 3 NC PTP Axes Pack unlimited*. For more information, please see the following links:

Direct link to documentation TC1250 | TwinCAT 3 PLC/NC PTP 10

Direct link to the documentation TF50x0 | TwinCAT 3 | NC PTP

NOTICE

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Careful linking

To ensure that the system starts smoothly, proceed carefully and sequentially when linking the movers to the Motion objects. Incorrect linking can cause problems when starting the system.

SoftDrive Input

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Calution 'TwinCAT Desired' (1	
TwinCAT Project	project)
SYSTEM	
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Real-Time	
Tasks	
ete Koutes	
TcCOM Objects	
Object1 (XtsPro	cessingUnit)
Object1 (Xts	Part)
Dbject2 (Xts	Track)
 Object3 (Xts 	Mover)
Imputs	riveInput
👂 🛄 Outi 🚛	Change Link
	Clear Link(s)
NC-Task 1 SAF	Go To Link Variable
Image	Taka Nama Ovar from linked Variable
Tables	
Objects	Move Address
⊿ 🚔 Axes →3	Online Write
▲ 🐴 Axis 1 →3	Online Force
Þ 🍇 Enc 兴	Release Force
	Add to Watch
🔺 🛄 Inpur 🎘	Remove from Watch
Þ 🐔 F 🚒	Add to Scope

The position setpoints and dynamics setpoints for the mover are provided for the calculation.

- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsMover) > Inputs
- Right-click on SoftDriveInput to open the context menu
- Click on Change Link... in the context menu

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- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsMover) > Inputs
- Double-click on SoftDriveInput

Variable Flags	Online	Online List		
Name:	SoftDrive	elnput		
Type:	SoftDrive	elnput		
Group:	Inputs	521	Size:	104.0
Address:	0 (0x0)		User ID:	0
Comment:				
	L			1000
ADS Info:				
ADS Info: Symbol Info:	Port: 502	244, 'Object1 (Xts)	ProcessingUnit).Ob	ject3 (XtsMover).Inputs.SoftDriv

Click on the Variable tab in the project window Details of the linking are displayed at Linked to....

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SoftDrive Output



The actual values for the position and dynamics of the mover are provided for the application.

- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsMover) > Outputs
- Right-click on SoftDriveOutput to open the context menu
- Click on Change Link... in the context menu

NOTICE

For SoftDrive Output linking, make sure that you select the same mover that you used for SoftDrive Input linking.



Outputs

SoftDriveOutput

The Attach Variable SoftDriveOutput (Input) dialog box opens.

- Expand MOTION > NC-Task 1 SAF > Axes > Axis 1 > Axis 1_Obj (CTcSoftDrive)
- Select OutputPointer
- ► Confirm with **OK**

A gray arrow on the variable indicates successful linking.

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Linking details



- Expand Solution-Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (XtsProcessingUnit) > Object (XtsMover) > Outputs
- Double-click on SoftDriveOutput

ridgs	Online Online	List	
Name:	SoftDriveOutput		
Type:	Soft DriveOutput		
Group:	Outputs	Size:	96.0
Address:	0 (0×0)	User ID:	0
Comment:			1
Comment:			,
Comment:			
Comment: ADS Info:			
Comment: ADS Info: Symbol Info:	Port: 50244, 'Ob	ject 1 (XtsProcessingUnit).01	oject3 (XtsMover).Outputs.Soft

Click on the Variable tab in the project window
 Details of the linking are displayed at Linked to....

6.1.4.5 Required settings

Once the linking has been completed, further settings are required for the TcCom objects, Motion objects and I/O objects before the XTS system can be put into operation.

If the XTS Configurator was used to create the XTS system, the required settings have been created automatically.

Processing Unit

Solution Explorer Д× Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-○ ○ 🏠 🗄 - 🐻 - 🗗 🏓 🗕 COM Objects Q Search Solution Explorer (Ctrl+ü) Double-click on Object (XtsProcessingUnit) Solution 'TwinCAT Project' (1 project) TwinCAT Project SYSTEM
 License Þ 🥚 Real-Time 🛅 Tasks ⊳ 🔀 Routes 🚺 Type System TcCOM Object 🔛 Object1 (XtsPart) Object1 (XtsPart)
Object2 (XtsTrack)
Object3 (XtsMover)
Object4 (XtsMover)
Object5 (XtsMover) Þ Þ Þ Object6 (XtsMover) Þ Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Click the Parameter (Init) tab in the project window Name Value Expand General Select OperationMode Normal or Simulation in the drop-down OperationMode Normal ~ menu Normal Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Interface Pointer Expand Mover Name Value Select the appropriate mover in the drop-down menu MoverType Mc AT9011_0050 MoverType UserSpecific AT9011_0050 AT9011_0070 AT9012_0050 MagnetPlateType MoverSortOrder MinMechanicalMoverDistance ATH9011 0075 Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Select the corresponding magnetic plate set of the mover in the drop-down menu MagnetPlateType Name Value AT9014_0070 • MoverType MagnetPlateType AT9001 0550 MoverSortOrder AT9001 0450 MinMechanicalMoverDistance AT9001 0AA0 AT9001_0775 ATH9001_0550 Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Interface Pointer Expand Mover ID Detection Name Value ▶ In the drop-down menu IdDetectionMode, select whether no, one or several Mover 1 are used on the XTS system IdDetectionMode MoverPositionAssignment ExpectedMoverids MultipleMover1 TriggerMoverIdDetection

	Name	Value
	Mover ID Detection	
-	Teaching	
	TeachingFileNumber	0
	TeachingMappingMode	Automatic
+	StartStandStillTeaching	
+	StartMovementTeaching	
	StopMovementTeaching	
	lsAbortOnTeachingWarningsEnabled	TRUE
	lsTeachingCheckSumCheckEnabled	FALSE
	IsTeachingEnabled	TRUE
+	TeachingCheckSum	FALSE
	TeachingWarningLevel	TRUE

- ► Expand *Teaching*
- Select **TRUE** in the *IsTeachingEnabled* drop-down menu

Modules

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earch Solutio	n Explorer (Ctrl+ü)		ρ-
earch Solution Solution ' Solution ' Minimitation ' Minimi	L Explorer (Ctrl+ū) TwinCAT Project' (1 project AT Project STEM License Real-Time Tasks Task 1 Routes Type System TcCOM Objects S Object 1 (XtsPorcessing ▲ Object 1 (XtsPort) ► Conformed (1/2000) ► Object 2 (AT2000) ► Object 2 (AT2000)	Unit) .0250) .0250) .0250)	- م ب
Object Conte	t Parameter (Init) Parameter	r (Online) Interfaces Data Poir	nter
Context:		1	~
Depend On:		Manual Config	~
Need Call	From Sync Mapping		
Data Areas:		Interfaces:	
Data Pointer:		Interface Pointer:	
Result:			
ID	Task		Name
1	00000000	~	
	00000000 03000011 'I/O Idle Tas 05000020 'NC-Task 1 05000010 'NC-Task 1 02010040 'Task 1'	k' SVB' SAF'	

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (ProcessingUnit)
- Double-click on Object (AT2xxx-0xxx)

- ► In the project window click on the **Context** tab
- Select the appropriate task from the *Task* drop-down menu

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The PositionIndex defines the position of the module in the XTS system. The first module has the hardware position 0, the other modules are counted in ascending order. The number of modules minus one gives the hardware position for the last module.

	Name	Value	
-	General		
	AdsPort	0x0000	
	TaskOID	00000000	-
	MotorTerminalOID	00000000	-
	SensorTerminalOID	00000000	-
	PositionIndex	0	
	Gap	0.0	
	Offset	0.0	
	ScalingFactor	1.0	

- Click the Parameter (Init) tab in the project window
- Expand General
- Enter a continuous value in the *PositionIndex* input field, starting with 0 for the first module

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bject	Context	Parameter (Init)	Parameter (Online) Interfaces Data Pointe	er
	Nam	ne	Value	CS
-	Gen			
	Ads	Port	0x0000	
	Task	OID	02010040	
	Mot	orTerminalOID	00000000	~
	Sens	orTerminalOID	010100A0 'Object8 (A12000_0250)'	^
	Posi	tionIndex	010100B0 'Object9 (A12000_0250)' 010100C0 'Object10 (AT2000_0250)'	
	Gap		010100D0 'Object11 (AT2050_0500)'	- H.
	Offs	et	010100E0 'Object12 (AT2050_0501)'	
	Scali	ngFactor	01010100 'Object3 (XtsMover)'	
	bean	ingrotter.	01010110 'Object4 (XtsMover)'	- He
			01010120 'Object5 (XtsMover)' 01010130 'Object6 (XtsMover)'	
			01010140 'Object7 (XtsInfoServer)'	- 11
			01010150 'Object8 (XtsStationInfo)'	
			02010040 'Task 1'	
			03000011 'I/O Idle Task'	
			03010010 'Device 1 (RT-Ethernet Adapter)	·
			03010030 'Device 3 (EtherCAT)'	
			03020001 'Box 1 (CU2508)'	
			03020002 'Term 2 (AT2001-0250)' 03020003 'Term 3 (AT2001-5250)'	
			03020004 'Term 4 (AT2000-0250)'	
			05020004 TCHTH4 (A12000 0250)	
Dbject	Context	Parameter (Init)	O3020005 'Term 5 (AT2000-0250)' Parameter (Online) Interfaces Data Pointe	er
Dbject	Context	Parameter (Init) ne	Value	er CS
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Dbject	Context Nam Genu Adsf Task Mot Sens Posi Gap	Parameter (Init) ne eral Port OID orTerminalOID orTerminalOID tionIndex	Value Value Value 0x0000 0x00000 0x0000 0x00000 0x0000 0x00000 0x0000 0x00000 0x00000 0x000000 0x00000 0x0000000 0x00000 0x0000000 0x00000 0x00000	
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	Context Nam Geno Adsf Task Mot Sens Posi Gap Offs Scali	Parameter (init) ne aral Port OID orTerminalOID tionIndex et ngFactor	Object Child Charles Data Pointe Value	ar CS
	Context Nam Geno Adsl Task Mot Sens Posit Gap Offs Scali	Parameter (Init) ne aral Port OID OrTerminalOID tionIndex et ngFactor	Value Value Value 0x0000 0x00000 0x000000 0x00000 0x0	
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	Context Nam Adsf Task Mot Sens Posi Gap Offs Scali	Parameter (Init) he cral Port OID orTerminalOID orTerminalOID tionIndex et ngFactor	Displayer Clinity (Lincol 220) Parameter (Online) Interfaces Data Pointe Value Data Pointe Data Pointe 0x0000 02010040 02010040 030200002 0000000 0000000 010100A0 'Object8 (AT2000_0250)' 01010080 'Object9 (AT2000_0250)' 010100B0 'Object1 (AT2000_0250)' 01010080 'Object12 (AT2000_0250)' 010100B0 'Object1 (AT2000_0250)' 01010000' Object12 (AT2050_0500)' 010100B0 'Object3 (XtsTrack)' 0101010' Object3 (XtsTrack)' 01010101 'Object3 (XtsMover)' 01010120 'Object3 (XtsMover)' 01010120 'Object3 (XtsMover)' 01010140 'Object3 (XtsMover)' 01010140 'Object3 (XtsMover)' 01010140 'Object3 (XtsMover)' 01010120 'Object3 (XtsMover)' 01010140 'Object3 (XtsMover)'	
	Context Nan Gent Adsl Task Mot Sens Gap Offs Scali	Parameter (Init) ne aral Port OID orTerminalOID tionIndex et ngFactor	Value Value 0x00000 "Term 5 (AT2000-0250)" Parameter (Online) Interfaces Data Pointe Value 0x0000 02010040 03020002 0000000 001010040 "Object8 (AT2000_0250)" 01010080 "Object9 (AT2000_0250)" 01010080 "Object9 (AT2000_0250)" 01010000 "Object10 (AT2000_0250)" 01010100 "Object10 (AT2000_0250)" 0101010 "Object10 (AT2000_0250)" 0101010 "Object10 (AT2000_0250)" 0101010 "Object10 (AT2000_0250)" 0101010 "Object10 (ATSMover)" 01010110 "Object10 (ATSMover)" 01010110 "Object10 (ATSMover)" 01010110 "Object10 (ATSMover)" 01010110 "Object10 (ATSMover)" 01010150 "Atxis 1_Obji (CTCSoftDrive)" 0201040 "Task1"	
	Context Nam Gen Adsl Task Mot Sens Gap Offs Scali	Parameter (Int) ne aral 20rt OID orTerminalOID orTerminalOID tionIndex et ngFactor	Value Value Value Value 0x0000 Value 0x00000 Value 0x00001 Value 0x0001 Value 0x0001 Value 0x0001 Value 0x0001 Value </td <td></td>	
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	Context Nam Gen Adsl Task Mot Sens Posi Gap Offs Scali	Parameter (Init) area oral OID orTerminalOID orTerminalOID tionIndex et ngFactor	Value Value Value Value 0x00000 Value 0x00000 Value 0x00000 Value 0x0000 Value 0x00000 Value 0x000010 Value <td></td>	
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Select the module used in the drop-down menu *MotorTerminalOID*

 Select sensor channel in the SensorTerminalOID drop-down menu

Track

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Name	Value	CS	Unit	
- General				
TaskOID	0000000	_ _		
IsClosed	FALSE	V		
IsIncludedInDetection	FALSE			
Polarity	TRUE			
Offset	0.0			
- PartConfigItems	[]		1 (Array Elements)	-
[0].ObjectID	00000000	*		
101 Polarity	Positive	+		

Object	Context Parameter (Init) Par	ameter (Online) Interfaces		
	Name	Value	CS	Unit
-				
	TaskOID	00000000		
	IsClosed	TRUE		
	IsIncludedInDetection	FALSE ~		
	Polarity	FALSE		
	Offset	TRUE		
	- PartConfigItems	[]		1 (Array Elements)
	[0].ObjectID	00000000		
	[0].Polarity	Positive		

CS Unit

bject Context Parameter (Init) Parameter (Online) Interfaces

Value

Name

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > Object (ProcessingUnit)
- Double-click on Object (XtsTrack)

- ► Click the Parameter (Init) tab in the project window
- Expand General
- Select TRUE in the *IsClosed* drop-down menu if the system is closed

OR

- Select FALSE in the *IsClosed* drop-down menu if the system is open
- Select TRUE in the drop-down menu *IsIncludedInDetection* if the track is included from Mover ID detection

OR

- Select FALSE in the drop-down menu IsIncludedInDetection if the track is excluded from Mover ID detection
- ► In the column *Units* of the drop-down menu select the number of parts that are included in the track

TaskOID			
	02010040	-	
IsClosed	TRUE	-	
IsIncludedInDetection	TRUE	× [
Polarity	Positive		
Offset	0.0		
PartConfightems	[]		1 (Array Element
[0].ObjectID	00000000	*	1 (Array Element
[0].Polarity	Positive	-	2 (Array Elements
			4 (Aray Element 5 (Aray Element 6 (Aray Element 7 (Aray Element 8 (Aray Element 9 (Aray Element 10 (Aray Elemen 11 (Aray Elemen 12 (Aray Elemen 13 (Aray Elemen 14 (Aray Elemen 15 (Aray Elemen 16 (Aray Elemen 17 (Aray Elemen 17 (Aray Elemen 17 (Aray Elemen 17 (Aray Elemen 17 (Aray Elemen

- ► Expand PartConfigItems
- In the ObjectId drop-down menu, select the part or parts that belong to the track

Name	Value		CS	Unit	
TaskOID	00000000	Ŧ			
IsClosed	TRUE	•			
IsIncludedInDetection	TRUE	٣			
Polarity	Positive	•			
Offset	0.0				
PartConfigItems	[]			1 (Array Elements)	
[0].ObjectID	00000000			~	
[0].Polarity	0000000 0101010 '00ject1 (XtbProcessing 0101002 '00ject1 (XtbProcessing 0101002 '00ject1 (XtbProcessing 0101003 '00ject1 (XtbDrocessing 0101003 '00ject1 (XtbDrocessing 0101003 '00ject1 (XtbDrocessing 0010000 '00ject1 (XtbDrocessing 00))	Unit)' '')'			

Mover	
	When creating movers manually, a universal mover object is in- serted by default. In addition to the selection of the mover type, the start position of the mover must also be determined.
Solution Explorer ・ ↓ × ○ ○ ☆ ☆ ・ ♂ ・ ♂ ↓ ♪ Search Solution Explorer (Ctrl+ ü)	Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc- COM Objects > Object (XtsProcessingUnit)
Solution 'TwinCAT Project (1 project) ■ TwinCAT Project ■ TwinCAT Project ■ SYSTEM ■ License ▶ ● Real-Time ▶ ■ Tasks ■ Toyle ■ Object1 (XtsPart) ■ Object2 (XtsTack) ▶ ■ Object3 (XtsMover) ▶ ■ Object3 (XtsMover)	Double-click on Object (XtsMover)
Object Context Parameter (Init) Parameter (Online) Data Area Interfaces	In the project window click on the Context tab
Context: 1 Depend On: Manual Config Need Call From Sync Mapping Manual Config Data Areas: Interfaces: 2 'Dutputs' Interfaces: 2 'Dutputs' Interface Pointer: Data Pointer: Interface Pointer: ID Task 1 00000000 03000011 'VO Idle Task' 03000010 'NC-Task 1 SVB' 00pect Context Parameter (Online) Data Area Interfaces Value Interfaces Mover Detection 0000000 SimulatedStartUpPosition 0000000 SimulatedStartUpPosition 0000000 SimulatedStartUpPosition 0000000 0101000' Object1 (AtSProcessingUnit)' Otionso' Object1 (AtSProcessingUnit)' 0101000' Object1 (AtSProcessingUnit)' Otionso' Object1 (AtSProcessingU	 Select the task in the <i>Task</i> drop-down menu Click the Parameter (Init) tab in the project window Expand <i>Simulation</i> In the <i>SimulatedStartUpPart</i> drop-down menu select a part on which the mover is to start
010100A0 'Object8 (AT2000_0250)' 01010080 'Object9 (AT2000_0250)' 01010080 'Object10 (AT2000_0250)' 01010020 'Object11 (AT2050_0500)' 01010000' Object12 (AT2050_0501)' 01010000' Object2 (AtsMover)' Object Context Parameter (Int) Parameter (Online) Data Area Interfaces	• Enter the exact position of the mover on the part in the Simulat
Name Value General 0.0000 AdsPort 0.0000 ActiveTrackObjectid 0000000 TaskOID 0000000 ConfiguredDetectionTrackObjectid 0000000 ConfiguredDetectionTrackObjectid 0000000 SimulatedStartUpPart 01010020 SimulatedStartUpPat 01010020	Enter the exact position of the mover on the part in the Simulat- edStartUpPosition input field

NC axis

Solution Explorer	Expand Solution Explorer > TwinCAT Project > MOTION > NC- SAF 1 Task > Axes
Image: Solution TwinCAT Project (1 project) Image: SySTEM Image: SySTEM <td>► Double click on Axis 1</td>	► Double click on Axis 1
General Settings Parameter Dynamics Online Functions Coupling Compensation Link To I/O	 In the project window click on the Settings tab Click Link To I/O
Select U/O Box/Terminal (Axis 1) Type Type Name Comment Set Drive (Depart) Comment	 The dialog box Select I/O Box/Terminal opens. ▶ Select the corresponding SoftDrive (Object) from the list ▶ Confirm with OK
General Settings Parameter Dynamics Online Functions Coupling Compensation Link To I/O Axis T_Obj1 (CTcSoftDrve) Link To PLC Axis Type: Soft Drive (Object) Unit: mm Postion: µm Velocity: mm/min Result mm/s Postion: Velocity: Axis Cycle Time / Access Divider Divider: 1 Que Cycle Time (ms): 2000	When the SoftDrive is selected, the Axis Type automatically changes to <i>SoftDrive (Object)</i> .
General Settings Parameter Dynamics Online Functions Coupling Compensation • Maximum Dynamics: • Online Value Online Value • Maximum Dynamics: • • • Reference Velocity 4200.0 • • Maximum Velocity 4000.0 • • Maximum Deceleration 80000.0 • • Default Dynamics: • • • Default Deceleration 20000.0 • • Default Deceleration 20000.0 • • Default Deceleration 20000.0 • • Hanual Motion and Homing: • • • + Kais Stop: • • • + Limit Switches: • • • + Monitoring: • • •	 In the project window click on the Parameter tab Expand Maximum Dynamics Enter the value 4200.0 in the input field Reference Velocity Enter the value 4000.0 in the input field Maximum Velocity Enter the value 80000.0 in the input fields Maximum Acceleration and Maximum Deceleration Expand Default Dynamics Enter the value 20000.0 in the input fields Deafult Acceleration and Default Deceleration Enter the value 20000.0 in the input field Default Interval
Youndoring: Setpoint Generator: NCI Parameter: Other Settings:	Enter the value 200000.0 in the input field Default Jerk

Solution Explorer	→ ₽ ×	► Expand Solution Explorer > TwinCAT Project > MOTION > NC-
		Task 1 SAF > Axes > Axis 1
Search Solution Explorer (Ctrl+ü)	- م _ر	
Solution 'TwinCAT Project' (1 project)		Double click on Enc
IwinCAI Project System		
A CONTION		
NC-Task 1 SAF		
💼 NC-Task 1 SVB		
🛟 Image		
Tables		
A 🗃 Axis 1		
👂 👯 Enc		
Þ ≃+∎ Drive		
Tak Ctrl		
Inputs Outputs		
Axis 1 Obi1 (CTcSoftDrive)		
Axis 2		
Axis 3		
Axis 4		
General NC-Encoder Parameter Time Compensation	Online	In the project window click on the Parameter tab
Parameter	Offline Value	Expand Encoder Evaluation
- Encoder Evaluation:		
Invert Encoder Counting Direction	FALSE 💌	Enter the value 3000 in the input field Modulo Factor
Position Bias	0.0	· · · · · · · · · · · · · · · · · · ·
Modulo Factor (e.g. 360.0°)	3000.0	Enter the value 0.2 in the input field Tolerance Window for Mod-
Tolerance Window for Modulo Start	0.2	ulo Start
+ Limit Switches:		
+ Filter:		
+ Homing:		
+ Other Settings:		

SoftDrive

olution Explorer	- - .	Expand Sol Task 1 SAF
arcn Solution Explorer (Enn-U) Solution TwinCAT Project ▷ SySTEM △ MOTION △ MOTION △ MOTION △ MOTION △ MOTION △ MORCTask 1 SAF ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ⓒ Image ○	ct) TcSoftDrive)	► Double clic
Object Context Parameter (Init) Parame	ter (Online) Data Area Interfaces Interface Pointe	In the proje
Context:	1 ~	Select the a
Depend On:	Manual Config 🗸 🗸	
Need Call From Sync Mapping		
2 SoftDriveCmdFromTC' 3 SoftDriveActualToTC' Data Pointer:	Interface Pointer:	
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ID Task	Name	
1 00000000	~	
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bject Context Parameter (Init) Param	meter (Online) Data Area Interfaces Interface	Click the Pa
Name	Value	
- General		
AdsPort	0x0000	Enter the value
HardwareModulo	3000.0	
OperationMode	8	
MaxCurrentOutput	12.0	
EmergencyRamp	10000.0	
EmergencyTimeQut	0.5	
Chan de Cliffor the house	0.1	

DIRECT_AT_SWITCHTIME

StandstillSwitchMode

- lution Explorer > TwinCAT Project > MOTION > NC-= > Axes > Axis
- k on Axis 1_Obj1 (CTcSoftDrive)

- ct window click on the Context tab
- appropriate task from the *Task* drop-down menu

- arameter (Init) tab in the project window
- neral
- alue **3000.0** in the input field *Hardware Modulo*

NOTICE

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Configuration of existing hardware components

All objects must correspond to the existing hardware components so that the configuration can be used in simulation and operation.

Once all objects correspond to the desired XTS system, the configuration can be used in the simulation. If required, modules and objects can be added or removed for a pure simulation project without existing hardware.

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6.1.5 Compatibility mode

The compatibility mode allows you to switch from the previous XTS Manager of software versions up to version 3.18.715.0 to the *TF5850* | *TwinCAT 3 XTS Extension* without having to reconfigure the XTS system. The old XTS Manager can still be used with all functions. Old versions of the XTS Utility Library, the XTS Tools as well as the *XTS Viewer* and the *XTS Support Assistant* will still work after the update.



Please note that while using the compatibility mode, the new functions, such as XTS Track Management and the Leave and Arrive functionality, or some new functions for simulation and visualization are not available. To extend your XTS system and use the new functions, you must convert your current configuration of XTS objects into a new project. Further information can be found in chapter "Conversion of old XTS system", [Page 72].

Old configuration	New configuration
TcCOM Objects	TcCOM Objects
 IO Object1 (XtsloDriver) 	XtsProcessingUnit 1
Info	Part 1
Module 1_Obj1 (AT2001_0250)	Imit Module 1
Module 2_Obj2 (AT2000_0250)	P i Module 2
Module 3_Obj3 (AT2000_0250)	p i Module 3
Module 4_Obj4 (AT2000_0250)	P I Module 4
Module 5_Obj5 (AT2050_0500)	Module 5
Module 6_Obj6 (AT2050_0501)	Module 7
Module 7_Obj7 (AT2001_0250)	Module ?
Module 8_Obj8 (AT2000_0250)	b Module 9
Module 9_Obj9 (AT2000_0250)	Module 10
Module 10_Obj10 (AT2000_0250)	Module 11
Module 11_Obj11 (AT2050_0500)	Module 12
Module 12_Obj12 (AT2050_0501)	Track 1
Mover 1	Mover 1
Mover 2	Mover 2
Mover 3	Mover 3
Mover 4	Mover 4
Mover 5	Mover 5
Mover 6	Mover 6
Mover 7	Mover 7
Mover 8	P Movers
Mover 9	Mover 10
Mover 10	 Info Server

To activate the new XTS software after the change, you only need to reload the XTS TcCOM objects. The old configuration and the XTS system work as usual without adjusting the project. Further information can be found in chapter "Reload TcCom objects", [Page 23].

During operation, a hidden new configuration is created in the background using the new object structure XTS Parts and XTS Tracks, which is internally linked to the old objects. This configuration can be seen in the *Online Objects* tab.

nine Objects Project Objects Online Changeable Objects Class Factories	
OTCID	Name
03000000	10
· 08500000	PicCtrl
02000000	RTime
01010020	Object2 (XtsloDriver)
01010010	Module 1_Obj1 (AT2001_0250)
01010030	Module 2_Obj2 (AT2000_0250)
01010040	Module 3_Obj3 (AT2050_0500)
01010050	Module 4_Obj4 (AT2050_0501)
01010060	Module 5_Obj5 (AT2000_0250)
01010070	Module 6_Obj6 (AT2000_0250)
01010080	Module 7_Obj7 (AT2050_0500)
01010090	Module 8_Obj8 (AT2050_0501)
01010490	Mover 1_Obj9 (XtsMover)
010104A0	Mover 2_Obj10 (XtsMover)
010104B0	Mover 3_Obj11 (XtsMover)
010104C0	Mover 4_Obj12 (XtsMover)
71010010	Object2 (XtsloDriver)_ProcessingUnit
71010002	IOPU
7101000C	Object2 (XtsloDriver)_DefaultPart
71010000	

6.1.6 Conversion of old XTS system

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Please note that while using the compatibility mode, the new functions of the XTS Track Management as well as the Leave and Arrive functionality or some new functions for simulation and visualization are not available. To extend your XTS system and use the new functions, you must convert your current configuration of XTS objects into a new project.

When converting an old XTS system up to software version 3.18.715.0, the following areas must be adjusted and carefully controlled, as only small changes in these areas produce large effects in the entire project:

- XTS TcCOM objects
- NC axes and SoftDrives
- XTS Utility Library



Example configuration

The conversion of an old system and the associated project is described using a closed system with 180° curves and four movers as an example.



To be safe, make a copy of your project before starting the conversion. It cannot be guaranteed that the following steps can be applied one hundred percent to every project. If you have difficulties with the conversion, contact the product specialist responsible for your region.
6.1.6.1 Removing old XTS Task and XtsIoDriver TcCOM object

First, the XTS Task and the structure of the *XtsIoDriver* TcCOM object must be removed from the old project.



If required, create a list of the most important settings of the *Xtslo-Driver* TcCOM object so that you can apply them later to the XTS Processing Unit object.

XTS Task

Solution Explorer				
© ⊃ ☆ 🛱 • To • ₫	1			
Search Solution Explorer (Ctrl+	·ü)			
 Solution 'TcHmiProject2' TwinCAT Project1 SYSTEM License Real-Time 12 Tasks 	(1 pr	oject)		
🖬 XTS Task 1	*-			
E Routes		Add New Item	Ins	
Type System	Ъ	Add Existing Item	Shift+Alt+A	
Iccom Object	X	Remove	Del	
MOTION		Save XTS Task 1 As		
PLC	•	Disable		
SAFETY				
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ANALYTICS				

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tasks
- ► Right-click on XTS Task to open the context menu
- ► In the context menu click **Remove**

XtsIoDriver TcCOM object



- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- ► Right-click on **Object (XtsIoDriver)** to open the context menu
- ► In the context menu click **Remove**

Online Objects Project Objects Online Changeable Objects Class Factories
OTCID Name
DTCID Select all with same TMI/TMC Description

Unselect all Reload TMI/TMC Description(s)

Select all with same TMI/TMC File

Module 5_Obj5 (AT2050_0500) Module 6_Obj6 (AT2050_0501) Module 7_Obj7 (AT2001_0250) Module 8_Obj8 (AT2000_0250) Module 9_Obj9 (AT2000_0250) Module 10_Obj10 (AT2000_0250) Module 11_Obj11 (AT2050_0500) Module 12_Obj12 (AT2050_0501)

Execute TMC Reload



If not already done, a TMC Reload must be performed. Further information can be found in chapter "Compatibility mode", [Page 71].

- In the project window click on the Project Objects tab
- Select all objects
- Right-click the selected objects to open the context menu
- Click on Reload TMI/TMC Description(s) in the context menu

Creating a new XTS TcCOM structure

ver

To convert an old XTS system, a new XTS system must first be configured. To do this, activate the *XTS Tool Window*. Further information can be found in chapter "Activation of the XTS Tool Window", [Page 224].

Start configuring the system. Further information can be found in chapter XTS system configuration. If required, you can set new parameters such as stations or simulation parameters for the movers already during configuration.

When configuring the movers, you can either accept the existing NC axes and SoftDrives or create new ones. Taking over the existing NC axes has the advantage that you do not have to set new links to the PLC. Furthermore, all tuning parameters and settings of the NC axes are taken over.

Reuse of NC axes

Add

			1	
d Move	rs for existing Axes?			×
	2 unused axes with a SoftDrive object have been detected. Would you like to create movers for them and add them to t	he selected proce	essing	unit?
	XtsProcessingUnit 1			
	X Yes, but only for selected axes:			
	Mover Axis 7			

Cancel

OK

The *Add Movers for existing Axes*? dialog box opens only if there are fewer movers than old NC axes in the new project.

The Add Movers for existing Axes? dialog box opens.

- Select all NC axes for which movers are to be created
- ► Confirm with OK

Note that the order in which the movers are selected has an influence on which mover is linked to which NC axis.



Once the configuration has been completed, all configured TcCOM objects are displayed in the project tree of the Solution Explorer.

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6.1.6.2 Reuse XtsIoDriver parameters

Special parameters, such as Mover 1 functionality, that you set under the old XtsIoDriver object can be set in the XTS Processing Unit object. In the XTS Processing Unit object you will find the setting options for all old parameters.

Solution Explorer 👻 🕂 🛪 TwinCA	FProject1 + ×	
ර ර බ ස - `⊙ - අ 🖋 - Object	Context Parameter (Init) Parameter (Online) Interfac	ees Event Classes XPU
Search Solution Explorer (Ctrl+u)	Name	Value
g Solution 'TwinCAT Project' (1 project)	Gameral	NOC.
MinCAI Project	OperationMode	Simulation
License	Mour	
Þ 🥚 Real-Time	Moustine	AT9011 0070
👂 🏪 Tasks	MagnetPlateTune	AT901_050
gHg Routes	MourSortOrdar	Arcardina
Ein type system	MinMechanicalMourrDistance	0.0
XtsProcessingUnit 1	MoverIdDetection	
▶ Kai MOTION	IdDetectionMode	Standard
PLC	MoverPositionAssignment	Standard
SAFETY SAFETY	+ ExpectedMoverids	
ANALYTICS	TriggerMoverIdDetection	
▶ 🔄 VO	Teaching	
	TeachingFileNumber	0
	+ StartStandStillTeaching	
	+ StartMovementTeaching	
	StopMovementTeaching	
	IsAbortOnTeachingWarningsEnabled	TRUE
	IsTeachingCheckSumCheckEnabled	FALSE
	+ TeachingCheckSum	[0x00, 0x00, 0x00]
	TeachingWarningLevel	Level_3
	TriggerTeachingFileFormatUpdate	
	Diagnostics	
	IsAutoDumpWritingEnabled	FALSE
	IsinputCheckEnabled	FALSE
	WriteDump	
	UsedEventLogger	EventLogger
	EtherCatMasterSyncTaskObjectId	00000000
	IsCycleTimeWarningSuppressed	FALSE
	IsMoverFrozenErrorActivated	FALSE
	IsPositionBasedErrorForwardingEnabled	FALSE
	Optimization	MaximizePositionAccuracyOP1
	TriggerRedetection	
	CalculateNormAmplitude	FALSE
	IsPositionNoiseEnabled	TRUE
	IsRandomStartUpEnabled	TRUE
	MoverDistance	60.0
	PositionOffset	40.0
	PositionNoiseBandwidth	0.02
	RandomStartUpBandwidth	10.0
	PositionStartUpSimulationMode	UseMoverParameters
	MoverldStartUpSimulationMode	UseRandomDistribution
	RandomInitMode	UseSystemTime
	RandomInitSeed	56789

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit
- ► Click the **Parameter (Init)** tab in the project window
- Check settings
- ▶ If necessary enter the settings of the old XTS project

6.1.6.3 Adjusting the cycle time of the XTS task

Solution Explorer

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Solution 'TwinCAT Project' (1 project)

Search Solution Explorer (Ctrl+ü)

Routes
 Type System
 TcCOM Objects

SAFETY C++ ANALYTICS

TwinCAT Project
 SYSTEM
 License
 Real-Time
 Tasks



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- The cycle time of the new XTS task must be set to 250 $\ensuremath{\mu s}$.
- Expand Solution Explorer > TwinCAT Project > SYSTEM
- Double-click on Real-Time

(tsQuickStartGuide_PRJ + ×					
Settings Online Priorities C++ D	ebugger				
Router Memory Configured Size [MB]: 32 Allocated / Available: 32 /	Global Tas Maximal S 30	k Config Rack Size [KB] 64KB ∨			
Available cores (Shared/Isolated):	1 🔹 3 🔹 Re	ad from Target Set on target]		
Core	RT-Core	Base Time	Con	e Limit	
0 (Shared)					
1 (Isolated)	✓ Default	1 ms	100	%	
2 (Isolated)		1 ms	• 100	%	
3 (Isolated)		250 µs	 100	%	
Object		RT-Core		Base Tim	e (ms)
XTS Task 1		Core 3		🚬 250 μs	
NC Task SAF		Core 2		💌 1 ms	
I/O Idle Task		Default (1)		💌 1 ms	
PlcTask		Default (1)		💌 1 ms	
Worker Task		Core 2		<u> </u>	
PIcAuxTask		Default (1)		💌 1 ms	

- ► In the project window click on the **Settings** tab
- Ensure that the XTS task is running on the correct RT-Core
- ▶ If required, change **RT-Core** via the drop-down menu
- Ensure that the Base Time is set to 250 µs
- If required, set Base Time value to 250 µs via the drop-down menu



- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tasks
- Double-click on the new XTS Task



- ▶ In the project window click on the Task tab
- Enter the value 1 in the input field Cycle ticks or set it using the arrow keys



For more information on the required Real Time settings, please refer to the relevant documentation or contact the product specialist responsible for your region.

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6.1.6.4 Check of NC axes and SoftDrive parameters

```
New NC axes
```

If you use new NC axes, all previous parameters must be taken over from the old XTS project. The parameters can either be added manually or imported in the *XTS Configurator* as a parameter set of the movers. For more information on all available parameters for the NC axes and the SoftDrive, refer to the SoftDrive documentation.

The new NC axes must be linked to the PLC:



The Modulo Factor for the NC axes and the SoftDrive must be set to the correct length of the system:

- Solution Explorer - I X G O ∯ 🛱 - ĬG - ı₽ 🗡 -Search Solution Explorer (Ctrl+ü) ρ. Solution 'TwinCAT Project' (1 project) TwinCAT Project SYSTEM Þ NC SAF NC_SVB Image Tables Objects Axes 🔺 📑 Axis 1 a Driv 🕍 Ctrl Þ 🕒 Inputs Outputs Þ SoftDrive 1_Obj1 (CtcSoftDrive) Þ Axis 2 L Avic 3
- Expand Solution Explorer > TwinCAT Project > MOTION > NC SAF > Axes
- Expand the axis whose settings are to be adjusted
- Double click on Enc

Functions of the driver

eneral	NC-Encoder Parameter Tin	ne Compensation	Online	
			0///: 1/ 1	
	Parameter		Offline Value	
· _	Encoder Evaluation:			
	nvert Encoder Counting Dire	ction	FALSE	
1	Position Bias		0.0	
	Modulo Factor (e.g. 360.0°)		2000.0	
	Tolerance Window for Mo	dulo Start	0.0	
+	Limit Switches:			
+	Filter:			
+ 1	Homing:			
+	Other Settings:			
	Maximum Position		0.0	
	Maximum Posicion		0.0	
0 1	xpiorer û ڨ • ₫ • ĭ₀ • ₫ ≯	-	• + ×	
ch So	lution Explorer (Ctrl+ü)		- م	
Solu	tion 'TwinCAT Project' (1 pro	oject)		
	Monormal Mathematical Action of the format oo the format oo the fo	_Obj1 (CtcSoftDri	ve)	
t Con	text Parameter (Init) Parameter (Online)	Data Area Interfaces	Interface Pointer Data Pointer	
N	lame	Value		
G	eneral	0-015-		
A	aseon lardwareModulo	2000.0		
0	perationMode	8		
N	faxCurrentOutput	12.0		
E	mergencyRamp	10000.0		
E	mergencyTimeOut	0.5		
SI	tandstillSwitchTime	U.1 DIRECT AT SMUTCHTMAN		
	anusunswitchiviode	DIRECT AT SWITCHTIME		
S	ontrolAreas			
C	ontrolAreas kternallO			

- In the project window click on the Parameter tab
- Expand Encoder Evaluation
- Ensure that the Modulo Factor is set to the length of the current system
- If required, enter the length of the current system in the input field Modulo Factor
- Expand Solution Explorer > TwinCAT Project > MOTION > NC SAF > Axes
- Expand the axis whose settings are to be adjusted
- Double click on SoftDrive

- Click the **Parameter (Init)** tab in the project window
- Expand General
- Ensure that the HardwareModulo value is set to the length of the current XTS system
- If required, enter the length of the current system in the input field HardwareModulo

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Existing NC axes



If you use existing NC axes from your old project, you must check the parameter PositionFeedbackMode of the corresponding Soft-Drive object. Incorrect settings can result in a changed behavior of the NC position.

- Expand Solution Explorer > TwinCAT Project > MOTION > NC SAF > Axes
- Expand the axis whose settings are to be adjusted
- ► Expand SoftDrive

ĺ

Double click on SoftDriveEncoder

- Click the Parameter (Init) tab in the project window
- Expand General
- Ensure that the PositionFeedbackMode is set to MOD-ULO_START
- If required, select MODULO_START in the PositionFeedback-Mode drop-down menu

6.1.6.5 Replace old XTS Utility calls

<pre>1 // XTS Diagnostic 2 fbXTSUnit(Axis := stMoverRef); 3 4 fbXtsVisuDiag(pXtsDiag := ADR(fbXTSUnit.stXtsUnit), 5 pGroupRef := ADR(stGroupRef), 6 nXtsId := 1); 7 </pre>	As the structure of the XTS objects in the project has changed fun- damentally during the conversion, the structure of the XTS Utility has also been changed. In the new configuration the old calls of the function blocks <i>FB_XtsUnit</i> and <i>FB_XtsVisuDiag</i> do not work cor- rectly anymore. Because the ADS read commands and write commands refer to other object IDs in the background, it is not possible to read data from or write data to the XtsloDriver object. The XtsUnit structure does not allow access to the data of the corresponding XTS objects, such as the Module CoE data. Each XTS Utility call to the PLC must be checked and replaced with a new function to obtain the desired values. It is necessary to find all the places where the old XtsUnit structure was used and determine the values that were written or read there. Many of the old calls to the XtsUnit structure can be replaced with the XTS Environment structure method.
	A basic example of what needs to be changed in the structure is the procedure for Mover ID detection:
<pre>//MoverId Functionality //check whether the position detection IF fbXtsUnit.stXtsUnit.stTcIoXtsDrv.stF //Check if "MoverIdDetectionMode" F IF fbXtsUnit.stXtsUnit.stTcIoXtsDrv E_MoverIdDetectionMode.Mover1</pre>	of the Movers has been completed. Parameter.bAreAllMoverPositionsValid THEN has been activated under the XtsIoDriver object y.stParameter.eMoverIdDetectionMode = In simulation. EdDetection" has already been started or the Moverl was found. arted OR bMoverIdDetected) Detection". CCIoXtsDrv.ipTcXtsIo.TriggerMoverIdDetection(); arted" is set to "True" after a single initiation. ed := TRUE; EdDetection".
<pre>//Cneck for error or success of "Mover] bMoverIdDetectionError := fbXtsUnit.stX bMoverIdDetected := fbXtsUnit.stXtsUnit</pre>	.dDetection". <pre>{tsUnit.stTcIoXtsDrv.stParameter.bHasMoverIdDetectionError; .stTcIoXtsDrv.stParameter.bIsMoverIdDetectionValid;</pre>
<pre>//Do not process any further until the IF NOT bMoverIdDetected THEN RETURN; END_IF // If the "MoverIdDetection" was not ac // then the activation of the "MoverIdI ELSE ; END_IF //If not all Mover positions are valid, ELSE RETURN; END_IF</pre>	"MoverId" was detected. ctivated in the XtsIoDriver object or running in simulation, Detection" and the search of Moerl is skipped. do not process any further.

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```
// MoverId Functionality
      // Check whether the position detection of the Movers has been completed.
10
     IF fbXtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.bAreAllMoverPositionsValid THEN
11
12
         // Check if "MoverIdDetectionMode" has been activated under the XtsIoDriver object
13
         IF fbXtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.eMoverIdDetectionMode = E_MoverIdDetectionMode.Mover1
14
             //and that we are not running in simulation.
15
             AND NOT bSimulation
16
             THEN
17
                  // Check whether the "MoverIdDetection" has already been started or the Mover1 was found.
18
                 IF NOT (bMoverIdDetectionStarted OR bMoverIdDetected)
19
                 THEN
20
                      // Trigger the "MoverIdDetection".
21
                      fbXtsUnit.stXtsUnit.stTcIoXtsDrv.ipTcXtsIo.TriggerMoverIdDetection();
22
                      // "bMoverIdDetectionStarted" is set to "True" after a single initiation.
23
                      bMoverIdDetectionStarted := TRUE;
24
                 END IF
25
                  // Check for error or success of "MoverIdDetection".
26
27
                  bMoverIdDetectionError := fbXtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.bHasMoverIdDetectionError;
28
                 bMoverIdDetected
                                          := fbXtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.bIsMoverIdDetectionValid;
29
30
                  // Do not process any further until the "MoverId" was deteced.
31
                  IF NOT bMoverIdDetected THEN
32
                      RETURN:
33
                  END IF
34
34
35
          // If the "MoverIdDetection" was not activated in the XtsIoDriver object or running in simulation,
36
         // then the activation of the "MoverIdDetection" and the search of Mover1 is skipped.
37
         ELSE
38
             ;
         END_IF
39
40
41
     // If not all Mover positions are valid, do not process any further.
42
     ELSE
         RETURN:
43
44
     END IF
```

In the old configuration, some calls to the Mover ID detection got the information of the XtsIoDriver object using the XtsUnit structure:

 20
 // Trigger the "MoverIdDetection".

 21
 fbXtsUnit.stXtsUnit.stTcIoXtsDrv.ipTcXtsIo.TriggerMoverIdDetection();

Since the XtsloDriver object is not present in the new configuration, the calls must be adapted so that the XtsEnvironment structure provides the information of the XtsProcessingUnit object for the calls:

 38
 // Trigger the "MoverIdDetection".

 39
 fbTcIoXtsXpu.TriggerMoverIdDetection();

In this way, many of the calls can be replaced. It should be noted that the XtsEnvironment structure differs from the old XTS structure in terms of initialization and collection of cycle data. Further information can be found in chapter "Add library", [Page 428].

Once all XtsUnit calls have been removed from the project, the configuration can be activated.

6.1.6.6 Activating the configuration

When you have made all changes in the project, you can activate the configuration, switch to the operation mode and start the PLC. If you have difficulty during activation, contact the product specialist responsible for your region.

If all calls have been replaced correctly, there will be no differences in the operation of the XTS system compared to the old configuration. In addition, all new functions for simulation and visualization are now usable and the project is ready for future updates of the XTS driver.

6.2 XTS Simulation functionality

The simulation functionality allows you to test a system without using real hardware. Further information can be found in chapter "XTS Simulation Builder", [Page 229].

6.2.1 Activating simulation mode

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When you configure a system with the *XTS Simulation Builder*, the simulation mode is automatically activated and it is not necessary to manually activate the simulation mode.

- Expand Solution Explorer > TwinCAT Project > SYSTEM > TcCOM Objects
- Double click on XtsProcessingUnit

- Click the Parameter (Init) tab in the project window
- Expand General
- Select Simulation in the drop-down menu OperationMode
- Set all other XTS Processing Units that are to run in simulation mode to simulation mode in the same way

Beckhoff recommends disabling the corresponding hardware of the XTS system in the I/O configuration to avoid accidental activation. All virtual devices must be disabled to activate an I/O configuration without existing hardware.

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Search	n Solution Explorer (Ctrl+ü)	، م
	olution 'TwinCAT Project' (1 proje TwinCAT Project SYSTEM ↓ License ↓ ♠ Real-Time ↓ ♠ Tasks ₩ Routes ₩ Type System ↓ ➡ TacCOM Objects ↓ ★ XtsProcessingUnit 1 ↓ ➡ Part 1	ct)
	Mover 1	
)bject (Irack I Mover 1 Context Parameter (Init) Parameter (Online) In	nterfaces Event Classes XPU
)bject (IFACK Mover 1 Context Parameter (Init) Parameter (Online) In Name	terfaces Event Classes XPU Value
bject (ITACK I IMOver 1 Cortext Parameter (Int) Parameter (Online) In Name General	terfaces Event Classes XPU Value
bject (ITACK I Mover 1 Cortext Parameter (Init) Parameter (Online) In Name General OperationMode	terfaces Event Classes XPU Value Simulation
bject (Variable View Context (Initial View Context (Initia) View Context (Initia) View Context (Initia) View Context	Iterfaces Event Classes XPU Value Simulation ~ Normal
bject (Varme Varmeter (Online) In Name General Operation Mode Mover Mover Mover IdDetection	terfaces Event Classes XPU Value Simulation v Normal Simulation
bject (Name General OperationMode Mover MoverIdDetection Teaching	terfaces Event Classes XPU Value Simulation ~ Normal Simulation
)bject (+ + +	ITack I Mover 1 Mover 1 Name General OperationMode Mover MoverIdDetection Teaching Diagnostics	terfaces Event Classes XPU Value Simulation V Normal Simulation
bject (+ + + + + + + +	Irack I Mover 1 Mover 1 Name General OperationMode Mover MoverIdDetection Teaching Diagnostics Advanced	Iterfaces Event Classes XPU Value Simulation v Normal Simulation

6.2.1.1 Disabling Devices



- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- ▶ Right-click on a **Device** to open the context menu
- ► Click **Disable** in the context menu

6.2.2 Important simulation settings

There are important parameters to be set under the TcCOM objects to determine how the simulation behaves when the XTS system is started. By default, the simulation behaves like a real system. For example, no XTS movers will be found if there are no XTS tracks in the detection process, or no axes can be activated if Mover ID detection has not been started.

6.2.2.1 XTS Mover Simulation Parameters

Solution Explorer	* ‡ ×
○ ○ 습 🗂 - ७ - 큔 🔑 -	-
Search Solution Explorer (Ctrl+ü)	<i>-</i> م
Solution 'TwinCAT Project1' (1 pro SysTEM License A Real-Time C Real-Time C Real-Time Tasks Type System C Mobjects C Mobjects C Mover 1 C Mover 2 C Move	oject)
Name	Value
+ General	
SimulatedStartUpPart	01010020
SimulatedStartUpPart	60.0
SimulatedStartUpPosition	1
SimulatedStartopid	<u>'</u>

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XtsProcessingUnit
- Double-click Mover 1

- Click the Parameter (Init) tab in the project window
- Expand Simulation
- ► In the *SimulatedStartUpPart* drop-down menu, select the part on which the mover is to start
- Enter the value for the start position of the mover in the input field SimulatedStartUpPosition
- Enter the value 1 in the input field SimulatedStartUpId so that the mover is detected as Mover 1 at startup

OR

Do not enter a value in the input field SimulatedStartUpId so that the mover is detected as a standard mover

These entries can also be made in the *XTS Configurator* and in the *XTS Simulation Builder* on the *Movers* page. For more information, see the chapters "XTS Configurator", [Page 258] and "XTS Simulation Builder", [Page 229].

XTS Simulation Builder

XTS Simulation Builder	Expand the sidebar and click on Configure
Load Project 🗸	
Start Select project or templates.	
Configure Configure the desired XTS	
Real-Time	
XTS Simulation Builder	 Click on the tab Movers
File Modules Parts Movers Tracks Sta	 Select the mover for which the settings are to be adjusted
Add Remove Mover Mover Modify	
 ▲ StsProcessingUnit 1 ▲ Parts ▲ Part 1 ▶ ➡ Modules ▲ Movers 	
Mover 1	
Mover 2	
Mover 3	Expand Dataila
ZTS Simulation Builder	 Enter the start position of the mover in the input field Start-Up
File Modules Parts Movers Tracks Sta	 Position In the Start-Up Part drop-down menu, select the part on which the mover is to start
▲ 🔁 XtsProcessingUnit 1	
A 📥 Parts	
Part I Modules	
A 🔒 Movers	
Mover 1	
Mover 2	
▲ Details	
Name Mover 1	
Start-Up Position: 55	
Start-Up Part: Part 1	

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Functions of the driver



Expand *Mover Details* to show the *Simulation Start-Up Settings*

- ► In the drop-down menu *Part*, select the part on which the mover is to start
- Enter the start position of the mover in the input field *Position*
- Enter 1 in the input field *ID* so that the mover is detected as Mover 1 when starting up

OR

► Do not enter a value in the input field *ID* so that the mover is detected as a standard mover

Parameter	(Init)

Parameter	Group	Туре	PTCID	Explanation
SimulatedStartUpPart	Simulation	OTCID	0x03080278	Determines the part on which the mover starts in simulation mode.
SimulatedStartUpPosi- tion	Simulation	LREAL	0x03080279	Determines the position of the selected part at which the mover is in simulation mode.
				Any position between 0 and the length of the part is pos- sible. The mover will not be found if other values are used.
				Unit: mm
SimulatedId	Simulation	STRING(3)	0x0308027E	Determines which ID the mover should have when the XTS system is in simulation mode and a Mover ID detec- tion is started.
•1				The mover is detected as Mover 1 in the simulation.
• -				The mover is detected as a standard mover in the simu- lation.

6.2.2.2 XTS Processing Unit Parameter



Further information can be found in chapter "Parameter (Init)", [Page 91].

Parameter	Group	Туре	PTCID	Explanation
MoverDistance	Simulation	LREAL	0x0308022E	Determines the distance be- tween the movers when the PositionStartUpSimulation- Mode UseOffsetAndDistance is selected.
				If the distance is too great, the movers will not fit on the XTS system and will there- fore not be found.
				Unit: mm
PositionOffset	Simulation	LREAL	0x0308022D	Determines the position of the first mover when the Po- sitionStartUpSimulationMode <i>UseOffsetAndDistance</i> is se- lected.
				If the offset is too large, the movers will not fit on the XTS system and will therefore not be found.
				Unit: mm

6.2.2.2.1 Parameter (Init)

Functions of the driver

Parameter	Group	Туре	PTCID	Explanation
PositionNoiseBandwidth	Simulation	LREAL	0x03080231	Determines the maximum deviation of the simulated position delay of the movers when the position noise is activated in the simulation.
				Unit: mm
RandomStartUpBand- width	Simulation	LREAL	0x03080232	Determines the maximum deviation of the start position between the movers when the PositionStartUp simula- tion mode <i>UseOffsetAndDis-</i> <i>tance</i> is selected.
				If the bandwidth is too large, the movers will not fit on the XTS system and will there- fore not be found.
				Unit: mm
PositionStartUpSimula- tionMode	Simulation	XTS.PositionStartUp- SimulationMode	0x03080230	Determines which parameter provides the start position of the mover in the simulation.
UseOffsetAndDistance	_	_		The parameter of the Tc- COM object <i>ProcessingUnit</i> is used
UseMoverParameters	_	_	_	The parameter of the Tc- COM object <i>Mover</i> is used
• UseRandomDistribu- tion	_	_	_	The movers are distributed randomly.
MoverIdStartUpSimula- tionMode	Simulation	XTS.MoverIdStartUp- SimulationMode	0x0308027D	Determines which parameter provides the Mover ID in the simulation.
• UseRandomDistribu- tion	_	_	-	The movers get their ID ran- domly according to the set- tings of the parameters <i>IdDe-</i> <i>tectionMode</i> and <i>Expected-</i> <i>MoverIds</i> .
UseMoverParameters	_	_	_	The parameter of the Tc- COM object <i>Mover</i> is used.
UseAlternation	_	-	_	The movers receive their ID one after the other, starting at 1.
RandomInitMode	Simulation	XTS.RandomInit- Mode	0x0308027F	Determines how the random distribution is applied.
• UseSystemTime	_	_	_	Creates a value based on the system time.
• UseInitSeed	_	_	_	Use of the value at parame- ter <i>RandomInitSeed</i> .
RandomInitSeed	Simulation	DINT	0x03080280	Determines the number for the random distribution if the RandomInitMode <i>UseInit-</i> <i>Seed</i> is selected.

6.3 Mover 1 functionality

Mover 1 serves as the reference mover of the XTS system. It is equipped with a special magnetic plate set. The special magnetic plate set Mover 1 is identified by an engraving on the set itself and a logo on the encoder flag.

6.3.1 Mover ID detection

During Mover ID detection, all movers are set in motion, barely visible, and reordered by the system. Since Mover 1 exhibits different behavior than the other movers due to its special magnetic plate set, it is automatically detected by the system. In this way, a clear assignment of the mover hardware to the NC axis is possible.

If the setting *StartAtFirstMover* is selected at the parameter *Mover*-*PositionAssignment*, the Mover 1 always has either the largest or the smallest position of all NC axes. If this is not yet the case after startup, standard detection and successful Mover ID detection, the complete system length is added to the position of single movers.

Planned Mover 1 position	Parameter Mover- SortOrder	Mover 1	Mover 6
Positions in the NC	axes before Mover	ID detection [mm]	
Smallest position	Ascending	360	27
Largest position	Descending	40	280
Positions in the NC	axes during Mover	ID detection [mm]	
Smallest position	Ascending	-	27 + 3000 system length
Largest position	Descending	40 + 3000 system length	-
Positions in the NC	axes after Mover ID	detection [mm]	
Smallest position	Ascending	360	3027
Largest position	Descending	3040	280

Example position calculation

Planned Mover 1 position	Parameter Mover- SortOrder	Positions in the NC axes [mm]	Mover 1	Mover 6
Smallest position	Ascending	Before Mover ID detection	360	27
		During Mover ID detection	-	27 + 3000 system length
		After Mover ID detection	360	3027
Largest position	Descending	Before Mover ID detection	40 + 3000 system length	280
		During Mover ID detection	360	3027
		After Mover ID detection	3040	280

Functions of the driver

Planned Mover 1 position Order		Positions in the NC axes before Mover ID detection		Positions in the NC axes during Mover ID detection		Positions in the NC axes after Mover ID de- tection	
		Mover 1	Mover 6	Mover 1	Mover 6	Mover 1	Mover 6
Smallest position	Ascending	360 mm	27 mm	_	27 mm + 3000 mm system length	360 mm	3027 mm
Largest position	Descending	40 mm	280 mm	40 mm + 3000 mm system length	_	3040 mm	280 mm



48 V power supply required The 48 V power supply is required to perform Mover ID detection.

6.3.2 Application in XTS Processing Unit object

6.3.2.1 Parameter



If you use the compatibility mode, you can control the Mover ID detection as usual via the *TcloXtsDrv* object. For this, follow the descriptions below for the application in the *XTS Processing Unit* object. In case of discrepancies between the two objects, it will be indicated separately.

Mover ID detection is controlled via the XTS Processing Unit object. You have the possibility to make settings via general parameters and to trigger the Mover ID detection manually without having to add a PLC project.

The following parameters are available for settings and for checking in the XTS Processing Unit object or in the TcloXtsDrv object:

Parameter	Explanation
IdDetectionMode	Setting whether one or more Movers 1 are present in the system.
MoverPositionAssignment	Setting that the Mover 1 receives the largest or smallest position of the NC axes on the system depending on the sort order.
ExpectedMoverIds	
[0].ld	Configure the expected mover IDs for ID detection mode MultipleMover 1.
• 1	Mover with magnetic plate set Mover 1.
• 0	Mover with magnetic plate set Mover Standard.
[0].Count	Number of expected Movers 1.
TriggerMoverIdDetection	Manual start of Mover ID detection.
HasIdDetectionError	Display whether an error has occurred during Mover ID detection.
IsIdDetectionValid	Display whether Mover 1 was detected.
IsIdDetectionActive	Display whether Mover ID detection is running.

XTS Processing Unit object

TcloXtsDrv object

Parameter	Explanation
MoverIdDetectionMode	Setting whether a Mover 1 is present in the system.
MoverPositionAssignment	Setting that the Mover 1 receives the largest or smallest position of the NC axes on the system depending on the sort order.
TriggerMoverIdDetection	Manual start of Mover ID detection.
IsMoverIdDetectionValid	Display whether Mover 1 was detected.
HasMoverIdDetection- Error	Display whether an error has occurred during Mover ID detection.

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MoverIdDetection



- Expand Solution Explorer > XtsProject > SYSTEM > TcCOM Objects
- Double click XtsProcessingUnit

Parameter (Init)

	Name	Value
+	Mover	
-	MoverldDetection	
	IdDetectionMode	Standard
	MoverPositionAssignment	Standard
-	- ExpectedMoverIds	[]
	TriggerMoverIdDetection	
+	Teaching	

- Click the Parameter (Init) tab in the project window
- Expand MoverIdDetection

WARNING

Risk of injury due to unforeseen movements

If you do not select a parameter even though there is one or more movers with the special Mover 1 magnetic plate set on the system, the movers will be energized incorrectly and the movers may move unpredictably.

Unforeseen movements of the movers can cause serious injuries to fingers due to crushing and damage to tools and the machine.

• Select the parameter *Mover1* or *MultipleMover1*.

bject	Context	Parameter (Init) Parameter	er (Online)	Interfaces	Event Classes	XPU
		Name	N	/alue		
+						
+						
-						
		IdDetectionMode		Mover1		~
		MoverPositionAssignme	ent S	standard		
	+	ExpectedMoverIds	R	Mover1 MultipleMov	/er1	
		TriggerMoverIdDetection	۱ I			
4		Diagnostics				
Object	Context	Parameter (Init) Paramete	r (Online)	Interfaces	Event Classes X	PU
	Nam	ie	Value			
+						
+						
-	Mov	erldDetection				
	ldDe	tectionMode	Standa	ard		
	Mov	erPositionAssignment	Stand	ard		~
	+ Expe	ctedMoverIds	Standa	ard		
	Trigg	erMoverIdDetection	StartA	tFirstMover		
+						
10						

Select Mover1 or MultipleMover1 in drop-down menu IdDetectionMode

To apply the settings, the configuration must be reactivated and the TwinCAT system must be restarted.

- ► Restart TwinCAT
- Select StartAtFirstMover in the drop-down menu MoverPositionAssignment

To apply the settings, the configuration must be reactivated and the TwinCAT system must be restarted.

Restart TwinCAT

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Name	Value	Unit	1
IdDetectionMode	Standard		N
MoverPositionAssignment	Standard	<u> </u>	1
- ExpectedMoverIds	[]	(Array Elements	1
[0].ld	1	1 (Array Element	s)
[0].Count	2	2 (Array Element	5)
TriggerMoverIdDetection			1

Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes XPU

Value

Standard

Standard

Download

[...]

- Expand ExpectedMoverIds
- Select 1 (Array Elements) or 2 (Array Elements) in the dropdown menu ExpectedMoverIds in the column Unit
- Enter the Mover ID type in the input field [0].Id
- Enter the number of expected Movers 1 in the input field [0].Count
- Right-click in the input field *TriggerMoverIdDetection* to open the context menu
- ► In the context menu click **Download**

The Mover ID detection is now manually triggered. All movers start the movement.

Parameter (Online)

Name

IdDetectionMode

ExpectedMoverIds

MoverPositionAssignment

TriggerMoverIdDetection

	Name	Online
land C	ontext Parameter (Init) Parameter (C	Online) Interfaces Event Classes XPU
ject U		
ject U	Name	Online
+	Name MoverDetection	Online
+	Name MoverDetection MoverIdDetection	Online
+	Name MoverDetection MoverIdDetection HasIdDetectionError	Online

- ► In the project window click on the **Parameter (Online)** tab
- ► Check result at *HasIdDetectionError*.

TRUE

•

Mover 1 was not detected. Possible causes:

- Mover ID detection was not started
- IsIdDetectionValid displays FALSE

FALSE

Mover 1 was detected. No errors occurred.

bject Cor	ntext Parameter (Init) Parameter (Online)	Interfaces Event Classes XPU	
	Name	Online	C
	HasIdDetectionError	FALSE	Г
	IsIdDetectionValid	TRUE	П

► Check result at *IsIdDetectionValid*:

TRUE

Mover 1 was detected. No errors occurred.

FALSE

Mover 1 was not detected. Possible causes:

- Mover ID detection was not started
- HasIdDetectionValid displays TRUE

If the Mover ID detection has failed:

- Check notifications in the message windows Error List and Output
- Activate the hidden parameter "DetectionInfoMessage", [Page 110]
- ► Adapt the parameter in the "TcSoftDrive object", [Page 107]
- Adjust hidden parameters of the XTS Processing Unit
- Perform Mover ID detection again
- ► Check result at *IsIdDetectionActive*

TRUE

Mover ID detection is active. No errors occurred.

FALSE

TF5850

Mover ID detection is not active. Possible cause:

Mover ID detection is not active

After the Mover IDs have been detected, you can call and check them via the Processing Unit or the Mover object:

Under the Processing Unit you will find the Mover IDs for all movers under the following path:

Parameter (Online) > Mover ID Detection > MoverIds

Under the Mover object, you will find the Mover IDs for each mover individually under the following path:

Parameters (Online) > Mover ID Detection > Id

Object Context Parameter (Int) Parameter (Online) Interfaces Event Classes XPU Name Online Online C MoverDetection MoverIdDetection C HasIdDetectionError FALSE C IsIdDetectionValid INUE C

Check Mover IDs

Name	Online	
Mover ID Detection		
HasIdDetectionError	FALSE	
IsIdDetectionValid	TRUE	
IsIdDetectionActive	FALSE	
Moverlds	[1, ,]	
[0]	1	
[1]		
[2]		
t Context Parameter (Init) Parameter (Online) Data Area Interface	15	
Name	Online	
Mover ID Detection		_
Id	1	
- Provide the second		

6.3.2.2 Hidden Parameters	
	For the advanced operation of the Mover ID detection you have the option to use <i>Hidden Parameters</i> . For example, you can change the time delay with which movers are moved within a pack and define the intervals at which movers are detected as a pack. However, usually the default parameters match your XTS system. The Mover ID detection can be started immediately. The search takes a few seconds and depends on the number of movers and the respective settings.
	The following hidden parameters are available for settings:
IdDiagConfiguration	Calculation parameters of Mover ID detection. Do not change!
DelayBetweenMoversInPack	Time delay [s] between triggering movers which are directly next to each other within the MoverPackGap. Unit: s.
DelayBetweenMoverPacks	Time delay [s] between triggering movers simultaneously which are not in the same mover pack. Unit: s
GapToDefineMoverPack	Gap [mm] between movers to define a new mover pack. Unit: mm
CompleteCriteria	Setting, from when a search should be evaluated as successful.
Show Online Values Show Hidden Parameter Expand All Collapse All	Activate the check box Show Hidden Parameter to show the Hidden Parameters
i	To prevent movers mechanical influencing one another, only the movement of one mover is triggered at any one time in a mover pack. On expiry of the search of a preceding mover in a pack and on

movement of one mover is triggered at any one time in a mover pack. On expiry of the search of a preceding mover in a pack and on expiry of the time DelayBetweenMoversInPack, the search for the next mover in the pack is started.

6.3.3 Use in the PLC

6.3.3.1 Versions

Via the PLC you have the possibility to trigger the Mover ID detection by using the program code. Two options are available for this:

PLC variant I (trigger via XtsUtility)

Start Mover ID detection by calling the method *TriggerMoverIdDetection*.

PLC variant II (trigger via ADS-Write)

Start of Mover ID detection by an ADSWRITE command on the parameter *TriggerMoverIdDetection* in the XTS Processing Unit object.



Observe computing time

The call of the PLC variant I requires more computing time. If the computing time for the application proves to be a problem, use the PLC variant II.

For the application of the PLC variant I (trigger via XtsUtility) the suitable library must be added:



Name for file path different

When creating the library under PLC, a name must be assigned. In the following example, no name has been assigned, so the file path is shown as *Untitled*. Note that your file path will look different accordingly.

- Expand Solution Explorer > TwinCAT Project > PLC > Untitled1 > Untitled Project
- ▶ Right-click on **References** to open the context menu
- ▶ In the context menu click on Add library ...

The dialog box Add Library opens.

- ► Expand (Miscellaneous)
- Click on Tc3_XTS_Utility
- ► Confirm with **OK**

The library is added to the project.

Add library





- Expand Solution Explorer > TwinCAT Project > PLC > PLC1 > PLC Project > References
- Check whether the Tc3_XTS_Utility library has been added to the project

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_	

Depending on whether the Processing Unit object or the TcIoXtsDrv object is used, the functions in the library differ.

PLC variant I (trigger via XtsUtility)

You have the option to trigger the Mover ID detection via PLC variant I. To trigger the search automatically, you can use the following sample codes for the Processing Unit object or the TcIoXtsDrv object:

XTS Processing Unit object

// E PROG VAR	Declaration Part GRAM MAIN	
V 7 11 (stMoverRef	: ARRAY [1cAxcnt] OF AXIS_REF;
	fbXtsUnit	: FB_XtsUnit;
	eMoverIdDetectionMode	: MoverIdDetectionMode:= MoverIdDetectionMode.Mover1;
	bStartMoverIdDetection	: BOOL := TRUE; //Can also be written to trigger the process manually after start up
	bMoverIdDetectionError bMoverIdDetected	: BOOL; : BOOL;
END	bMoverIdDetectionActive VAR	: BOOL;
VAR	- Constant	
v 1 11 (cAxcnt	: INT:=10; // Example
END_	_VAR	
//		
// I // C fbXt	<pre>Programm Part Cyclic call of the main block of csUnit(Axis := stMoverRef);</pre>	of the XtsUtility Library.
// C IF N END_ // N	Check if the position detection NOT fbXtsUnit.stXtsUnit.stTcIoN // If not all Mover positions RETURN; IF Moverl Functionality	n of the Movers has been completed. KtsDrv.stParameter.bAreAllMoverPositionsValid THEN s are valid, do not process any further.
// C IF e	Check if "MoverIdDetectionMode MoverIdDetectionMode = E_Move:	" has been activated. rIdDetectionMode.Mover1 THEN
	IF bStartMoverIdDetection AND bStartMoverIdDetection:	D NOT (bMoverIdDetectionActive OR bMoverIdDetected) THEN =FALSE;
	<pre>// Trigger the "MoverId: fbXtsUnit.stXtsUnit.stT bMoverIdDetectionActive END_IF</pre>	Detection". cIoXtsDrv.ipTcXtsIo.TriggerMoverIdDetection(); :=TRUE;
	<pre>// Check for error or success bMoverIdDetectionError := fb; bMoverIdDetected := fb;</pre>	s of "MoverIdDetection". XtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.bHasMoverIdDetectionError; XtsUnit.stXtsUnit.stTcIoXtsDrv.stParameter.bIsMoverIdDetectionValid;
	<pre>// If the detection has an e: IF bMoverIdDetectionError THI bMoverIdDetectionActive DETURN.</pre>	rror, check for errors in output and try again. EN :=FALSE;
	END_IF	
	<pre>// Do not process any furthe: IF NOT bMoverIdDetected THEN RETURN:</pre>	r until the "MoverId" was deteced.
	END_IF bMoverIdDetectionActive:=FAL	SE;
// т	If the "MoverIdDetection" was	not activated.
// t Else	then the start of the "MoverId	Detection" and the search of Mover1 is skipped.
END	; IF	
_		

TcIoXtsDrv object

```
// Declaration Part
PROGRAM MAIN
VAR
     fbXtsEnvironment
                                       : FB TcIoXtsEnvironment;
     bInit
                                       : BOOL;
                                       : BOOL:=TRUE; // Can also be written to trigger the process
     bStartMoverIdDetection
                                        manually after start up
     bMoverIdDetectionError
                                      : BOOL;
                                       : BOOL;
     bMoverIdDetected
     bMoverIdDetectionActive
                                       : BOOL;
END VAR
//-----
                          _____
// Programm part
//Trigger only once in init.
IF NOT bInit THEN
     IF fbXtsEnvironment.Init(TRUE) THEN
          fbXtsEnvironment.Init(FALSE);
          bInit:=TRUE;
     END IF
     RETURN;
END IF
// Check if the position detection of the Movers has been completed.
IF NOT fbXtsEnvironment.XpuTcIo(1).GetAreAllPositionsValid() THEN
     // If not all Mover positions are valid, do not process any further.
     RETURN;
END IF
// Mover1 Functionality
// Check if "MoverIdDetectionMode" has been activated under the XtsProcessingUnit object.
IF fbXtsEnvironment.XpuTcIo(1).GetMoverIdDetectionMode() = MoverIdDetectionMode.Mover1 THEN
     // Check if the "MoverIdDetection" has already been started or the MoverI was found. IF bStartMoverIdDetection AND NOT (bMoverIdDetectionActive OR bMoverIdDetected) THEN
          bStartMoverIdDetection:=FALSE;
          // Trigger the "MoverIdDetection".
          fbXtsEnvironment.XpuTcIo(1).TriggerMoverIdDetection();
     END IF
     // Check for error or success of "MoverIdDetection".
     bMoverIdDetectionError := fbXtsEnvironment.XpuTcIo(1).GetHasMoverIdDetectionError();
     bMoverIdDetected := fbXtsEnvironment.XpuTcIo(1).GetIsMoverIdDetectionValid();
     bMoverIdDetectionActive := fbXtsEnvironment.XpuTcIo(1).GetIsMoverIdDetectionActive();
     // If the detection has an error, check for errors in output and try again.
     IF bMoverIdDetectionError THEN
          RETURN;
     END IF
     // Do not process any further until the "MoverId" was deteced.
     IF NOT bMoverIdDetected THEN
         RETURN;
     END IF
     // Do not process any further until the "MoverId" was deteced.
     IF NOT bMoverIdDetected THEN
         RETURN;
     END IF
// If the "MoverIdDetection" was not activated in the XtsProcessingUnit object,
// then the activation of the "MoverIdDetection" and the search of Mover1 is skipped.
ELSE
```

END_IF

PLC variant II (trigger via ADS-Write)

You have the option to trigger the Mover ID detection via PLC variant II. Parameters of the XTS Processing Unit object can be accessed via ADSREAD or ADSWRITE commands.

For more information, please see the following links:

- Direct link to the TE1000 TwinCAT 3 manual | PLC library: Tc2_System
- Direct link to the function blocks

You need the following XTS-specific information for parameterization:

Parameter	Code block	Explanation
Task Port	PORT : T_AmsPort;	Task Port of the XTS task.
Object Id	IDXGRP : UDINT;	Object ID from the XTS Processing Unit object.
PTCID	IDXOFFS : UDINT;	PTCID of the parameter.

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tasks
- Double-click on XTS Task

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- ► In the project window click on the **Task** tab
- Read value at Port
- The value 350 is preset by default.

i 🔜 Twin(AT Project	roject" ((project)			
4 6 SY	STEM					
	License					
Þ 🥝	Real-Tim	e				
▲ 🏦	Tasks					
	💷 XTS Ta	ask 1				
	PIcTa:	sk				
3日	Routes					
e	Type Syst	em				
▶ 🛅	TcCOM C	Objects				
N Jour NA	OTION					
ask Online	Parameter (Or	nline) Add	Symbols			
ask Online	Parameter (Or	nline) Add	Symbols	Pert.	250	
ask Online Name:	Parameter (Or XTS Task	nline) Add 1	Symbols	Port:	350	*
Auto Start	Parameter (Or XTS Task	nline) Add 1	I Symbols	Port: Object Id:	350 0x02010020	<u>*</u>
Auto start	Parameter (Or XTS Task y Managemer	nline) Add 1 nt	I Symbols	Port: Object Id: Options	350 0x02010020	•
Name: Auto start Auto Priority Priority:	Parameter (Or XTS Task y Managemer	nline) Add 1 nt	I Symbols	Port: Object Id: Options Disable	350 0x02010020	÷
Auto start Auto start Auto Priority: Cycle ticks:	Parameter (Or XTS Task y Managemer 1 1	nline) Add 1 nt 0.250	I Symbols	Port: Object Id: Options Disable	350 (0x02010020	•
Auto start Auto start Auto Priority Cycle ticks:	Parameter (Or XTS Task y Managemer 1 1 1	nline) Add 1 nt 0.250 0 ‡	ms	Port: Object Id: Options Disable Create s	350 (0x02010020 nymbols ude external symbo	ls
Auto start Auto start Auto Priority: Cycle ticks: Start tick (Separa	Parameter (Or XTS Task y Managemer 1 1 \$ modulo): te input updat	nline) Add 1 nt 0.250 0 0 te	i Symbols	Port: Object Id: Options Disable Create s	350 (0x02010020 symbols ude external symbo	ls
Name: Auto start Auto Priority: Cycle ticks: Start tick (Separa Pre	Parameter (Or XTS Task y Managemer 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	nline) Add 1 nt 0.250 0 ↓ te 0 ↓	s Symbols	Port: Object Id: Options Disable Create s	350 (0x02010020 ymbols ude external symbo	ls
Name: Auto start Auto Priority: Cycle ticks: Start tick (Separa Pre Warning by	Parameter (Or XTS Task y Managemer 1 1 v Managemer 1 ticks: y exceeding	nline) Add 1 nt 0.250 0 ≎ te 0 ≑	Symbols	Port: Object Id: Options Disable Create s	350 (0x02010020 ymbols ude external symbo	s
Auto Start Auto Start Auto Prionty: Cycle ticks: Start tick (Start tick (Meaning by Messag	Parameter (Or XTS Task y Managemer 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	nline) Add 1 nt 0.250 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 ¢ 0 0 0 0 0 0 0 0 0 0 0 0 0	ms	Port: Object Id: Options Disable Create s	350 (0x02010020 nymbols ude external symbol	ls
ask Online Name: Auto start Auto Priority: Cycle ticks: Start tick (Separa Pre Warning by Matchdog Cy	Parameter (Or XTS Task y Managemer 1 \$ modulo): te input updat ticks: y exceeding ge box cles:	nline) Add 1 nt 0.250 0 ≎ 0 ≎	I Symbols	Port: Object Id: Options Disable Create s Inclu	350 (0x02010020 ymbols ude external symbol point exceptions	Is

Solution Explorer

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Object Id



- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- ► Double-click on XTS Processing Unit

- ► In the project window, click on the **Object** tab
- Read value at Object Id

PTCID



- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double-click on XTS Processing Unit

The displayed values of the XTS Processing Unit object and the TcIoXtsDrv object differ from each other.

- Click the Parameter (Init) tab in the project window
- ► Read value at *TriggerMoverIdDetection*

Sample TriggerMoverIdDetection

Below are sample codes for a *TriggerMoverIdDetection*:

ADSWRITE

ADSREAD

// Declaration part PROGRAM MAIN VAR fbAdsRead : AI TempData : BC END_VAR	DSREAD; OOL; // Needs to be the dat	a type that is read
// fbAdsRead(NETID := ``, PORT := 350, IDXGRP := 16#0 IDXOFFS := 16#2 LEN := SIZE DESTADDR := ADR(READ := TRUE	, // Taskport 01010010, // Object I 251, // PTDCID o EOF(TempData), // Size of (TempData), // Address E); // Trigger	of the XTS-Task d of the driver object f IsIdDetectionValid the read out data to which the data should be written to

6.3.4 Extended operation in the TcSoftDrive object

6.3.4.1 Parameter

The Processing Unit object is used to control and execute the Mover ID detection for each mover axis. You have the possibility to adjust the sequence of the search, by setting some parameters as well as configuring the detection procedure via the mover axis. However, usually the default parameters match your XTS system.

The following tables show the default parameters for the Beckhoff movers:

Adjustment of the default parameters with customer-specific

Parameter	Default	Min	Max	Unit	Tab
DetectionMinMovement	0.1	0.01	2.0	mm	Init
DetectionFilter	250	0	5000	Hz	Init
DetectionCurrentRamp	25	10	1000	mA/ms	Init
DetectionMaxCurrent	12	0.5	13	А	Init

ĺ	movers With customer-specific movers that differ from the Beckhoff movers in terms of rigidity, mass or some other deviating mechanical behav- ior, it may be necessary to adjust the default parameters in order to optimize the Mover ID detection.
DetectionMinMovement	Minimum position change that the mover must experience during Mover ID detection for detection to be successful.
DetectionFilter	Filter for current change.
DetectionCurrentRamp	Ramp of the current of the Mover ID detection.
DetectionMaxCurrent	Maximum value of the current of the Mover ID detection.
DetectionStatus	Status of Mover ID detection.

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AXIS 2	
· · ·	

- Expand Solution Explorer > TwinCAT Project > MOTION > NC SAF > Axes > Mover Axis > SoftDrive > Data Pointer
- Double click on FeedForward_Obj6 (CTcSdFeedForward)

Parameter (Init)

DetectionMaxCurrent

	Name	Value		
-	MoverIdDetection			
	DetectionMinMovement	0.1		
	DetectionFilter	250.0		
	DetectionCurrentRamp	25.0		
	DetectionMaxCurrent	12.0		
2	Ontimization			
oject	Context Parameter (Init) Parameter (C	Inline) Interfaces Interface Pointe		
	Name	Value		
	DetectionMinMovement	0.1		
	DetectionFilter	250.0		

- Click the Parameter (Init) tab in the project window
- Expand MoverIdDetection

▶ If necessary, reduce the value for the minimum position change during Mover ID detection in the input field DetectionMinMovement to reduce the position change of the movers

OR

If necessary, increase the value for the minimum position change during Mover ID detection in the input field DetectionMin-Movement to increase the position change of the movers

Object	Context Parameter (Init) Parameter (Init)	arameter (Online) Interfaces Interface Pointer
	Name	Value
+		
-		
	DetectionMinMovemen	t 0.1
	DetectionFilter	250.0
	DetectionCurrentRamp	25.0
	DetectionMaxCurrent	12.0

12.0

Object	Context	Parameter (Init)	Parameter (Online)	Interfaces	Interface Pointer	
	Nam	ie	١	/alue		
+						
-						
	DetectionMinMovement DetectionFilter DetectionCurrentRamp		nent 0	0.1 250.0		
			2			
			np 2	5.0		
	Dete	ctionMaxCurren	t 1	2.0		

Object Context Parameter (Init) Parameter (Online) Interfaces Interface Pointer

Name	Value	
DetectionMinMovement	0.1	
DetectionFilter	250.0	
DetectionCurrentRamp	25.0	
DetectionMaxCurrent	12.0	

▶ If necessary, reduce the value for the current change filter in the input field DetectionFilter to build up the current more slowly and

make Mover ID detection smoother

OR

- ▶ If necessary, increase the value for the current change filter in the input field DetectionFilter to build up the current more quickly and make Mover ID detection more jerkily
- If necessary, change the *DetectionCurrentRamp* value for the ramp of the Mover ID detection current
- ▶ If necessary, change the DetectionMaxCurrent value for the limit of the Mover ID detection current

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Parameter (Online)

Object	Context	Parameter (Init)	Parameter (Online)	Interfaces	Interface Pointer
Nam	ne		Online		
Dete	DetectionStatus		OFF		

- ► In the project window click on the **Parameter (Online)** tab
- ► Check result at *DetectionStatus*:

OFF

Mover ID detection is not used.

ACTIVE

Mover ID detection is running.

ERROR

Mover ID detection failed.

FOUND_Standard

The standard magnetic plate set was found for a specific mover.

FOUND_Mover1

The magnetic plate set Mover 1 was found for a specific mover.

6.3.4.2 Hidden Parameters

For the advanced operation and configuration of the Mover ID detection you have the option to use *Hidden Parameters*. For example, you can adjust various waiting times of the movers.

Hidden Parameters	Default	Min	Мах	Unit	Tab
DetectionStandstillVelocityLimit	15	1	1000	mm/s	Init
DetectionStandstillSwitchTime	0.015	0.00	1.0	S	Init
DetectionTimeOut	2	0	10	s	Init
DetectionInfoMessage	FALSE	FALSE	TRUE		Init

The following table shows the default parameters:

Show Online Values Show Hidden Parameter Expand All Collapse All	Activate the checkbox Show Hidden Parameter to show the Hidden Parameters
DetectionStandstillVeloc-	Definition of the maximum velocity for the standstill monitoring.
ityLimit	Value < default parameter:
	The search changes to the next phase later.
	Value > default parameter:
	The search changes to the next phase earlier.
DetectionStandstillSwitchTime	Time in which the velocity of the mover must be below the value of the parameter <i>DetectionStandstillVelocityLimit</i> .
	Value < default parameter:
	The search is accelerated.
	Value > default parameter:
	The search is decelerated.
DetectionTimeOut	Total timeout for the Mover ID detection. An error occurs if this time is reached. Possible causes:
	 too little movement due to too small a value in the input field <i>De-tectionMaxCurrent</i>
	missing 48 V power supply
	 too large a value in the input field DetectionMaxMovement
	 too small a value in the input field DetectionMaxMovement
	You should always be able to achieve the <i>DetectionMinMovement</i> with the default parameter <i>DetectionMaxCurrent</i> .
DetectionInfoMessage	Messages are displayed in the TwinCAT output window.

6.3.5 Detection phases of Mover ID detection

The following figures show the effects of the parameters of a Mover ID detection. Phases 1 to 4 are mapped with the default parameters as an example.



6.3.5.1 Phase 1

Position	Explanation
1	The absolute value of the current vector is increased in accordance with the parameter <i>Detection-CurrentRamp</i> .
2	The movement is monitored until the value of the <i>DetectionMinMovement</i> parameter is reached.
3	The current is decreased via a filter, defined by the <i>DetectionFilter</i> parameter.

Set first current vector

Functions of the driver

6.3.5.2 Phase 2

► Wait until the mover comes to a standstill again



Position	Explanation
1	Wait until the velocity is below the limit set with the parameter DetectionStandstillVelocityLimit.
2	The velocity must lie continuously below the limit velocity for the time set with the parameter <i>Detec-</i> <i>tionStandstillSwitchTime</i> .

6.3.5.3 Phase 3



Position	Explanation
1	The absolute value of the current vector is increased in accordance with the parameter <i>Detection-</i> <i>CurrentRamp</i> .
2	The movement is monitored until the value of the <i>DetectionMinMovement</i> parameter is reached.
3	The current is decreased via a filter, defined by the <i>DetectionFilter</i> parameter.

Functions of the driver

6.3.5.4 Phase 4

► Wait until the mover comes to a standstill again



Position	Explanation
1	Wait until the velocity is below the set limit of the parameter DetectionStandstillVelocityLimit.
2	The velocity must lie continuously below the limit velocity for the time set with the parameter <i>Detec-</i> <i>tionStandstillSwitchTime</i> .

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6.4 Teaching functionality

6.4.1 Teaching at standstill

Teaching at standstill is an additional function that can be used to calibrate the null value signal of sensors on XTS modules.

All sensor values are recorded from modules on which no mover is present that could affect the sensors. The recorded values are saved in a special teaching file that is used to set the real values to 0. If, for example, a sensor of a module on which no mover is present returns 500, this value is recorded and saved so that the offset has to be -500 to achieve the null value.

Teaching at standstill can be performed to eliminate interfering effects on the module and to achieve improved accuracy and improved detection of the movers.

NOTICE

Pay attention to the revision number

Modules with a sensor revision level of \geq 18 are already compensated in production. Additional teaching is only necessary if the accuracy has to be improved or if there are problems with the detection of the movers.

Modules with a sensor revision level of \leq 17 must be manually compensated in order to start the system and detect the movers.



Pay attention to the type of system

Teaching at standstill can only be used with the XTS Standard system and is not available for the XTS Hygienic system.

6.4.1.1 Activating teaching

Object C	Context Parameter (Init) Parameter (Online)	Interfaces Event Classes Interface Pointer
	Name	Value
+		
+		
+		
+		
-	Teaching	
	TeachingFileNumber	0
	TeachingMappingMode	Automatic 💌
+	StartStandStillTeaching	
+	StartMovementTeaching	
	StopMovementTeaching	
	IsAbortOnTeachingWarningsEnabled	TRUE
	IsTeachingCheckSumCheckEnabled	FALSE
	IsTeachingEnabled	TRUE 🗸
+	TeachingCheckSum	FALSE
	TeachingWarningLevel	TRUE
	TriggerTeachingFileFormatUpdate	

- Click the Parameter (Init) tab in the project window
- Expand *Teaching*
- Select TRUE in the drop-down menu IsTeachingEnabled to enable teaching

You also have the option of enabling teaching in the XTS Configurator. Further information can be found in chapter "Teaching", [Page 265].

Functions of the driver

6.4.1.2 Enter the number of the teaching file

Teaching must be enabled in order to enter the number of the teaching file.

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 - Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
 - Double click on XtsProcessingUnit

Change teaching file number

Always change the number of the teaching file before commencing with a new teaching. The old file will be used and overwritten if the number of the teaching file is not changed or if the configuration is not loaded.

Beckhoff recommends using the current date for the number of the teaching file. For the first teaching on April 3rd, 2021, for example, the numbers 202104031 could be used and for the second teaching on the same day the numbers 202104032 and so on.

	Name	Value
	General	
	Teaching	
	TeachingFileNumber	202104031
+	StartStandStillTeaching	
+	StartMovementTeaching	
	StopMovementTeaching	
	IsAbortOnTeachingWarningsEnabled	TRUE
	IsTeachingCheckSumCheckEnabled	FALSE
+	TeachingCheckSum	[0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, .
	TeachingWarningLevel	Level_3
	TriggerTeachingFileFormatUpdate	
	Diagnostics	
	Advanced	
_		
File	: Edit View Projec © - © १२ - १ - १ Build 4024.11 (Loaded)	tt Build Debug ☐

- Click the Parameter (Init) tab in the project window
- ► Expand Teaching
- ► Enter the number of the teaching file in the input field *Teaching-FileNumber*

You also have the option of changing the TeachingFileNumber in the *XTS Configurator*. Further information can be found in chapter "Teaching", [Page 265].

Click the ActivateConfiguration button to activate the configuration and load the number of the teaching file

6.4.1.3 Selecting the teaching mode

Before teaching at standstill, you must define the *teachingSelection* parameter with which the teaching is to be executed. The selection of the parameters decides which module has to be entered in the input field *.selectionString*.

ExcludeSpecifiedItems

IncludeSpecifiedItems

Modules on which a mover is present should be excluded from the teaching. The corresponding module numbers must be entered in the input field *.selectionString*.

Modules on which there are no movers are included in the teaching. The corresponding module numbers must be entered in the input field *.selectionString*.

- Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes XPU Name Value TeachingFileNumber 20210403 StartStandStillTeaching teachingSelection .selectionString StartMovementTeaching StopMovementTeaching IsAbortOnTeachingWarningsEnabled TRUE IsTeachingCheckSumCheckEnabled FALSE TeachingCheckSum [0x00, 0x 00, 0x00, 0x00, 0x00, 0x00, 0x TeachingWarningLevel Level_3 TriggerTeachingFileFormatUpdate
 - 1

Expand StartStandStillTeaching

- Select ExcludeSpecifiedItems in the drop-down menu .teachingSelection to exclude modules with movers from the teaching
 OR
- Select IncludeSpecifiedItems in the drop-down menu .teachingSelection to include modules without movers into the teaching

Pay attention to distances

Teaching a module on which a mover is present can lead to incorrect compensation of a neighboring module if the distance between the mover and the edge is too small.

Make sure that the encoder flag of a mover does not affect the teaching of an empty module.



It is important when selecting the *teachingSelection* parameter that the distance between the encoder flag [1] of a mover and the outer edge [2] of an empty module is at least 20 mm.

6.4.1.4 Entering the module



Γ

The module number can be found in *Solution Explorer > TwinCAT Project > SYSTEM > TcCOM Objects > XtsProcessingUnit > Part > Module.*

Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes XPU Name Value TeachingFileNumber 202104031 StartStandStillTeaching .teachingSelection ExcludeSpecifiedItems selectionString 1,2,3,5-8 StartMovementTeaching StopMovementTeaching IsAbortOnTeachingWarningsEnabled IsTeachingCheckSumCheckEnabled TRUE FALSE TeachingCheckSum [0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, TeachingWarningLevel Level_3

	TriggerTeach	ingFileFormatUpdate			
+					
			_		
Object	Context	Parameter (Init)	Parameter (Online)	Interfaces	Data Pointer
_					
	Name	2	Value		(
-					
	AdsPo	ort	0x015e		[
	TaskO	ID	02010020		[
	Moto	rTerminalOID	03020001		-
	Senso	rTerminalOID	03020002		- I
	Positi	onIndex	0		[
	Gap		0.0		ſ
	Offset		0.0		[

► Enter the module number in the input field of *.selectionString* The module numbers can be entered using the characters - and , or a combination of both characters, for example 1-4, 1,2,3,4 or 1-3,4.

- Click the **Parameter (Init)** tab in the project window
 Enter the hardware position in the input field *PositionIndex*
- The first module has the hardware position 0.

6.4.1.5 Starting teaching

1.0

ScalingFactor

	Name	Value		
	TeachingFileNumber	202104031		
-	StartStandStillTeaching			
	.teachingSelection	ExcludeSp		
	.selectionString	1,2,3,5-8 1 Upload		
+	StartMovementTeaching	Ф Сору То		
	StopMovementTeaching			
	IsAbortOnTeachingWarningsEnabled	TRUE		
	IsTeachingCheckSumCheckEnabled	FALSE		
+	TeachingCheckSum	[0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x		
	TeachingWarningLevel	Level_3		
	TriggerTeachingFileFormatUpdate			

After selecting the teaching mode and entering the respective module, the teaching can be started.

- Right-click in the input field StartStandStillTeaching to open the context menu
- ► In the context menu click **Download**

The teaching is started and takes a few seconds.



The messages *Teaching is started* and *Teaching is stopped* appear in the message window *Error List*.



If the message [...] are not in the expected range (-600.000000, 600.000000) appears, the modules are not compensated and have a sensor revision level of \leq 17.

If the message Mover lost errors appears:

- Check whether the correct teaching mode has been entered in the drop-down menu teachingSelection
- Check whether the correct modules have been entered in the input field .selectionString

i

If warnings are displayed in the *Error List* or *Output* message windows, there may be a problem with your module's encoder. Contact the product specialist responsible for your region.

The teaching is complete as soon as all empty modules have been compensated. Depending on the number of modules, the movers and the teaching mode, teaching must be repeated several times until each module has been calibrated empty. In the *IncludedSpecifiedItems* mode, check that there are no movers on the modules entered in the input field *selectionString*.

The configuration must be activated again after checking and correcting the entries.

- File
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- Click on the button Activate Configuration to activate the configuration

Messages appear in the *Error List* message window indicating that the teaching file was loaded and the plausibility check was successful.

Error List	
Entire Solution 🔹 🔯 0 Errors 🔒 0 of 5 Warnings 🚺 33 Messages Clear Build + IntelliSe	ense 🔹
¹⁴ Description P	roject
03.04.2021 14:42:46 672 ms XtsProcessingUnit 1 (0x01010010): 12 XTS module(s) are loaded.	
03.04.2021 14:42:52 349 ms XtsProcessingUnit 1 (0x01010010): Enable time is set.	
03.04.2021 14:42:51 263 ms XtsProcessingUnit 1 (0x01010010): Teaching data TcloXts.TeachingData.202104031 is loaded.	
03.04.2021 14:42:45 404 ms 'TwinCAT System' (10000): TcNc Server started: TcNc.	
03.04.2021 14:42:45 231 ms 'TwinCAT System' (10000): Loading configuration of COM server TF6420Server !	
03.04.2021 14:42:54 601 ms XtsProcessingUnit 1 (0x01010010): IO Processing Unit (ID = 1): EtherCAT is ready now (2 device(s) are checked).	
🕕 03.04.2021 14:42:45 445 ms 'TwinCAT System' (10000): TcRTime Server started: TcRTime.	
🚺 03.04.2021 14:42:45 827 ms 'TCOM Server' (10): EventLogger is used.	
1 03.04.2021 14:42:45 258 ms 'TwinCAT System' (10000): TcloEth Server started: TcloEth.	
03.04.2021 14:42:45 430 ms 'TwinCAT System' (10000): TcloXts Server started: TcloXts.	
 03.04.2021 14:42:51 258 ms XtsProcessingUnit 1 (0x01010010): Mover ID detection mode 'Mover1' is activated. 	
03.04.2021 14:42:46 672 ms XtsProcessingUnit 1 (0x01010010): 6 XTS mover(s) are loaded.	
03.04.2021 14:42:54 899 ms XtsProcessingUnit 1 (0x01010010): Teaching data plausibility check is passed successfully.	
🕕 03.04.2021 14:42:54 915 ms XtsProcessingUnit 1 (0x01010010): All XTS mover(s) are detected.	
03.04.2021 14:42:52 349 ms XtsProcessingUnit 1 (0x01010010): Is registered by all tasks as IO driver.	

If the teaching file was not loaded and the plausibility check was not successful:

Check which messages are displayed at Output



If warnings are displayed in the *Error List* or *Output* message windows, there may be a problem with your module's encoder. Contact the product specialist responsible for your region. vinCAT is in Run mode, the result of the teaching can also be ked in the project window on the *Parameter (Online)* tab.

- xpand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

- n the project window click on the Parameter (Online) tab
- xpand Teaching

e teaching file has been overwritten, the parameter IsTeachhanged indicates TRUE.

e teaching was valid and the teaching file was loaded correctly, the parameter IsTeachingValid indicates TRUE.

If the teaching file uses the latest version, the parameter IsTeachingFileUpToDate indicates TRUE.

6.4.1.6 Teaching file update

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lsDefaultTeachingAvailable

IsTeachingFileFormatUpToDate

IsTeachingChanged

IsTeachingValid

Name

Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Interface Pointer

Online

FALSE

FALSE

FALSE

FALSE

Solution Explorer

Þ

An already saved teaching that was created with an older software version can be used by the latest software version.

- ► Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

- ▶ In the project window click on the **Parameter (Online)** tab
- Expand Teaching

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Check the online status of the parameter IsTeachingFileFor-matUpToDate

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Þ			VDU	
Diject Context Paramet	ter (Init) Parameter (Onli	ine) Interfaces Event Classe	es AFU	
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Dbject Context Paramet	ter (Init) Parameter (Onli	Interfaces Event Classe	es Aru	
beject Context Paramet	ter (Int) Parameter (Oni	ne) Interfaces Event Classe	es ArU	
biject Cortext Paramet Name + MoverDetecti + MoverldDetec Teaching IsTeachingCha	ter (Int) Parameter (Onl	ine) Interfaces Event Classe Online TRUE		
bject Cortext Paramet Name + MoverDetectio + MoverlaDetect Faching IsTeachingCha IsTeachingVali	en (init) Parameter (Oni en tion inged d	Ine) Interfaces Event Classe Online TRUE TRUE		

Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Interface Pointer Name Value TeachingFileNumber 0 TeachingMappingMode Automatic + StartStandStillTeaching + StartMovementTeaching StopMovementTeaching IsAbortOnTeachingWarningsEnabled IsTeachingCheckSumCheckEnabled TRUE FALSE FALSE IsTeachingEnabled + TeachingCheckSum [0x00, 0x00, 0x00, 0x00, 0x00, 0x00 TeachingWarningLevel Level 3 TriggerTeachingFileFormatUpdate 🛃 Download 1 Upload Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes Interface Pointer Online CS Name IsDefaultTeachingAvailable FALSE FALSE IsTeachingChanged IsTeachingValid TRUE

TRUE

IsTeachingFileFormatUpToDate

If the online status of the parameter *IsTeachingFileFormatUpToDate* indicates FALSE:

- ► Click the Parameter (Init) tab in the project window
- ► Expand Teaching
- Right-click in the input field *TriggerTeachingFileFormatUpdate* to open the context menu
- ► In the context menu click **Download**

If the download was successful, the parameters *IsTeachingValid* and *IsTeachingFileFormateUpToDate* indicate TRUE.

If the download was unsuccessful, the parameters *IsTeachingValid* and *IsTeachingFileFormateUpToDate* indicate FALSE and an error message is displayed in the *Error List* message window.

6.5 Track Management functionality

With the Track Management functionality, an XTS system can be split into individual, spatially separated track sections. Moving track sections, for example, allow movers to switch between two fixed but spatially separated track sections. On the moved track sections, both the movers and the modules have their full functionality and remain as a full track.

An XTS system with Track Management requires more advanced programming to move the movers and monitor their position than an XTS standard system because the movers no longer travel constantly on a single closed track and their sequence changes as they move to other tracks.

6.5.1 Closed XTS system



In a closed XTS system, the sequence of modules and movers always remains constant. The movers thus have only one possible track on which they can move.

6.5.2 XTS system with Track Management



In an XTS system with Track Management, modules can change their position and align with other modules. In this way, new tracks are created and the order of the movers changes.

6.5.3 Requirements

In order to use an XTS system with Track Management, some software and hardware requirements must be met.

6.5.3.1 Software

The following software versions must be available on your system:

Software	Version
TwinCAT 3	3.1.4024.0 or higher
TF5850 TwinCAT 3 XTS Extension	3.20.700.0 or higher
TF5400 TwinCAT 3 Advanced Motion Pack	3.1.10.14 or higher

6.5.3.2 Hardware

To implement XTS Track Management, you need at least one module with AT2002-0249 connector in addition to several modules, to enable an air gap between the modules for the moving track section. In addition, one or more movers and a suitable mechanical system for the moving track section, such as a spindle axis or linear motor, are required.

The following components must be present in your XTS system to use Track Management:

- · At least one shortened module with connector AT2002-0249
- · Cables with connectors
- Mover: AT9011-0x70, AT9014-0x70 or external Mover

For more information, refer to the chapter "Configuration setup", [Page 125] and the XTS original operating instructions:

Direct link to the XTS original operating instructions

6.5.4 Configuration setup

In contrast to a closed XTS system, an XTS system with Track Management differs significantly in its structure with fixed and moving track sections. In order for a track section to be moved, an air gap is required between the moving and fixed track sections. The required air gap can be realized by using shortened modules and corresponding guide rails.

6.5.4.1 Traversing axes for moving track sections



The interlocking of the Beckhoff guide rails enables a track section to be moved in the X-direction and Y-direction. Movement in the Z-direction is not possible due to the interlocking of the guide rails.



For moving a track section in X-direction and Y-direction or in Z-direction, parallel guide rails from third party manufacturers must be used, which do not interlock.

6.5.4.2 Air gap

The required air gap can be realized with one or two AT2002-0249 modules. This module is 1 mm shorter than a standard XTS module and allows an air gap of 1 mm or 0.5 mm on both sides.



For an XTS system with Track Management with Beckhoff guide rails, two AT2002-0249 modules are used as modules with a length of 250 mm. This results in a gap of 1 mm on both sides of the moving track section.

Due to the interlocking of the Beckhoff guide rails, this air gap is large enough to move the track section and small enough to move the movers without problems.

The air gap must be entered in the parameters. Further information can be found in chapter "Enter air gap", [Page 135].



For a Track Management system without Beckhoff guide rails, an AT2002-0249 module is used as a module with a length of 250 mm. This results in a gap of 0.5 mm on both sides of the moving track section.

The air gap must be entered in the parameters. Further information can be found in chapter "Enter air gap", [Page 135].

NOTICE

Only one AT2002-0249 module for external guide rails

External guide rails may only be used with a single AT2002-0249 module, as the tolerances are lower. Rails that do not interlock result in higher friction when passing over the physical air gap.

Contact the manufacturer of the external guide rail to clarify whether the guide rail can be used for XTS Track Management.

6.5.4.3 Mover



Only use Beckhoff 70 mm movers or external movers

Only Beckhoff movers with a length of 70 mm and external movers that comply with the specified tolerances may be used for Track Management.

Only the following movers are approved for Track Management:

- AT9011-0070
- AT9014-0070
- External movers

Contact the manufacturer of the external mover to clarify whether the mover can be used for Track Management and whether the mover and the guide system are suitable.

6.5.4.4 Cabling

Compared to a closed XTS system, an XTS system with Track Management uses more modules with feed, since each moving track section requires its own feed.

For applications with more than 32 modules with feed, contact the product specialist responsible for your region.

6.5.4.5 Tracks

Based on parts, the exact position of the mover and its travel path is determined. The different parts combine to form tracks on which the movers travel.



Example with four parts

The composition of parts into tracks is illustrated using an XTS system with four parts as an example



Further information can be found in chapter "XTS Configuration", [Page 24].

6.5.4.6 Variants for the mover organization

The order of the movers changes permanently due to the moved track sections. Therefore, it is necessary to use object-oriented programming to organize the movers within the system.

For example, the mover organization can take a local or a global approach. Furthermore, these approaches can be combined and the advantages of both approaches can be used optimally.

Local approach

The local approach is suitable for an XTS system with:

- many movers
- many moving parts

This approach gives you the possibility to work with a small number of tracks. In this example, the XTS system has ten possible tracks, but only two tracks are used. Movers switch from one track to the next in virtual stations.



The decisive factor when using the local approach is that collision avoidance must be performed manually. When a mover changes from one track to another, the remaining movers no longer detect the mover on the moving track section, since collision avoidance is track-based. The programmer must ensure that the movers are on the correct track and do not collide with each other.

For more information on collision avoidance, see the chapter "Collision Avoidance functionality", [Page 140].

Global approach

The global approach is suitable for an XTS system with:

- few movers
- few moving parts

This approach gives you the possibility to work without virtual stations and only with tracks. In this example, the XTS system has ten possible tracks that are not simultaneously activated for the movers. In this approach, the movers are switched to the correct track based on the position of the moving track sections.



While the two outer track sections move, in this configuration all parts are independent tracks. As soon as a moving track section matches the upper module, a new configuration with a new track is formed. In this example, Part 2, Part 3 and Part 4 together form Track 5 and the movers automatically switch to this new track.

This global approach is suitable for a manageable number of movers and tracks. The more moving track sections there are in your XTS system, the more possible tracks there are. The exponential growth leads to the fact that at a certain point the number of possible configurations is too large and the global approach is unsuitable for this system.

The collision avoidance of the movers takes place without manual testing and correctly.

i

Activation of a new track stops active movement commands The MC_ActivateTrack currently cancels the active movement command of all movers as soon as a new track is activated. The movement command must then be reactivated manually. You must check if it is possible to activate the new tracks for all movers, otherwise an error will be thrown at the function block.

Mixed approach

The mixed approach combines the respective advantages of the local and global approach. The XTS system is split into sections where the tracks manage the movers globally. Each of these sections has a limited number of possible configurations that are easy to configure. Collision avoidance can be used to its full extent.

Two globally organized sections are then interconnected with a virtual station using the local approach, allowing movers to move from one global system to the other.



6.5.5 Programming of an XTS system with Track Management

Since the movers no longer travel constantly on a single closed track, their continuous position, which is specified by the NC, changes. Due to the moving track sections, it is possible for movers to overtake each other. As a result, the starting positions of the movers change and movers can have the same continuous position.

It is required that an XTS system with Track Management uses advanced programming to move and monitor the position of the movers.



Standard XTS system

In a closed XTS system, each position exists only once. The maximum position corresponds to the length of the system. After the mover has traveled the entire length once, it is started again at position 0.

XTS system with Track Management

For the position determination of the movers on an XTS system with Track Management, the positions and the object IDs of all parts or all tracks are required to avoid duplicate positions of movers.



If the position determination is only based on the position on a part, Mover 1, Mover 2, Mover 3, Mover 4 and Mover 5 in this example all have the same position of 190 mm. Only by combining *PartPosition* and *PartId* is a single exact position determination for each mover possible. Alternatively, the combination of *TrackPosition* and *TrackId* can be used to determine the exact position of the movers, since this combination also only exists once in the system.

6.5.5.1 Enter air gap

The air gap for moving track sections realized with a shortened AT2002-0249 module must be entered in TwinCAT. When entering, please note from which side your system is displayed in TwinCAT.



If the XTS system is displayed in the view *Front*, the air gap [1] is located on the left side of the module [2].

If the XTS system is displayed in the *Back* view, the air gap [1] is located on the right side of the name plate [3] of the module [2].



Manual input or use of TwinCAT Tools

You have the option of creating the air gap manually or quickly and easily via the TwinCAT Tools *XTS Configurator* and *XTS Simulation Builder*.

For more information, see the chapters "XTS Configurator", [Page 258] and "XTS Simulation Builder", [Page 229].

Enter manually

Solution Explorer	→ 中 >
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Search Solution Explorer (Ctrl+	ū) 🤷
Solution 'TwinCAT Project Image: TwinCAT Project Image: SYSTEM Image: License Image: Point Project Image: Point Project	; ; ;ProcessingUnit) (XtsPart)
≥ ∎ Objecti	ct1 (AT2002 0250)
D Dbje	ct2 (AT2000_0250)
Object Context Parameter (Init)	Parameter (Online) Interfaces Data Pointer
Name	Value
- General	
AdsPort	0x0000
TaskOID	00000000
MotorTerminalOID	0302000ь
SensorTerminalOID	0302000c
PositionIndex	0
Gap	1.0
Offset	0.0
ScalingFactor	1.0

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Object > Object (XtsProcessingUnit)
- Double-click on Object (AT2002_0249)

- Click the **Parameter (Init)** tab in the project window
- Expand General
- Enter a value for the gap between the modules in the Gap input field

Enter in the XTS Configurator

XTS Configurator			
	Par	ts	
XtsProcessing	Unit 1 🔹 🕇	× % 🌣	Configu
Parts Modules			
Module List			
Name	Туре	Gap [mm]	Lengt
A Part 1 (XtsPro	ocessingUnit	1)	
Module 1	AT2002_0249	0	249
Part 2 (XtsPro	ocessingUnit	1)	
Module 2	AT2002_0249	0	249
Module 3	AT2000_0250	0	250
Part 3 (XtsPro	ocessingUnit	1)	
Part 4 (XtsPro	ocessingUnit	1)	
4	5		•
Details: Module 2			0000000000
Gap: 0			mm
Length: 249			mm

- ► Open page *Parts*
- Click on the **Modules** tab
- Click on a module
- Enter a value for the gap between the modules in the Gap input field

Enter in the XTS Simulation Builder



- Expand XtsProcessingUnit > Parts > Part 1 > Modules
- Click on a module
- Enter a value for the gap between the modules in the Gap input field

6.5.5.2 Enable track

The movers need activated tracks so that the XTS Driver gets the information which coils have to be activated to move the movers. After the start, all movers have their active track on which they are found. You have the possibility to activate tracks manually by downloading the respective parameters with the TrackId. To activate another track for a mover, the mover must be on a part of the XTS track to be activated.

Read with XTS Utility library or ADS

The actual values for the position can be read using the XTS Utility library or ADS.

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XTSProcessingUnit
- Double-click on Object (XtsMover)

- ▶ In the project window click on the Parameter (Online) tab
- Expand General
- Right-click in the input field ActiveTrackObjectId to open the context menu
- ► In the context menu click **Download**



Read out in PLC

MC_ActivateTrac	k
Execute BOOL TrackId OTCID Axis Reference To AXIS_REF	BOOL Done BOOL Busy BOOL Error UDINT ErrorId

MC_ActivateTrack function block

The *MC_ActivateTrack* function block is used to activate a track. The Execute command triggers an event and status bits can be read to get feedback from the function block.

The function block can be used in the PLC and takes over the Track Object ID from the track object. If the Track Object ID is set to 0, the absolute reference system, which is used by default, can be reactivated for the NC axis.

While the track for the mover is activated in the XTS driver in order to be able to drive over the modules, the track is also activated as a reference system in the NC. The reference system can then be used for positioning in various motion functions, for example *MoveAbsoluteCA*, *HaltCA*, *GearInPosCA*.

The axis must be part of a CA group for the function block to work. The function block *MC_ActivateTrack* automatically cancels other motion commands when they are triggered.

Further information can be found in the documentation *TF5410 TwinCAT* 3 | *Collision Avoidance*:

Direct link to the documentation TF5410 | TwinCAT 3 | Motion Collision Avoidance

6.5.5.3 Determine track positions

Determining the position of the movers based on parts of a circulating track does not work for an XTS system with Track Management, since the parts can be parts of different tracks. The MC_ReadTrack-Positions function is used to determine the position and object ID of all parts and all tracks. This information can be used to determine the exact position of a mover in the system.

The actual values for the position can be read using the XTS Utility library or ADS.

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XTSProcessingUnit
- Double-click on Object (XtsMover)

- ► In the project window click on the Parameter (Online) tab
- Expand Mover Detection > PositionInfo
- Read values for .partPosition, .trackPosition, .partObjectId and .trackObjectId

Read with XTS Utility library or ADS

Solution Explorer	* II X
	-
	-
Search Solution Explorer (Ctrl+ü)	- ۵ړ
Image: Solution TwinCAT Project Image: SYSTEM Image: System	iingUnit)) k) vci) ver) ver)
Object Context Parameter (Init)	arameter (Online) Data Area Interfaces
Name	Online
- Mover Detection	
IsActive	TRUE
- PositionInfo	
.partPosition	1508.82298850575
.trackPosition	1506.82298850575
.partObjectId	01010020
trackObjectId	010100f0
+ Mover ID Detection	

Read out in PLC

MC_ReadTrackPositions
Enable BOOL Valid
Axis Reference To AXIS_REF
MC_LREAL TrackPosition
OTCLD TrackId
MC_LREAL PartPosition
OTCLD PartId
BOOL Error
UDINT ErrorId

The MC_ReadTrackPosition function block can be used to transfer setpoints from the NC to the PLC.

MC_ReadTrackPositions function block

This function block is different from the other motion function blocks. *Enable* activates the function block and enables a cyclic reading process of the positions. Status signals are read to get a feedback from the function block.

The function block returns the current set positions of the parts and tracks and the associated object IDs. The axis of the movers located on the parts and tracks must be part of a CA group so that the function block returns valid values. If no track is activated for the axis, the absolute setpoints, the track and the Part ID are returned with 0.

Further information can be found in the documentation *TF5410 TwinCAT 3* | *Collision Avoidance*:



6.5.5.4 Move to an absolute position

In the options of the motion command MC_MoveAbsoluteCA there is a Position Reference System and a Dynamic Reference System where the track on which the mover is located must be specified. By entering the track, the motion profile is calculated correctly and rejected if necessary, if the motion profile is outside the limits of the track. If the input of the track is missing, it is calculated against the absolute system. If the part is entered instead of the track, it is calculated against the part.

Read out in PLC

MC_MoveAbsolut	teCA
Execute BOOL ContinuousUpdate BOOL Position MC_LREAL Velocity MC_LREAL Deceleration MC_LREAL Jerk MC_LREAL Gap MC_LREAL BufferMode MC_BUFFER_MODE Direction MC_DIRECTION Options ST_MoveAbsoluteCAOptions Axis Reference To AXIS_REF	BOOL Done BOOL Busy BOOL Active BOOL CommandAborted BOOL Error UDINT ErrorId

MC_MoveAbsoluteCA function block

This function block instructs a single axis to move to the absolute position defined in the function block, based on collision avoidance. Collision avoidance has higher priority than the motion command. Therefore, the axis may slow down or wait while the motion command is executed to avoid a collision. The function block does not output the signal *Done* until the axis has reached its target position.

Further information can be found in the documentation *TF5410 TwinCAT 3* | *Collision Avoidance*:

Direct link to the documentation TF5410 | TwinCAT 3 | Motion Collision Avoidance

6.5.5.5 Collision Avoidance functionality

The Track Management supports the Collision Avoidance functionality. Collision Avoidance works like a closed XTS system, but there are a few special features to consider.

Only one CA group is required for an XTS system. Under the CA group, there is a hidden domain management that manages the collision avoidance for the different track combinations. Each track is represented by a domain and the movers of this domain can avoid collision among themselves. This means that collision avoidance works exclusively on the basis of tracks.

If the movers travel on the same track, they recognize each other and can automatically avoid a collision. If the movers are on different tracks but on the same part, they will not recognize each other and may collide without manual control.



Track-based collision avoidance

Currently, only a track-based collision avoidance calculation is available. A parts-based collision avoidance system is still under development.

6.6 Leave and Arrive functionality

The *Leave and Arrive* functionality enables dynamic adjustment of the number of movers in an XTS system during operation. Movers can be removed from the system for service work, for example, or removed from the system and added again as required.



Current cycle rate of 60 movers per minute

Adding and removing movers is currently limited to a cycle rate of 60 movers per minute.

6.6.1 Examples



With the *Leave and Arrive* functionality, movers can be removed from the system for maintenance while the rest of the system remains in operation.



Movers can be removed from the system if they are temporarily not needed, for example, during a product change. Removed movers can be added back to the system if necessary.



Movers can leave the system, move to a track section without XTS functionality and be added back to the system at another location.

Beckhoff recommends transport using simple conveyor technology only for systems with a length of at least 30 m.

6.6.2 Requirement

It is necessary to add an additional task so that the mover detection can take place in parallel with the operation of the other modules and movers.

The additional task is added during configuration with the *XTS Con-figurator*. However, the additional task can also be added manually if needed. Further information can be found in chapter "AUX Task for the Leave and Arrive functionality", [Page 310].

6.6.2.1 Add additional task manually

Solution Explorer 👻 🕂 🗙	Expand Solution Explorer > TwinCAT Project > SYSTEM
G O 🟠 📇 - To - 🗗 🏓 🗕	Dight click on Tasks to open the context manu
Search Solution Explorer (Ctrl+ü)	
Solution TwinCAT Project (1 project) Solution TwinCAT Project (1 project) Solution TwinCAT Project Real-Time Real-Time Solution TwinCAT Project Add New Item Ins Routes Add Existing Item Shift+Alt+A Fype S Rename Contemport Rename C++ Add Auxiting Item Shift+Alt+A C++ Add Auxiting Item Shift+Alt+A Add Existing Item Shift+Alt+A C++ Auxiting Item Shift+Alt+A Add Existing Item Shift+Alt+A C++ Auxiting Item Shift+Alt+A Solution TwinCAT Solution TwinCAT	Click Add New Item in the context menu
▶ 🔁 I/O	
Insert Task X	The Insert Task dialog box opens.
Marroy XTS Aux Task	Enter a name for the task in the input field Name
Type Cancer Type Cancer	Confirm with OK
O TwinCAT Task With Image	
O TwinCAT Job Task (Worker Task)	
Solution Explorer	Expand Solution Explorer > TwinCAT Project > SYSTEM > Tasks
Search Solution Explorer (Ctrl+ū)	
J Solution 'TwinCAT Project' (1 project)	Double-click on XTS Aux Task
TwinCAT Project	
SYSTEM	
 Real-Time 	
▲ 🎁 Tasks	
ii XTS Task 1 ⊨ XTS Aux Task	
語 Routes	
Type System	
P III ICCOM Objects MOTION	
PLC	
SAFETY	
▶ 2 1/0	
2	

Functions of the driver



After a task has been added for mover detection, movers can be removed using the Leave function or added again using the Arrive function.

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6.6.3 System startup

After the system startup and the first mover detection, all detected movers are switched to active. The first mover detection is required and is automatic. After the first mover detection you have the possibility to adjust the settings for further mover detections.

6.6.4 Leave function

The controllers of an active mover are switched on and the mover may be integrated into a CA motion command, for example *MC_MoveAbsoluteCA*. The mover must first be stopped and removed from the control system before it can be removed from the system.

For the removal of the mover, the control is switched off for the Tc-COM object *Mover* using the PLC and the *AXIS_REF* interface. Once the mover is passive via the XTS Utility, its information has been reset to the default settings and its position is 0, it can be removed from the system without the mover triggering an error. The links of the mover to its corresponding SoftDrive object and to its NC axis remain.

The diagram shows the structure of the *Leave* sequence required to remove a mover from the system.



6.6.4.1 Remove Mover

Disabling movers

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Solution 'TwinCAT Project' (1 project)

 Image: Track 1

 Image: Track 1

ConfiguredDetectionTrackObjectId

Object Context Parameter (Init) Parameter (Online) Data Area Interfaces

Value

00000000

Search Solution Explorer (Ctrl+ü)

TwinCAT Project
 SYSTEM
 License
 Real-Time
 Tasks
 Routes
 Type System
 TcCOM Objects
 XtsProcessingUnit 1
 Part 1

Name

TriggerArrive

TriggerLeave

Solution Explorer

NOTICE

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Errors in the control system and damage to movers and modules due to incorrectly removed movers If active movers are removed that are not in control, it can lead to problems with the control system and the entire system can be put into an error state.

- Remove from the system only passive movers that are not in control and have been removed from the CA group.
- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XtsProcessingUnit
- Double-click on the mover, which is to be removed from the system

- Click the Parameter (Init) tab in the project window
- ► Expand *Mover Detection*
- Right-click in the input field *TriggerLeave* to open the context menu
- In the context menu click Download

Checking the result

After the download, you can check whether the mover has been successfully deactivated and whether the total number of movers has decreased.

Obje	ct C	ontext Parameter (Init)	Parameter (Online) Data Area Interface	s		
		Name	Online			
-	- Mover Detection					
		IsActive	FALSE			
	+	PositionInfo				
•						
•						

- ► In the project window click on the **Parameter (Online)** tab
- Expand *Mover Detection*
- Make sure the IsActive parameter is FALSE



- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

- ► In the project window click on the Parameter (Online) tab
- Expand Mover Detection
- Check if the number of movers has decreased at ActiveMover-Count

If the mover is passive and the number of movers has decreased, the mover can be removed from the system.

6.6.5 Arrive function



Use Arrive function only to add movers

The *Arrive* function can only be used to add movers to an XTS system that were previously removed using the *Leave* function or were already passive when the system was started. It is not possible to change the configuration of an XTS system with the *Arrive* function.

One or more passive movers must be activated, placed in control and added to a group before they can be moved via a CA motion command.

The links of the mover to its corresponding SoftDrive object and to its NC axis already exist. The mover must be active, added to a group, and on the correct track to be powered up and moved on the system using the PLC and the *AXIS_REF* interface.

6.6.5.1 Structure

Adding movers can be done in two different ways:

- multiple movers
- single mover

The two Arrive sequences differ from each other in their structure. The corresponding sequences can be found on the following pages.



* Required if not all movers return to the system and/or a separate track is used for mover detection.

Multiple movers

- 149

Single mover

The figure shows the structure of the required *Arrive* sequence to add a mover to the system.



6.6.5.2 Adding movers

You have the possibility to add several movers back to the system at the same time with a mover detection. You can also add a single mover in this way or use the variant for adding a single mover. With the second variant, only a single mover can be added at a time and not several movers at the same time. For more information on adding a single mover, see the chapter "Single mover", [Page 153].

NOTICE

Errors in the control system and damage to movers and modules caused by other movers

Only movers that match the configuration may be added. It is not possible to add additional movers, a different type of mover or movers with a different magnetic plate set, since it is not possible to move these movers.

 Make sure to add only movers that match the configuration of your system.

If one or more movers are added, a new mover detection must be started to find the movers. After you have defined how many movers should be detected on which tracks, the mover detection can be started.

Unlike the initial mover detection, a mover detection to add movers is performed only once and is not repeated cyclically. Cyclic repetition only occurs if the corresponding parameter for repetition has been adjusted.

NOTICE

Errors in the control system and damage to movers and modules caused by movers that are already in control

There must not be any movers on the track on which the mover detection of additional movers is to be executed that are already in control. Movers that are already in control can react uncontrollably in the event of a mover detection and cause damage to movers and modules.

- Make sure that there are no movers on the track for mover detection of new movers that are already in control.
- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit



Enabling movers



Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes	Click the Parameter (Init) tab in the project window
Name Value	Expand Mover Detection
+ General + Mover	► Enter the number of movers to be detected in the input field <i>Con</i> -
- Mover Detection	figuredDetectionCount
ConfiguredDetectionCount 2	Make sure that no movers that are in control are on the track that
TriggerDetection	is to be used for mover detection
TriggerRedetection	
+ Mover ID Detection	
+ leaching + Diagnostics	
+ Advanced	
+ Simulation	
Solution Explorer	Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc- COM Objects > XtsProcessingLinit
Search Solution Explorer (Ctrl+ü)	Click on the track to be used for mover detection
Solution 'TwinCAT Project' (1 project)	Click on the track to be used for mover detection
TwinCAT Project M SYSTEM	
License	
Real-Time Tasks	
译 Routes	
Type System TcCOM Objects	
XtsProcessingUnit 1	
Part 1	
▶ 🗿 Mover 1	
D IFall Mover 2	N. Olich the Deveneter (heit) to be in the provident via deve
Object Context Parameter (Init) Parameter (Online) Interfaces	Click the Parameter (Init) tab in the project window
Name Value	Expand General
- General	Select TRUE in the drop-down menu IsIncludedInDetection
TaskOID 00000000	
IsClosed TRUE	
IsIncludedInDetection TRUE	
Offset	
+ PartConfigItems []	
Solution Explorer T X	Double click on Yts Processing Init
Search Solution Explorer (Ctrl+ū)	
Solution 'TwinCAT Project' (1 project)	
TwinCAT Project Group System	
 Real-Time Image: Image: I	
Brand States	
TCCOM Objects	
XtsProcessingUnit 1	
Object Context Parameter (Init) Parameter (Online) Interfaces Event Classes	Right-click in the input field <i>TriggerDetection</i> to open the context
	menu
+ General	In the context menu click Download
+ Mover	
- Mover Detection	
ConfiguredDetectionCount 0 ConfiguredRetryCount 0	
TriggerDetection	
TriggerRedetection	
+ Teaching Copy To	
+ Diagnostics	
+ Advanced	
+ Simulation	

Checking the result

After downloading, you can check if the mover detection was successful or if the number of passive and detected movers differs.

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

- ▶ In the project window click on the **Parameter (Online)** tab
- Expand Mover Detection

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ρ.

- Check if the number of active movers is correct at ActiveMover-Count
- Check how many mover detections are displayed at Detection-CycleCount
- Check whether the parameter DetectionState indicates Suc-ceeded

For each mover it is possible to check whether it is active or passive. Only active movers are displayed in the XTS View. Passive movers are not displayed in the XTS View because passive movers remain undetected by the system.

- Ψ× ρ. Routes 👫 Type System TcCOM Objects XtsProcessingUnit 1 Þ 🔡 Part 1 Track 1 A M Mover 2 Þ Ь Object Context Parameter (Init) Parameter (Online) Data Area Interfac Online Name IsActive + PositionInfo
- ▶ Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XtsProcessingUnit
 - Click on the mover whose state is to be checked

Check whether the parameter *IsActive* indicates **TRUE**

Single mover



Simultaneous addition of multiple movers not possible

With this variant, only a single mover can be added to the system. If you want to add multiple movers, you need to repeat the steps for each mover or use the variant to add multiple movers. Further information can be found in chapter "Multiple movers", [Page 151].

	ALSPIDCESSINGUILLI		
⊳ 5	MOTION		
Object (Context Parameter (Init) Parame	eter (Online) Interfaces	
	Name	Online	
-	Mover Detection		
	ActiveMoverCount	10	
	AreAllPositionsValid	TRUE	
	DetectionCycleCount	1	
	DetectionCycleCountTotal	1	
	DetectionState	Succeeded	
	DetectedMoverCount	10	
	ExpectedMoverCount	10	
	ScannedModuleCount	0	
+	MoverPositions	r	
	Mayar ID Dataction	[10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	
	Movar ID Deketion	<u></u>	
iolution E	Mover ID Detection	<u>un</u>	
iolution E	xplorer	<u>-</u>	
iolution E C C C Gearch So	xplorer Little - Joe - All Joe - Little - Joe - L	(10, 11, 11, 11, 11, 11, 11, 11, 11, 11,	

P	tasks	
	E Routes	
	Type System	
	TcCOM Objects	
	XtsProcessingUnit	1
⊳ ⊈	MOTION	
Object (Context Parameter (Init) Param	eter (Online) Interfaces Event Classes
	Name	Online
-	Mover Detection	
	ActiveMoverCount	10
	AreAllPositionsValid	TRUE
	DetectionCycleCount	1
	DetectionCycleCountTotal	1
	DetectionState	Succeeded
	DetectedMoverCount	10
	ExpectedMoverCount	10
	ScannedModuleCount	0
+	MoverPositions	[,,,,,,,

Solution Explorer

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Solution 'TwinCAT Project' (1 project)

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TwinCAT Project SYSTEM License leal-Time A mover detection is needed to find a single mover and add it to the system. Unlike the initial mover detection after system startup, a mover detection to add movers is performed only once and is not repeated cyclically. Cyclic repetition only occurs if the corresponding parameter for repetition has been adjusted.

Enabling movers

Image: Solution Explorer (Ctrl+U) Solution TwinCAT Project (1 project) Image: Solution TwinCAT Project (1 project) Image: Solution TwinCAT Project (2 project) Imag	Unit
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Solution 'TwinCAT Project' (1 project) TwinCAT Project System Real-Time Trype System Trype System TrCOM Objects Track 1 Mover 1 Mover 2 Mover 1 Starter (Online) Data Area Interfaces	Unit
Dbject Context Parameter (Init) Parameter (Online) Data Area Interfaces Name Value CS Ceneral Configured Detection Configured Detection TrackObjectId 000000000	Unit
Name Value CS + General Mover Detection ConfiguredDetectionTrackObjectid 00000000	Unit
General Mover Detection ConfiguredDetectionTrackObjectId 00000000	
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TriggerArrive 00000000 01010010 'XtsProcessingUnit 1'	^
InggerLeave 01010020 'Mover 10'	- H
+ Simulation 01010030 'Mover 9' 01010040 'Mover 8'	
01010050 'Mover 7'	
01010060 'Mover 6' 01010070 'Mover 5'	
01010080 'Mover 4'	- 1
01010090 'Mover 3' 01010000 'Mover 3'	
01010040 Mover 2 010100C0 'Track 1'	
010100D0 'Part 1'	
010100E0 Module 12"	
01010100 'Module 10'	
01010110 'Module 9' 01010120 'Module 8'	
01010130 'Module 7'	
01010140 'Module 6' 01010150 'Module 5'	
01010160 'Module 4'	
01010170 'Module 3' 01010180 'Module 2'	
01010190 'Module 1'	
010101A0 'SoftDrive 1' 010101B0 'SoftDrive 1 FeedForward'	
0101010 SoftDrive 1 Filter'	
010101D0 'SoftDrive 1 VelocityContr	ol'
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- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects > XtsProcessingUnit
- Click on the Mover to be activated

- Click the Parameter (Init) tab in the project window
- Expand *Mover Detection*
- In the drop-down menu ConfiguredDetectionTrackObjectId select the track on which the mover is located

- Right-click in the input field *TriggerArrive* to open the context menu
- In the context menu click **Download**

Checking the result

TriggerArrive

TriggerLeave

ConfiguredDetectionTrackObjectId

Object	Co	ntext	Parameter (Init)	Parame	ter (Online)	Data Area	Interfaces
		Nam	ie		Online		
-		Mov					
	1	IsAct	ive		TRUE		
	+	Posit	ionInfo				
+							
+							

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Upload
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- ► In the project window click on the **Parameter (Online)** tab
- Expand Mover Detection
- Check whether the parameter *IsActive* indicates **TRUE**

6.6.6 Parameter

Special parameters of the XTS system can be set for the *Leave and Arrive* functionality. The following tables contain all parameters that can be assigned to the *Leave and Arrive* functionality.

6.6.6.1 Processing Unit

6.6.6.1.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
ConfiguredDetection- Count	Mover Detection	UDINT	0x030802B4	Sets the number of movers for mover detection.
ConfiguredRetryCount	Mover Detection	UDINT	0x030802F1	Sets the number of repeti- tions for mover detection if not all configured movers are detected.
TriggerDetection	Mover Detection	TriggerDetection	0x030802B5	When the TriggerDetection is downloaded, a mover detec- tion is performed for the number of configured movers on the configured tracks.

6.6.6.1.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
ActiveMoverCount	Mover Detection	UDINT	0x030802B7	Returns the number of active movers.
AreAllPositionsValid	Mover Detection	BOOL	0x03080256	Returns TRUE if the posi- tions of all movers are cor- rect.
DetectionCycleCount	Mover Detection	UDINT	0x03080259	Returns the number of mover detections.
DetectionCycleCountTo- tal	Mover Detection	UDINT	0x030802EC	Returns the number of mover detections since the driver was started.
DetectionState	Mover Detection	XTS.DetectionSta- teEnum	0x030802ED	Returns the state of the mover detection.
DetectedMoverCount	Mover Detection	UDINT	0x0308033E	Returns the number of de- tected movers currently on the system.
DetectedMoverCount	Mover Detection	UDINT	0x03080257	Returns the number of movers detected during the last mover detection.
ExpectedMoverCount	Mover Detection	UDINT	0x03080258	Returns the number of ex- pected movers - equal to the number of created mover ob- jects.
ScannedModuleCount	Mover Detection	UDINT	0x03080225	Returns the number of mod- ules found during a mover detection.

6.6.6.2 Mover

6.6.6.2.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
ConfiguredDetection- TrackObjectId	Mover Detection	UDINT	0x030802F0	Sets the object ID of the track on which the mover de- tection is executed when TriggerArrive is triggered.
TriggerArrive	Mover Detection	TriggerArrive	0x030802EE	When TriggerArrive is down- loaded, a mover detection is performed for a mover on the configured track. After suc- cessful mover detection, the mover becomes active.
TriggerLeave	Mover Detection	TriggerLeave	0x030802EF	When TriggerLeave is down- loaded, the active mover is removed from the control. The mover can no longer be used and can be removed from the system without trig- gering an error.

6.6.6.2.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
IsActive	Mover Detection	BOOL	0x030802B6	Determines the value indicat- ing whether the mover is ac- tively used or is currently passive. An active mover can be removed from the control if you plan to remove it from the system.

6.7 Parameter

Numerous parameters of the XTS system can be set with TwinCAT. The following tables contain all parameters that can be assigned to the TcCOM objects.

6.7.1 Processing Unit

6.7.1.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
OperationMode	General	OperationMode	0x0308022C	Choose between 'Normal' to work with actual hardware and 'Simulation' to work in simulation.
				For more information, see "OperationMode", [Page 188].
MoverType	Mover	MoverType	0x0000090	Choose the appropriate mover type. Use custom for a non Beckhoff mover.
				For more information, see "MoverType", [Page 188].
MagnetPlateType	Mover	MagnetPlateType	0x00000091	Selection of the magnetic plate set.
				Attention! Choose the cor- rect magnet plate type. If not correct the mover can jump unexpectedly.
				For more information, see "MagnetPlateType", [Page 188].
MoverSortOrder	Mover	SetOrderEnum	0x00000048	Choose the sort order of the movers.
				For more information, see "MoverSortOrder", [Page 188].
MinMechanicalMover- Distance	Mover	LREAL	0x0308027A	Gets/sets the minimum posi- tion distance between the movers, which has to be measured in the curve. As a default the distance belong- ing to the mover type is used.
IdDetectionMode	MoverIdDetection	MoverIdDetection- Mode	0x03080246	Choose the ID detection mode to enable Mover 1 de- tection.
				For more information, see "IdDetectionMode", [Page 189].
MoverPositionAssign- ment	MoverIdDetection	MoverPosition- Assignment	0x03080253	Defines the lowest/highest position
				For more information, see "MoverPositionAssignment", [Page 189].

Parameter	Group	Туре	PTCID	Explanation
ExpectedMoverIds	MoverIdDetection	-	0x03080267	Configure the expected mover IDs for ID detection mode MultipleMover 1.
				For more information, see "ExpectedMoverIds", [Page 189].
TriggerMoverIdDetection	MoverIdDetection	TriggerMoverIdDe- tection	0x03080250	Triggers the Mover ID detec- tion.
				Attention! The axes con- troller will be momentary en- abled.
TeachingFileNumber	Teaching	UDINT	0x0308022A	The number is appended to the teaching file name - like 'TcloXts.Teaching- Data.0.bootdata'.
				For more information, see "Enter the number of the teaching file", [Page 116].
StartStandStillTeaching	Teaching	_	0x03080228	On download the teaching is started on the specified mod- ules and will be stopped au- tomatically.
				For more information, see "StartStandStillTeaching", [Page 189].
StartMovementTeaching	Teaching	-	0x03080269	On download the teaching is started. Then move movers over every module.
				For more information, see "StartMovementTeaching", [Page 190].
StopMovementTeaching	Teaching	StopMovement- Teaching	0x03080270	On download the teaching will be applied instanta- neously.
IsAbortOnTeaching- WarningsEnabled	Teaching	BOOL	0x00000057	If set to <i>TRUE</i> then a teach- ing warning causes that the driver does not start up.
				For more information, see "IsAbortOnTeachingWarn- ingsEnabled", [Page 190].
IsTeachingCheckSum- CheckEnabled	Teaching	BOOL	0x00000055	If set to <i>TRUE</i> then the spec- ified check sum is used to validate that the correct teaching file is loaded and is not corrupt.
				For more information, see "IsTeachingCheckSum- CheckEnabled", [Page 190].

Parameter	Group	Туре	PTCID	Explanation
TeachingCheckSum	Teaching	_	0x00000054	Array of values of the teach- ing check sum. After a new teaching one can read (up- load) the checksum from the driver. For more information, see
				"TeachingCheckSum", [Page 190].
TeachingWarningLevel	Teaching	TeachingWarn- ingLevel	0x0308028C	Specifies how strict the val- ues of the teaching are checked.
				For more information, see "TeachingWarningLevel", [Page 191].
				1 means very strict and
				3 is the lowest level.
TriggerTeachingFileFor- matUpdate	Teaching	TriggerTeachingFile- FormatUpdate	0x00000A9	Triggers the system to up- date the teaching file format of the given teaching file on changing back to config mode
				(overwrites the old file).
IsAutoDumpWritingEn- abled	Diagnostics	BOOL	0x00000049	If enabled then the driver writes dump files automati- cally in certain situations (at start up, in error cases).
				For more information, see "IsAutoDumpWritingEn- abled", [Page 191].
IsInputCheckEnabled	Diagnostics	BOOL	0x03080283	Enables the plausibility check of all input channels on the system.
				For more information, see "IsInputCheckEnabled", [Page 191].
WriteDump	Diagnostics	WriteDump	0x00000044	If downloaded manually then the driver writes a dump file.
UsedEventLogger	Diagnostics	EventMessenger	0x000000A4	Specifies how events/mes- sages are reported by the driver.
				For more information, see "UsedEventLogger", [Page 191].
EtherCatMasterSync- TaskObjectId	Advanced	OTCID	0x03080233	Set the object ID of the task which is responsible for trig- gering the EtherCAT master which is set to independent DC time.
				Suggested when using the 16 port EtherCAT network card.
IsCycleTimeWarning- Suppressed	Advanced	BOOL	0x00000046	If enabled then the warning that the driver does not run at 250 us is disabled.

Parameter	Group	Туре	PTCID	Explanation
IsMoverFrozenErrorActi- vated	Advanced	BOOL	0x00000097	If enabled then the mover position is observed -
				if it does not change for a number of cycles then an er- ror is issued.
				For more information, see "IsMoverFrozenErrorActi- vated", [Page 192].
IsPositionBasedError- ForwardingEnabled	Advanced	BOOL	0x00000092	If enabled then a hardware error is forwarded based on the position to the movers which are located on the faulting modules.
				For more information, see "IsPositionBasedErrorFor- wardingEnabled", [Page 192].
Optimization	Advanced	OptimizationEnum	0x00000047	Optimizes the movers move- ment or positioning slightly. Standard is optimize posi- tioning.
				For more information, see "Optimization", [Page 192].
TriggerRedetection	Advanced	TriggerRedetection	0x0000098	If downloaded then all movers will loose their posi- tion and a new detection is performed. The order of movers might change.
CalculateNormAmplitude	Advanced	BOOL	0x030802B1	If set to <i>TRUE</i> then the mover's amplitude will be normalized.
IsPositionNoiseEnabled	Simulation	BOOL	0x0308022F	If enabled then a random noise using the specified bandwidth is added to the mover positions.
IsRandomStartUp- Enabled	Simulation	BOOL	0x03080285	If enabled and mode UseOff- setAndDistance is active then the start-up positions of the movers are randomized using the specified band- width.
MoverDistance	Simulation	LREAL	0x0308022E	Gets/sets the distance be- tween simulated movers at start-up.
PositionOffset	Simulation	LREAL	0x0308022D	Gets/sets the position where the first simulated mover should be detected.
PositionNoiseBandwidth	Simulation	LREAL	0x03080231	Gets/sets a bandwidth which describes how much a position should toggle.
RandomStartUpBand- width	Simulation	LREAL	0x03080232	Gets/sets a bandwidth which is used to modify the start-up positions of the movers. It is additionally applied to the offset and distance.

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Parameter	Group	Туре	PTCID	Explanation
PositionStartUpSimula- tionMode	Simulation	PositionStartUpSimu- lationMode	0x03080230	Defines how the start-up po- sitions for the movers should be generated.
				For more information, see "PositionStartUpSimulation- Mode", [Page 193].
MoverIdStartUpSimula- tionMode	Simulation	MoverIdStartUpSim- ulationMode	0x0308027D	Defines how the mover ID(s) are generated at start-up.
				For more information, see "MoverIdStartUpSimulation- Mode", [Page 193].
RandomInitMode	Simulation	RandomInitMode	0x0308027F	Defines the mode to initialize the random seed.
				For more information, see "RandomInitMode", [Page 193].
RandomInitSeed	Simulation	DINT	0x03080280	Gets/sets the seed which is used to generate random numbers used for the posi- tions and IDs.

6.7.1.2 Hidden Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
IdDiagConfiguration	MoverIdDetection	_	0x03080100	Configure the memory size of ID Detection in the dump file.
				Attention! Do not change.
				For more information, see "IdDiagConfiguration", [Page 193].
DelayBetweenMoversIn- Pack	MoverIdDetection	LREAL	0x03080247	Time delay [s] between trig- gering movers which are di- rectly next to each other within the MoverPackGap.
				Unit: s
DelayBetweenMover- Packs	MoverIdDetection	LREAL	0x03080248	Time delay [s] between trig- gering movers simultane- ously which are not in the same mover pack.
				Unit: s
GapToDefineMoverPack	MoverIdDetection		0x03080249	Gap [mm] between movers to define a new mover pack.
				Unit: mm
CompletionCriteria	MoverIdDetection	MoverIdDetection- CompletionCriteria	0x0308027B	Defines the criteria to com- plete the ID Detection.
				For more information, see "CompletionCriteria", [Page 194].
DumpWriterFallback- Mode	Diagnostics	DumpWriterFallback- Mode	0x030802B2	Gets/sets the mode which specifies if extra memory can be used to write a dump file or not. This may be used if the normal buffer for the dump is too small.
IsPartBasedHandling- Activated	Advanced	BOOL	0x03080284	If enabled then the status and control of all terminals is evaluated based on parts.
				Attention! Beta functionality.
IncludedTrackCheck- Timeout	Advanced	UDINT	0x03080293	Gets/sets the timeout in sec- onds after which a warning is thrown, if no tracks are in- cluded to detection.
				Unit: s

6.7.1.3 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
AreAllPositionsValid	MoverDetection	BOOL	0x03080256	Returns <i>TRUE</i> if all mover positions are valid.
DetectionCycleCount	MoverDetection	UDINT	0x03080259	Returns the number of de- tection cycles.
DetectedMoverCount	MoverDetection	UDINT	0x03080257	Returns the number of de- tected movers during the lat- est detection cycle.
ExpectedMoverCount	MoverDetection	UDINT	0x03080258	Returns the number of ex- pected movers - equal to the number of created mover ob- jects.
ScannedModuleCount	MoverDetection	UDINT	0x03080225	Returns the number of mod- ules which are scanned dur- ing one detection cycle.
MoverPositions	MoverDetection	_	0x0308020D	Returns an array containing the actual positions of all movers.
HasIdDetectionError	MoverIdDetection	BOOL	0x03080252	Returns <i>TRUE</i> if the mover ID detection has failed.
IsIdDetectionValid	MoverIdDetection	BOOL	0x03080251	Returns <i>TRUE</i> if the mover IDs are detected.
IsIdDetectionActive	MoverIdDetection	BOOL	0x03080268	Returns <i>TRUE</i> if the mover ID detection is running.
Moverlds	MoverIdDetection	_	0x0308027C	Returns an array containing the IDs of all movers.
IsTeachingChanged	Teaching	BOOL	0x0308022B	Returns <i>TRUE</i> if a teaching has been performed during the driver is running.
IsTeachingValid	Teaching	BOOL	0x03080255	Returns <i>TRUE</i> if the teach- ing is valid.
IsTeachingFileFor- matUpToDate	Teaching	BOOL	0x03080290	Returns <i>TRUE</i> if the teaching file uses the latest format definition.
HasInputCheckError	Diagnostics	BOOL	0x0308028F	Returns the result of the in- puts check.
DriveState	Info	DriveState	0x000000A0	Returns the state of the drive system.
PartOrigins	Info	_	0x03080261	Returns an array containing all the origin transforms of the parts.
VersionString	Info	STRING(31)	0x03080287	Returns the version string of the driver.
MoverCount	Structure	UDINT	0x0308020A	Returns the number of movers.
MoverObjectIDs	Structure	_	0x0308020B	Returns an array containing the object IDs of all movers.
PartCount	Structure	UDINT	0x03080203	Returns the number of parts.
PartObjectIDs	Structure	_	0x03080224	Returns an array containing the object IDs of all parts.
TaskCount	Structure	UDINT	0x000009C	Returns the number of tasks.
TaskObjectIDs	Structure	-	0x0000009D	Returns an array with the task object IDs.

Parameter	Group	Туре	PTCID	Explanation
TrackCount	Structure	UDINT	0x0308020E	Returns the number of tracks.
TrackObjectsIDs	Structure	_	0x0308020F	Returns an array containing the object IDs of all tracks.

6.7.2 Mover

6.7.2.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0x03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.
ActiveTrackObjectId	General	OTCID	0x03080209	Gets/sets the Track object ID that is currently active/should be activated for the mover.
TaskOID	General	OTCID	0x03002060	Gets/sets the XTS Task that is used for calculations for the mover.
SimulatedStartUpPart	Simulation	OTCID	0x03080278	Gets/sets the part on which the mover is detected during simulation.
SimulatedStartUpPosi- tion	Simulation	LREAL	0x03080279	Gets/sets the parts position on which the mover is de- tected during simulation.
SimulatedStartUpId	Simulation	STRING(3)	0x0308027E	Gets/sets the ID of the mover on which is used in simulation.

6.7.2.2 Hidden Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
IsCommutationInverted	General	BOOL	0x03080200	Attention! Parameter is only for tests - if the commutation is inverted and the magnet plate set does not match, the mover cannot be safely con- trolled!
				Attention! Beta functionality.
				For more information, see "IsCommutationInverted", [Page 194].

6.7.2.3 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
ld	MoverIdDetection	STRING(3)	0x03080266	Returns the ID of the mover.
AxisId	Info	UDINT	0x03080288	Gets the ID of the associated axis.
AxisObjectId	Info	OTCID	0x0308028A	Gets the object ID of the as- sociated axis.
DistanceDriven	Info	LREAL	0x0000050	Returns the value of the ab- solute distance driven by the mover in mm.
				Unit: mm
DistanceDrivenInKm	Info	LREAL	0x00000051	Returns the value of the ab- solute distance driven by the mover in km.
				Unit: km
DriveAddress	Info	UINT	0x0000087	Returns the address of the drive (motor) terminal on which the mover is currently on.
DriveModuleNumber	Info	UDINT	0x0000066	If <i>HasDriveError</i> is <i>TRUE</i> then the drive number is set to the first module number which signals an error.
DriveTerminalOid	Info	OTCID	0x0000070	If <i>HasDriveError</i> is <i>TRUE</i> then the object ID of the drive terminal is set.
EncoderAddress	Info	UINT	0x0000088	Returns the address of the encoder (sensor) terminal on which the mover is currently on.
EncoderModuleNumber	Info	UDINT	0x00000067	If <i>HasEncoderError is TRUE</i> then the encoder number is set to the first module num- ber which signals an error.
EncoderTerminalOid	Info	OTCID	0x0000071	If <i>HasEncoderError is TRUE</i> then the object ID of the encoder is set.
HasDriveError	Info	BOOL32	0x0000068	Returns <i>TRUE</i> if the motor module which is used by a mover signals an error.

Parameter	Group	Туре	PTCID	Explanation
HasEncoderError	Info	BOOL32	0x00000069	Returns <i>TRUE</i> if the encoder module which is used by a mover signals an error.
MasterNetId	Info	AMSNETID	0x0000089	Returns the NetId of the EtherCAT master to which the drive/encoder belong to.
PositionInfo	Info	_	0x03080286	Returns the part and track position as well as their object IDs.
SoftDriverOid	Info	OTCID	0x03080289	Gets the object ID of the soft drive.

6.7.2.4 Data Area

Inputs

Parameter	Туре	Size	Offset	Explanation
SoftDriveInput	SoftDriveInput	104	0	Cyclic data structure for communication from Mover object to SoftDrive object of the axis.

Outputs

Parameter	Туре	Size	Offset	Explanation
SoftDriveOutput	SoftDriveOutput	96	0	Cyclic data structure for communication from Soft- Drive object to Mover object.

6.7.3 Part

6.7.3.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
TaskOID	General	OTCID	0x03002060	Gets/sets the XTS Task that is used for calculations for the part.
ModuleSide	General	ModuleSide	0x03080262	Module side of the part shown in the Tool Window and XTS Viewer.
				For more information, see "ModuleSide", [Page 194].
OriginTransform	General	-	0x03080260	Origin transformation for the Part shown in the Tool Win- dow and XTS Viewer.

6.7.3.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
DriveState	Info	DriveState	0x000000A0	Returns the state of the drive system.
GlobalNumber	Info	UDINT	0x03080227	The <i>GlobalNumber</i> is used to distinguish all parts which are managed by one XPU.
Length	Info	LREAL	0x03080206	Returns the length of the part.
AreaCount	Structure	UDINT	0x03080234	Returns the number of ar- eas.
AreaObjectIDs	Structure	_	0x03080235	Returns an array containing the object IDs of all areas.
ModuleCount	Structure	UDINT	0x03080207	Returns the number of mod- ules.
ModuleObjectIDs	Structure	_	0x03080208	Returns an array containing the object IDs of all modules.

6.7.4 Info Server

6.7.4.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0x03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.

6.7.4.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
StationInfoCount	Structure	UDINT	0x03080275	Returns the number of movers.
StationInfoObjectIds	Structure	_	0x03080276	Returns an array containing the object IDs of all station infos.

6.7.5 Station Info

6.7.5.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0x03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.
StationId	General	UDINT	0x03080271	Gets/sets the station ID.
StationColor	General	UDINT	0x03080277	Gets/sets the station color
				in ARGB.
StartPositionOnPart	General	LREAL	0x03080272	Gets/sets the start position on the first part.
EndPositionOnPart	General	LREAL	0x03080273	Gets/sets the end position on the last part.
StopPositions	General	LREAL	0x03080274	Gets/sets an array of stop positions. The valid range starts from 0 mm to the total length of all configured parts.
PartObjectIds	General	-	0x03080224	Gets/sets the parts which be- long to the station.
IsEnabled	General	BOOL	0x0308023C	Gets/sets whether the station is enabled or not.
				For more information, see "IsEnabled", [Page 194].
Description	General	STRING(1023)	0x0308023A	Description of the station.
				Attention! Entering a de- scription is optional.

6.7.5.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
PartCount	Structure	UDINT	0x03080203	Returns the number of parts.
StopPositionCount	Structure	UDINT	0x0308028E	Returns the number of stop positions.

6.7.6 Io Driver

6.7.6.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0x03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.
MoverType	General	MoverType	0x0000090	Choose the appropriate mover type. Use custom for a non Beckhoff mover.
				For more information, see "MoverType", [Page 188].
MagnetPlateType	General	MagnetPlateType	0x00000091	Selection of the magnetic plate set.
				Attention! Choose the cor- rect magnet plate type. If not correct the mover can jump unexpectedly.
				For more information, see "MagnetPlateType", [Page 188].
MoverSortOrder	General	SortOrderNum	0x00000048	Choose the sort order of the movers.
				For more information, see "MoverSortOrder", [Page 188].
MinMechanicalMover- Distance	General	LREAL	0x0308027A	Gets/sets the minimum posi- tion distance between the movers, which has to be measured in the curve.
				As a default the distance be- longing to the mover type is used.
PermanentDataConfigu- ration	Teaching	-	0x00000020	Gets/sets a structure con- taining the teaching file num- ber.
StartStandStillTeaching- Parameter	Teaching	-	0x00000010	Gets/sets a structure con- taining the result of the teaching process.
StopStandStillTeaching- Parameter	Teaching	-	0x00000011	Gets/sets a structure con- taining the result of the teaching process.
IsAbortOnTeaching- WarningsEnabled	Teaching	BOOL	0x00000057	If enabled , will abort startup of the driver if there are teaching warnings.
				For more information, see "IsAbortOnTeachingWarn- ingsEnabled", [Page 190].

Parameter	Group	Туре	PTCID	Explanation
IsTeachingCheckSum- CheckEnabled	Teaching	BOOL	0x00000055	If enabled, a teaching check sum check is applied at startup.
				For more information, see "IsTeachingCheckSum- CheckEnabled", [Page 190].
TeachingCheckSum	Teaching	-	0x00000054	Array of values of the teach- ing check sum. After a new teaching one can read (up- load) the checksum from the driver.
TeachingWarningLevel	Teaching	TeachingWarn- ingLevel	0x0308028C	Determines the value above which the input check and the teaching issue warnings.
				Level_1: very strict
				Level_3: low
TriggerTeachingFileFor- matUpdate	Teaching	TriggerTeaching- FileFormatUpdate	0x03080291	Triggers the system to up- date the teaching file format of the given teaching file on changing back to config mode
				(overwrites the old file).
MoverIdDetectionMode	MoverIdDetection	MoverIdDetection- Mode	0x00000201	Choose the ID detection mode to enable Mover 1 de- tection. Standard means that mover ID detection is off.
				For more information, see "MoverIdDetectionMode", [Page 194].
MoverPositionAssign- ment	MoverIdDetection	MoverPosition- Assignment	0x00000208	Defines the lowest/highest position.
				For more information, see "MoverPositionAssignment", [Page 195].
TriggerMoverIdDetection	MoverIdDetection	TriggerMoverIdDe- tection	0x00000205	Triggers the Mover ID Detec- tion.
				Attention! The axes con- troller will be momentary en- abled.
IsAutoDumpWritingEn- abled	Diagnostics	BOOL	0x00000049	If enabled then the driver writes dump files automati- cally in certain situations (at start up, in error cases).
				For more information, see "IsAutoDumpWritingEn- abled", [Page 191].

Parameter	Group	Туре	PTCID	Explanation
IsInputCheckEnabled	Diagnostics	BOOL	0x03080283	Enables the plausibility check of all input channels on the system.
				For more information, see "IsInputCheckEnabled", [Page 191].
WriteDump	Diagnostics	WriteDump	0x00000044	If downloaded manually then the driver writes a dump file.
UsedEventLogger	Diagnostics	EventMessenger	0x03080292	Specifies how events/mes- sages are reported by the driver.
				For more information, see "UsedEventLogger", [Page 191].
IncludeModuleAreasIn- Record	Diagnostics	BOOL	0x00000095	Attention! Do not change! Obsolete parameter.
				For more information, see "IncludeModuleAreasIn- Record", [Page 195].
IncludeMoverAreasIn- Record	Diagnostics	BOOL	0x00000096	Attention! Do not change! Obsolete parameter.
				For more information, see "IncludeMoverAreasIn- Record", [Page 195].
DumpWriterFallback- Mode	Diagnostics	DumpWriterFall- backMode	0x030802B2	Gets/sets, which extra mem- ory can be used for dump writing, if the driver fails to write a dump in first attempt.
IsCycleTimeWarning- Suppressed	Advanced	BOOL	0x00000046	If enabled, surpressed warn- ings for cycle times different than 250 us (only possible when working in simulation)
IsMoverFrozenErrorActi- vated	Advanced	BOOL	0x00000097	If enabled, throws an error instead of a warning, if a mover position is frozen.
				For more information, see "IsMoverFrozenErrorActi- vated", [Page 192].
lsPositionBasedError- ForwardingEnabled	Advanced	BOOL	0x00000092	If enabled, makes it possible to start up and shut down single parts instead of the whole XTS.
				Attention! Beta functionality.
				For more information, see "IsPositionBasedErrorFor- wardingEnabled", [Page 192].
Optimization	Advanced	OptimaizationEnum	0x00000047	Optimizes the movers move- ment or positioning slightly. Standard is optimize posi- tioning.
				For more information, see "Optimization", [Page 192].

Parameter	Group	Туре	PTCID	Explanation
TriggerRedetection	Advanced	TriggerRedetection	0x00000098	Triggers a new Mover detec- tion process.
TriggerResort	Advanced	BOOL	0x0000061	Triggers a resort of the Mover Positions. Based on the MoverSortOrder parame- ter, the first Mover will get the lowest or highest posi- tion.

6.7.6.2 Hidden Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
DelayBetweenMoversIn- Pack	MoverIdDetection	LREAL	0x00000202	Time delay [s] between trig- gering movers which are di- rectly next to each other within the MoverPackGap.
				Unit: s
DelayBetweenMover- Packs	MoverIdDetection	LREAL	0x00000203	Time delay [s] between trig- gering movers simultane- ously which are not in the same mover pack.
				Unit: s
GapToDefineMoverPack	MoverIdDetection	LREAL	0x00000204	Gap [mm] between movers to define a new mover pack.
				Unit: mm
IncludedTrackCheck- Timeout	Advanced	UDINT	0x000000A5	Gets/sets the timeout in sec- onds after which a warning is thrown, if no tracks are in- cluded to detection.
				Unit: s

6.7.6.3 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
IsTeachingFileFor- matUpToDate	Miscellaneous	BOOL	0x00000A8	Gets if the teaching file for- mat of the current loaded teaching file is correct for the used driver version.
AreAllMoverPositionVa- lid	Miscellaneous	BOOL32	0x0000072	Returns <i>TRUE</i> if all movers have been detected.
IsTeachingValid	Miscellaneous	BOOL32	0x00000073	Returns <i>TRUE</i> if teaching data is valid.
DetectedMoverCount	Miscellaneous	DINT	0x0000074	Returns the count of de- tected movers.
ExpectedMoverCount	Miscellaneous	DINT	0x0000075	Returns the count of ex- pected movers.
ModuleCount	Miscellaneous	DINT	0x0000078	Returns the number of mod- ules.
ModuleObjectIDs	Miscellaneous	_	0x00000079	Returns an array containing the object IDs of all modules.
MoverCount	Miscellaneous	DINT	0x0000080	Returns the number of movers.
MoverObjectIDs	Miscellaneous	_	0x0000081	Returns an array containing the object IDs of all movers.

Parameter	Group	Туре	PTCID	Explanation
MoverPositions	Miscellaneous	_	0x000008A	Returns an array containing the actual positions of all movers.
IsMoverIdDetectionValid	Miscellaneous	BOOL32	0x00000206	Returns <i>TRUE</i> if the Mover ID Detection have been detected.
HasMoverIdDetection- Error	Miscellaneous	BOOL32	0x00000207	Returns <i>TRUE</i> if the Mover ID Detection failed.

6.7.6.4 Data Area

Info

Parameter	Туре	Size	Offset	Explanation
AreAllMoverPosi- tionsValid	BOOL32	4.0	0	Returns <i>TRUE</i> if all movers have been detected.
IsTeachingValid	BOOL32	4.0	4	Returns <i>TRUE</i> if teaching data is valid.
DetectedMoverCount	DINT	4.0	8	Returns the count of de- tected movers.
ExpectedMoverCount	DINT	4.0	12	Returns the count of ex- pected movers.

6.7.7 Track

6.7.7.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
TaskOID	General	OTCID	0x03002060	Gets/sets the XTS Task that is used for calculations for the mover.
IsClosed	General	BOOL	0x0308021D	Gets/sets if the track is closed as a circle or open ended.
IsIncludedInDetection	General	BOOL	0x03080226	Gets/sets if the track is in- cluded in the detection process of the mover and the mover Id detection.
Polarity	General	Polarity	0x03080201	Gets/sets which direction the track has in the global context.
				Attention! Only <i>positive</i> is supported at the moment.
Offset	General	LREAL	0x03080202	Gets/sets the offset for the track.
PartConfigItems	General	_	0x03080204	Gets/sets an array of part configuration items contain- ing the part object id and the polarity the part has, within the track.
				Attention! Only <i>positive</i> po- larity is supported at the mo- ment!

6.7.7.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
Length	Info	LREAL	0x03080206	Gets the actual length of the track.
ModuleCount	Info	UDINT	0x03080207	Gets the number of modules included in the track.
PartCount	Structure	UDINT	0x03080203	Gets the number of parts in- cluded in the track.
PartInfoltems	Structure	_	0x03080205	Gets an array of part infor- mation items containing the part object id, the polarity the part has within the track, the offset the part has in the track and the actual part length.

6.7.8 Control Area

6.7.8.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
Name	General	STRING(1023)	0x03080239	Name of the area.
				Attention! Entering a name is optional.
Description	General	STRING(1023)	0x0308023A	Description of the area.
				Attention! Entering a de- scription is optional.
StartPosition	General	LREAL	0x03080236	Position on the part in mm where the area starts.
				Unit: mm
EndPosition	General	LREAL	0x03080237	Position on the part in mm where the area ends.
				Unit: mm
BlendInLength	General	LREAL	0x0308023E	Length from the start of the area until the new parame- ters are fully used.
BlendOutLength	General	LREAL	0x0308023F	Length before the end of the area where the previously used parameter set is started to be used again.
IsEnabled	General	BOOL	0x0308023C	Gets/sets if the current con- trol areas is active or not.
				For more information, see "IsEnabled", [Page 194].

6.7.8.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
Length	Info	LREAL	0x03080238	The length of the area
				(end position – start posi- tion).
IsValid	Info	BOOL	0x0308023D	Returns <i>TRUE</i> , if all settings are valid and the control area can be used.

6.7.9 AT20xx_0xxx

6.7.9.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0X03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.
TaskOID	General	OTCID	0X03002060	Gets/sets the XTS Task that is used for calculations for the mover.
MotorTerminalOID	General	OTCID	0x0000009	Sets the object ID of the cor- responding motor terminal.
SensorTerminalOID	General	OTCID	0x0000000A	Sets the object ID of the corresponding sensor terminal.
PositionIndex	General	UDINT	0x0000006	The index defines the posi- tion of the module in the XTS system.
				The first module has the hardware position 0, the other modules are counted in ascending order.
				The number of modules mi- nus one gives the hardware position for the last module.
Gap	General	LREAL	0x0308028B	Defines the gap between the previous module and this module.
Offset	General	LREAL	0x0000007	Defines an offset for the module to compensate me- chanical tolerances of the modules production process.
ScalingFactor	General	LREAL	0x0000008	Defines a ScalingFactor for the module to compensate mechanical tolerances of the modules production process.
6.7.9.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
Angle	Info	LREAL	0x0000083	Returns the angle of the module in mm.
			0.0000007	
GlobalNumber	Info	UDINT	0x03080227	The global number is used to distinguish all modules which are manged by one XPU.
Length	Info	LREAL	0x0000082	Returns the length of the module in mm. The length is measured along the center of the coils.
MaatarNatid	Info		0,0000000	Poturno the Notid of the
Masternetic	Inio	AMSINETID	0x00000000	EtherCAT master to which the terminals belong to.
DriveAddress	Drive Info	UINT	0x0000084	Returns the address of the drive (motor) terminal.
DriveConfigIdentity	Drive Info	-	0x0000062	Gets a structure of the con- figured drive identity contain- ing the vendor id, the code, the revision and the serial number.
				For more information, see "DriveConfigIdentity", [Page 196].
DriveOnlineIdentity	Drive Info	-	0x0000063	Gets a structure of the online drive identity containing the vendor id, the code, the revi- sion and the serial number.
				For more information, see "DriveOnlineIdentity", [Page 196].
DriveState	Drive Info	DriveState	0x00000A0	Gets the state of the motor module.
EncoderAdress	Encoder Info	UINT	0x0000085	Returns the address of the encoder (sensor) terminal.
EncoderConfigIdentity	Encoder Info	-	0x0000064	Gets a structure of the con- figured encoder identity con- taining the vendor id, the code, the revision and the serial number.
				For more information, see "EncoderConfigIdentity", [Page 196].
EncoderOnlineIdentity	Encoder Info	-	0x0000065	Gets a structure of the online encoder identity containing the vendor id, the code, the revision and the serial num- ber.
				For more information, see "EncoderOnlineIdentity", [Page 196].

Parameter	Group	Туре	PTCID	Explanation
EncoderSensorValues	Encoder Info	-	0x00000093	Gets the array of the 32 en- coder sensor channel val- ues.
				For more information, see "EncoderSensorValues", [Page 197].
DriveDeviceType	Drive CoE	UDINT	0x030802A0	Gets the DeviceType from the CoE interface of the mo- tor Module.
DriveDeviceName	Drive CoE	STRING(15)	0x030802A1	Gets the DeviceName from the CoE interface of the mo- tor Module.
DriveHardwareVersion	Drive CoE	STRING(7)	0x030802A2	Gets the HardwareVersion from the CoE interface of the motor Module.
DriveSoftwareVersion	Drive CoE	STRING(7)	0x030802A3	Gets the SoftwareVersion from the CoE interface of the motor Module.
DriveBtn	Drive CoE	Btn	0x030802AF	Gets the BTN* from the CoE interface of the motor Mod- ule.

* The Beckhoff Traceability Number, BTN for short, can be found on every mover and on every module under the DataMatrix code.

6.7.9.3 Data Pointer

Parameter	Туре	PTCID	HW VariableName	Size
Control	UINT	0x00000005	Control	2
CurrentSetpoint- Values[014]	INT	0x0000002	Current setpoint value Ch1-15	2
State	UINT	0x00000004	State	2
CurrentActual- Values[014]	INT	0x0000001	Current actual value Ch.1-15	2
RawPosition- Values[031]	INT	0x3F000101	Value Channel 01-32	2

6.7.10 ATH20x0_0xxx

6.7.10.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
AdsPort	General	WORD	0x03002090	Gets/sets the ads port.
				The port should be used to read/ write parameters via ADS.
TaskOID	General	OTCID	0x03002060	Gets/sets the XTS Task that is used for calculations for the mover.
MotorTerminalOID	General	OTCID	0x0000009	Sets the object ID of the cor- responding motor terminal.
SensorTerminalOID	General	OTCID	0x0000000A	Sets the object ID of the cor- responding sensor terminal.
PositionIndex	General	UDINT	0x0000006	The index defines the posi- tion of the module in the XTS system.
				The first module has the hardware position 0, the other modules are counted in ascending order.
				The number of modules mi- nus one gives the hardware position for the last module.
Gap	General	LREAL	0x0308028B	Defines the gap between the previous module and this module.
Offset	General	LREAL	0x0000007	Defines an offset for the module to compensate me- chanical tolerances of the modules production process.
ScalingFactor	General	LREAL	0x0000008	Defines a ScalingFactor for the module to compensate mechanical tolerances of the modules production process.

6.7.10.2 Parameter (Online)

Parameter	Group	Туре	PTCID	Explanation
Angle	Info	LREAL	0x0000083	Returns the angle of the module in mm.
GlobalNumber	Info	UDINT	0x03080227	The global number is used to distinguish all modules which are manged by one XPU.
Length	Info	LREAL	0x00000082	Returns the length of the module in mm. The length is measured along the center of the coils.
MasterNetId	Info	AMSNETID	0x00000086	Unit: mm Returns the NetId of the EtherCAT master to which the terminals belong to.
DriveAddress	Drive Info	UINT	0x0000084	Returns the address of the drive (motor) terminal.
DriveConfigIdentity	Drive Info		0x00000062	Gets a structure of the con- figured drive identity contain- ing the vendor id, the code, the revision and the serial number.
				For more information, see "DriveConfigIdentity", [Page 196].
DriveOnlineIdentity	Drive Info	_	0x00000063	Gets a structure of the online drive identity containing the vendor id, the code, the revi- sion and the serial number.
				For more information, see "DriveOnlineIdentity", [Page 196].
DriveState	Drive Info	DriveState	0x000000A0	Gets the state of the motor module.
EncoderAddress	Encoder Info	UINT	0x0000085	Returns the address of the encoder (sensor) terminal.
EncoderConfigIdentity	Encoder Info	_	0x00000064	Gets a structure of the con- figured encoder identity con- taining the vendor id, the code, the revision and the serial number.
				For more information, see "EncoderConfigIdentity", [Page 196].
EncoderOnlineIdentity	Encoder Info	_	0x00000065	Gets a structure of the online encoder identity containing the vendor id, the code, the revision and the serial num- ber.
				For more information, see "EncoderOnlineIdentity", [Page 196].

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Parameter	Group	Туре	PTCID	Explanation
EncoderSensorValues	Encoder Info	-	0x0000093	Gets the array of the 64 en- coder sensor channel val- ues.
				For more information, see "EncoderSensorValues", [Page 197].
DriveDeviceType	Drive CoE	UDINT	0x030802A0	Gets the DeviceType from the CoE interface of the mo- tor Module.
DriveDeviceName	Drive CoE	STRING(15)	0x030802A1	Gets the DeviceName from the CoE interface of the mo- tor Module.
DriveHardwareVersion	Drive CoE	STRING(7)	0x030802A2	Gets the HardwareVersion from the CoE interface of the motor Module.
DriveSoftwareVersion	Drive CoE	STRING(7)	0x030802A3	Gets the SoftwareVersion from the CoE interface of the motor Module.
DriveBtn	Drive CoE	Btn	0x030802AF	Gets the BTN* from the CoE interface of the motor Mod- ule.

* The Beckhoff Traceability Number, BTN for short, can be found on every mover and on every module under the DataMatrix code.

6.7.10.3 Data Area

Decompressed Sensor Data

Parameter	Туре	Size	Offset	Explanation
EncoderSensorValues	ARRAY [053] OF LREAL	432.0	0	64 hall sensor values

Data Pointers

Parameter	Туре	PTCID	HW VariableName	Size
Control	UINT	0x00000005	Control	2
CurrentSetpoint- Values[014]	INT	0x0000002	Current setpoint value Ch.1-15	2
State	UINT	0x00000004	State	2
CurrentActual- Values[014]	INT	0x0000001	Current actual value Ch.1-15	2
HallSensorValues	ATHCompressed- Data64	0x000000A2	BinaryData	2

6.7.11 Data Recorder

6.7.11.1 Parameter (Init)

Parameter	Group	Туре	PTCID	Explanation
BufferSize	General	ULINT	0x00010003	Gets/sets the number of samples for the buffer.
CycleDelay	General	UDINT	0x00010011	Gets/sets the number of cy- cles for the delay for the record.
ImageSections	General	_	0x00010001	Gets/sets an array of image section items containing ob ject id, area number, start address and size.
				For more information, see "ImageSections", [Page 197].
IsRingBufferModeActi- vated	General	BOOL	0x00010009	Gets/sets if the ring buffer is activated or not.
				For more information, see "IsRingBufferModeActi- vated", [Page 197].
WriteRecord	General	WriteRecord	0x00010005	Triggers the recording process.
TraceLevelMax	Diagnostics	TcTraceLevel	0x03002103	Controls the amount of log messages.
				For more information, see "TraceLevelMax", [Page 197].
FilePartSize	Advanced	UDINT	0x00010006	Gets/sets the size of a file part.
FileOperationTimeout	Advanced	UDINT	0x00010007	Gets/sets the time in ms af- ter which the file operation should abort.
				Unit: ms
ResetInfoArea	Advanced	BOOL	0x00010002	Gets/sets if the info area should be reset after record.
				For more information, see "ResetInfoArea", [Page 197].

6.7.11.2 Parameter (Online)

Parameter	Туре	PTCID	Explanation
FrameCount	ULINT	0x00010004	Gets the number of frames that should be recorded.
FrameSize	UDINT	0x00010008	Gets the size of the frames that should be recorded.
RecorderFrameCount	ULINT	0x00010010	Gets the number of frames that were actually recorded.

6.7.11.3 Data Area

Info

Parameter	Туре	Size	Offset	Explanation
UpdateTime	LREAL	8.0	0	Estimated update time
UpdateTimeMin	LREAL	8.0	8	Minimal update time
UpdateTimeMax	LREAL	8.0	16	Maximum update time

6.7.12 Specific data types



These parameters provide you with additional information to the parameters listed so far. At the end of each table you have the option of jumping back to the beginning of the respective parameter group.

6.7.12.1 OperationMode

Parameter	Туре	Explanation
Normal	OperationMode	TwinCAT runs with the current hardware.
Simulation	OperationMode	TwinCAT runs in simulation mode
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.2 MoverType

EnumInfo	Туре	Explanation	
UserSpecific	MoverType	User-specific mover	
AT9011_0050	MoverType	Mover AT9011-0050	
AT9011_0070	MoverType	Mover AT9011-0070	
AT9012_0050	MoverType	Mover AT9012-0050	
ATH9011_0075	MoverType	Mover ATH9011-0075	
Back to Processing Unit "Parameter (Init)", [Page 158]			
Back to Io Driver "Parameter (Init)", [Page 173]			

6.7.12.3 MagnetPlateType

EnumInfo	Туре	Explanation	
AT9001_0550	MagnetPlateType	Magnetic plate set AT9001-0550	
AT9001_0450	MagnetPlateType	Magnetic plate set AT9001-0450	
AT9002_0550	MagnetPlateType	Magnetic plate set AT9002-0550	
AT9001_0AA0	MagnetPlateType	Magnetic plate set AT9001-0AA0	
AT9001_0883	MagnetPlateType	Magnetic plate set AT9001-0883	
AT9001_0775	MagnetPlateType	Magnetic plate set AT9001-0775	
ATH9001-0550	MagnetPlateType	Magnetic plate set ATH9001-0550	
	Back to Processing Unit "Parameter (Init)", [Page 158]		
	Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.4 MoverSortOrder

Parameter	Туре	Explanation	
Ascending	SortOrderEnum	Movers will be counted positive, starting at 1 beginning at the XTS hardware zero position.	
Descending	SortOrderEnum	Movers will be counted negative, starting at the highest mover number beginning at the XTS hardware zero position.	
Back to Processing Unit "Parameter (Init)", [Page 158]			
Back to Io Driver "Parameter (Init)", [Page 173]			

6.7.12.5 IdDetectionMode

Parameter	Туре	Explanation
Standard	MoverIdDetection- Mode	All movers have a Mover Standard magnetic plate set. Mover ID detection is switched off.
Mover1	MoverIdDetection- Mode	One Mover has the Mover 1 magnetic plate set.
MultipleMover1	MoverIdDetection- Mode	Several movers have the Mover 1 magnetic plate set.
	Back to Proces	ssing Unit "Parameter (Init)", [Page 158]

6.7.12.6 MoverPositionAssignment

Parameter	Туре	Explanation
Standard	MoverPositionAssign- ment	All movers keep their absolute position.
StartAtFirstMover	MoverPositionAssign- ment	The first mover gets the highest or lowest absolute position depending on the <i>MoverPositionAssignment</i> .
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.7 ExpectedMoverIds

Parameter	Туре	Value	Explanation
ld	STRING(3)	1	Mover ID.
			"1" for movers with the magnetic plate set <i>Mover 1</i> .
			"-" for movers with magnetic plate set <i>Stan- dard</i> .
Count	UDINT	2	Number of expected movers.
Back to Processing Unit "Parameter (Init)", [Page 158]			

6.7.12.8 StartStandStillTeaching

Parameter	Туре	Explanation
TeachingSelection	TeachingSelection	Selection, if the modules from the string should be included or ex- cluded for the teaching process.
 ExcludeSpeci- fiedItems 	_	Modules with movers. These modules should be excluded from teaching.
 IncludeSpeci- fiedItems 	_	Empty modules. These modules should be integrated into teach- ing.
selectionString	STRING(1023)	Module numbers according to the parameter <i>TeachingSelection</i> .
		The module numbers can be entered with the sign "-" or "," or a combination of both signs, e.g. "1-4", "1,2,3,4" or "1-3,4".
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.9 StartMovementTeaching



Pay attention to the type of system

StartMovementTeaching can only be used with the XTS Standard system and is not available for the XTS Hygienic system. These parameters are ignored in the XTS Hygienic system.

Parameter	Туре	Explanation
teachingSelection	TeachingSelection	Selection, if the modules from the string should be included or ex- cluded for the teaching process.
 ExcludeSpeci- fiedItems 	_	Modules with movers. These modules should be excluded from teaching.
 IncludeSpeci- fiedItems 	_	Empty modules. These modules should be integrated into teach- ing.
selectionString	STRING(1023)	Module numbers according to the parameter <i>TeachingSelection</i> .
		The module numbers can be entered with the sign "-" or "," or a combination of both signs, e.g. "1-4", "1,2,3,4" or "1-3,4".
	Back to Process	sing Unit "Parameter (Init)", [Page 158]

6.7.12.10 IsAbortOnTeachingWarningsEnabled

Parameter	Туре	Explanation
TRUE	BOOL	Driver will abort start up when there are teaching warnings.
FALSE	BOOL	Driver will not abort start up when there are teaching warnings.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.11 IsTeachingCheckSumCheckEnabled

Parameter	Туре	Explanation
TRUE	BOOL	Teaching check sum check is performed at startup.
FALSE	BOOL	Teaching check sum check is not performed at startup.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.12 TeachingCheckSum

Parameter	Туре	Explanation
[0][15]	BYTE	Values for the teaching check sum.
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.13 TeachingWarningLevel

Parameter	Туре	Explanation
Level_1	TeachingWarn- ingLevel	Very strict
Level_2	TeachingWarn- ingLevel	Normal
Level_3	TeachingWarn- ingLevel	Low
	Back to Proc	essing Unit "Parameter (Init)", [Page 158]

6.7.12.14 IsAutoDumpWritingEnabled

Parameter	Туре	Explanation
TRUE	BOOL	Dumps are written automatically at special events, e. g. mover de- tection, mover id detection, mover lost, …
FALSE	BOOL	No dumps are written automatically.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.15 IsInputCheckEnabled

Parameter	Туре	Explanation
TRUE	BOOL	Activates the plausibility check of all input channels of the system.
FALSE	BOOL	Deactivates the plausibility check of all input channels of the sys-
		tem.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.16 UsedEventLogger

Parameter	Туре	Explanation
StandardMessage- Interface	EventMessenger	Messages are thrown in the user chosen standard massaging in- terface.
EventLogger	EventMessenger	Messages are thrown in the VS Event Logger.
TC3EventLogger	EventMessener	Messages are thrown in the TC3 Event Logger.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.17 IsCycleTimeWarningSuppressed

Parameter	Туре	Explanation
TRUE	BOOL	No cycle time warnings are thrown.
FALSE	BOOL	Cycle time warnings are thrown if the XTS task cycle time devi- ates from 250us.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.18 IsMoverFrozenErrorActivated

Parameter	Туре	Explanation
TRUE	BOOL	If a mover freezes, an error will be thrown.
FALSE	BOOL	If a mover freezes, a warning will be thrown.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.19 IsPositionBasedErrorForwardingEnabled

Parameter	Туре	Explanation
TRUE	BOOL	DriveDeviceError bit of the NC axis will show TRUE if the respec- tive Mover stands on a module with a fault even before the mover axis is enabled.
FALSE	BOOL	DriveDeviceError bit of the NC axis won't show TRUE if the re- spective mover stands on a module with a fault before the mover axis is enabled. It will show TRUE, when the mover axis is en- abled.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.20 Optimization

Parameter	Туре	Explanation
No	OptimizationEnum	No optimization is applied.
MaximizePositionAc- curacyOP1	OptimizationEnum	The system will be optimized for position accuracy.
SmoothMovemen- tOM1	OptimizationEnum	The system will be optimized for movement smoothness.
CombinationOC1	OptimizationEnum	The system will be optimized for a combination of smoother move- ments and position accuracy.
Back to Processing Unit "Parameter (Init)", [Page 158]		
Back to Io Driver "Parameter (Init)", [Page 173]		

_

6.7.12.21 PositionStartUpSimulationMode

Parameter	Туре	Explanation
UseMoverParame- ters	PositionStartUpSimu- lationMode	Movers will start up in simulation with their given simulated start up position.
UseOffsetAndDis- tance	PositionStartUpSimu- lationMode	Movers will start up in simulation based on the configured offset and distance position parameters.
UseRandomDistribu- tion	PositionStartUpSimu- lationMode	Movers will start up in simulation with a random position.
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.22 MoverIdStartUpSimulationMode

Parameter	Туре	Explanation
UseMoverParame- ters	MoverIdStartUpSimu- lationMode	Movers will start up in simulation with their given simulated start up position.
UseAlternation	MoverIdStartUpSimu- lationMode	Movers will start up in simulation with an alternating id based on the expected mover ids settings.
UseRandomDistribu- tion	MoverIdStartUpSimu- lationMode	Movers will start up in simulation with a random id based on the expected mover ids settings.
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.23 RandomInitMode

Parameter	Туре	Explanation
UseSystemTime	RandomInitMode	Random distribution is calculated based on system time.
UseInitSeed	RandomInitMode	Random distribution is calculated based on seed.
Back to Processing Unit "Parameter (Init)", [Page 158]		

6.7.12.24 IdDiagConfiguration

Parameter	Туре	Explanation
floatBufferSize	UDINT	Allocated buffer space for position and current values.
intBufferSize	UDINT	Allocated space for communication data between SoftDrive and TcloXts.
requiredCurrentDevi- ation	REAL	Necessary current change difference to consider.
requiredPositionDe- viation	REAL	Necessary position change difference to consider.
Back to Processing Unit "Hidden Parameter (Init)", [Page 163]		

6.7.12.25 CompletionCriteria

Parameter	Туре	Explanation
CheckEveryMover	MoverIdDetection- CompletionCriteria	Every Mover gets the detection movement and will be checked for its id.
CompleteAfter- Mover1Found	MoverIdDetection- CompletionCriteria	Once the mover with the special Mover 1 magnetic plate set is found, the detection process will be finished.
Back to Processing Unit "Hidden Parameter (Init)", [Page 163]		

6.7.12.26 IsCommutationInverted

Parameter	Туре	Explanation
TRUE	OTCID	Attention! The parameter is only for tests - if the commutation is inverted and the magnetic plate set does not match, the inverter cannot be controlled safely!
FALSE	OTCID	Attention! The parameter is only for tests - if the commutation is inverted and the magnetic plate set does not match, the inverter cannot be controlled safely!
Back to Mover "Hidden Parameter (Init)", [Page 167]		

6.7.12.27 ModuleSide

Parameter	Туре	Explanation
Back	ModuleSide	Modules are shown from the motor type plate side.
Front	ModuleSide	Modules are shown from the encoder side.
Back to Part "Parameter (Init)", [Page 170]		

6.7.12.28 IsEnabled

Parameter	Туре	Explanation
TRUE	BOOL	Gets/sets whether the station is enabled.
FALSE	BOOL	Gets/sets whether the station is disabled.
Back to Station Info "Parameter (Init)", [Page 172]		
Back to Control Area "Parameter (Init)", [Page 179]		

6.7.12.29 MoverIdDetectionMode

Parameter	Туре	Explanation
Standard	MoverIdDetection- Mode	Detection mode is disabled. Only standard movers are used.
Mover1	MoverIdDetection- Mode	Detection mode is enabled. A Mover 1 is used.
MultipleMover1	MoverIdDetection- Mode	Detection mode is enabled. Several Mover 1 are used.
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.30 MoverPositionAssignment

Parameter	Туре	Explanation
Standard	MoverPositionAssign- ment	Defines the lowest/highest position.
StartAtFirstMover	MoverPositionAssign- ment	Defines the lowest/highest position.
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.31 IncludeModuleAreasInRecord

Parameter	Туре	Explanation
TRUE	BOOL	Module areas are included in record.
		Attention! Do not change! Obsolete parameter.
FALSE	BOOL	Module areas are not included in record.
		Attention! Do not change! Obsolete parameter.
Back to Io Driver "Parameter (Init)", [Page 173]		

6.7.12.32 IncludeMoverAreasInRecord

Parameter	Туре	Explanation
TRUE	BOOL	Mover areas are included in record.
		Attention! Do not change! Obsolete parameter.
FALSE	BOOL	Mover areas are not included in record.
		Attention! Do not change! Obsolete parameter.
Back to lo Driver "Parameter (Init)", [Page 173]		

6.7.12.33 IsClosed

Parameter	Туре	Explanation
TRUE	BOOL	The track is closed as a circle.
FALSE	BOOL	The track is open ended.
Back to Track "Parameter (Init)", [Page 178]		

6.7.12.34 IsIncludedInDetection

Parameter	Туре	Explanation
TRUE	BOOL	Track is included in process of mover detection and mover id de- tection.
FALSE	BOOL	Track is not included in process of mover detection and mover id detection.
Back to Track "Parameter (Init)", [Page 178]		

6.7.12.35 Polarity

Parameter	Туре	Explanation
Positive	Polarity	Track has positive counting direction.
Negative	Polarity	Track has negative counting direction.
Attention! Not supported at the moment.		
Back to Track "Parameter (Init)", [Page 178]		

6.7.12.36 DriveConfigIdentity

Parameter	Туре	Explanation
vendor	UDINT	Vendor ID
code	UDINT	Product code
revision	UDINT	Product revision
serial	UDINT	Serial number
Back to AT20xx_0xxx "Parameter (Online)", [Page 181]		
Back to ATH20x0_0xxx "Parameter (Online)", [Page 184]		

6.7.12.37 DriveOnlineIdentity

Parameter	Туре	Explanation
vendor	UDINT	Vendor ID
code	UDINT	Product code
revision	UDINT	Product revision
serial	UDINT	Serial number
Back to AT20xx_0xxx "Parameter (Online)", [Page 181]		
Back to ATH20x0_0xxx "Parameter (Online)", [Page 184]		

6.7.12.38 EncoderConfigIdentity

Parameter	Туре	Explanation	
vendor	UDINT	Vendor ID	
code	UDINT	Product code	
revision	UDINT	Product revision	
serial	UDINT	Serial number	
Back to AT20xx_0xxx "Parameter (Online)", [Page 181]			
Back to ATH20x0_0xxx "Parameter (Online)", [Page 184]			

6.7.12.39 EncoderOnlineIdentity

Parameter	Туре	Explanation	
vendor	UDINT	Vendor ID	
code	UDINT	Product code	
revision	UDINT	Product revision	
serial	UDINT	Serial number	
Back to AT20xx_0xxx "Parameter (Online)", [Page 181]			
	Back to AT	H20x0_0xxx "Parameter (Online)", [Page 184]	

6.7.12.40 EncoderSensorValues

Parameter	Туре	Explanation
[0] - [31]	LREAL	Encoder sensor value of respective channel
Back to AT20xx_0xxx "Parameter (Online)", [Page 181]		
	Back to ATH20x0)_0xxx "Parameter (Online)", [Page 184]

6.7.12.41 ImageSections

Parameter	Туре	Explanation
ObjectID	OTCID	Object ID
AreaNumber	UDINT	Area number
StartAddress	UDINT	Start position
Size	UDINT	Image size
	Back to Data R	ecorder "Parameter (Init)", [Page 186]

6.7.12.42 IsRingBufferModeActivated

Parameter	Туре	Explanation	
TRUE	BOOL	Ring buffer is active	
FALSE	BOOL	Ring buffer is not active	
Back to Data Recorder "Parameter (Init)", [Page 186]			

6.7.12.43 TraceLevelMax

Parameter	Туре	Explanation
tlAlways	TcTraceLevel	Controls the amount of log messages. All messages are thrown.
tlError	TcTraceLevel	Controls the amount of log messages. Only error messages are thrown.
tlWarning	TcTraceLevel	Controls the amount of log messages. Error and warnings are thrown.
tlInfo	TcTraceLevel	Controls the amount of log messages. Errors, warnings and infos are thrown.
tlVerbose	TcTraceLevel	Controls the amount of log messages. No messages are thrown.
	Back to Da	ta Recorder "Parameter (Init)", [Page 186]

6.7.12.44 ResetInfoArea

Parameter	Туре	Explanation	
TRUE	BOOL	Info area is reset.	
FALSE	BOOL	Info area is not reset.	
Back to Data Recorder "Parameter (Init)", [Page 186]			

Commissioning 7

The first steps of commissioning depend on whether you have hardware or not. If a different procedure is required, the corresponding links are shown at the beginning of the respective chapter.

7.1 Open or create project



Hardware available

If you have hardware, you can open an existing project or create a new project. You can continue with one of the following chapters:

- "Opening an existing project", [Page 198]
- "Creating a new project", [Page 199]



Hardware not available

period.

If you do not have any hardware, you can open an existing project or create a new project using the XTS Simulation Builder. Beckhoff recommends using the XTS Simulation Builder. You can continue with one of the following chapters:

- "Opening an existing project", [Page 198]
- "XTS Simulation Builder", [Page 229]

Opening an existing project 7.1.1

Once you have opened TwinCAT, you have the option of opening an existing project on the start screen or in the menu.

Start screen



Menu



- ▶ In the menu File click on the menu item Open...
- Click on Project/Solution in the submenu
- Click on an existing project to open it

The list shows you the most recently opened projects from the previous day, the previous week, the previous month and the previous

Click on an existing project in the list to open it

7.1.2 Creating a new project

Debug

Ctrl+S

Ctrl+Shift+S

Ctrl+P

TwinCAT

TwinSAFE

Project

Tile.

ρ

PLC Team

Parts

Tracks

Movers

Stations

Ctrl+Shift+N 04)

Ctrl+N

XtsProjectManual

Tool Window

XtsProjectManual - TcXaeShell File Edit View Project Build

Add to Source Control

New Open

Start Page

Add

Close Close Solution

Save XtsProjectManual

Source Control
Page Setup...
Print...

Account Settings

Save XtsProjectManual As... Save XtsProjectManual as Arch

Sand XtsProjectManual by E-Mail... Save All To set up an XTS system and connect it to all hardware components, you must first set up a TwinCAT 3 project. For commissioning, you must create a new TwinCAT XAE project with Solution.

- ▶ In the menu File click on the menu item New
- Click on Project in the submenu

Recent Projects and Solutions Exit Alt+F4	· 8					
New Project					?	×
▶ Recent	Sort by	Default		Search (Ctrl+E)		ρ-
▲ Installed	7	TwinCAT XAE Project (XML format)	TwinCAT Projects	Type: TwinCAT Projects		
 TwinCAT Measurement TwinCAT HMI TwinCAT Projects TwinCAT PLC TcXaeShell Solution 				TwinCAT XAE System Manager Configuration		
Not finding what you are lookin Open Visual Studio Installe	ng for?					
Name: TwinCAT P	Project	aante\TeYaaShall		Province		
Solution name: TwinCAT P	roject	ובוונג ונאמכסוופוו		 Create directory for solution 		
				Create new Git repository		
				ОК	Cano	:el

The New Project dialog box opens.

- Click on TwinCAT Projects
- Enter a name in the input field Name

Select a file path from the drop-down menu *Location*

OR

- Click on Browse to open the Project Location dialog box and select a file path
- Enter a name in the input field Solution name
- Confirm with OK

7.2 Preparing hardware



Hardware not available

If you do not have any hardware, you can configure a system. You can continue with the following chapter:

• "System configuration", [Page 204]



Hardware available

If you have hardware, you can continue with the following steps.

- 7.2.1 Check hardware
- Check correct connection of all XTS hardware components to the IPC and the mains connection

The following LEDs must be lit on all modules:

- Link / Act
- 24 V / 4 A

If the LEDs do not light up:

- Check cables and connectors
- ► Check EtherCAT settings for communication with the target PC

7.2.2 Connect target PC



Same software version on target PC and engineering PC Make sure that the same software version is installed on your target PC as on your engineering PC.

- Expand Solution Explorer > TwinCAT Project
- Double-click on SYSTEM

- ▶ In the project window, click on the General tab
- Click Choose Target



Commissioning

Choose Target System	× The dialog box <i>Choose Target System</i> opens.
Cancel	The dialog box <i>Choose Target System</i> lists all target PCs to which there are routes from the development system.
Search (Ether	If the desired target PC is not yet listed:
Search (Fieldb	■ Click Search (Ethernet)
	If you work locally on your engineering PC:
	► Click <local></local>
Set as Defa	After you have selected <local>, you can continue with the following chapter:</local>
Connection Timeout (s):	"Check target PC", [Page 202]
📧 Add Route Dialog	× The dialog box <i>Add Route Dialog</i> opens.
Enter Host Name / IP: Refresh Status Broadcast S Host Name Connected Address AMS NetId TwinCAT_OS Varsion Encommit Comment	Activate the checkbox Advanced Settings
dvanced Settings Unidirectional Add Route Close	
Add Route Dialog	Activate the checkbox IP Address
Host Name Connected Address AMS Netid TwinCAT OS Version Progenpiet Commert	 Click Broadcast Search
Route Name (Target) Route Name (Remote): \$	
Vitual AmsNelld (NAT): Transport Type: TEP_IP VITUAL AmsNelld (NAT): Temporary O Project O Nore 2 Static O Static O Temporary O Temporary	
Address Info: O Host Name O P Address Advanced Settings Unidirectional Connection Timeout (b) 5	
Max Fragment Size (KByte): 0	
Select Adapter(s)	× The dialog box <i>Select Adapter(s)</i> opens.
Intel(R) Ethernet Connection (7) I219-IM 169 Realtek USB GbE Family Controller 172.	Deactivate the checkbox Realtek USB GbE Family Controller
	► Confirm with OK
ОК Са	cel
Add Route Dialog	 Click on the target PC
Enter Host Name / IP. Refresh Status Broadcast S Host Name Connected differes AMS Nelld TwinCAT OS Version Encember	Click Add Route
not rane connecto Addes para relia (wrA u svetico regoport	2/24000
Route Name [Target] C<62x4337	
Vertravelut (NAT): O'Socio Socia 1.1 Target Route Remote Route Vertual AmsNell (NAT): O'Project O'None / Ser Static @ Static Static	
Address Info: Temporary O Temporary O Hork Name P Address C Advanced Settings Uridirectional	
Connection Timeout (s): 5 🔅 Max Fragment Size (H8yte): 0 💠 Add Route Close	

-

Commissioning

Add Remote Route Secure ADS [ft/mCAT 31 > 4024] Set Signed Certificate Deck Frageprint:	 The dialog box Add Remote Route opens. ► Enter the password for the target PC in the input field Password ► Confirm with OK
Add Route Dialog X Enter Hoxt Name / IP. Referith Status Bicadcast Search Hoxt Name Connected Address AMS NetId TwinCAT Ox Version Frapepoint Ox 63A337 169	 The successful connection of the target PC is indicated by a closed lock in the <i>Connected</i> column. ▶ Confirm with Close
> Roude Name (Target): CX462A337 Roude Name (Remote): MattHaturvalandon Vitual AnaNetid (NAT): Target Route Remote Remote Route None / Server Vitual AnaNetid (NAT): © Project © Static O None / Server © Static © Static © Static O Temporary O Host None @ IB Address © Addrenced Setting: Undirectional Convection Timecut (s): 5 • Add Route Core	
Choose Target System X	The dialog box Choose Target System opens.
Image: Comparison of the second sec	► Confirm with OK
Connection Timeout (s):	

7.2.2.1 Check target PC



- Check whether the target PC is selected
- ▶ If required, select the target PC from the drop-down menu

7.2.3 Scanning I/O Devices



- Ensure that TwinCAT is in Config Mode
- If required, click on the button Restart TwinCAT (Config Mode) to activate the Config Mode

Solution Explorer		▼ ╄ ×	
0001-10	- 🗗 🎾		
Search Solution Explore	r (Ctrl+ü)	- م	
Solution 'TwinCAT TwinCAT Projec SYSTEM Solution 'S VSTEM MOTION Do Contemporate SAFETY C++ ANALYTICS V/O Solution S	Project' (1 project) tt		
Devices			
iviar 1	Add New Item	ins	
Ĩ.	Add Existing Item	Shift+Alt+A	
	Add New Folder		
	Export EAP Config File		
1	Scan		
	Paste	Ctrl+V	
	Paste with Links		
TcXaeShell X			
HINT: Not all types	of devices can be found	lautomatically	
	ОК	Abbrechen	

- ► Expand Solution Explorer > TwinCAT Project > I/O
- Right-click on **Devices** to open the context menu
- ► Click Scan in the context menu

The dialog box *TcXaeShell* opens.

► Confirm with **OK**

Depending on the components of your XTS system, there are different devices to choose from:

- one RT-Ethernet adapter for each connected CU2508
- one EtherCAT Device for each infeed line of the XTS system
- *EtherCat Devices* for the bus terminals contained in the control cabinet

Beckhoff recommends naming the devices clearly for a better overview.

The dialog box 8 new I/O devices found opens.

- Activate the checkboxes of the devices that are to be selected for the current configuration
- ► Confirm with **OK**

×

OK.

The dialog box *TcXaeShell* opens.

► Confirm with **Yes**

Device 3 [EtherCAT Automation Protoco] Device 5 [EtherCAT Automation Protoco] Device 6 [EtherCAT] Device 6 [EtherCAT] Device 6 [EtherCAT]	Cancel Select All
Device 9 (PT Ethernet Protocol)	Unselect All
TcXaeShell	×
? Scan for boxes	
Yes No	

8 new I/O devices found

Device 1 (EtherCAT Automation Protocol)

7.3 System configuration

You have various options for configuring an XTS system. The procedure for configuring a system depends on whether you have hardware or not:



Hardware available

If hardware is available, you can create the system with the *XTS Configurator* or manually. Beckhoff recommends using the *XTS Configurator*. You can continue with one of the following chapters:

- "XTS Configurator", [Page 258]
- "Create new XTS system manually", [Page 39]



Hardware not available

If no hardware is available, you can create the system with the *XTS Simulation Builder* or manually. Beckhoff recommends using the *XTS Simulation Builder*. You can continue with one of the following chapters:

- "XTS Simulation Builder", [Page 229]
- "Create new XTS system manually", [Page 39]

7.4 Checking I/O devices



Connection to the power supply and 48 V required

To commission a real XTS system, the system must be connected to the power supply and 48 V must be connected.

Once you have configured the XTS system, you can put the configuration into operation and move the movers.



Hardware available

To put a system into operation, the I/O devices must be enabled.



Hardware not available

To put a simulated system into operation, the I/O devices must be disabled.

You can see whether the devices are enabled or disabled by the display of the devices in the Solution Explorer:



The device is enabled.



The device is disabled.



- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- Check whether all XTS-relevant devices are enabled

If the devices are disabled, the devices must be enabled.

7.4.1 Activate



- ▶ Press and hold the button **Ctrl** to select the devices
- Right-click on the XTS relevant devices
- Click Disable in the context menu

7.5 Activating the configuration	
Image: Solution Explorer Solution Explorer Solution Explorer Solution Explorer Solution TwinCAT Project (1 project) Solution TwinCAT Project Solution TwinCAT P	Click on the button Activate Configuration to activate the configuration
Activate Configuration X	The dialog box Activate Configuration opens.
Project: TwinCAT Project	Make sure that the correct project and the correct target PC are selected in the input fields <i>Project</i> and <i>Target</i>
Target: 🖹 CX62A937 (5.98.169.55.1.1)	► Confirm with OK
OK Cancel	
Properties Toolbox	As soon as the system is activated, an animated TwinCAT symbol displayed in the information bar and status bar. The XTS system

mbol is stem is ready for operation. You can make changes to the current configuration at any time by reopening the XTS Configurator.



The XTS Tool Window can only be set to Running mode if the configuration is activated and TwinCAT is in Run mode.



► In the XTS Tool Window activate the button Check to enable live view

The XTS Tool Window is in Running mode and shows the current mover positions.

Mover ID detection 7.6

> Perform a Mover ID detection to locate Mover 1 on the system. Further information can be found in chapter "Mover 1 functionality", [Page 93].

7.7 Activating NC axes

▶ Expand Solution Explorer > TwinCAT Project > MOTION > NC-Solution Explorer • I X ◎ ◎ ☆ 📇 - 🐻 - 🗗 🔑 -Task 1 > Axes Search Solution Explorer (Ctrl+ü) ρ. Double-click Mover Axis 1 Solution 'TwinCAT Project' (1 project) TwinCAT Project SYSTEM
 MOTION 🔣 NC-Task 1 4 📑 NC-Task 1 SVB 📑 Image Tables Objects ta Axes 🖬 M Þ Hover Axis 2 Þ Hover Axis 3 Mover Axis 4 Mover Axis 5 Mover Axis 6 Þ Hover Axis 7 Þ Hover Axis 8 Hover Axis 9 Þ Hover Axis 10 Þ PLC SVEELA ▶ In the project window, click on the **Online** tab General Settings Parameter Dynamics Online Functions Coupling Comp sation 53.7978 Setpoint Position: [mm] 53.8031 Click Set Setpoint Velocity: [mm/s] 0.0000 Lag Distance (min/max): [mm] Actual Velocity: [mm/s] 0.0009 (-0.006, 0.006) -2.6980 Override:
 [%]
 Total / Control Output:
 [%]
 E

 100.0000 %
 0.00 / 0.00 %
 0.00 / 0.00 %
 E
 0 (0x0) Status (log.) Status (phys.) Enabling Ready Calibrated NOT Moving
Moving Fw
Moving Bw Coupled Mode In Target Pos. Controller Feed Fw Feed Bw Set Reference Velocity 4200 [mm/s] ↓ Controller Kv-Factor [mm/s/r T Target Velocity 0 Target Pos nm] [mm/s] ® F8 E1 F9

NC axis of the mover.



Use the button *All* to enable the controllers *Controller*, *Feed Fw* and *Feed Bw* to move the movers. If you click on the button *All*, the *Set Enabling* window closes automatically.

Before you can move a mover, you must activate the corresponding

The dialog box Set Enabling opens.

Click on All to enable all controllers

OR

- Activate the checkboxes Controller, Feed Fw and Feed Bw to enable the controllers
- ► Confirm with **OK**

The axis controllers are enabled and the corresponding mover can be moved.

7.8 Moving the mover



Once you have activated the configuration and the NC axes of the movers, you can now move one or more movers.

Observe the representation of a simulated system

If no real XTS system is connected and you are working with a simulated system, the movers overtake and overlap in the display in the XTS Tool Window. In a real system, this overlapping is not possible; instead, the movers collide.

The movers can be moved to any position using the buttons or to a defined position using a direct motion command. In addition, certain functions can be used for movement, but these are not controlled via the buttons.

7.8.1 Controls

The list shows the most important controls:



Fast backwards

Moves the mover backwards at the velocity entered in the input field *Manual Velocity (Fast)*.

Preset: 600 [mm/s]



Slowly backwards

Moves the mover backwards at the velocity entered in the input field *Manual Velocity (Slow)*.

Preset: 100 [mm/s]



Slowly forward

Moves the mover forwards at the velocity entered in the input field *Manual Velocity (Slow)*.

Preset: 100 [mm/s]



Fast forward

Moves the mover forwards at the velocity entered in the input field *Manual Velocity (Fast)*.

Preset: 600 [mm/s]



Start a direct motion command

Starts a direct motion command to the target position entered in the input field *Target Position* at the velocity entered in the input field *Target Velocity*.



Stop direct motion command

Stops the direct motion command.



[mm]

Ť

Cancel motion command and reset

Stops the current motion command and resets the NC axis.



Controller enable

Enables the controller for moving the movers.



Target Position input field

Enables the target position of the mover to be entered for a direct motion command.

[mm/s]
Ť

Velocity input field

Enables the velocity for the mover to be entered for a direct motion command.

7.8.2 Any position



Button only controls the selected mover

The buttons for moving the movers only control the selected NC axis with the corresponding mover on the currently active track. If you want to move several movers using the buttons, the movers must be coupled. Further information can be found in chapter "Coupling movers", [Page 222].

 - +
 ++
 ↔
 Ø
 ●

 F1
 F2
 F3
 F4
 F5
 F6
 F8
 F9

If the buttons are inactive, the selected NC axis of the mover is not activated or the NC axis is coupled with another NC axis.

Backward

Has Job	Moving Bw
Controller Kv-Factor:	[mm/s/mm]
Target Position: 0	[mm]
F1 F2	+ ++ F3 F4

 Left-click and hold the F1 button to move the mover quickly backwards

OR

Left-click and hold the F2 button to move the mover slowly backwards

Forward

Has Job Movir	ng Bw
Controller Kv-Factor:	[mm/s/mm]
Target Position: 0	[mm]
F1 F2 F	+ ++ 3 F4

Left-click and hold the F3 button to move the mover slowly forwards

OR

Left-click and hold the F4 button to move the mover quickly forwards

7.8.3 Direct motion command

	1	
General Settings Parameter Dyn	amics Online Functions	Coupling Compensation
	1852.0079	Setpoint Position: [mm] 1851.9999
Lag Distance (min/max): [mm] Ac	ctual Velocity: [mm/s]	Setpoint Velocity: [mm/s]
Override: [%] To	otal / Control Output: [%]	Error:
100.0000 %	-0.00 / -0.00 %	0 (0×0)
Status (log.) Ready NOT Moving Calibrated Moving Fw Has Job Moving Bw	Status (phys.) Coupled Mode In Target Pos. In Pos. Range	Enabling Controller Set Feed Fw Feed Bw
Controller Kv-Factor: [mm/s	/mm] Reference Vel	ocity: [mm/s]
Target Position:	[mm] Target Velocit	y: [mm/s]
-1 F2 F3	++ F4 Ft Ft F6	® →• F8 F9

The distances traveled so far are added up to an absolute position [1]. From this absolute position, the mover moves in a positive or negative direction until the target position [2] is reached at the defined velocity [3].

In contrast, with the *Modulo* function, the distances traveled are not added up and the distance already traveled does not have to be completely reversed in order to reach the target position. Further information can be found in chapter "Modulo / Modulo shortest way / Modulo plus direction / Modulo minus direction", [Page 215].

Enter a value for the position to which the mover is to be moved in the input field *Target position*

- Enter the velocity at which the mover is to be moved in the input field Target Velocity
- Click on the F5 button to start the direct motion command

The mover is moved to the target position at the defined velocity.

Controller Kv-Factor: [mm/s/mm]
1
Target Position: [mm]
0
- + F1 F2 F3 F4
n Pos. Range
Reference Velocity: [mm/s]
4200
Target Velocity: [mm/s]
0

Moving Bw

Hr

Has Job

Cancel direct motion command

n Pos. Range	Feed Bw
Reference Velocity	: [mm/s]
4200	Ţ
Target Velocity:	[mm/s]
0	
	R →•
F5 F6	F8 F9

• Click on the **F6** button to cancel the direct motion command

7.8.4 Functions

Various motion commands are available in the *Functions* tab and can be used after entering a few values.

- General Settings Parameter Dynamics Online Functions Coupling Compensation Setpoint Position: [mm] 55.0052 54.9999 Extended Start Start Mode: Absolute Start Target Position: [mm] Stop Target Velocity: [mm/s] 0 Acceleration: [mm/s2] [mm/s2] Last Time: Deceleration: [s] 0.00000 Jerk: [mm/s3] Raw Drive Output Output Mode: Percen Start Output Value: 0 [%] Stop Set Actual Position Absolute 0 Set \sim Set Target Position 0 \sim Absolute Set
- ► In the project window, click on the Functions tab

7.8.4.1 Absolute

This function moves the mover to the entered position.

Starting

General Settings Parameter Dynamics Online Functions Coupling Compensation Setpoint Position: [mm] 55.0052 54.9983 Extended Stat Start Mode: led Start Start Target Position Target Velocity Acceleration 1/921 inoreas Nodulo Nodulo shortest way Modulo plus direct. Modulo minus direct Deceleration: m/s21 Last Time 0.00000 Jerk: m/s3] Raw Drive Output Output Mode: Output Value: Set Actual Position Absolute Set Set Target Position 0.00 Set Absolute Sequence (Bode General Settings Parameter Dynamics Online Functions Coupling Comp Setpoint Position [mm] 55.0052 54.9999 Extended Start Start Mode: Absolute Target Position m] Target Velocity: [mm/s] Acceleration m/s2] Deceleration m/s2] Last Time [s] Jerk: 0.00000 /s3] Raw Drive Output

Pe

0

0

Select Absolute in the drop-down menu Start Mode

- ► Enter the target positions in the input field *Target Position*
- Enter a value for the velocity in the input field Target Velocity
- If required, activate the checkbox Acceleration to enter a value for the acceleration in the input field
- If required, activate the checkbox **Deceleration** to enter a value for the deceleration in the input field
- If required, activate the checkbox Jerk to enter a value for the jerk in the input field
- Click on Start to start the function Absolute
- The mover moves to the target position entered.

Stop

Output Mode:

Output Value:

Absolute

Absolute

Set Actual Position

Set Target Position



Start

Set

Set

[%]

Stopping only during the procedure

The function can only be stopped during the movement to the target position. After moving to the target position, the button *Stop* is automatically disabled.

Click on Stop to stop the function Absolute

	943.2	2200	etpoint Position: [mm 942.6021
Extended Start			
Start Mode:	Absolute	\sim	Start
Target Position:	55	[mm]	Stop
Target Velocity:	1000	[mm/s]	
Acceleration:	300	[mm/s2]	
Deceleration:	50	[mm/s2]	Last Time: [s]
Jerk:	0	[mm/s3]	8.21200
Raw Drive Output			
Output Mode:	Percent	\sim	Change
Output Value:	0	[%]	Stop
Set Actual Position			
Absolute ~	0		Set

7.8.4.2 Relative

With this function, the mover travels a defined route.

Starting

	54.9960 Setpoint Position:
Extended Start	
Start Mode:	Relative V Start
Target Position:	Absolute [mm] Stop
Target Velocity:	Relative Endless + [mm/s]
Acceleration:	Endless - [mm/s2]
Deceleration:	Modulo Modulo shortest way [mm/s2]
	Modulo plus direct.
	Jog +
Raw Drive Output	Jog -
Output Mode:	+ 1 Start
Output Value:	+ 0.01 [%] Stop
Set Actual Position	-1
Absolute ~	- 0.1 Set
Set Target Position	- 0.001
Absolute ~	Reversing Sequence Set
	Velo Step Sequence
	C (D 1)
	Sinus Oscillation
	Sinus Sequence (Bode) Sinus Oscillation
neral Settings Paramet	Inus sequence (gooe) Snus Oscillation ter Dynamics Online Functions Coupling Compensati
neral Settings Paramet	Inus sequence (gooe) Sinus Oscillation ter Dynamics Online Functions Coupling Compensati 555.0017 Setpoint Position: 55.0
neral Settings Paramet	Sinus Sequence (ucose) Sinus Oucliation ter Dynamics 55.0017
neral Settings Paramet	Sinus Sequence (ucode) Sinus Sociliation ter Dynamics 55.0017 Setpoint Position: 55. Relative
neral Settings Paramet Extended Start Start Mode: Target Position:	Sinus Sequence (gooe) Sinus Oscillation ter Dynamics 55.0017 Setpoint Position: 55.001 Relative 0 Imm
neral Settings Paramet Extended Start Start Mode: Target Position: Target Velocity:	Sinus Sociliation ter Dynamics 55.0017 State Belative 0 0 0 0 0 0 0 0 0 0 0
neral Settings Paramet Extended Start Start Mode: Target Position: Target Velosity: Acceleration:	Sinus Sequence (ucose) Sinus Sociliation ter Dynamics 55.0017 Setpoint Position: 55.0017 Relative 0 [mm] 0 [mm]/s] 0 [mm]/s2
Extended Start Extended Start Start Mode: Target Velocity: Acceleration: Deceleration:	Sinus Sequence (code) Sinus Sociliation ter Dynamics 55.0017 Setpoint Position: 55.001 Relative 0 [mm] 0 [mm/s] 0 [mm/s2] 0 [mm/s2]
eral Settings Paramet Extended Start Start Mode: Target Position: Target Velocity: Acceleration: Deceleration: Deceleration:	Sinus sequence (uode) Sinus Osciliation ter Dynamics Online Functions Coupling Compensation 55.0017 Setpoint Postion: 55.0 Relative Stat 0 (mm/s)
heral Settings Paramet Extended Start Start Mode: Target Velocity: Acceleration: Deceleration: Jark: Rew Drive Output	Sinus Sociliation Sinus Sociliation ter Dynamics 55.0017 State 0 1 0 1 0 1 0 1 0 1
neral Settings Paramet Extended Start Start Mode: Target Position: Target Volotty: Acceleration: Deceleration: Isrk: Raw Drive Output Output Mode:	Sinus Sequence (ucose) Sinus Oucliation ter Dynamics 55.0017 Start 0 [mm/s] 0 [mm/s2] 0 [mm/s3] 0.000 Percent Start
neral Settings Paramet Extended Stat Stat Stat Mode: Target Volotity: Target Volotity: Acceleration: Deceleration: Deceleration: Deceleration: Output Volue:	Sinus Sequence (code) Sinus Oscillation ter Dynamics 55.0017 Start 0 [nm] 0 [nm/s]
neral Settings Paramet Extended Start Start Mode: Target Position: Target Velocity: Acceleration: Deceleration: Deceleration: Direk: Raw Drive Output Output Mode: Output Velue: Set Actual Position	Sinus Sequence (code) Sinus Sociliation ter Dynamics 55.0017 Setpoint Position: 55.0017 Stat 0 [mm/s2] 0 [mm/s2] 0 [mm/s2] 0 [mm/s3] 0 [mm/s3] 0 [mm/s3] 0 [mm/s3] 0 [mm/s3] 0 [mm/s3]
heral Settings Paramet Extended Start Start Mode: Target Velocity: Acceleration: Deceleration: Deceleration: Derk: Rew Drive Output Output Mode: Output Value: Set Actual Position Absolute V	Bitule sequence (code) Situe Sociliation Eer Dynamics Online Functions Coupling Compensation 555.0017 Setpoint Postion: 55.0 Relative Stat Stop Stat 0 jmm/s2] Last Time: 0.000 Percent Stat Stop Stat 0.000 0 [%] Stat 0.000 Stat 0.000

Select **Relative** in the drop-down menu *Start Mode*

- Enter a value for the length of the route in the input field Target Position
- Enter a value for the velocity in the input field *Target Velocity*
- If required, activate the checkbox Acceleration to enter a value for the acceleration in the input field
- If required, activate the checkbox **Deceleration** to enter a value for the deceleration in the input field
- If required, activate the checkbox Jerk to enter a value for the jerk in the input field
- ► Click on Start to start the function Relative

The mover travels the defined length of the route.

Stop



Stopping only during the procedure

The function can only be stopped during the movement to the target position. After moving to the target position, the button *Stop* is automatically disabled.

Click on Stop to stop the function Relative

	ootango	rurumotor	Cynamics Offilin	c rano	COU	ping comper	aduol1
			267.0	6399	Set	point Position:	[mm 268.0414
Exten	ded Start						
Start	Mode:		Relative	~		Start	
Targe	t Position:		600		[mm]	Stop	
Targe	t Velocity:		1000		[mm/s]		
🗹 Ac	celeration:		300		[mm/s2]		
∠ De	eceleration:		50		[mm/s2]	Last Time:	s
🗌 Je	rk:		0		[mm/s3]	5	89600
Raw I	Drive Outpu	t					
Outpu	t Mode:		Percent	~		Change	
Outpu	t Value:		0		[%]	Stop	
Set A	ctual Positio	n					
Abso	olute	\sim	0]	Set	
Set Ta	arget Positio	n			_		
Abso	olute	~	0		1	Set	

7.8.4.3 Endless + / Endless -

With this function, the mover moves infinitely in a positive or negative direction.

Starting

	54.9962	Se	tpoint Positio	n: [mm 55.0052
Extended Start				
Start Mode:	Endless + V		Start	
Target Position:	Absolute	[mm]	Stop	
Target Velocity:	Relative Endless +	[mm/s]		
Acceleration:	Endless -	[mm/s2]		
Deceleration:	Modulo Modulo shortest wav	[mm/s2]	Lant Time:	[e]
Lerk:	Modulo plus direct.	[mm/s3]	Lust mile.	0.00000
	Joa +			0.00000
Raw Drive Output	Jog -		Chard	
Output Mode:	+ 0.1		Start	
Output Value:	+ 0.01	[%]	Stop	
Set Actual Position	- 1			
Absolute ~	- 0.1		Set	
Set Target Position	- 0.001			
Absolute \vee	Reversing Sequence		Set	
	Velo Step Sequence			
	Sinus Sequence (Bode)			
	Carles Coolecter			
eneral Settings Parameter	Dynamics Online Fund	tions Cou	pling Comp	ensation
	55.0050) Se	tpoint Positio	n: [mm 55.0052

nm]

[mm/s]

nm/s2]

nm/s2]

Last Tim

Start

Set

Set

[s]

0.00000

Select Endless + in the drop-down menu Start Mode OR

Select Endless - in the drop-down menu Start Mode

- ► Enter a value for the velocity in the input field *Target Velocity*
- If required, activate the checkbox Acceleration to enter a value for the acceleration in the input field
- If required, activate the checkbox **Deceleration** to enter a value for the deceleration in the input field
- If required, activate the checkbox Jerk to enter a value for the jerk in the input field
- Click on Start to start the function Endless + or Endless -
- The mover moves infinitely forwards or backwards.

Stop

Target Position

Target Velocity

Acceleration

Deceleration

Raw Drive Output Output Mode:

Set Actual Position

0

0

 \sim

Output Value:

Absolute Set Target Position

Absolute

Jerk

neral Settings Parame	ter Dynamics Online	Functions Col	upling Compensation
	10300.3	385 ^{Se}	tpoint Position: [mm] 10301.5618
Extended Start			
Start Mode:	Endless +	\sim	Start
Target Position:	0	[mm]	Stop
Target Velocity:	600	[mm/s]	
Acceleration:	300	[mm/s2]	
Deceleration:	50	[mm/s2]	Last Time: [s]
Jerk:	0	[mm/s3]	5.04400
Raw Drive Output			
Output Mode:	Percent	\sim	Change
Output Value:	0	[%]	Stop
Set Actual Position			
Absolute ~	0		Set
Set Target Position			
Absolute	0		Set

Click on Stop to stop the function Endless + or Endless -

7.8.4.4 Modulo / Modulo shortest way / Modulo plus direction / Modulo minus direction

The mover moves to a defined position with these functions. Depending on the selected modulo function, the mover travels the shortest distance, forwards or backwards to the target position. The following functions are available:

ModuloThe mover moves to the target position. If the value in the input fieldTarget Position is negative, the mover moves backwards to the target position.

The mover moves forwards or backwards the shortest way to the target position. It is not possible to enter a negative value in the input field *Target Position*.

Modulo plus directionThe mover only moves forward to the target position. It is not possi-
ble to enter a negative value in the input field Target Position.

Modulo minus directionThe mover only moves backwards to the target position. It is not
possible to enter a negative value in the input field *Target Position*.



Modulo example

The input of values is shown using the function *Modulo* as an example.

Starting

Modulo shortest way

	55.0116 55.005
Extended Start	
Start Mode:	Modulo V Start
Target Position:	Absolute [mm] Stop
Target Velocity:	Endless + [mm/s]
Acceleration:	Endless - [mm/s2]
Deceleration:	Modulo Modulo shortest way [mm/s2] Last Time: [s]
Jerk:	Modulo plus direct. [mm/s3] 0.00000
Raw Drive Output	Jog +
Output Mode:	+ 1 Start
Output Value:	+ 0.1 + 0.01 [%] Stop
Set Actual Position	+ 0.001
Absolute ~	- 0.1 Set
Set Target Position	- 0.01
Absolute ~	Reversing Sequence Set
	Sinus Sequence (Bode)
neral Settings Parameter	Sinus Sequence (Bode) Sinus Oscillation
neral Settings Paramet	Sinus Sequence (Rode) Sinus Oscillation er Dynamics Online Functions Coupling Compensation 555 00888
neral Settings Parametr	Sinus Sequencie (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Position: [mm 55.0052
neral Settings Parametr	Sinus Sequence (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 555.0088 Setpoint Position: Imm 55.0052 Modulo V Start
neral Settings Parametr Extended Start Start Mode: Target Position:	Sinus Sequence (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 555.0088 Setpoint Postion: [mm 550.0057 Modulo V Stat
neral Settings Paramete Extended Start Start Mode: Target Position: Target Velocity:	Sinus Sequence (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Postion: fmm 55.005 Modulo fmm] 0 [mm/s]
eral Settings Paramete Extended Start Start Mode: Target Velocity: Acceleration:	Sinus Sequencie (Rode) Sinus Cociliation er Dynamics Online Functions Coupling Compensation 555.0088 Setpoint Position: Imm 55.005 Modulo Modulo Imm Stop 0 Imm/s2
eral Settings Paramete Extended Start Start Mode: Target Position: Target Velocity: Acceleration: Deceleration:	Sinus Sciquencie (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 55.0088 Stat 0 0 0 0 0 0 0 0 0
eral Settings Parametr Extended Start Start Mode: Target Poation: Target Velocity: Acceleration: Deceleration: Uerk:	Sinus Sequencie (Bode) Sinus Cosiliation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Position: [mm 55.005 Modulo fmm/s] 0 [mm/s2]
Extended Start Start Mode: Target Position: Target Velocity: Poceleration: Deceleration: Deceleration: Raw Drive Output	Sinus Sciquencie (Bode) Sinus Osciliation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Position: jmm 55.005 Modulo Modulo Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s2 Imm/s3 Imm/s Imm/s3 Imm/s I
eral Settings Paramete Extended Start Start Mode: Target Position: Target Velocity: Acceleration: Deceleration: Jark: Raw Drive Output Output Mode:	Modulo Stat 0 [mm/s] 0 [mm/s2]
Extended Start Start Mode: Target Volotity: Acceleration: Deceleration: Isrk: Raw Drive Output Output Mode: Output Mode: Output Volue:	Sinus Sequence (Bode) Sinus Cacillation er Dynamics Online Functions Coupling Compensation 555.0088 Setpoint Position: Imm 550.00 Modulo Finni Sitop O Finni Sitop O Finni Sitop Finni Si
Extended Start Start Mode: Target Velocity: Acceleration: Deceleration: Jerk: Raw Drive Output Output Mode: Output Vulue: Start Actual Position	Sinus Sequence (Bode) Snue Osoliation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Position: fmm 55.005/ Modulo fmm/s Stop 0 0 fmm/s2 0 fmm/s2 0 fmm/s2 0.00000 0 Percent 0 ftp Stop 0 fty Stop 0.00000
eral Settings Parametr Extended Start Start Mode: Target Pooliton: Target Velocity: Acceleration: Deceleration: Deceleration: Deceleration: Output Volue: Set Actual Position Absolute	Sinus Sequence (Bode) Sinus Oscillation ter Dynamics Online Functions Coupling Compensation 55.0088 Setpoint Position: Imm 55.005/ Modulo V Stat 55.005/ 0 [mm/s] Stop 0 0 [mm/s2] 0 [mm/s2] 0.00000 Percent V Start 0.00000 0 [tx] Stop 0.00000

Select Modulo in the drop-down menu Start Mode

- Enter a value for the target position in the input field Target Position
- Enter a value for the velocity in the input field Target Velocity
- If required, activate the checkbox Acceleration to enter a value for the acceleration in the input field
- If required, activate the checkbox **Deceleration** to enter a value for the deceleration in the input field
- If required, activate the checkbox Jerk to enter a value for the jerk in the input field
- Click on Start to start the function Modulo

The mover moves to the target position entered.

Stop

1

Stopping only during the procedure

The function can only be stopped during the movement to the target position. After moving to the target position, the button *Stop* is automatically disabled.

Click on Stop to stop the function Modulo


7.8.4.5 Reversing Sequence

With this function, the mover moves back and forth between two positions.

Starting

	55 0054	Setpoint Position: [mr
	55.0054	55.005
Extended Start		a .
Start Mode:	Reversing Sequence ~	Start
Target Position I:	Relative	Stop
Target Velocity:	Endless + [mm	/s]
Target Position 2:	Modulo	1
dle Time:	Modulo shortest way s Modulo plus direct.	Last Time: [s]
	Modulo minus direct.	0.00000
Raw Drive Output	Jog -	
Output Mode:	+1	Start
Output Value:	+ 0.01 [%]	Stop
Set Actual Position	+ 0.001	
Absolute ~	- 0.1	Set
Set Target Position	- 0.001	
Absolute ~	Reversing Sequence	Set
	Start/Ston Sequence	
	Start/Stop Sequence Velo Step Sequence	
	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation	
	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation	
eral Settinos Parame	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation	Coupling Compensation
eral Settings Parame	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation	Coupling Compensation
eral Settings Parame	Start / Stop Sequence Velo Step Sequence Sirus Sequence (Bode) Sirus Oscillation	Coupling Compensation Setpoint Position: [m
eral Settings Parame	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Occillation eter Dynamics Online Functions 54.9988	Coupling Compensation Setpoint Position: [m 55.005
eral Settings Parame	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation Eter Dynamics Online Functions 54.9988 Revensing Sequence V	Coupling Compensation Setpoint Position: [m 55.005 Start
eral Settings Parame Extended Start Start Mode: Target Position 1:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation Eter Dynamics Online Functions 54.9988 Revening Sequence	Coupling Compensation Setpoint Position: [m 55.005 Start
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Velocity:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation Eter Dynamics Online Functions 54.9988 Reversing Sequence V 0 fmm 0 fmm	Coupling Compensation Setpoint Position: [m 55.005 Start] Stop
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Velocity: Target Velocity: Target Position2:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Cacillation Eter Dynamics Online Functions 54.9988 Revensing Sequence V 0 [mm 0 [mm 0 [mm	Coupling Compensation Setpoint Position: mm 55.005 Start] Stop /s]
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Position 2: idle Time:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Occillation Eter Dynamics Online Functions 54.9988 Revensing Sequence V 0 fmm 0 fmm 0 fmm	Coupling Compensation Setpoint Position: fm 55.005 Start] Stop /s]] Last Time: [5]
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Velocity: Target Position 2: Ide Time:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Ocalitation 54,9988 Revensing Sequence ~ 0 firm 0 firm 0 s	Coupling Compensation Setpoint Position: [m 55:005 (Sat) Rop /s]] Last Time: [6] 0,00001
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Position 2: die Time: 2010 Date Octore	Start/Stop Sequence Velo Stery Sequence (Bode) Sinus Sequence (Bode) Sinus Oscillation 54.9988 Reversing Sequence ~ 0 fmm 0 fmm 0 s	Coupling Compensation Setpoint Position: [mr 55.005 Start //s] Last Time: [s] 0.00000
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Velocity: Target Position 2: Idle Time: Raw Drive Output	Start/Stop Sequence Velo Start/Stop Sequence Sinus Sequence (Bode) Sinus Oscillation Eter Dynamics Online Functions 54.9988 Reversing Sequence 0 fint 0 fint 0 s	Coupling Compensation Setpoint Position: mi 55.005 Start] Last Time: [6] 0.00000 Start
eral Settings Parame Extended Start Start Mode: Target Position 1: Target Velocity: Target Velocity: Target Position 2: dle Time: Raw Drive Output Dutput Value:	Start/Stop Sequence Velo Step Sequence Sinus Sequence (Bode) Sinus Oscillation Eter Dynamics Online Functions 54.9988 Reversing Sequence V 0 imm 0 imm 0 imm 0 imm 0 imm 0 imm 0 imm 0 imm	Coupling Compensation Setpoint Position: mm 55.005 Stat Last Time: [s] 0.00000 Start Roo
eral Settings Parame Stanted Start Start Mode: Target Position 1: Target Velocity: Target Position 2: die Time: Raw Drive Output Dutput Mode: Dutput Volue: Start Lostion	Start/Stop Sequence Velo Start/Stop Sequence Sinus Sequence (Bode) Sinus Oscillation Start Dynamics Online Functions 54,9988 Revensing Sequence V 0 firm 0 firm 0 firm 0 s	Coupling Compensation Setpoint Position: [m 55:005 (Rat) Last Time: [s] 0.00000 Start Stop

Select Reversing Sequence in the drop-down menu Start Mode

- Enter a value for the first target position in the input field Target Position1
- Enter a value for the velocity in the input field *Target Velocity*
- Enter a value for the second target position in the input field Target Position2
- Enter a value for the idle time at the target in the input field *Idle Time*
- Click on Start to start the function Reversing Sequence

The mover now moves continuously back and forth between the two target positions.

Stop

eneral Settings	Parameter	Dynamics	Online	Function	ons C	oupling	Compens	sation
			55.00	063	5	etpoint	Position:	[mm] 55.0000
Extended Start					L			
Start Mode:		Reversir	ng Sequer	nce v		Sta	rt	
Target Position 1:		55	-		[mm]	Sto	р	
Target Velocity:		500		_	[mm/s]			
Target Position 2:		1250			[mm]			
Idle Time:		2			s	Last	Time:	s
							2.2	24800
Raw Drive Output								
Output Mode:		Percent		\sim		Cha	ange	
Output Value:		0			[%]	Sto	p	
Set Actual Position	1							
Absolute	\sim	0				Set		
Set Target Position	1							
Absolute	\sim	0				Set		

Click on Stop to stop the function Reversing Sequence

7.8.4.6 Start/Stop Sequence

With this function, the mover travels a defined distance to the next stop and executes this function permanently.

Starting

	55.0074 Setpoint Position: [mm] 55.0052
Extended Start	
Start Mode:	Start/Stop Sequence >
Target Position:	Absolute [mm] Stop
Target Velocity:	Relative [mm/s]
	Endless -
Idle Terrer	Modulo
idie filme.	Modulo plus direct.
	Modulo minus direct. 0.00000
Raw Drive Output	Jog
Output Mode:	+ 1 Start
Output Value:	+ 0.01 [%] Stop
Set Actual Position	+ 0.001
Absolute	~ - 0.1 Set
Set Target Position	- 0.01
Absolute	Reversing Sequence Set
	Start/Stop Sequence
	Sinus Sequence (Bode)
	Sinus Oscillation
eneral Settings Paran	neter Dynamics Online Functions Coupling Compensation
	55.0134 Setpoint Position: [mm]
Extended Start	00.0002
Start Mode:	Start/Stop Sequence ~ Start
Target Position:	0 [mm] Stop
-	- International Action

[s] 0.00000

Last Time

Start

Set

Set

Select Start/Stop Sequence in the drop-down menu Start Mode

- Enter a value for the distance to the next stop in the input field Target Position
- ► Enter a value for the velocity in the input field *Target Velocity*
- Enter a value for the idle time at the target in the input field *Idle Time*

► Click on **Start** to start the function *Start/Stop Sequence* The mover now travels the entered distance continuously until the next stop.

Stop

Idle Time:

Raw Drive Output

Set Actual Position

Set Target Position

0

0

Output Mode:

Output Value:

Absolute

Absolute

	8925.0087 Setpoint Position: [mm]
Extended Start	
Start Mode:	Start/Stop Sequence V
Target Position:	150 [mm] Stop
Target Velocity:	800 [mm/s]
Idle Time:	1 Last Time: [s] 0.31200
Raw Drive Output	Percent V Change
Output Value:	0 [%] Stop
Set Actual Position	
Absolute ~	150 Set

Click on Stop to stop the function Start/Stop Sequence

7.8.4.7 Velo Step Sequence

With this function, the mover moves between two target positions at two different velocities.

Starting



Select Velo Step Sequence in the drop-down menu Start Mode

The distances between the first and second target positions can be different, as they depend on the two velocities and the identical travel time.

neral Settings F	arameter	Dynamics Online Fu	inctions Cou	upling Compensation
		55.005	2 ^{Se}	tpoint Position: [mm] 55.0052
Extended Start				
Start Mode:		Velo Step Sequence	\sim	Start
Target Velocity1:		0	[mm/s]	Stop
Target Velocity2:		0	[mm/s]	
Driving Time:		0	s	
Idle Time:		0	s	Last Time: [s]
No Of Cycles:		0	0, 1,2	0.00000
Raw Drive Output				
Output Mode:		Percent	\sim	Start
Output Value:		0	[%]	Stop
Set Actual Position				
Absolute	\sim	0		Set
Set Target Position				
Absolute	\sim	0		Set

- Enter the velocity values in the input fields Target Velocity1 and Target Velocity2
- Enter a value for the driving time in the input field *Driving Time*
- Enter a value for the idle time at the target in the input field *Idle Time*
- Enter a value for the number of driving cycles in the input field No of cycles
- Click on Start to start the function Velo Step Sequence

The mover now travels the entered number of travel cycles or permanently the time-dependent route to the two target positions. Stop



Stop depending on No of cycles

If no value has been entered in the input field *No of cycles*, the mover moves continuously. The function can be ended at any time using the *Stop* button.

If a value has been entered in the input field *No of cycles*, the mover stops automatically after the entered number of cycles and the *Stop* button is automatically disabled. The cycles can be ended at any time using the *Stop* button.

► Click on Stop to stop the function Velo Step Sequence



7.8.4.8 Sine Sequence (Bode)

With this function, the mover moves forwards and backwards periodically.

Starting

	EA OCOA Setpoint Position: [n
	54.9624 55.00
Extended Start	
Start Mode:	Sinus Sequence (Boc ~ Start
Start Frequency:	Absolute Hz Stop
Stop Frequency:	Endless + Hz
Frequency Steps:	Endless - 1,2,3
Sinus Base Velocity:	Modulo shortest way [mm/s] Last Time: [s]
Feed Constant Motor:	Modulo plus direct. [mm/Rev] 0.89400
Raw Drive Output	Jog +
Output Mode:	+ 1 Start
Output Value:	+ 0.1 + 0.01 [%] Stop
Set Actual Position	+ 0.001
Absolute ~	- 0.1 Set
Set Target Position	- 0.01
Absolute ~	Reversing Sequence Set
	Velo Step Sequence
	Sinua Seguence (Pede)
	Sinds Sequence (bode)
1.0	Sinus Oscillation
neral Settings Paramete	er Dynamics Online Functions Coupling Compensation 54,9780 Setport Position: In 55,0780
neral Settings Paramete	er Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Position: In 5500 Setpoint Position: Setpoint Position: State
neral Settings Paramete Extended Start Start Mode:	er Dynamics Online Functions Coupling Compensation 54.9780 Sinus Sequence (Box ×
eral Settings Paramete Extended Start Start Mode: Start Frequency:	Sinus Sequence (Bor ∨ Start
Extended Start Start Mode: Start Frequency: Ston Frequency:	Comparison Contractions Provide Contractio
eral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency: Frequency:	Sinus Cacilitation Sinus Cacilitation Sinus Cacilitation Solution
Terral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency: Stops: Stops Rase Menotry:	Sinus Section er Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Position: Im Im 55.000 Sinus Sequence (Bor V Start Im Im 1m 0 Hz Im Im Im Im Im 1m <
heral Settings Parametr Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velocity: Feed Constant Motor:	Sinus Sectlation er Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Position: [m] 55.000 Sinus Sequence (Box V Stat 55.000 0 Hz 12.3 0 0 [mm/s] Last Time: [s] 0 [mm/s] Last Time: [s]
heral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velochy: Feed Constant Motor: Baw Drue On tort	Sinus Section arr Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Postion: [m] 0 Hz 0 Hz 0 [mm/8] 0 [mm/Rev] 0.8440
heral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velocty: Feed Constart Motor: Raw Drive Output Output Mode:	Sinus Sequence (Bor v) Stat 0 Hz Stop 0 Hz Stop 0 Hz Stop 0 Iz.3 Imm./Fey 0 Iz.3 Stop 0 Iz.3 Stop 0 Iz.3 Stat
neral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velocity: Feed Constant Motor: Raw Dirve Output Output Mode: Output Velue:	Sinus Calification er Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Position: In In 55.00 Sinus Sequence (Bor Start Stop 55.00 0 Hz Stop 12.3 0 12.3 0 Inm/Rev] 0.89400 Percent V Start Start 0 12.3 0 Inm/Rev] 0.89400
heral Settings Parameter Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velocity: Feed Constant Motor: Raw Drive Output Output Mode: Output Value: Set Actual Position	Envisor extration Envisor Socilitation Error Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Position: Im 55.00 Sinus Sequence (Bor ∨ 0 Hz Start 0 Hz Start 0 Hz Start 0 Inm/S Last Time: Is 0 Imm/Rev] 0.89400 Percent v 0 Ital Start 0 Ital
heral Settings Parametr Extended Start Start Mode: Start Frequency: Stop Frequency: Frequency Steps: Sinus Base Velocity: Feed Constant Motor: Raw Dive Output Output Mode: Output Value: Set Actual Position	Sinus Section ar Dynamics Online Functions Coupling Compensation 54.9780 Setpoint Postion: [m] 55.000 Sinus Sequence (Bor ∨ Stat 9 9 0 Hz Stop 9 0 Hz Stop 0 12.3 0 Imm/8 Last Time: [s] 0 [m] Stat 0 3400 Percent [14] Stop 0 3540 0 [14] Stop 0 35400

Select Sinus Sequence (Bode) in the drop-down menu Start Mode

- ► Enter values for the frequencies in the input fields *Start Frequency* and *Stop Frequency*
- Enter a value for the number of frequencies in the input field Frequency Steps
- Enter a value for the velocity in the input field Sinus Base Velocity
- Enter a value for the feed motor in the input field Feed Constant Motor
- Click on Start to start the function Sinus Sequence (Bode)

Stop



Stopping only during the procedure

The function can only be stopped during the movement to the target position. After moving to the target position, the button *Stop* is automatically disabled.

Click on Stop to stop the function Sinus Sequence (Bode)



7.9 Coupling movers

You have the option of coupling different NC axes with each other and moving several movers simultaneously.



Mover positions are retained

With the linear coupling of movers with a coupling factor of 1, the current positions of the movers to be coupled are used and the distance between the movers is maintained when the movers are moved.



Coupling example NC axis 2 with NC axis 1

The coupling of the movers is described using NC axis 2 with NC axis 1 as an example.

- ► Expand Solution Explorer > TwinCAT Project > MOTION > Axes
- Click on Mover Axis 2

Solution Explorer	▼ ₽ ×
© © ☆ 🔐 - To - @ 🔑 🗕	
Search Solution Explorer (Ctrl+ü)	<i>-</i> م
Image: Solution 'TwinCAT Project' (1 project) Image: Image Image: Image Image: Image Image: Image Image: Image Image: Image Image	
Mover Axis 2	
Mover Axis 3	
Mover Axis 5	
Mover Axis 6	
Mover Axis 7	
Mover Axis 8	
Mover Axis 9	
Mover Axis 10	
PLC A SAFETY	

The selected NC axis is not listed, as the NC axis cannot be coupled with itself.

- ▶ In the project window, click on the **Coupling** tab
- Select the axis in the drop-down menu Master Axis to which the axis is to be coupled

neral Settings Parame	eter Dynamics Online Functions	Coupling Compensation
	144.9881	Setpoint Pos.: m] 144.9896
Master/Slave Coupling		
Master Axis:	\sim	Couple
Coupling Mode:	Mover Axis 1 Mover Axis 2	Decouple
Coupling Factor:	Mover Axis 4	Change Factor
Parameter 2:	Mover Axis 5 Mover Axis 6	Stop
Parameter 3:	Mover Axis 7 Mover Axis 8	
Parameter 4:	Mover Axis 9 Mover Axis 10	
Table Id:	0	
Interpolation Type:	Linear \sim	
Slave Offset:	0	Absolute
Master Offset:	0	Absolute

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	145.00	084	Setpoint Pos.: m] 145.0012
Master/Slave Coupling			
Master Axis:	Mover Axis 1	\sim	Couple
Coupling Mode:	Linear	\sim	Decouple
Coupling Factor:	1	1	[mm/mm] Change Factor
Parameter 2:	0		Stop
Parameter 3:	0		
Parameter 4:	0		
Table Id:	0		
Interpolation Type:	Linear	\sim	
Slave Offset:	0		✓ Absolute
Master Offset:	0		Absolute

7.10 Decoupling movers

Solution Explorer 🔹 👎 🗙	Expand Solution Explorer > TwinCAT Project > MOTION > Axes
○ ○ ☆ ☆ - '⊙ - ♂ /> -	N Click on Mover Avia 2
Search Solution Explorer (Ctrl+ü)	
Solution 'TwinCAT Project' (1 project) Solution 'TwinCAT Project Solution 'TwinCAT Project Solution 'TwinCAT Project Solution 'TwinCAT Project Solution 'TwinCAT Project' (1 project) Solution 'TwinCAT	
General Settings Parameter Dynamics Online Functions Coupling Compensation	In the project window, click on the Coupling tab
145.0063 Setpoint Pos.: m]	Click on Decouple to decouple the NC axis
Master/Slave Coupling	The NC axis is decoupled and can be coupled with another NC axis
Coupling Mode: Linear V Decouple	or moved individually.
Coupling Factor: [mm/mm] Change Factor	,
Parameter 2: 0 Stop	
Parameter 4: 0	
Table Id:	
Interpolation Type:	
Slave Offset: 0 Absolute	
Plasoute	

8.1 XTS Tool Window

The XTS Tool Window is the user interface for all XTS-related components of your TwinCAT project. It is the main page to control all XTS systems of your running project. In the XTS Tool Window you will find helpful tools such as the XTS Configurator, the XTS Simulation Builder and the XTS System View.

8.1.1 Activation of the XTS Tool Window

After you have successfully installed *TF5850 TC3 XTS Extension* and opened a new project in *TwinCAT 3 XAE* (*TcXaeShell* or *VS 2013*), you must first activate the XTS Tool Window.



- ► In the menu TwinCAT click on the menu item XTS
- Click on XTS Tool Window in the submenu



Like all other dialog boxes, you can place the *XTS Tool Window* in the Visual Studio environment.



TF5850

8.1.2 Operating elements

	The list shows the most important controls:
TwinCAT Project9	Project selection drop-down menu Displays the selected project and lists the available projects.
C	Update Updates the contents of the selected project.
Ø	Open XTS Configurator Opens the XTS Configurator to configure the hardware.
Ø	Open XTS Simulation Builder Opens the XTS Simulation Builder to configure a simulated system.
Ç	Open XTS IO Timing Configurator Opens the XTS IO Timing Configurator for configuring the real-time and distributed clocks.
Configurator Theme 🔻	Theme drop-down menu Displays the selected theme and lists the available themes.
\$	Options Opens the dialog box <i>Options</i>
Σ	Zoom window width Scales the view to the window width.
Q	Zoom original size Scales the view to the preset original size.
Q	Custom zoom Scales the view to the custom size.
Parts	XTS Parts tab Lists all XTS Parts of the current configuration. Displays the properties of all XTS Parts.
Tracks	XTS Tracks tab Lists all XTS Tracks of the current configuration. Displays the properties of all XTS Tracks.
Movers	XTS Mover tab Lists all XTS Movers in the current configuration. Displays the properties of all XTS Mover.
Stations	XTS Stations tab Lists all XTS Stations of the current configuration. Displays the properties of all XTS Stations.

8.1.3 Information lists

The information lists of Parts, Tracks, Movers and Stations provide detailed information about the respective objects and their properties.

8.1.3.1 Information list Parts

Parts	XtsProcessing	Unit 1 🔻	Ŧ
	Name	Length	Module Side
Irac	Part 1	3000	Front
ធ			
z			
love			
SLS			
8			
tatic			
suc			
	4		
	Name	Position Index	Drive Id
	Module 1	0	0.0.0.0
	Module 2	1	0.0.0.0
	Module 3	2	0.0.0.0
	Module 4	3	0.0.0.0
	Module 5	4	0.0.0.0
	Module 6	5	0.0.0
	Module 7	6	0.0.0.0
	Module 8	7	0.0.0
	Module 9	8	0.0.0.0 🖵
	4		•

Click on the Parts tab to call up the information list Parts

The information list *Parts* displays all parts of the currently selected processing unit and provides information about the length, orientation and position in the coordinate system in the XTS View.

A processing unit can be selected using the filter in the upper area. The parts belonging to the processing unit are listed.

In the lower list all modules of a part are listed with the most important information. Selected modules are highlighted in the list and in the view.

8.1.3.2 Information list Tracks



▶ Click on the Tracks tab to call up the information list Tracks

A processing unit can be selected via the filter in the upper area. The information list *Tracks* shows all tracks of the currently selected processing unit.

Selected tracks are visualized in the view.

All parts of a track are listed in the lower list. In addition, important information of the part is displayed.

8.1.3.3 Information list Movers

Parts	XtsProcessing	JUnit 1 🔻	-
	Name	Axis	Sof
Irac	Mover 1	Mover Axis 1	SoftDrive
ធ	Mover 2	Mover Axis 2	SoftDrive
	Mover 3	Mover Axis 3	SoftDrive
5	Mover 4	Mover Axis 4	SoftDrive
/ers	Mover 5	Mover Axis 5	SoftDrive
	Mover 6	Mover Axis 6	SoftDrive
Sta	Mover 7	Mover Axis 7	SoftDrive
tio	Mover 8	Mover Axis 8	SoftDrive
ß	Mover 9	Mover Axis 9	SoftDrive
	Mover to	Mover Axis Tu	SOLDING
	4		►

► Click on the **Movers** tab to call up the information list *Movers*

The information list *Movers* shows all movers of the currently selected processing unit and provides information about the NC axes, the SoftDrive and the simulation settings.

A processing unit can be selected using the filter in the upper area. The movers belonging to the processing unit are listed.

Selected movers are highlighted in the list and in the view.

8.1.3.4 Information list Stations

2	Color	ID	Name	Start Po:
arts		1	Station 1	750
		2	Station 2	1750
Tracks		3	Station 3	0
Movers				
Stations				

► Click on the **Stations** tab to call up the information list *Stations*

The information list *Stations* shows all stations and their properties. The start position and the end position on the respective part as well as all stop positions are listed.

The stations are visualized in the view.

8.1.4 Open Options... dialog box

XT:	5 Tool Window				- T
	TwinCAT Project	• C 🕸 🖗 🖏	Tool Window Theme	• 🍄 🥖	
Parts					
Ī					

Numerous options are available for configuring the XTS View. The settings of the XTS View are stored in so-called themes. These themes can be edited and used by all windows that can display XTS Views.

► Click on the button **Options**...

The dialog box *Options* opens.

Further information can be found in chapter "Dialog box Options...", [Page 353].

8.2 XTS Simulation Builder

With the *XTS Simulation Builder* you can create virtual constructions of the XTS hardware in Sandbox style and generate I/O components for simulation in TwinCAT.

The creation and adjustment of a virtual XTS system is fully supported by the XTS View, so that you can operate the *XTS Simulation Builder* intuitively. In addition, many configuration options of the XTS software are supported so that you can make full use of the tool for planning and simulating new XTS systems.



Example configuration

In this example configuration, a closed XTS system with 180° clothoids and ten movers is set up, corresponding to the configuration of a 3 m XTS starter kit.

8.2.1 Open XTS Simulation Builder

 Activate the XTS Tool Window as described in the chapter "XTS Tool Window", [Page 224]



Click on the button Start the XTS Simulation Builder... in the XTS Tool Window

The XTS Simulation Builder opens.

When the *XTS Simulation Builder* is opened, the start page shows a welcome screen with information on the interactive usage options of the *XTS Simulation Builder*.

- ► If necessary, enlarge window for better operability
- If required, activate the checkbox Don't show this again to hide the welcome screen

You can reactivate the function at any time via the menu item *Options...*





Below the welcome screen is a list of templates from which you can select preconfigured XTS systems. You can easily change the templates with just a few parameters, for example to adjust the length of the system or the type of curve segments.

8.2.1.1 Controls

Start page

The list shows the most important controls:

Preview and edit Opens the page for previewing and editing the template.
Generate system Accepts the template as a system and opens the page <i>Builder</i> .
Open sidebar Opens the sidebar.
Close sidebar Closes the sidebar.
Button Go To Previous Sten



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đ

 \gg

 \ll

Button Go To Previous Step Opens the previous page.



Button Go To Next Step Opens the next page.

8.2.2 Open template



For a quick start, you can use one of the templates and adapt it to the desired size of the system if required.

► Click on the button **Oval Template**

The *Preview & Edit Template...* dialog box opens. The exact configuration of the system with the set parameters is displayed and can be adjusted and edited.

The small preview image shows the shape of the selected XTS system. The large display shows the exact system size and module arrangement for the set parameters.

- Select an XTS system in the drop-down menu
- Enter values for the exact system size in the input fields Length and Typical Feed-in Length
- Select the curve segment type of the modules in the drop-down menu Curve Type
- Click on the button Create System from template and go to next page. to continue

8.2.3 Simulate XTS system



The following pages describe how to set up an XTS system with the *XTS Simulation Builder* without using a template. The functions described are also available when using a template. The variant with template is therefore not described separately.

Oval Template					
	Length Typical Feed-in length	1000	mm	Ð	ക്
	Curve Type:	AT2050-0500	٣	~	\$
Rect Template					
⊢a –					
	Length, ac	1250	mm		
T.	Length, b: Typical Feed-in length:	750	mm	Ģ	đ
	Curve Type:	AT2040-0250	*		
L Template					
, ,					
	Length, a	1250	mm	۵	*
	cr Typical Feed-in length	1500	mm	190	ę

► Click on the button Go To Next Step to continue

OR

Click on the button >> to expand the sidebar

Further information on the sidebar can be found in chapter "Sidebar", [Page 254].



Navigation with buttons or the sidebar

The pages can be accessed using the buttons *Go To Previous Step* and *Go To Next Step* or using the sidebar. Both variants can be combined with each other at any time.



The individual steps are described using the variant with the buttons *Go To Next Step* as an example.



The page Configure opens.



Add modules

File Modules

File

Add Remove Module Module

X

File Modules	Parts	Movers	Tracks	Stations	Processing Unit	
Add Remove Module Module						•
			Cre	ate		

Tracks Stati

Mov

Processing Unit

cessing Uni

Double-click on AT2050-0500 to add the module to the XTS System View

OR

- Click on AT2050-0500 to select the module
- Click Add Module

The module is displayed in the XTS System View.

Double-click on AT2001-0250 to add the module to the XTS System View

OR

Click on AT2001-0250 to select the module



Click Add Module

The module is displayed in the XTS System View.

Double-click on AT2000-0250 to add the module to the XTS System View

OR

- ► Click on **AT2000-0250** to select the module
- ▶ Add three more modules AT2000-0250 in the same way
- The modules are displayed in the XTS System View.
- ► Add one module AT2050-0500 and AT2001-0250 and three modules AT2000-0250 in the same order





The system is closed and completed.

8.2.3.1.1 Check modules



► Click on a module

obtain further information.

The following information is displayed under Details:

- Gap
- · Length of the selected module

Selected modules are highlighted in the list and in the XTS System View.

You can click on the modules in the menu in the left-hand column to

8.2.3.2 Parts

File	Modules	Parts	Movers	Tracks	Static	ons Processin	g Unit				
+		X		w m		Module-Side:	Front	•	X-Offset:	0	
Add Part	Template	Remove Part	Split	Keep Position	Merge	Rotation:	0	•	Y-Offset:	0	Show Close Gap
	Create			Modify	,			Transfor	mation		Info

The *Parts* tab contains all settings and functions for creating and removing parts.

Parts can be selected by clicking on a single module, by clicking on several modules while holding down the Ctrl or Shift key or by clicking on all modules of a part while holding down the Alt key.

You can move parts in the coordinate system of the XTS view while pressing and holding the Alt key and the left mouse button. The X-coordinates and Y-coordinates are then automatically adjusted. Alternatively, you can move a part by changing the coordinates manually. With the function *Module-Side* you can choose between the front and rear view of the modules.

The list shows the most important controls:



Adds a part to the selected Processing Unit



Split

Module-Side: Front

X-Offset: 0

Rotation:

Add from template

Opens the dialog box *Add part from template...* for inserting a part from a template.

× Remove Part

Removes the selected part from the selected Processing Unit.

Split Part

Creates a separate part from the selected modules of a part.

Keep Position Keeps the position

Keeps the positions of the modules when splitting a part.

Merge Parts

Adds two selected parts to the first selected part.

Module-Side drop-down menu

Displays the selected module side and lists the available module sides.

Rotation drop-down menu Allows you to select a preset angle between -180° and 180° or enter

your own value. The reference point is the first module of a part.

X-Offset input field

Allows you to enter an offset for the reference point of the first module of a part on the X coordinate.

Controls

Y-Offset: 0

Y-Offset input field

Allows you to enter an offset for the reference point of the first module of a part on the Y coordinate.



•

Show Close Gap

Shows the distance from the starting point to the end point of a part with a line. The exact distance of the X-coordinate and Y-coordinate are displayed as a tooltip when the mouse pointer is moved over the displayed value. If the button Show Close Gap is activated, all distances are also shown in the status bar.

All added modules are automatically assigned to a part. If required,

In this example configuration, one part is sufficient. The following de-

Add Part



Show Close Gap

Click on the tab Parts

Example configuration

the system can be split into several parts.

scription is for explanatory purposes only.

Split the system into parts



Press and hold the button Ctrl to click on all modules that are to be added to a new part

Click on Split



Check parts

🔺 🔁 XtsP	rocessingUnit 1			
🔺 📥 F	Parts			
▲	Part 1			
	🔺 🚞 Modules			
	AT2050-0500			
	AT2001-0250			
	AT2000-0250			
	AT2000-0250			
	AT2000-0250			
	AT2050-0500			
	AT2001-0250			
	AT2000-0250			
	AT2000-0250			
	AT2000-0250			
	A Movers			
Tracks				
 Details 	100000000000000000000000000000000000000			
Front Side:	Front 🔻			
Length:	3000	mm		
X:	0	mm		
Y:	0	mm		
Alpha:	0	۰		

The selected modules are removed from Part 1. A new Part 2 is added with the selected modules.

You can click on the parts in the menu in the left-hand column to obtain further information.

Click on a part

The following information is displayed under *Details*:

- · Alignment in the coordinate system
- · Position in the coordinate system

Selected parts are highlighted in the list and in the XTS System View.

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Set properties

You can select for each part whether the front or the back of the XTS modules is to be shown and how the position and installation position are to be displayed. With these properties, every possible view of an XTS system can be tested or adapted to your existing XTS system.

Module side

Front	Back

- Details 4 Front Side: Front Back Length: mm Front X: mm Y: 0 mm Alpha: 0 • A Details Front Side: Front • 3000 Length: mm X: 0 mm Y: 0 mm Alpha: 0
- Select the module side in the drop-down menu *Front Side*

- Enter values for the position of the part in the input fields X and Y
- Enter the value for the installation position of the part in the Alpha input field

Example configuration

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In this example configuration, the part is positioned in the center of the XTS System View, the front is selected as the view, and the installation position is left at 0°.



Press and hold the left mouse button and the Alt key to move the part into the correct position

8.2.3.3 Movers

File	Modules	Parts	Movers	Tracks	Stations	Processing Unit
Add	Remove Mover	▶ 0		, c		
	Ν	lodify				Туре
					The tab placing c Movers several r ing all me	<i>Movers</i> contains all the functions for adding, removing, re- or changing movers. can be selected by selecting a single mover, by selecting movers while holding down the Ctrl or Shift key or by select- overs while holding down the Alt key.
Conti	ols					
					The list s	shows the most important controls:
				Add Mover	Adding Adds a n	movers nover.
				Remove Mover	Remove Removes	Mover s the selected mover(s).
					Input fie Allows ye	Id number of movers ou to enter the required number of movers.
					Apply n Applies t	umber he number from the input field.
				•	Mover s Displays mover ty	election drop-down menu the available mover types and allows you to select the pe.

Adding movers

You have the option of adding a single mover or several movers at the same time.

- Click on the tab Movers
- Expand the drop-down menu if required

Single movers



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Double-click on AT9011-0070, to add the mover to the XTS System View

OR

- Click on AT9011-0070 to select the mover
- Click on Add Mover
- ► Add more movers in the same way

Multiple movers

XTS Simulation Builder	
File Modules Parts Movers	Tracks Stations Processing Unit
+ × •	Standard
Add Remove Mover Mover Modify	
XtsProcessingUnit 1	Hygienic Design
File Modules Parts Movers	Tracks Stations Processing Unit
+ × ▶ □	
Add Remove Mover Mover	
Modify	Туре
File Modules Parts Movers	Tracks Stations Processing Unit
+ 🗙 🕨 10	
Add Remove	
Mover Mover Modify	Туре
	. Use ALT + Drea to
<u>a</u> a a	move a part of a mov

- Click on AT9011-0070 to select the mover
- Enter the number of movers in the input field Edit the Mover Count of the active Part
- Click on the button Apply to add the number of movers

The movers are added to the system.

Check movers

▲ StsProcessingUnit 1							
🔺 📥 Parts							
A 👬 Part 1							
Þ 🗂 I	Modules						
Movers							
Mover 1							
[A Mover 2						
[Mover 3						
[A Mover 4						
[A Mover 5						
[A Mover 6						
[A Mover 7						
[A Mover 8						
[Mover 9						
[A Mover 10						
🕨 🚞 Tracks							
 Details 							
Name	Mover 1						
Start-Up Position:	55						
Start-Up Part:	Part 1 🔹						

You can click on the movers in the menu in the left-hand column to obtain more detailed information.

Click on a Mover

The following information is displayed under *Details*:

- Name of the mover
- Start position of the mover
- · Part on which the mover starts

Selected movers are highlighted in the list and in the XTS System View.

8.2.3.4 Tracks	
File Modules Parts Movers Trace	cks Stations Processing Unit
	The tab <i>Tracks</i> contains all the functions for adding and removing tracks. You can select the tracks from the list. The parts and modules of the track are then marked with a green line.
Controls	The list shows the most important controls:
Add Empty	Add empty track Adds an empty track.
Remove Track	Remove Track Removes the selected track.
ित्वका Create from Parts	Create track Creates a track from the selected parts. The order of the parts within the track is defined by the order in which the parts are selected
Show Close Gap	Show Close Gap Shows the distance from the starting point to the end point of a part with a line. The exact distance of the X-coordinate and Y-coordinate are displayed as a tooltip when the mouse pointer is moved over the displayed value. If the button <i>Show Close Gap</i> is activated, all dis- tances are also shown in the status bar.
Add Track	
	All added parts are automatically assigned to a track. If required, a system with several parts can be split into several tracks.

► Click on the tab **Tracks**

ers Tracks Stations

Add

Processing Un

Split system into tracks



Example configuration

In this example configuration, one track is sufficient. The following description is for explanatory purposes only.



Check tracks

▲ 🔁 XtsProcessingUnit 1				
🕨 📥 Parts				
🔺 🚞 Tracks				
🔺 🔝 Track 1				
🚻 Part 1				
🔺 🔝 Track 2				
Part 2				
▲ Details				
Is closed:	×			
Is included in detection:	×			
Length:	3000	[mm]		

Set properties

Click on a track

The following information is displayed under Details:

- Length of the track
- Closed or open system

obtain more detailed information.

· included in mover detection or not

The selected track is displayed with a green line in the XTS System View.

You can click on the tracks in the menu in the left-hand column to

NOTICE

Avoid damage to the product and functional errors

Be sure to correctly specify whether you are configuring a closed XTS system or an XTS system with defined endpoints. If the specification is incorrect, the movers may leave the XTS system if the XTS system is open. In the case of a closed XTS system with incorrect specification, the movers cannot travel in a circle as usual.

Details		
Is closed:	×	
Is included in detection:	×	
Length:	3000	[mm]

Details		
Is closed:	×	
Is included in detection:	×	
Length:	3000	[mm]

Activate the checkbox is closed so that the movers can move around the start/end position of the track

OR

Deactivate the checkbox is closed

For systems without Track Management or systems with only one track, the checkbox *Is included in detection* must always be activated.

 Activate the checkbox Is included in detection so that all movers are detected by a module that belongs to the part of this track

OR

Deactivate the checkbox Is included in detection

8.2.3.5 Stations			
File Modules Par Add Remove Station Station Create	rts Movers ⁻	Tracks <mark>Stations</mark>	Processing Unit
		The <i>Stations</i> stations.	tab contains all the functions for adding and creating
Controls		The list shows	the meet important controls:
	s	Add Station Adds a statior	
	Re	Remove Part Removes the	selected station.
Add Station			
File Modules Parts Movers Tracks Stations Pri Add Remove Station Station	ocessing Unit	Click on the cl	e tab Stations
Add Station Create		► Click on A	dd Station
 ▲ StsProcessingUnit 1 ▶ ➡ Parts ▶ ➡ Tracks ▲ ➡ Info Server ➡ Station 1 		A station is ac	lded to the system.
Is Enabled:	× 0	Click on A add a part	dd Part over which the station should be drawn to to the station
Color:	▼ Chatica 1		
Description:	Station I		
' Start Position On First Part:	: 10 [m	ım]	
End Position On Last Part:	200 [m	ım]	
Parts			
+		Ŧ	
No parts have Press 'add' b	ve been added, yet. button to add a part.		



The station is displayed in color in the XTS System View.

Adding stop positions

▲ Details		000000000
Is Enabled:	×	
ID:	0	
Color:	•	
Name:	Station 1]
Description:		
Start Position On First Part:	10	[mm]
End Position On Last Part:	200	[mm]
Parts		
+		Ŧ
160 th 160	Part 1 (XtsPr 🔻	×
Stop Positions		
+		Ŧ
Stop Positions		******
+		Ŧ
→ 0	[mn	n] 🗙
2913		 One All + Dog to more a part is a more

• Click on Add stop position to add a stop position

▶ Enter a value for the stop position in the input field

The stop position is displayed as a diamond on the line of the station.

Check station

▲ 🔁 XtsProcessingUnit 1			
🕨 📥 Parts			
🕨 🚞 Tracks			
🔺 🛅 Info Server			
🔚 Station 1			
▲ Details			
Is Enabled:	×		
ID:	0		
Color:	•		
Name:	Station 1		
Description:			
Start Position On First Part:	10	[mm]	
End Position On Last Part:	200	[mm]	

You can click on the stations in the menu in the left-hand column to obtain further information.

Click on a station

The following information is displayed under Details:

- · Enabled or disabled
- ID of the station
- Color of the station
- Name of the station
- · Description of the station
- Start position
- End position

The properties of the selected station are displayed under the menu.

Set properties

Is Enabled:	×	
ID:	0	
Color:	•	
Name:	Station 1	
Description:		
Start Position On First Part:	10	[mm]
End Position On Last Part:	200	[mm]

 Activate the checkbox **Is enabled** to show the station OR

- Deactivate the checkbox is enabled to hide the station
- Enter a value in the input field ID
- ► Choose a color from the drop-down menu *Color*

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

- Enter a name for the station in the input field Name
- ► If required, enter a short description of the station in the *Description* input field
- ► Enter a value in the input field Start Position On First Part
- Enter a value in the input field End Position On Last Part



8.2.3.7 **Real-Time**



In the last step, the real-time settings for the XTS system can be made.

Controls

	The list shows the most important controls:
ц.	Load target CPU Loads a new target CPU and overwrites existing CPUs.
	Input field Number of CPUs Allows you to enter the number of CPUs required.
	Input field Number of isolated CPUs Allows you to enter the number of isolated CPUs.
	Apply number Applies the number from the input field.
AUX	AUX Task display Displays the configuration of the AUX task.
Î	Move CPU upwards Moves the selected task up one CPU.
Ļ	Move CPU downwards Moves the selected task down one CPU.
圃	Remove task Removes the selected task from the CPU.
Processing Unit System	Processing Unit and System button Switches between the Processing Unit and System.
+	Add Processing Unit or TwinCAT System Task Adds a Processing Unit or a TwinCAT System Task.
×	Remove Processing Unit Removes the selected Processing Unit.
>>>	Open sidebar

Opens the sidebar.



Close sidebar Closes the sidebar.



Button Go To Previous Step Opens the previous page.



Button Go To Next Step Opens the next page.

Real-time settings

You have the option of making settings for the available TwinCAT tasks and the Processing Units.



▶ Select a value in the drop-down menu Base Time of the CPU

The set value is adopted for the task connected to the CPU and the number of cycle ticks is adjusted accordingly. Further information can be found in chapter "Real-Time", [Page 305].

If all settings have been made correctly, you can go to *Generation Settings*.

Click on the button Go To Next Step to continue

8.2.3.8 Generation settings

Project Name: XtsProject Project Full Path: C\Users\Administator\Documents\XtsSolution\XtsProject.XtsProject.XtsProj Location: C\Users\Administator\Documents\XtsSolution\XtsProject.XtsProject.XtsProj Solution Name: XtsSolution Solution Name: XtsSolution Solution Nume: C\Users\Administrator\Documents\XtsSolution\Xt	TTS Simulation Builder				
Project Name: XtsProject Project Full Path: CAUsers/Administrator/Documents/XtsSolution/XtsProject/XtsPro	C Q				
Project Full Path: CLUsers/Administrator/Documents/KtsSolution/KtsProject/Kts	Project Name:		XtsProject		
Location: CAUSers/Administrator/Documents	Project Full Pa	th:	$\label{eq:c:Users} C: \label{eq:c:Users} Administrator \ Documents \ Xts Solution \ Xts Project \ Xts Project \ ts project \ Solution \ Solut$		
Solution Name: KtsSolution Solution Full Path: Cl-Users\Administrator\Documents\XtsSolution\XtsSolution.sln Append to Solution? Solution Directory? Solution Directory? Solution Soluti	Location:		C:\Users\Administrator\Documents		
Solution Full Path: CAUSersVAdministrator/Documents/VttsSolution/VttsSolution.sln Append to Solution? Solution Directory?	Solution Name	2:	XtsSolution		
Append to Solution?	Solution Full P	ath:	C:\Users\Administrator\Documents\XtsSolution\XtsSolution.sln		
Solution Directory?	Append to Sol	ution?			
XTS Simulation Builder Colorent Johnson Statings Project Full Pain Colorent Johnson Statings Project S	Solution Direc	tory?	X		
X5 Simulation Nutlet X5 Simulation Nu					
Colleart Mathinian Convertision Statinger	XTS Simulation	WTS Simulation Builder			
Solution Directory? Concention Settings	0				
Pojet Name Xubriget Pojet Fall Ciluen/Administrator/Document/Xubriget/Xu	Gen 🖓	Seneration Settings			
Projekt Full Path Oldern/Administrator/Document/Wahrger(XthProjekt)spm) Anight devolution specific	Project Name: XtsProject				
Location: CUBent/Administrator/Bocuments Popter Simultanov/Bocuments Popter Simultanov/Bocuments Statutor Name XiSolution Name	Project Full Path:	Full Path: C:\Users\Administrator\Documents\XtsProject\			
Soldon Name XbSoldion Soldon All Park: Collare Administrator/Documents/XtiProjet30210731_XtiProjet301 Append to Soldon A	Location	C\Users\Administrator\Documents Project directory already exists! It will be overwritten.			
Solution Full Park: ClUbers/Administrator/Documents/XttiProject/2021/0711_XtiProject.sin Append to Solution 1 ¥ Solution Directory?	Solution Name:	s XtsSolution			
Append to Solution? 14 Solution Directory?	Solution Full Path:	Full Path: C\Users\Administrator\Documents\XtsProject\20210731_XtsProject.sIn			
Solution Directory?	Append to Solution? 💌				
	Solution Directory?				

Finally, you can make general settings for I/O generation. For example, you can choose whether a new project or a new Solution should be created. You can also integrate the I/O objects into an existing project.

The generation settings of the *XTS Simulation Builder* help you to transfer the I/O configuration to an existing project or to generate a new TC3 XAE project and a solution in Visual Studio.

If a TC3 project is already open, the option *Modify TwinCAT Project* is available to add the I/O devices of the configured XTS system to the existing project.

There are several options that can be selected when creating the new project:

 Enter a name in the input fields *Project Name* and *Solution* Name

By default, the names *XtsProject* and *XtsSolution* are preset.

Project Full Path and *Solution Full Path* specify the exact path where the files are located after creation. These paths cannot be edited and are only used for a better overview.

Enter a file path in the input field *Location*

OR

- Click on ... to open the *Project Location* dialog box and select a file path
- ► Activate the checkbox Append to Solution? to create a Solution
- Activate the checkbox Solution Directory? to add the project to an existing Solution

If none of the options are selected, the project and the Solution are in the same directory.

If errors occur when creating the Solution or project with the specified settings, the input fields with incorrect entries are highlighted in red.

In this example, the Solution from the specified directory is to be appended. A warning appears as there is already a project and a Solution with the same name. If you continue with the creation, the existing files will be overwritten.

If all settings have been made correctly, you can create the Solution or project.

• Click on the button **Go To Next Step** to continue

8.2.3.9 Completing the configuration

On the next page, you will see that all the information has been entered and that the *XTS Simulation Builder* can generate the I/O objects.

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Click on the button Go To Next Step to continue

If the checkbox *Close automatically after finished* is deactivated, the page *Finished* is displayed.

Click on **x** to close the XTS Simulation Builder

The *XTS Simulation Builder* closes. The I/O objects are created and the project is ready for use.

8.2.3.10	Sidebar			
				The sidebar can be expanded on every page of the <i>XTS Simulation Builder</i> . The sidebar provides an overview of the pages of the <i>XTS Simulation Builder</i> and can be used to navigate between the pages.
Controls				
				The list shows the most important controls:
			>>>	Open sidebar Opens the sidebar.
			«	Close sidebar Closes the sidebar.
		Load Project	\checkmark	Project loaded Indicates that the project has been loaded. This button cannot be clicked.
		Welcome	N.S.	Start page Displays the start page of the <i>XTS Simulation Builder</i> .
		Configure Configure the desired XTS		Button Configure Opens the page Configure to configure the desired system.
		Real-Time Edit the real time configuration.		Button Real-Time Opens the page <i>Real-Time</i> to edit the real-time settings.
		Generation Settings Configure project name & target f	folder.	Button Generation Settings Opens the page Generation Settings to edit the generation settings.
		Summary		Button Summary
				Opens the page <i>Summary</i> . The checkbox <i>Close automatically after finished</i> can be activated or deactivated.
		Build Build the project.		Button Build Applies all settings and builds the configuration
				Closes the XTS Simulation Builder.
		Finished		Page Finished Indicates that all settings have been applied and the configuration is finished. This page is only displayed if the checkbox <i>Close automati-</i> <i>cally after finished</i> is deactivated.
		3		Display <i>Page open</i> Indicates that the page has been opened and exited with a button in the sidebar.
			\checkmark	Display <i>Page edited</i> Indicates that the page has been opened and exited with the button <i>Go To Next Step</i> .
Navigatio	n			

Instead of navigating with the buttons *Go To Next Step* and *Go To Previous Step*, you have the option of opening the sidebar and navigating between the individual pages of the *XTS Simulation Builder* using the buttons.

Stert Templats

Image: Stert Templats
<

🗭 🧟

Click on the button to open the sidebar

The sidebar opens. You can use the buttons to navigate between the pages of the *XTS Simulation Builder*:

• Click on a button to call up the corresponding page

Completing the configuration



- Click on the button **Build** to build the configuration
 OR
- Click on the button Go To Next Step to continue
 The configuration is built and the XTS Simulation Builder closes.

XTS Tools

8.2.4 File



The *File* tab contains all general settings for the *XTS Simulation Builder*, such as options and theme settings.

8.2.4.1 Controls

		The list shows the most important controls:
¢	Open options	Options Opens the dialog box <i>Options</i>
Ð	Import Construction	Import Construction Opens the dialog box <i>Import Construction</i> for importing an existing xml system construction.
đ	Export Construction	Export Construction Opens the dialog box <i>Export Construction</i> for exporting the current system construction as an xml file.
	Export Image	Export Image Opens the dialog box <i>Export Image</i> for exporting the system con- struction as a png file.
	Configurator Theme 🔻	Theme drop-down menu Displays the selected theme and lists the available themes.

8.2.4.2 Open Options... dialog box

File				
Open options	Active Theme:			
😓 Import Construction	Simulation Builder Theme			
Export Construction				
Export Image				

Click on the File tab

Click on **Open options**...

The dialog box *Options...* opens.

Further information can be found in chapter "Dialog box Options...", [Page 353].

8.2.4.3 Import system construction



- ► Click on the File tab
- Click on Import Construction...

The dialog box Import Construction ... opens.

- Select an xml file on the PC
- Click Open

8.2.4.4 Export system construction

File		
ф	Open options	Active Theme:
æ	Import Construction	Simulation Builder Theme 🔹
¢	Export Construction	
2	Export Image	

Click on the File tab

• Click on **Export Construction**...

The dialog box Export Construction ... opens.

- Enter a name in the input field *Filename*
- Select a file path on the PC
- Click Save

The current system construction is saved as an xml file on your PC.

8.2.4.5 Export Image

	File
Open options	Active Theme:
Import Construction	Simulation Builder Theme
Export Construction	
Export Image	
Export Image	□ ×
Select the view to export: Cur	rent View 🔻
Select the background color:	-
Ľ	Save As Close

- You have the option of exporting current views.
- Click on the File tab
- Click on Export Image...

The dialog box **Export Image...** opens.

Select Current View in the drop-down menu Select the view to export to save only one view of the system without borders

OR

- Select Full View in the drop-down menu Select the view to export to save the entire view
- ► If required, select a color for the background in the drop-down menu Select the background color

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

- Click on Copy to copy the view to the clipboard
- OR
- Click on Save As... to save the view as a png image and select the storage location

OR

Cancel with Close

8.3 XTS Configurator

The new user interface of the XTS software simplifies the work and handling of the ever larger and more sophisticated track layouts implemented with XTS. The simple pictorial structure makes a decisive contribution to fast commissioning and intuitive operation. A large number of XTS systems can be set up very easily, regardless of length, shape or variant. The new configurator replaces the XTS Manager, which was integrated in the XTS IO Driver object in the previous software version.

A main aim of the XTS software is to support the Track Management function. Using this function, you can split the XTS system into individual sections, which you then join together to form continuous tracks. This gives you the possibility to mechanically align individual sections in different ways and thus use the movers more flexibly on the XTS system.



Example presentation

This chapter shows the individual steps of the *XTS Configurator*. If there is a different procedure between a closed XTS system and an XTS system with Track Management, this is indicated in the text.

The individual steps of the *XTS Configurator* are shown as examples for the following two XTS systems:

Closed XTS system



A closed XTS system with 180° clothoids and ten movers, corresponding to the configuration of a 3 m XTS starter kit.

XTS system with Track Management



XTS Track Management with four parts and six movers.

The difference between these two configurations of an XTS system is that in a closed XTS system the order of modules and movers always remains constant. The movers thus have only one possible track on which they can move.

In an XTS system with Track Management, modules can change their position and align with other modules. Thus, the order of modules and movers can be changed, as new tracks can be formed. To be able to keep the overview of these functions, the parts and tracks have been introduced.

The part is the physical hardware component on which the mover travels, comparable to a road section for a car. The Track, on the other hand, is the actual path that the mover follows. The path is created by assembling the individual hardware components. In comparison with the car, a possible route with different roads is created. Further information can be found in chapter "Basic principles", [Page 26].

Parts and tracks are objects that can be created in the TwinCAT project using the *XTS Configurator*. A simple XTS system can be created with only one part and one track for all movers. More complex XTS systems can consist of several Parts that are joined together to form different tracks. This opens up completely new possibilities for handling XTS components.

8.3.1 Open XTS Configurator

Before you open the *XTS Configurator*, you must create a project, check your hardware, connect the system to the target PC and scan the I/O devices. Further information can be found in chapter "Commissioning", [Page 198].

- Activation of the XTS Tool Window
- Further information can be found in chapter "XTS Tool Window", [Page 224].
- ► Click on the button Start the XTS Configurator...





The XTS Configurator opens.

- ▶ If necessary, enlarge window for better operability
- Click on the button Go To Next Step to continue

OR

► Click on the button >> to expand the sidebar

Further information can be found in chapter "Sidebar", [Page 312].



Navigation with buttons or the sidebar

The pages can be accessed using the buttons *Go To Previous Step* and *Go To Next Step* or using the sidebar. Both variants can be combined with each other at any time.



The individual steps are described using the variant with the buttons *Go To Next Step* as an example.

8.3.2 System configuration

XTS Configurator		-		×
	Processing Units			
► ₩ ¢				
XtsProcessingUnit 1			×	÷
▲ General				
Operation Mode:	Normal •			
A Mover				
Mover Type:	AT9014_0055 -			
Magnet Plate Type:	AT9001_0550 -			
Mover Sort Order:	Ascending -			
Mover ID Detection				
ID Detection Mode:	Standard 👻			
Teaching				
Is Teaching Enabled:				
▲ Diagnostic				
Auto Dunna Militian				



8.3.2.1	Processing	Units
---------	------------	-------



Controls

On the first page of the *XTS Configurator*, the Processing Unit is created. To get an overview, it is possible to filter the objects of the Processing Unit.

Since software version 3.21.700, the Processing Unit has replaced the XTS IO Driver object.

The list shows the most important controls:



Add Processing Unit Adds a Processing Unit.



Naming Assistant Opens the dialog box *Rename*...

\$

Options Opens the dialog box *Options*...

X Remove Processing Unit Removes the selected Processing Unit.



Open sidebar Opens the sidebar.

Close sidebar
 Closes the sidebar.



Button Go To Previous Step Opens the previous page.



Button Go To Next Step Opens the next page.

Add Processing Unit

VTC Configuration		
x15 Configurator		
	Processing Units	
• 🛠 🌣		
XtsProcessingUnit 1		
4 General		
Operation Mode:	Normal 👻	
▲ Mover		
Mover Type:	AT9014_0055 -	
Magnet Plate Type:	AT9001_0550 -	
Mover Sort Order:	Ascending 👻	
A Mover ID Detection		
ID Detection Mode:	Standard -	
▲ Teaching		
Is Teaching Enabled:		
▲ Diagnostic		
Auto Dump Writing:		

- Click the button + to add another Processing Unit
- If necessary, click the button x to remove a selected Processing Unit



In this example configuration, one Processing Unit is sufficient. Multiple Processing Units are used when there is more than one independent system on the IPC or in the project. Independent means that none of the modules or movers are used by another XTS system.

The following settings must be made for the Processing Unit:

Operation Mode

General		
Operation Mode:	Normal	•
Mover	Normal	
Mover Type:	Simulation	
Magnet Plate Type:	AT9001_0550	•
Mover Sort Order:	Ascending	•
Mover ID Detection		
ID Detection Mode:	Standard	•

- Expand General
- Select Normal in the drop-down menu Operation Mode to specify that the system is in operation

OR

Select Simulation in the drop-down menu Operation Mode to specify that the system runs in simulation mode

XTS Tools

Mover

٢	XtsProcessingUnit 1	
⊳	General	
4	Mover	
	Mover Type:	AT9014_0055 •
	Magnet Plate Type:	UserSpecific
	Mover Sort Order	AT9011_0050
		AT9011_0070
4	Mover ID Detection	AT9012_0050
	ID Detection Mode:	AT9014_0055
4	Teaching	ATU0011_0075
	Is Teaching Enabled:	
ä	YtsProcessingUnit 1	
.	Ashocessingonici	
V	General	
4	Mover	
	Mover Type:	AT9014_0055 •
	Magnet Plate Type:	AT9001_0550 -
	Mover Sort Order:	AT9001_0550
		AT9001_0450
1	Mover ID Detection	AT9001_0AA0
	ID Detection Mode:	AT9001_0775
4	Teaching	ATH9001_0550
	Is Teaching Enabled:	
÷	XtsProcessingUnit 1	
Þ	General	
	Mover	
	Mover Type:	AT9014_0055 •
	Magnet Plate Type:	AT9001_0550 -
	Mover Sort Order:	Ascending 🔹
4	Mover ID Detection	Ascending
	ID Detection Mode:	Descending Standard
4	Teaching	

- Expand *Mover*
- Select the mover type in the drop-down menu Mover Type

 Select the magnetic plate set in the drop-down menu Magnet Plate Type

Select Ascending in the drop-down menu Mover Sort Order if the movers are to be counted in ascending order from the system zero point

ЭR

Select **Descending** in the drop-down menu *Mover Sort Order* if the movers are to be counted in descending order from the system zero point

Mover ID detection



- ► Expand *Mover ID Detection*
- Select the number of Movers 1 in the drop-down menu ID Detection Mode

264 -

Teaching



Note the revision number on the module

Teaching is only required for modules with a revision level less than or equal to 17. For more information, refer to the chapter "Name plate" in the *XTS Standard* original operating instructions.



Change teaching file number

Always change the number of the teaching file before commencing with a new teaching. The old file will be used and overwritten if the number of the teaching file is not changed or if the configuration is not loaded.

Beckhoff recommends using the current date for the number of the teaching file. For the first teaching on April 3rd, 2021, for example, the numbers 202104031 could be used and for the second teaching on the same day the numbers 202104032 and so on.

- Expand Teaching
 - Activate the checkbox Is Teaching Enabled to display the input field Teaching File Number

OR

- Deactivate the checkbox Is Teaching Enabled to hide the input field Teaching File Number
- Enter a number in the input field *Teaching File Number*

Further information can be found in chapter "Teaching functionality", [Page 115].

Diagnostic

XtsProcessingUnit 1

Mover ID Detection

Is Teaching Enabled:

Teaching File Number:

General

Teaching

Diagnostic

Mover

Þ

XtsProcessingUnit 1 General Mover Mover ID Detection Teaching Diagnostic Auto Dump Writing:

×

0

Evpond	Diagnostia
Expand	Diagnoslic

 Activate the checkbox Auto Dump Writing to activate the automatic writing of dump files

OR

Deactivate the checkbox Auto Dump Writing to switch off the automatic writing of dump files

If the *Auto Dump Writing* is activated, you can specify in which cases a dump file should be written.

Activate the checkboxes On Mover Detection Error, On Mover Lost, On Failing ID Detection, On Module Error and On Module Warning to write a dump file

OR

- Activate the checkboxes On Mover Detection Error, On Mover Lost, On Failing ID Detection, On Module Error and On Module Warning deto avoid writing dump files
- Click on the button Go To Next Step to continue

Ş	XtsProcessingUnit 1			
Þ	General			
Þ	Mover			
Þ	Mover ID Detection			
Þ	Teaching			
4	Diagnostic			
	Auto Dump Writing:	×	On Mover Detection Error:	×
			On Mover Lost:	×
			On Failing ID Detection:	×

XTS Tools

8.3.2.2	Parts		
			After you have created the Processing Unit and added a Task, the
			A closed XTS system usually consists of a single part. For an XTS
			system with Track Management, several parts are required.
c			
Controls			
			The list shows the most important controls:
			Filter Processing Unit Filters the list based on the selected Processing Unit.
		Vt-Dus se sein alleit 4	Processing Unit drop-down menu
		XtsProcessingUnit 1	Displays the selected Processing Unit and lists the available Pro- cessing Units.
			Add Part
			Adds a part to the selected Processing Unit.
			Remove Part
		×	Removes the selected part from the selected Processing Unit. The
			part remains in the list of available parts.
		₽¢	Naming Assistant
			Opens the dialog box <i>Rename</i> …
		ð	, Options
			Opens the dialog box <i>Options</i>
		Configurator Theme	Theme drop-down menu
		configurator meme	Displays the selected theme and lists the available themes.
			Button Parts and Modules
		Parts Modules	Switches between the display of parts and modules.
		_	
		2	Scales the view to the window width.
		Q	Zoom original size
			ocales the view to the preset original size.
		Q	Custom zoom
			Scales the view to the custom size.
		>>>>	Open sidebar
			Opens the sidebar.
			Close sidebar
			Closes the sidebar.



XTS Tools

Add Part



Filter

۲	XtsProcessingUnit 1	•	+×	^₀ 📓	

- ► In the drop-down menu *XTS Processing Unit* select the Processing Unit to which a Part is to be added
- Click + button to add a new part
- ▶ If required, click on the **x** button to remove a selected part

 Activate the Filter button to show only the parts of the selected Processing Unit

OR

 Deactivate the Filter button to show the Parts of the entire project

Parts Modul	es			
Part List				
Name	e	Module Side	Length [mm]	
Part 1		Front	3000	0
4				h
1				
Details: Page 1	art 1 👋			200000
Module Side:	Front		•	
Length:	3000			mm
X:	0			mr
Y:	0			mm
Alpha:	0			۰
• + × 1				

Part properties

► Click on a part in the **Part List** to display its properties

The properties of the selected part are displayed at *Details: Part 1*. The information can also be read out using the *XTS Utility* in the PLC.

Depending on whether you want to configure a closed XTS system or an XTS system with Track Management, the following steps differ from each other.

Closed XTS system

The following steps are required if you want to configure a closed XTS system.

Further information on the configuration of an XTS system with Track Management can be found in chapter "XTS system with Track Management", [Page 273].

Assigning devices

In the lower area of the detail display, you can select devices for your part. Select the order of the devices according to their occurrence in the XTS system.

Click on the button + to add a device

A Details: Part 1 Module Side: Front • 0 X: mm Y: 0 mm 0 Alpha: **+** × † ↓ Ŧ × Choose Devices for Part. 🛃 💻 🚥 Device 1 Device 3 OK Cancel

The dialog box Choose Devices for Part... opens.

You have the possibility to filter the devices or to add only single infeed lines or modules to the selected part. You can choose from the following filters:

- Select devices
- Select infeed lines
- Select individual modules

Select devices



- Click on the button Select devices to activate the filter
- Click on a device

OR

Press and hold the Ctrl key to select multiple devices in the appropriate order

Select infeed lines



- Click on the button Select infeed lines to activate the filter
- Click on an infeed line

OR

Press and hold the Ctrl key to select multiple infeed lines in the appropriate order

Select individual modules

OK



Cancel

- ► Click on the button Filter Module to activate the filter
- Click on a module

OR

- Press and hold the Ctrl key to select multiple modules in the appropriate order
- ► Confirm with **OK**

Checking devices



► Click the **Zoom to fit** button

The configured part is displayed and can be scaled to the appropriate format.

Check whether the correct devices have been selected in the appropriate order



Sorting devices

If the order is not correct:

Click on a device

► Use the arrow keys to move the device up or down

OR

- Click on the **x** button to remove a device
- Add more devices if needed

Set properties

Next you can set the properties of the parts. You can select for each part whether the front or the back of the modules is to be shown and how the position and installation position are to be displayed. With these properties, every possible view of your XTS system can be mapped and adapted to your existing XTS system.

Module side

Front	Back



The value for the length cannot be changed in the properties.

Parts Modul	es			
Part List				
Name	9	Module Side	Length [mm]	
Part 1		Front	2000	0
4		_		
•				•
A Details: Page 1	art 1 🜼			
Module Side:	Front		•	
Length:	2000			mm
X:	0			mm
Y:	0			mm

- Select module side in the drop-down menu *Module Side*
- Enter the position of the part in the input fields X and Y
- Enter the value for the installation position of the part in the Alpha input field



1

Example configuration

In this example configuration, the part is positioned in the center of the XTS System View, the front is selected as the view, and the installation position is left at 0° .

You can enter the values for the position of the part manually or move the part to the correct position by holding down **Alt** and pressing the left mouse button.

Click on the button Go To Next Step to continue

The following pages describe the steps required to configure the parts for an XTS system with Track Management. The further steps for a closed XTS system can be found in the chapter "Tracks", [Page 278].



XTS system with Track Management The following steps are required if you want to configure an XTS system with Track Management. Further information on the configuration of a closed XTS system can be found in chapter "Closed XTS system", [Page 269]. Assigning devices Select the order of the devices according to their occurrence in the XTS system. In this example configuration, four parts with one device each are required. Two of these parts consist of one movable module and two further parts consist of four modules each, which form a 1 m long, fixed module segment. Click on the button + to add a device A Details: Part 1 Module Side: Front • 0 X: mm Y: 0 mm Alpha: 0 • 🛨 🗙 🕇 🗜 Ŧ The dialog box Choose Devices for Part... opens. × Choose Devices for Part... 📆 💭 🚥 Device 1 Device 2 Device 3 Device 4

OK

Cancel

You have the possibility to filter the devices or to add only single infeed lines or modules to the selected part. You can choose from the following filters:

- Device
- Infeed line
- Module

Select devices



Click on the button Select devices to activate the filter

Click on a device

OR

Press and hold the Ctrl key to select multiple devices in the appropriate order

Select infeed lines



- Click on the button Select infeed lines to activate the filter
- Click on an infeed line
- OR
- Press and hold the Ctrl key to select multiple infeed lines in the appropriate order

Select individual modules



- Click on the button Select individual modules to activate the filter
- Click on a module

OR

Press and hold the Ctrl key to select multiple modules in the appropriate order

Confirm with OK

To configure the XTS system with Track Management, three more parts must be configured.

Checking devices



► Click the **Zoom to fit** button

The configured parts are displayed and can be scaled to the appropriate format.

- Check whether the correct devices have been selected in the appropriate order
- If necessary, press and hold the left mouse button and the Alt key to move parts into the correct position



Sorting devices

If the order is not correct:

- Click on a device
- ► Use the arrow keys to move the device up or down OR
- Click on the x button to remove a device
- Add more devices if needed

Set properties

Next you can set the properties of the parts. You can select for each part whether the front or the back of the modules is to be shown and how the position and installation position are to be displayed. With these properties, every possible view of your XTS system can be mapped and adapted to your existing XTS system.

Module side

Front	Back

The value for the length cannot be changed in the properties.

- Select module side in the drop-down menu Module Side
- Enter the position of the part in the input fields X and Y
- Enter the value for the installation position of the part in the Alpha input field

Parts Module	es			
Part List				
Name		Module Side	Length [mm]	
Part 1	F	ront	2000	0
4				
4				•
Details: Pa	art 1 accord			•
 Details: Pa Module Side: 	art 1 Front		•	• ••••••
 Details: Pa Module Side: Length: 	Front		•	• •••••••••] mm
 Details: Pa Module Side: Length: X: 	art 1 Front 2000 0) mm mm
 Details: Pa Module Side: Length: K: K: 	art 1 Front 2000 0 0) mm mm mm



Example configuration

In this example configuration, the parts are positioned in the center of the *XTS System View*, the front is selected as the view, and the installation position is left at 0° .



You can enter the values for the position of the parts manually or move the parts to the correct position by holding down **Alt** and pressing the left mouse button.

Click on the button Go To Next Step to continue

XTS Tools

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8.3.2.3	Tracks			
	elle a) minimimimimi	aninimimimimi BBB		The next step is to add Tracks. A closed XTS system usually consists of a single track that contains one or more parts. Several Tracks are required for an XTS system with Track Management so that the movers can switch between dif- ferent part combinations.
Controls				
				The list shows the most important controls:
				Filter Processing Unit Filters the list based on the selected Processing Unit.
		XtsProcessingUnit 1	•	Processing Unit drop-down menu Displays the selected Processing Unit and lists the available Pro- cessing Units.
			+	Add Track Adds a Track to the selected Processing Unit.
			×	Remove Track Removes the selected Track from the selected Processing Unit.
			Ŗ	Naming Assistant Opens the dialog box <i>Rename</i>
			¢	Options Opens the dialog box <i>Options</i>
		Configurator Theme	•	Theme drop-down menu Displays the selected theme and lists the available themes.
				Zoom window width Scales the view to the window width.
			Q	Zoom original size Scales the view to the preset original size.
			Q	Custom zoom Scales the view to the custom size.
			+	Add Part Adds a part to the selected Processing Unit.
			×	Remove Part Removes the selected part from the selected Processing Unit. The part remains in the list of available parts.
			«	Close sidebar Closes the sidebar.



Button Go To Previous Step

Opens the previous page.

|--|

Button Go To Next Step Opens the next page.

Add track



In the drop-down menu XTS Processing Unit select the Processing Unit to which a Track is to be added

- Click + button to add a new track
- ► If required, click on the **x** button to remove a selected track

Filter



 Activate the Filter button to show only the tracks of the selected Processing Unit

OR

 Deactivate the Filter button to show all tracks of the entire project

Track properties

Track List			
Name	Is closed	Is included	Length [
Track 1	×	×	3000
4			÷.
 Details: Track 1 			
ls closed:	×		
Is included in detection:	×		
Length:	2000		[mm]
Part Configurations			000000000000
+			÷
era. 🏴 era.	Part 1		×

• Click on a track in the Track List to display its properties

The properties of the selected track are displayed at *Details: Track 1*. The information can also be read out using the XTS Utility in the PLC.

Define parameters

For each track you need to set the three most important parameters:

NOTICE

Avoid damage to the product and functional errors

Be sure to correctly specify whether you are configuring a closed XTS system or an XTS system with defined endpoints. If the specification is incorrect, the movers may leave the XTS system if the XTS system is open. In the case of a closed XTS system with incorrect specification, the movers cannot travel in a circle as usual.

Details: Track 1		
Is closed:	×	
Is included in detection:	×	
Length:	3000	[mm]
Details: Irack 1		
Is closed:	×	
Is included in detection:	×	
Length:	3000	[mm]

- Activate the checkbox Is closed if the XTS system is closed OR
- ▶ Deactivate the checkbox Is closed if the XTS system is open
- Activate the checkbox Is included in detection if the XTS system is closed or only has one track

OR

Deactivate the checkbox Is included in detection if the XTS system is open or has multiple tracks

1

If the XTS system contains tracks that share parts, you must define which tracks perform the detection. It is important that each part within a Processing Unit only occurs once in the detection process, otherwise too many movers may be displayed and the startup of the XTS system may be prevented.

Add Parts

Track List

4

Is closed:

Length:

+

+

Name

Details: Track 1

Part Configurations

Part Configurations

Is included in detection:

Is closed

×

×

×

Part 1

Part 1

Is included...

×

Length |

[mm]

×

Select the order of the parts according to their appearance in the XTS system. Make sure that the parts form a continuous line on which the movers can move.

Click + button to add an XTS Part

In the drop-down menu XTS Part select the Part to be added to the current track

Closed XTS system



In this example configuration, the track contains only the previously configured part. Thus, the circular track of the XTS system automatically appears as a colored line.

A colored line appears outside the tracks assigned to the part. Using this line you can check if the selected track is valid and if the parts have been added in the correct order.

Click on the button Go To Next Step to continue

XTS system with Track Management



A green line appears outside the tracks assigned to the part. Using the green line you can check if the selected track is valid and if the parts have been added in the correct order.

In this example configuration there are ten possible and reasonable configuration variants of the tracks:

- each part as single track = 4 tracks
- both movable modules are positioned next to the upper or lower part = 2 tracks
- only one of the movable modules is next to the lower and next to the upper part = 4 tracks

The more parts there are in the XTS system, the more possibilities there are to connect them mechanically to form tracks. However, it often does not make sense to configure as many tracks as possible. Each part must be assigned to a track so that the mover detection can be carried out. Additional tracks can be created on the XTS system depending on the required movements of the movers.

In this example configuration, none of the tracks has a closed track, so the checkbox *Is Closed* is not set for any of the configured tracks.

Since there are some tracks that share individual parts, the checkbox *Is included in detection* cannot be activated for every track. The checkbox must be activated for the tracks that match the current hardware configuration at the time of mover detection.



If both moving parts are next to the upper part, there are two tracks in the current configuration.

- Track 5 consists of Part 1, Part 2 and Part 3
- Track 4 consists of Part 4

For these two tracks, the checkbox *Is included in detection* is activated to ensure that the correct number of movers is detected on the XTS system. The checkbox is not activated for all other tracks.

If there are changes to the hardware configuration up to the time of commissioning, you can redefine the parameter *Is included in detection* via the PLC. If necessary, this change should be made during commissioning of the XTS system.

Often it is sufficient to include the track in the detection process. However, this only works if there is no mover on the transition between two parts, otherwise too many movers will be detected by the XTS system.

Click on the button Go To Next Step to continue

.

8.3.2.4 Stations

i	The <i>Stations</i> function is currently still in beta phase. In the future, even more functions and information will be available and the current interface may also change.
	The Stations are very useful to visualize the XTS system and related applications. A Station provides information about where individual processes take place within the XTS system to illustrate the struc- ture of the entire application.
Controls	
	The list shows the most important controls:
+	Add Station Adds a station.
×	Remove Part Removes the selected station.
₽¢	Naming Assistant Opens the dialog box <i>Rename</i>
•	Options Opens the dialog box <i>Options</i>
Configurator Theme 🔻	Theme drop-down menu Displays the selected theme and lists the available themes.
\mathfrak{Q}	Zoom window width Scales the view to the window width.
Q	Zoom original size Scales the view to the preset original size.
Q	Custom zoom Scales the view to the custom size.
*	Add Part Adds a part to the selected station.
Part 1 (XtsProcess 🔹	Part selection drop-down menu Displays the selected part and lists the available parts.
×	Remove Part Removes the selected part from the station. The part remains in the list of available parts. This button is only visible if a part has been added to the station.
+	Add stop position Adds a stop position to the selected station.



Station properties

Color	D Statio	Name on 1	Start P 10	ositior
∢				•
Details: Stat	ion 1		00000000000000	55555555
Is Enabled:		×		
ID:				
Color:			•	
Name:		Station 1		
Description:				
Start Position (On First Part:	10		[mm]
End Desition ()	n Last Part:	300		[mm]

► Click on a station in the **Station List** to display its properties The properties of the selected station are displayed at *Details: Station 1*. The information can also be read out using the XTS Utility in the PLC.

Color	ID	Name	Start P	osition
	Static	on 1	10	
4				•
Details:	Station 1			
Is Enabled:		×		
ID:				
Color:			•	
Name:		Station 1		
Description	1:			
Start Positio	on On First Part:	10		[mm]
End Positio	n On Last Part:	300		[mm]
arts				

 Activate the checkbox Is Enabled to show the station in the XTS View

OR

- Deactivate the checkbox Is Enabled to hide the station in the XTS View
- Enter a value in the input field *ID*
- ► Choose a color from the drop-down menu *Color*

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

- ▶ Enter a name for the station in the input field Name
- ► If required, enter a short description of the station in the *Description* input field

Start position and end position

A start position and an end position must be defined for each station. It makes a difference whether you have created a single part or multiple parts in your XTS system.

A single part

The following specifications must be observed for a single part:

- The value in the input field *End Position On Last Part* must be greater than the value in the input field *Start Position On First Part*
- The entered value in the input field *End Position On Last Part* can only be smaller than the entered value in the input field *Start Position On First Part*, if the part is added a second time to the *Parts*



Symbol	Explanation
-	Start position of the station, <i>Start Position On First Part</i>
•	End position of the station, <i>End Position On Last</i> <i>Part</i>

Multiple parts

The following specifications must be observed for multiple parts:

- The start position is on the first part and the end position on the last part of the selected list
- The order of the parts must be selected according to their appearance in the XTS system. The parts must form a continuous line on which the movers can move

Further information can be found in chapter "Add Part", [Page 288].



Symbol	Explanation
•	Start position of the station, <i>Start Position On First</i> <i>Part</i>
•	End position of the station, <i>End Position On Last</i> <i>Part</i>

- Enter a value in the input field Start Position On First Part
- ► Enter a value in the input field End Position On Last Part

Color	ID	Name	Start	Position
	Static	on 1	10	
4)
Details	Station 1			
Is Enabled	k -	×		
ID:				
Color:			•	
Name:		Station 1		
Descriptio	in:			
Start Position On First Part:		10		[mm
End Position On Last Part:		300		[mm
arts				

Add Part

The stations have precisely defined start positions and end positions. The start position is on the first part and the end position on the last part of the selected list. For all other parts of the list, the station stretches over the full length.



Select the order of the parts according to their appearance in the XTS system. Make sure that the parts form a continuous line on which the movers can move.

Closed XTS system

Start Position On First Part: 10

End Position On Last Part: 300

Parts

+

Parts



[mm]

[mm]

- X

In this example configuration, the station only contains the previously configured part. For example, a simple station is created.

- Click on the + button to add a part
- ▶ If required, click on the **x** button to remove a selected part
- ► Select a part in the drop-down menu
- Add and select additional parts as needed



Part 1 (XtsProcessi

The station is displayed as a line outside the track. If the line is not displayed or the line is not continuous, check the entries of the start positions and end positions as well as the order of the parts.

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XTS system with Track Management



In this example configuration, a simple feeder station is created on the previously configured Part 3.

- Click on the + button to add a part
- ▶ If required, click on the **x** button to remove a selected part
- Select a part in the drop-down menu
- Add and select additional parts as needed

The station is displayed as a line outside the track. If the line is not displayed or the line is not continuous, check the entries of the start positions and end positions as well as the order of the parts.

		1
Start Position On First Part:	10	[mm]
End Position On Last Part:	300	[mm]
Parts		
+		-
Parts		
+		Ŧ
815. BIS.	Part 3 (XtsProcessi 🔻	×
	Part 1 (XtsProcessingUni	t 1)
0 D11	Part 2 (XtsProcessingUni	t 1)
Stop Positions	Part 3 (XtsProcessingUni	t 1)
Station 1		
		_
<u>Pep</u>		minimininini
	n nin nin nin nin nin nin nin nin nin n	•
16-p		

Adding stop positions

After all parts for the station have been added and selected, stop positions for the movers can be defined.

Stop position within the station

ĺ

A new stop position is always automatically located at the start of the station with the position 0 mm. When entering the position, make sure that you move the position from the start of the station and that the value is within the defined length of the station.

Example of a stop position



While the station shown has a start position of 300 mm and an end position of 1200 mm on the part, these values do not apply to the stop position. Only values between 0 mm and 900 mm can be assigned for the stop positions, which corresponds to the length of the station. In this example, an entered value of 300 mm for the stop position corresponds to a position of 600 mm on the part.

- Click on the + button to add a stop position
- Enter a value for the stop position in the input field

The stop position is displayed as a diamond on the line of the station.

► Click on the button Go To Next Step to continue



8.3.2.5	Movers			
				In this step, the movers for the XTS system are added. Each mover is connected to an NC axis and communicates with the NC via its SoftDrive object. Each XTS system requires at least one mover.
Controls				
				The list shows the most important controls:
				Filter Processing Unit Filters the list based on the selected Processing Unit.
			+	Adding movers Adds a mover to the selected Processing Unit.
				Input field number of movers
				Allows you to enter the required number of movers.
			P	Keep mover Deactivates excess movers if the number of movers entered in the input field is less than the existing number of movers.
				Apply number Applies the number from the input field.
			•	Display Mover activated Indicates that the mover is activated in the project.
			•	Display Mover deactivated Indicates that the mover is deactivated in the project.
			×	Remove Mover Removes the selected mover.
				Export parameter set Opens the dialog box Export Parameter Set…
			-	Import parameter set Opens the dialog box Import Parameter Set…
			Q	Reset parameter set Resets the parameter sets of all movers to the default settings.
			×	Activation of the copy template of the parameter sets Activates or deactivates the parameter set copy template.
		A1, A1. B1		Parameter set copy template input field
				Allows you to enter the copy template of the parameter sets that are to be applied to the movers of the selected Processing Unit.
				Display of the parameter set copy template Displays the copy templates of the parameter sets.

₿¢	Naming Assistant Opens the dialog box <i>Rename…</i>
\$	Options Opens the dialog box <i>Options</i>
Configurator Theme 🔻	Theme drop-down menu Displays the selected theme and lists the available themes.
Σ	Zoom window width Scales the view to the window width.
Q	Zoom original size Scales the view to the preset original size.
Q	Custom zoom Scales the view to the custom size.
>>>	Open sidebar Opens the sidebar.
*	Close sidebar Closes the sidebar.
	Button Go To Previous Step Opens the previous page.
	Button Go To Next Step Opens the next page.



XTS Tools

Individual movers

XtsProcessi	ngUnit 1	• 🕂 O	₽.►
 General Setting 	IS		
Mover Type:	AT9011	_0070	•
MagnetPlate Type:	AT9001	_0550	•

Click on the + button to add a new mover

Multiple movers

XtsProcessi	ngUnit 1 🔻 🕇 10	19 🕨
 General Setting 	s	· · · · · · · · · · · · · · · · · · ·
Mover Type:	AT9011_0070	•
MagnetPlate Type:	AT9001_0550	

- Enter the number of movers required in the input field Number of Movers
- Click on the Apply button to add the number of movers

The distance from the center of the mover to the center of the mover is 80 mm.

Remove Mover

You have the possibility to remove a single mover or several movers at the same time. When removing multiple movers, you have two options.

Single movers

G	eneral Setting	s	
ove	r Туре:	AT9011_0070	
lagn	etPlate Type:	AT9001_0550	
N	lover List		
•	Name	Axis	
•	Name Mover 1	Axis Mover Axis 1	SoftD
•) () ()	Name Mover 1 Mover 2	e Axis Mover Axis 1 Mover Axis 2	SoftD SoftD

- ► In the Mover List, click on a mover that is to be removed
- Click on the x button to remove the selected mover

Multiple selected movers



- Press and hold the Ctrl key to select multiple movers in the Mover List
- Click on the x button to remove the selected movers

Any several movers

	XtsProcessingUnit 1	+ 10	
٦	XtsProcessingUnit 1	- + s	
0	Mover 1	Mover Axis 1	SoftDrive
0	Mover 2	Mover Axis 2	SoftDrive
0	Mover 3	Mover Axis 3	SoftDrive
0	Mover 4	Mover Axis 4	SoftDrive
0	Mover 5	Mover Axis 5	SoftDrive
0	Mover 6	Mover Axis 6	SoftDrive
0	Mourer 7	Mour Avie 7	Co#Drive

- ► Deactivate the button Keep existing Movers on Apply
- Enter the number of movers required in the input field Number of Movers
- Click on the Apply button

	XtsProcessingUnit 1	• + 5	n 🕨 🗙
0	Mover 1	Mover Axis 1	SoftDrive 🔺
0	Mover 2	Mover Axis 2	SoftDrive
0	Mover 3	Mover Axis 3	SoftDrive
0	Mover 4	Mover Axis 4	SoftDrive
0	Mover 5	Mover Axis 5	SoftDrive

At the end of the *Mover List*, as many movers are deleted until the number of movers corresponds to the value in the input field *Number of Movers*.

_

Disabling movers

You can disable single movers or several movers at the same time. By disabling them, the movers and their properties are preserved and do not need to be recreated later.

Single movers



Click on the button Enable/Disable State of a mover to disable the mover

If required, click on the button Enable/Disable State of a mover to enable the mover again

If the *Keep existing Movers on Apply* button is enabled, the movers will not be removed, but disabled.

- XtsProcessingUnit 1 - + 10 × XtsProcessingUnit 1 - + s × Mover 1 Mover Axis 1 SoftDrive 0 Mover Axis 2 Mover 2 SoftDrive Mover 3 Mover Axis 3 SoftDrive Mover 4 Mover Axis 4 SoftDrive Mover Axis 5 Mover 5 SoftDrive Mover 6 Mover Axis 6 SoftDrive A Maure 7 Maure Auie 7 C-4D XtsProcessingUnit 1 - + 5 × 8 Mover 1 Mover Axis 1 SoftDrive . Mover 2 Mover Axis 2 SoftDrive Mover 3 Mover Axis 3 SoftDrive Mover 4 Mover Axis 4 SoftDrive Mover 5 Mover Axis 5 SoftDrive Mover Axis 6 SoftDriv Mover 6
- Activate the button Keep existing Movers on Apply
 - Enter the number of movers required in the input field Number of Movers
 - Click on the Apply button

At the end of the *Mover List*, as many movers are disabled until the number of movers corresponds to the value in the input field *Number of Movers*.

Mover properties



part of the selected Processing Unit. The movers can be selected to display their properties. You can give each mover, NC axis and SoftDrive object its own

In this example configuration, we add a total of ten movers to the XTS system. These movers are automatically lined up on the first

name. If no name is assigned, the movers are numbered in sequence. When adding or removing movers, note that this may change the naming order.

► If required, enter a name in the input fields *Name*, *Axis Name* and *SoftDrive Name*

Simulation settings

Simulated Start-Up Settings:

Simulated Start-Up Settings:

Part 1 Part 1

Part 1

60

Part:

ID:

Part:

ID:

Position:

Position:

To test the behavior of the movers virtually, you can create a simulation. There are three possible settings for the movers in this simulation:

· Selection of a part

mm

mm

•

- · Determination of a precise position
- Using a mover as Mover 1
- ► In the drop-down menu *Part* select a part on which the mover is to start
- Enter a value for the exact position of the mover on the part at *Position*

If the *MoverIdDetection* is activated, the value in the input field ID defines whether the XTS Mover is created as Mover 1. Otherwise the input field ID remains without an entry.

Simulated Sta	art-Up Settings:	
Part:	Part 1 🔹	
Position:	60	mm
ID:		

- ► Enter a mover ID in the input field *ID*
- Make sure that the number of IDs defined matches the settings of the *Parameters (Init)* tab under the Processing Unit object.

Parameter Sets

By creating and reusing Parameter Sets, you can transfer special properties, such as the controller settings for a specific mover loading, from one mover to another. Furthermore, you have the possibility to use different standard Parameter Sets for different movers.

By default, new movers receive the Parameter Set that corresponds to the specified mover type. However, you have the option to assign an empty Parameter Set to each mover.

Movers that have already been created do not have a Parameter Set and will not be changed when the Configurator is run unless they are assigned a different Parameter Set.

The Parameter Sets are defined for movers without load. If you use the movers with a load, the Parameter Sets must be adjusted. If you have any questions, please contact the product specialist responsible for your region.



Selecting a Parameter Set

Creating a Source Set

Source Set	Parameter Set	Sin
	•	Part 1
	-	Part 1
	-	Part 1
	•	Part 1
		Part 1

 Select a Parameter Set from the drop-down menu Parameter Set

Click on the button Source Set of a mover

A Source Set is added. The first Source Set is named A1. If there are already several Source Sets, continue with the next letter of the alphabet. For example, if there are already three Source Sets, the next Source Set will be named D1.

Selecting a Source Set



Activate the button Enable or disable Parameter Copy Pattern to enable the input field Edit the Parameter Copy Pattern

The Source Set can be selected manually for each mover.

Transfer source set

You can transfer Source Sets to single or multiple movers. You can select a Source Set for each single mover or define one or more Source Sets using the *Parameter Copy Pattern* function. If different Source Sets are selected, this order is transferred to all movers of the selected Processing Unit.

You can select Source Sets from the drop-down menu Parameter Sets and transfer them to other movers.

To a single mover



 Select a Parameter Set from the drop-down menu Parameter Set

To multiple movers



Click on Enable or disable Parameter Copy Pattern to enable the input field for the Source Sets

Use existing Source Sets

If Source Sets have already been created, you can now enter them in the input field in the desired order. Source Sets can also be used several times.

► The sequence of the new Source Sets is adopted in the input field *Edit the Parameter Copy Pattern*.

The entered Source Sets are transferred to the movers one after the other.



Using new Source Sets

If no Source Sets have been created yet and *Parameter Copy Pattern* is enabled, the new Source Sets will be applied in the order in which you select them.

	Sim
•	Part 1
Ŧ	Part 1
	Part 1
	Part 1
-	Part 1
×	Part 1
	• • • • • • • • • • • • • • • • • • •

Click on the button Source Set of a mover

XTS Tools



Exporting Source Sets



Source Sets can be exported and imported as well as saved on your computer. This way you get a better overview of the different mover settings.

► Click on the button Export a Parameter Set ...

The dialog box Export Parameter Set ... opens.

 Select a Source Set for the export in the drop-down menu Choose Parameter Set

By default, the name of the selected Source Set of a mover type is copied to the input fields *Name* and *Comment*. For Source Sets that are self-added, the name of the mover that provides the basis for the Source Set is inserted.

Choose Parameter Set:	@UserSpecific	•	
Date Created:	2/1/2022 5:28:00 PM		
Name:	UserSpecific]
Comment:			

- Enter a name for the Source Set in the input field Name
- If required, enter a comment in the input field Comment
- Confirm with Export As... to start the export

Importing	a Sou	rce Set
-----------	-------	---------

⇒ 🤄 Qr 🐁		AC M	Click on the button Import a Parameter Set …
Import Parameter Set	c	×	The dialog box Import Parameter Set opens.
Select file to open:			 Click the button to open the dialog box Open a Parameter Set
Name Comment:			In the dialog box Open a Parameter Set select a correspond- ing file on the computer
Impor	Cancel		
mport Parameter Set	Ē	×	By default, the name of the selected Source Set of a mover type is copied to the input fields <i>Name</i> and <i>Comment</i> .
Date Created: 3/1	" 18/2022 1:12:27 PM		Confirm with Import to start the import
Name Mo	over 3 - Parameter Set		Imported Source Sets are added to the end of the <i>Parameter Set</i> list and marked with @I and a consecutive number.
Exported from Mover 3	3		
Impor	rt Cancel		
Mover List		000000000	The Source Set is added to the list of Parameter Sets and can be
Source Set	Parameter Set	Sim 📤	
	■ B1 ▼ F	Part 1	
E	-	Part 1	
100	@UserSpecific	Part 1	
	@AT9011_0050		
	@AT9011_0070	Part 1	
	@AT9012_0050	Part 1	
	@AT9014_0055	Dart 1	
	@AT9014_0070		
	🔲 @D	art 1	
	A1	Part 1	
	B1		

Resetting a Source Set

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	∢ 🕨

C1

You can reset all movers to the *default Parameter Set* at the same time.

- ► Go to and click the button **Reset to Defaults**
- Click on the button Go To Next Step to continue

8.3.2.6 Real-Time

Controls

	The last step is to make the real-time settings for the XTS system.
	The list shows the most important controls:
	Load target CPU Loads a new target CPU and overwrites existing CPUs.
	Input field Number of CPUs Allows you to enter the number of CPUs required.
	Input field Number of isolated CPUs Allows you to enter the number of isolated CPUs.
	Apply number Applies the number from the input field.
AUX	AUX Task display Displays the configuration of the AUX task.
Î	Move CPU upwards Moves the selected task up one CPU.
ţ	Move CPU downwards Moves the selected task down one CPU.
圃	Remove task Removes the selected task from the CPU.
Processing Unit System	Processing Unit and System button Switches between the Processing Unit and System.
+	Add Processing Unit or TwinCAT System Task Adds a Processing Unit or a TwinCAT System Task.
×	Remove Processing Unit Removes the selected Processing Unit.
>>>	Open sidebar Opens the sidebar.
*	Close sidebar Closes the sidebar.
	Button Go To Previous Step Opens the previous page.



Button Go To Next Step Opens the next page.

Real-time settings

You have the option of making settings for the available TwinCAT tasks and the Processing Units.

▶ Select a value in the drop-down menu Base Time of the CPU

The set value is adopted for the task connected to the CPU. The number of Cycle Ticks is adjusted accordingly.

1 m:

Scan available cores

XTS Configurator

If you are using a real XTS system with a corresponding IPC, the available cores of the IPC must be scanned. The cores can also be isolated after scanning.

▶ Click on the button Read target CPU to scan the available cores

The dialog box Info opens.

Confirm with Yes

The number of available cores is displayed in the left-hand field after scanning.

The number of isolated cores that are fully used for TwinCAT is displayed in the right-hand field.

Further information on isolating cores can be found in chapter "Isolating cores", [Page 311].





Enable cores for TwinCAT

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Real-Time

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CPU 0

CPU 3

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XTS Task 1

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4 DNC-Task 1

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8 💼 🏌 🖡 NC-Task 1 SVB

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Example IPC with 4 cores

The procedure for distributing the tasks to the cores is shown as an example for an IPC with 4 cores.

Click on the button + of Available TwinCAT Tasks to call up the overview of available cores and tasks

The dialog box Add TwinCAT Task opens.

The available cores and tasks are listed in the overview. The isolated cores are identified by a colored marking of the respective line.

It I I CPU 0 10 CPU × 250 µs 🔹

Ok

Ok

Each task may only run on one core and must be set to 250 µs.

- ► Activate the checkbox of the core CPU 3
- Ensure that the Base Time is set to 250 μs
- ▶ If required, select 250 µs in the drop-down menu Base Time
- Click on the arrow buttons Mover task CPU up and Mover task CPU down to move the XTS Task 1 to the core CPU 3

XTS Tools



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Real-Time	-	D	×
10 4 3 F AUX			
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091 1 000stat 1 1 1 1 1 1 1 1			
092 10 1 40 1 <td></td> <td></td> <td></td>			
+			
ImProcessingUnit 1			
011 28 m * 1 1 28 m * 1 1 1 1 1 28 m * 1 1 1 1 1 1 28 m * 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	>	ĸ	
+			
»		•	

The settings are displayed in the *XTS Configurator* and XTS Task 1 is added to XtsProcessingUnit 1.

Alternative view

You have the option of displaying the distribution of cores and tasks in an alternative view. This view corresponds to the display of the cores and tasks in the dialog box *Add TwinCAT Task*.



• Click on the **System** tab to display the alternative view

Add more cores



- If you need more cores for your configuration, you can add them to XtsProcessingUnit 1.
- Click on the button + of XtsProcessingUnit 1 to add further cores

AUX Task for the Leave and Arrive functionality

An AUX Task under XtsProcessingUnit 1 is required for the *Leave and Arrive* functionality.

Conjunt C	 Click on the button AUX to add an XTS Aux Task to XtsProcessingUnit 1 Click on the button + of XTS Aux Task to add a task
Assign Aux-Task to XtsProcessingUnit 1	The dialog box Assign Aux-Task to XTSProcessingUnit 1 opens.
	 Activate the checkbox of a task to select it
CPU 1 📴 🔲	► Confirm with OK
1 ms 1 ms	The selected task is added to the XTS Aux Task.
CPU 2 1 ms 1 ms	
Ok Cancel	
The Configuration	Ensure that the Base Time is set to 250 μs
	► If required, select 250 µs in the drop-down menu <i>Base Time</i>
+	Make sure that the Cycle Ticks of the I/O Idle Task of the XIS Aux Task are set to 1
• Rohumangkut 1 • Ish 1 + 2 • Ish 1	If required, enter 1 in the input field Cycle Ticks
>> < >	 Click on the button Go To Next Step to continue

Isolating cores

Solution Explorer

○ ○ 🏠 · 🔂 · 🗇 🏓 🗕

Search Solution Explorer (Ctrl+ü) Solution 'TwinCAT Project' (1 project)

> Routes Type System TcCOM Objects MOTION

Settings Online Priorities C++ Debugger

Settings Online Priorities C++ Debugger

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RT-Core

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32 / 31 Available cores (Shared/Isolated):

RT-Core

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ted):

Global Task Config

ilobal Task Config

Maximal Stack Size [KB] 64KB ~

Base Time 1 m:

Maximal Stack Size [KB] 64KB <>

Base Time

1 ms

Read from Target Set on target

from Target Set on target

Core Limit

Core Limit 80 %

outer Me

Router Memory

Core

Configured Size [MB]:

Allocated / Available:

Configured Size [MB]: Allocated / Available:

TwinCAT Project SYSTEM License Tasks Þ

The number of available cores depends on the IPC used. Most systems have 4 or 12 cores, but 8 or 64 cores are also possible. Each core used for the XTS system must be isolated. At least one core must not be isolated in order to be able to use it for Windows. For more information on the distribution of cores, please contact the product specialist responsible for your region.



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Q.

XTS Configurator must be closed

Isolating cores is only possible if the XTS Configurator is closed.

- Expand Solution Explorer > TwinCAT Project > SYSTEM
- Double-click on Real-Time

- Click on Read from Target to call up the distribution of the cores
- Click on Set on Target to change the distribution of the cores

NOTICE

Saving and closing other applications

As the IPC is automatically restarted after entering the cores to be isolated, save and close all other applications that are open on the IPC.

Change number of shared cores	×
Available (Shared/Isolated):	
Set Cancel	

The dialog box Change number of shared cores opens.

Enter the number of isolated cores using the arrow keys

OR

- Enter the number of isolated cores in the input field Available (Shared/Isolated)
- ► Confirm with **Set**

The IPC restarts automatically.

8.3.2.7	Sidebar		
			The sidebar can be expanded on every page of the Configurator. The sidebar provides an overview of the Configurator pages and can be used to navigate between the pages.
Controls			
controls			The list shows the most important controls:
		>>	Open sidebar Opens the sidebar.
		*	Close sidebar Closes the sidebar.
		Load Project Load the project configuration. ✓	Project loaded Indicates that the project has been loaded. This button cannot be clicked.
		Welcome $\xi^{\rm M}_{n,\vec{v}}$	Start page Displays the start page of the XTS Configurator.
		Processing Units Edit the processing unit configuration.	Button Processing Units Opens the page Processing Units to edit the Processing Units.
		Parts Edit the part configuration.	Button <i>Parts</i> Opens the page <i>Parts</i> to edit the parts.
		Tracks Edit the track configuration.	Button <i>Tracks</i> Opens the page <i>Tracks</i> to edit the tracks.
		Stations Edit the station configuration.	Button <i>Stations</i> Opens the page <i>Stations</i> to edit the stations.
		Movers Edit the mover configuration.	Button <i>Movers</i> Opens the page <i>Movers</i> to edit the movers.
		Real-Time Edit the real time configuration.	Button <i>Real-Time</i> Opens the page <i>Real-Time</i> to edit the real-time settings.
		Summary	Button Summary Opens the page Summary. The checkbox Close automatically after finished can be activated or deactivated.
		Build Build the modified project.	Button Build Applies all settings and builds the configuration. Closes the <i>XTS Configurator</i> .
		Finished	Page Finished Indicates that all settings have been applied and the configuration is finished. This page is only displayed if the checkbox <i>Close automati-</i> <i>cally after finished</i> is deactivated.

Display Page open

Indicates that the page has been opened and exited with a button in the sidebar.

Display Page edited

Indicates that the page has been opened and exited with the button Go To Next Step.

Instead of navigating with the arrow keys, you have the option of opening the sidebar and using the buttons to navigate between the pages of the XTS Configurator.

Click on the button to open the sidebar

The sidebar opens. You can use the buttons to navigate between the pages of the XTS Configurator.

Click on a button to call up the corresponding page

► Click on the button **Build** to build the configuration

Navigation

BECKHOFF Version: 1.1.1

Click on the button Go To Next Step to continue The configuration is built and the XTS Configurator closes.

OR

Completing the configuration 8.3.3

After all the required settings have been made, you can complete the configuration.



Completing the configuration





Click on the button Go To Next Step to continue
 The changes are saved and the XTS Configurator closes.

TF5850

8.3.4 Checking the configuration

Solution Explorer
○ ○ 🏠 🛱 - To - @ 🔑 🗕
Search Solution Explorer (Ctrl+ü)
Image: Solution 'TwinCAT Project' (1 project) Image: System Image: System<
Type System
TcCOM Objects
XtsProcessingUnit 1
▲ Part 1
Module 1
P Module 2
b Module 3
Module 5
Module 6
Module 7
Module 8
Module 9
Module 10
Module 11
Module 12
Track 1
Mover 1
Mover 2
Nover 5
b B Mover 5
Mover 6
Mover 7
Mover 8
Mover 9
Mover 10
Info Server

All configured TcCOM objects are displayed in the Solution Explorer project tree.



You can view the configured XTS system in the XTS System View of the *XTS Tool Windows*. Use the *Zoom to fit* function for a better detailed view.

XTS Tools

Parts	XtsProcess	ingUnit 1 🔻	:
	Name	Axis	So
l lac	Mover 1	Mover Axis 1	SoftDriv
ធ	Mover 2	Mover Axis 2	SoftDriv
	Mover 3	Mover Axis 3	SoftDriv
Ş	Mover 4	Mover Axis 4	SoftDriv
Vers	Mover 5	Mover Axis 5	SoftDriv
- *'	Mover 6	Mover Axis 6	SoftDriv
۲¥	Mover 7	Mover Axis 7	SoftDriv
atio	Mover 8	Mover Axis 8	SoftDriv
, S	Mover 9	Mover Axis 9	SoftDriv
	Mover 10	Mover Axis 10	SoftDriv
þ	XtsProcessingl	Jnit 1 🔻	Ŧ

The settings and properties of all configured objects can now be accessed in the information windows of the *Parts*, *Tracks*, *Mover* and *Stations*.

- Check that all settings and properties are correct
- ► Change settings and properties if required
- Activate the button Filter to show only the objects of the selected Processing Unit

OR

 Deactivate the button Filter to show all objects of the entire project

If all settings are correct, you can put the configuration into operation. Further information can be found in chapter "Commissioning", [Page 198].

8.3.5 Naming Assistant

- 🐕 🖻



The naming assistant is available in the *XTS Configurator* for all components. The procedure is illustrated using the renaming of a Processing Unit as an example.



The name of the button of the naming assistant depends on the component that is to be renamed. The appearance of the button is identical on every page of the XTS Configurator and the name always begins with *Choose names for*.

Click on the button to open the naming assistant

The naming assistant *Rename Tasks and Processing Units...* opens.

You have the option of renaming one or more components at the same time.

NOTICE

Do not use duplicate names

Be careful not to enter names that are already in use. This can lead to configuration problems.

8.3.5.1 Renaming an individual component



- Enter a name in the input field New Name
- Confirm with Apply

The entry is saved and the dialog box closes.

8.3.5.2 Renaming multiple components



- Enter a name in the input field *Base Name*
- Enter a number in the input field *Starting Number*



j

Press and hold the Ctrl key to select several Processing Units in the list

The number of selected Processing Units is displayed in the field *Count of selected renamings to which the pattern is applied*.

Second tab for renaming the tasks

The Processing Unit naming assistant is the only one to have a second tab. Tasks can be renamed in the same way using this second tab.

	ocessing Units				×
C	e careful to generate name	es that are u	nique and will not match names of exis	ting object	s.
essing Unit Naming	Task Naming				
►					
 Apply a naming Base Name: Starting Number: 	g pattern to the selected it XPU 10 App	ems: Iy Naming P	attern (3)		
	Current Name		New Name		
* XtsPro	Current Name	Þ	New Name XPU 10		
* XtsPro XtsPro	Current Name occessingUnit 1 occessingUnit 2	۵ ۵	New Name XPU 10 XtsProcessingUnit 2		
* XtsPro XtsPro	Current Name occessingUnit 1 occessingUnit 2 occessingUnit 3	Þ	New Name XPU 10 XtsProcessingUnit 2 XPU 11		
 XtsPrc XtsPrc XtsPrc XtsPrc XtsPrc 	Current Name occessingUnit 1 occessingUnit 2 occessingUnit 3 occessingUnit 4	Þ Þ	New Name XPU 10 XtsProcessingUnit 2 XPU 11 XPU 12		

Click the button Apply Naming Pattern

The *Base Name* and the *Starting Number* are applied to the selected Processing Units. The *Starting Number* is increased by the value 1 one after the other.

Confirm with Apply

The entry is saved and the dialog box closes.

8.3.6 Open Options... dialog box

	XtsProcessingUnit 1	-	+ ×	5	ö	Config
1	·····			~	T	

► Click on the button **Options...**

The dialog box *Options...* opens.

Further information can be found in chapter "Dialog box Options...", [Page 353].

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IO Timing Configurator 8.4

The IO Timing Configurator contributes to fast commissioning and intuitive operation. It supports the setting of the distributed clocks required to synchronize all EtherCAT devices of the XTS system.

Checking I/O devices 8.4.1

The I/O devices that are not used for the XTS system must be disabled so that the automatic settings for the XTS system can be used. You can see whether the devices are enabled or disabled by the display of the devices in the Solution Explorer:

Enabled

The device is enabled.



Disabled

The device is disabled

- Solution Explorer ▼ ₽ × 이 이 🟠 📩 - 🐻 - 라 🔑 🗕 Search Solution Explorer (Ctrl+ü) ρ-Solution 'TwinCAT Project' (1 project) TwinCAT Project Þ SYSTEM MOTION Þ PLC SAFETY ₩. C++ 2 1/0 E Devices ⊳ Revice 1 ⊳ 🔫 Device 2 🐏 Mapping
- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- Check whether all XTS-relevant devices are disabled

If the devices are enabled, the devices must be disabled.

8.4.1.1 Disabling

Solution Explorer 🔹 👎 🗙				
G O 🏠 🛗 - To -	a .	<u> </u>		
Search Solution Explorer (Ctrl+ü)				
Solution 'TwinCAT Project' (1 project) Solution 'TwinCAT Project Gamma System Motion Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data Data D				
 Device 1 Device 2 	ŋ	Сору	Ctrl+C	
😭 Mappings	ж	Cut	Ctrl+X	
		Paste with Links		
	X	Remove	Del	
	۰	Disable		

- Press and hold the Ctrl key to select all XTS relevant devices
- ▶ Right-click on all XTS relevant devices to open the context menu
- Click Disable in the context menu

8.4.2 Opening of IO Timing Configurator



Welcome!

 Click on the button Start the IO Timing Configurator ... in the XTS Tool Window

Further information can be found in chapter "Activation of the XTS

The IO Timing Configurator opens.

Activation of the XTS Tool Window

Tool Window", [Page 224].

- ► If necessary, enlarge window for better operability
- ► Click on the button Go To Next Step to continue



IO Timing Configurator					- 🗆	×
DC Settings						
S XTS 1.1 (EtherCAT) •						÷
Device	Shift time	User shift time	Input shift time	Input user shift time	Reference Clo	:k
- 🕂 CU2508 1 (RT-Ethernet Adapte						
	146.52 μs	0 μs	-25 µs	0 µs	Term 1 (AT2001-02	i0) 🔻
2. 🖾 📫 🖬 🖬 🖬 🖬 🛄 🖬 🛄 🖬 🛄 🖬	147.8 μs	0 µs	-25 µs	0 µs	Term 13 (AT2001-0)	150) 🔻
BusTerminals (EtherCAT)	0 μs	0 µs	0 μs	0 µs	•	
4						•
					•	

The DC Settings page opens.

8.4.3.1 Controls	
	The list shows the most important controls:
8	Button Automatic configuration settings Applies the preset configuration settings for the devices.
Term 1 (AT2001-0250) 🔻	Drop-down menu Reference Clock Displays the reference clock selected for the device and lists the available reference clocks.
	Button Go To Previous Step Opens the previous page.
	Button Go To Next Step Opens the next page.
~	Display DC Master Identifies the selected DC Master.
8.4.3.2 Searching the device	
5	In the <i>DC Settings</i> menu you have the possibility to search for devices.
i	Name parts sufficient for the search Only a part of the device name is needed for the search. All devices that contain the entered string at any position in the device name are listed.
IO Timing Configurator	Enter a term or parts of the device name in the input field to search for one or more devices
DC Settings	
XTS 1.1 (EtherCAT)	
XTS 1.1 (EtherCAT)	
	The search result for the entered string is displayed
Bu 🛞 XTS 1.1 (EtherCAT) 🔹	
Device	
BusTerminals (EtherCAT)	

-

IO Timing Configurator

- 몲

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8.4.3.3 Automatic configuration settings

DC Settings

CU2508 1 (RT-Ethernet Adar

NOTICE

Use automatic configuration settings

Beckhoff recommends using the automatic configuration settings and not changing these values.

To use the automatic configuration settings, the I/O devices that do not contain XTS components must be disabled. Further information can be found in chapter "Checking I/O devices", [Page 319].

 Click on the button Automatic configure settings to apply the automatic configuration settings



XTS 1.1 (EtherCAT)



Select a DC Master in the drop-down menu Select a DC Master

The selected DC Master is marked with a crown.

The DC Master is always the first supply segment, which later serves as master for all other CU2508. The port multiplier containing this infeed line is the master port multiplier from which lines are pulled to other port multipliers. For more information, see the Real-Time and Distributed Clocks documentation.

► Click on the button Go To Next Step to continue

8.4.4 DC Sync Cables

1	Visibility depending on CU2508 The <i>DC Sync Cables</i> page is only displayed if a CU2508 is used in the configuration. For more information please refer to the Real- Time documentation.
8.4.4.1 Controls	
	The list shows the most important controls:
	Button Go To Previous Step Opens the previous page.
	Button Go To Next Step Opens the next page.
8 4 4 2 Searching for ports	
o.4.4.2 Searching for ports	In the <i>DC Sync Cables</i> menu you have the possibility to search for ports.
IO Timing Configurator	Enter a digit in the input box to search for one or more ports
。 B B C Sync Cables	
• 금급 CU2508 1 (RT-Ethernet Adap	
- 3. 🖾 Ø Unused 🗸	
IO Timing Configurator	The search result for the entered digit is displayed.
。 B B C Sync Cables	
4	
• 물급 CU2508 1 (RT-Ethernet Adap	
4. 🖾 Ø Unused 🔹	

8.4.4.3 Setting ports

For each port, you have the option of selecting whether it should remain unused, be used as a Sync Master or as a Sync Slave.



Example CU2508

Setting a sync connection between Port 5 and Port 8 is shown as an example for two CU2508.

Select **Sync-Master** in the drop-down menu of *Port 5*

The subordinate *CU2508* receives the data from the Sync Master and becomes a Sync Slave.

Click on the button Go To Next Step to continue


8.4.5 Completing the configuration



After all the required settings have been made, you can complete the configuration.

Click on the button Go To Next Step to continue
 The changes are saved and the *IO Timing Configurator* closes.

8.4.6 Enabling I/O devices

After the *IO Timing Configurator* has been closed, all I/O devices can be enabled again in the Solution Explorer.

Solution Explorer			- ∓ ∓ ×		
○ ○ 🏠 · 🐻 · 🗿 🗡 🗕					
Search Solution Explorer (Ctr	l+ü)		- C		
Solution 'TwinCAT Project' (1 project) Solution 'TwinCAT Project Solution					
Mappings	Ð	Сору	Ctrl+C		
	ж	Cut	Ctrl+X		
		Paste with Links			
	×	Remove	Del		
	•	Disable			

- Expand Solution Explorer > TwinCAT Project > I/O > Devices
- Press and hold the Ctrl key to select the XTS relevant devices
- Right-click on the XTS relevant devices to open the context menu
- Click **Disable** in the context menu

8.5 XTS Viewer

8.5.1 Opening the viewer

After you have successfully installed *TF5850 TC3 XTS Extension*, you can open the *XTS Viewer* like any other Windows application.

You can find the XTS Viewer under the file path C:\TwinCAT\Functions\TF5850-TC3-XTS-Technology\TcXtsViewer or as an icon on your desktop.



► Double-click on the **XTS Viewer** icon on your desktop The *XTS Viewer* opens.

8.5.2 Operating elements

The list shows the most important controls:

<local> •</local>	Drop-down menu Target PC Displays the configuration of the selected target PC and lists the available PCs.
Ø	Connect to target PC Enables the connection to the target PC.
S	Continuous update Continuously updates the connection with the target PC.
+	Add additional view Adds an additional window for the target PC.
¢	Options Opens the dialog box <i>Options</i>
Front 🝷	Module-Side drop-down menu Displays the selected module side and lists the available module sides.
0 🗸	Rotation drop-down menu Allows you to select a preset angle between -180° and 180° or enter your own value. The reference point is the first module of a part.
XTS Viewer Theme 🔻	Theme drop-down menu Displays the selected theme and lists the available themes.
æ	Configuring View Opens the dialog box <i>Configure View</i> .
Q	Zoom window width

Scales the view to the window width.



Zoom original size

Scales the view to the preset original size.



Custom zoom

Scales the view to the custom size.

8.5.3 Connecting to the target system

An XTS Viewer application can only be connected to one target PC. The main window *XTS Viewer* and the additional windows *XTS View* can be customized, although they share the same target and options. To connect multiple target PCs, additional XTS Viewer applications must be opened.

To connect an XTS Viewer application to a target PC, you have two options:

- Start screen
- In the Viewer

8.5.3.1 Start screen



- Select the target PC in the drop-down menu
- Click on the button **Connect**



The XTS system of the target PC, which is in *Run Mode*, is displayed in the *XTS Viewer*.



Target also valid for additional views The selected target PC also applies to any additional view added via the button *Add additional View*.

XTS Tools

8.5.3.2 In the Viewer



- Click on the button Connect to selected Target to deactivate the previous target PC
- Select a target PC in the drop-down menu *Choose Target...*
- Click on the button Connect to selected Target to activate the new target PC

The XTS system of the target PC, which is in *Run Mode*, is displayed in the *XTS Viewer*.

8.5.4 Continuous update

By deactivating the continuous update, the positions of the movers and modules are no longer updated. If the movers are moving too fast, it is possible to create a standstill view by deactivating the continuous update.



Deactivation also applies to other XTS views

Disabling continuous updating also applies to any XTS views added via the button.



 Click on the button Continuous Update to disable continuous update

OR

Click on the button Continuous Update to enable the continuous update

8.5.5 Create View



Click on button Additional View

An additional XTS View opens.

8.5.6 Open Options... dialog box

रि XTS Viewer (Version	n 3.2107.3.0)
<local></local>	- 🖉 😋 + 🔅
Front • 0	🔹 XTS Viewer Theme 🔻 🛷

8.5.7 Open pop-up menu



▶ Right-click on the background to open the pop-up menu The pop-up menu opens. Further information can be found in chapter "Pop-up menu", [Page 337].

Further information can be found in chapter "Dialog box Options...",

Numerous options are available for configuring the XTS Views and for the basic settings of the XTS Tools. The settings of the XTS Views are stored in so-called themes. These themes can be edited and used by other windows with XTS View integration, such as the

XTS Tool Window.

[Page 353].

Click on the button Options... The dialog box Options opens.

8.5.8 ToolTips

The ToolTips provide information on most of the *XTS Viewer* controls and components.

8.5.8.1 Mover



Move the mouse pointer over the mover The tooltip shows the name of the mover and its position.

8.5.8.2 Modules



► Move the mouse pointer over the module

The tooltip shows the name and the type of the module as well as the affiliation to the part.

8.5.8.3 Tracks



► Move the mouse pointer over the track The tooltip shows the name of the track.





► Move the mouse pointer over the part The tooltip shows the name of the part.

8.6 XTS Support Assistant, Beta

The *XTS Support Assistant* collects debug information of the XTS system currently running on the TwinCAT target system. The desk-top application stores the collected debug information in so-called reports. The reports can be sent to an XTS specialist or XTS support to get a quicker overview of the XTS system.

Currently reports can only be generated on the TwinCAT target PC. Running the *XTS Support Assistant* on an engineering PC does not provide all the required information.



The *XTS Support Assistant* is currently still in beta phase. In the future, even more functions and information will be available.

8.6.1 Open XTS Support Assistant

After you have successfully installed *TF5850 TC3 XTS Extension*, you can open the *XTS Support Assistant* like any other Windows application.

You can find the XTS Support Assistant as an icon on your desktop or under the file path C:\TwinCAT\Functions\TF5850-TC3-XTS-Technology\TcXtsSupportAssistant.



 Double-click on the XTS Support Assistant icon on your desktop

The XTS Support Assistant opens.

8.6.2 **Operating elements**

The list shows the most important controls:



Information area

Opens the input fields of the information area.



Drivers and versions

Opens the list of TwinCAT drivers and their versions.



Attachments

Opens the list of attachments.

Save

Opens the dialog box for saving the report.

Controls in the attachments area



Activates or deactivates whether the TcloXts files should be sent as attachments.

8.6.3 Information area



- Enter the customer name in the input field Customer
- Enter a detailed description of the problem in the field Descrip-tion

The fields ID and Date Created are filled in automatically.

Driver versions 8.6.4



Click on the button Driver Versions

The page Drivers Versions shows all installed TwinCAT drivers and the versions used.

8.6.5 Attachments



Click on the button File Attachments

The page File Attachments shows all files that are sent as attachments. The files are divided into three categories:

- Boot Files
- Target Files
- TcloXts Dump Files

Boot Files

Target Files

TcloXts Dump Files

8.6.5.1 Selecting

XTS Support Assistant

The information that is sent as an attachment with the report is divided into the following categories:

The boot files are customer-specific files based on the project. For example, they contain the current project configuration without the PLC project and logged events from the application log.

Target files are project-independent base files, such as system teaching files.

TcloXts Dump Files are files containing all relevant data written from the Processing Unit object or the XtsloDrv object of the TcloXts Driver using the *WriteDump* parameter or the automatic dump functionality

Beckhoff recommends sending as much information as possible with the report so that the product specialist responsible for your region has all the necessary information.

All categories are activated by default. Deactivated categories are excluded from the report.

 If required, click on the button Boot Files, Target Files or TcloXts Dump Files to deactivate the category and exclude it from the report

OR

 If required, click on the button Boot Files, Target Files or TcloXts Dump Files to activate the category and send it as attachments

Single files cannot be removed from the list of a category. You can exclude single files from the report only by moving the files from their original location to another location. After the report has been created, the files must be inserted back into their original location.

8.6.5.2 Saving



Click on the Save button

Descriptions - Name Onters					NI
ageneer meeroone	Neve	Interconductors	3m	(inte	per 4
* Schnellaugriff					
OneDrive	Contraction of the second seco	And the second second	Descentration		
	Comm Office Tomation	Con Millioner	Determination		
Dieser PC	THE OWNER WATER OF THE OWNER OF T	THE OWNER WHEN	Determinen		
Netzwerk	- Constants	ACCESSION 111	Datainadoar		
	Designer Statistication	10.0000-00.00	Debelowing		
	100	2010/02/01/010	Detrination		
	18	11000011040	Dubelendner		
	1.Audited	15/10/001114-01	Dubelendner		
	Paul Rate 207	CARLORN PLAN	Detrination		
	attention from	NORCE AND ADDRESS OF ADDRESS OF ADDRESS ADDRES	Dubelendner		
	Ribitation	DATE OF THE OWNER	Dateiendner		
	Reductation, Dotto	INTEREST CALC	Dateiandner		
Dateiname: Report-2021-10-28-0	5-22-40.zp				

The dialog box Safe report... opens.

- Select a file path
- Enter a name in the input field File name

By default, the file name consists of *Report*, the date and the time at which the *XTS Support Assistant* was started, for example *Report-2023-10-28-09-22-40.zip*

Confirm with Save

8.6.5.3 Writing dump files

The dump files can be written via the TcCom objects *XtsProcessing*-*Unit* or *XtsIoDriver*.



Example XtsProcessingUnit

Writing the dump files is shown using the TcCom object *XtsProcessingUnit* as an example.

Solution Explorer	▼ ∓ ×
○ ○ 🏠 🛗 - Ìo - ฮ 🕨 🗕	
Search Solution Explorer (Ctrl+ü)	<i>-</i> م
↓ Solution 'TwinCAT Project' (1 project) ↓ ↓ ↓ <td< td=""><td></td></td<>	
XtsProcessingUnit 1	
Hart 1 Track 1 Mover 1	

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

Manual

	Name	Value	CS
+	Teaching		
-	Diagnostics		
	IsAutoDumpWritingEnabled	FALSE	- I
	IsInputCheckEnabled	FALSE	<u> </u>
	WriteDump		
	UsedEventLogger	EventLogg	
	Advanced	T. Upload	
		🔶 Copy To	

- Click the **Parameter (Init)** tab in the project window
- ► Expand *Diagnostics*
- Right-click in the input field Write Dump to open the context menu
- ► In the context menu click **Download**

The dump files are written manually and stored in C:\ on your target PC.

Error List	
Entire Solu	ution 🔹 🛛 🕄 0 Errors 🛛 🚺 1 Warning 🛛 0 of 30 Messages 🛛 Clear 🗎
^{'4} D	Description
A 16	sirC/THR Jones 23 N/Infector or Granting Report Aster Hubble at Informatio
0	(in page 17 Will be used to an other of the dependence for MC brown agency's strategistery."
0	10.2023 In 1996 All the [Sainfail Mid-thepister insciption for Galdenay' from 'D',
0	LOLDED TO THE BIT was ("InterCall Staff cheptone description for VAC Decay Sergery " Machinese")
Error List	Output

The *Error List* and *Output* message windows display messages indicating that the dump files were written successfully.

XTS Tools

Automatic

	Name	Value	CS
÷	Teaching		
-	Diagnostics		
	IsAutoDumpWritingEnabled	FALSE	~
	IsInputCheckEnabled	FALSE	
	WriteDump	TRUE	
	UsedEventLogger	EventLogger	

- ► Expand *Diagnostics*
- Select TRUE in the drop-down menu IsAutoDumpWritingEnabled

To apply the settings, the configuration must be reactivated and the TwinCAT system must be restarted.

Restart TwinCAT

For example, the dump files are written automatically on events such as a Mover detection or a Mover ID detection and stored in C:\ on your target PC.

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8.7 Pop-up menu



The pop-up menu is available in the *XTS Tool Window* and *XTS Viewer*.

Different display type

The color of the pop-up menu differs in the *XTS Tool Window* and in the *XTS Viewer*. The functionality is identical in both tools. The description of the functionality is illustrated using the *XTS Tool Window* as an example.

Show all parts	Show all parts
Hide all parts	Hide all parts
Configure view	Configure view
Scope	Scope
Show mover infos	Show mover infos
Show module infos	Show module infos
Show diagnosis history	Show diagnosis history
Snapshot	Snapshot
XTS Tool Window	XTS Viewer

8.7.1 Show parts



- Right-click on the background to open the pop-up menu
- Click on Show all parts in the pop-up menu to show all parts

8.7.2 Hide parts



- ▶ Right-click on the background to open the pop-up menu
- Click on Hide all parts in the pop-up menu to hide all parts

8.7.2.1 Hide a part



A pop-up menu with fewer setting options appears when you click on a module instead of the background.

- ▶ Right-click on the module to open the pop-up menu
- ▶ Click on Hide Part 1 in the pop-up menu to hide Part 1

8.7.2.2 Do not hide a part



- ▶ Right-click on the module to open the pop-up menu
- Click on Hide all but Part 1 in the pop-up menu to hide all parts except Part 1

8.7.3 Configure View

The dialog box *Configure View...* is opened in the same way in the *XTS Tool Window* and in the *XTS Viewer*. The *XTS Viewer* also has an additional button to open the dialog box.

Open dialog box in XTS Tool Window and XTS Viewer



- ▶ Right-click on the background to open the pop-up menu
- Click on Configure View... in the pop-up menu

The dialog box Configure View opens.

► If required, adjust the positioning and opacity of the dialog box Further information can be found in chapter "Positioning and opacity", [Page 351].

The dialog box allows you to search for component types or for a specific component. You can also filter components and show or hide them.

In the XTS Viewer you also have the option of opening the dialog

Open dialog box in XTS Viewer

TS Viewer (Ver	sion 3.2107.3.0)		
<local></local>	× Ø	ध + 🗢	
Back 🔻	0 -	XTS Viewer Theme	- 4

box *Configure View* using a button:

Click on button Configure View

The dialog box Configure View opens.

8.7.3.1 Controls

The list shows the most important controls:

Filter Parts

Activates or deactivates the parts in the list.

Filter Tracks

Activates or deactivates the tracks in the list.

Filter Mover ค้

Activates or deactivates the movers in the list.

Filter Part Info Bars

Activates or deactivates the part info bars and dimensions in the list.

Filter Info Bars 1

Activates or deactivates the info bars in the list.

Component search input field

Allows you to enter a search term. All components containing this term are searched for.

Exact search checkbox

Activates or deactivates the search for an exact search term. If the checkbox is activated, only the component that exactly matches the search term is searched for.

Reset entries Х

Deletes all entries in the Component search input field.

8.7.3.2 Search components



Example search for Mover 1

The effects of the spelling of a search term are illustrated using the search for Mover 1 as an example.

Standard search

For the standard search, it is sufficient to enter only part of the search term. The upper or lower case of the search term is irrelevant.

Enter the search term over 1 in the input field Search

All components that contain the part of the search term are displayed in the results list. Both Mover 1 and Movers 10 to 19 contain the search term *over 1*.



Exact search

Configure View

With the exact search, the search term must be entered exactly. The upper or lower case of the search term is relevant.

Activate the checkbox Exact text match

: <u>::て</u> 何 🖬 📑	Ŧ
X	x
Configure View 🔺 🗖	×
まて ぼ 首 ユ	= (
Mover 1	X
🔺 🗶 🔀 XtsProcessingUnit 1	
🔺 🗶 🤒 Mover	(
🗙 🖪 Mover 1	
Configure View 🔺 🗖	×
まて 何 画 ユ	Ŧ
	X

×

► Enter the search term **Mover 1** in the input field Search

Only the component that corresponds exactly to the term entered is displayed in the results list. Only Mover 1 corresponds exactly to the search term. Movers 10 to 19 are not displayed as their name contains another digit.

If the search does not return a result, check the spelling of the search term. Pay attention to upper and lower case letters and the correct spelling of the search term.

Even if a new search does not return any results:

Deactivate the checkbox Exact text match to use the standard search

8.7.3.3 Filter components

You can filter by component type to show or hide certain components in the view. By default, all filters are enabled.



Dependence of parts and tracks

It is not possible to hide only the part or the track. Parts and tracks are dependent on each other and can only be shown or hidden together. Single modules can also not be hidden.

Deactivate the button Filter Parts

The parts are deactivated and cannot be expanded in the *Configure View*.

Configure View	×
来て ぼ量 ユ	Ŧ
	X
▲ 🗶 🔁 XtsProcessingUnit 1	
👂 🗶 😑 Dimensions	
🗙 📥 Parts	
👂 🗙 🚞 Tracks	
🕨 🗶 🤒 Mover	

8.7.3.4 Show or hide components



Example Show or hide components

nents or entire component types.

Expand Mover

OR

Showing and hiding the components is illustrated using the movers as an example.

Activate the checkbox of a mover to show the mover

• Deactivate the checkbox of a mover to hide the mover

You can use the list of components to show or hide single compo-

Single components



Component group



- Activate the checkbox of the Mover component group to show all movers
- OR
- Deactivate the checkbox of the Mover component group to hide all movers

8.7.4 Show scope



You have the possibility to select different parameters from the following categories:

- SoftDrive Scope Variables
- General

The dialog box Select Parameters opens.

- ► Click on a parameter
- ► Confirm with **OK**

Click on the button + to add the parameter

A scope for the selected mover and parameter is displayed.

SoftDrive - Scope V Actual Commutation Position	ariables		
Actual Commutation Position			
Actual Commutation Position	anables		A
network Current	a(ActComPos)	mm	returns the actual commutation position for HW.
A stud Fallen for Free	S(ActCurr)	A	Returns the actual current.
Actual Pollowing Error	S(Actronowingerror)	mm	Patients the actual position rollowing error.
Actual Position Control Out	S(ActPosCtrlO(#)	10000	Returns the setucial position.
Actual Velocity	\$(ActVelo)	mm/	Returns the actual velocity.
Actual Velocity Error	\$(ActVeloError)	mm/	Returns the actual velocity error.
Control	\$(nControl)		Returns the DS402 control word of the soft drive.
Error	\$(nError)		Returns the actual soft drive error.
Hardware Position	S(ActHwPos)	mm	Returns the actual hardware position.
Set Acceleration Interpolated	S(SetAccep)	mmv	Returns the setpoint acceleration from interpolator.
Set lack laterorolated	S(SetCull) S(Catlackto)	A mark	Recurs the setpoint current non-velocity control and PF1.
Set Position Interpolated	S(SetDealte)	mm	Returns the seturint position from interpolator
Set Velocity Interpolated	\$(SetVeloltp)	mm/	Returns the setpoint velocity from interpolator.
Status	S(nStatus)		Returns the DS402 control word of the soft drive.
Warning	\$(nWarning)		Returns the actual soft drive warnings.
General			
Justice and Marrie	(Olama)		Returns the same of the Warn Object instance
NC Modulo Position	S(ActNcModuloPos)	mm	Returns the actual NC modulo nosition.
NC Position	S(ActNcPos)	mm	Returns the actual NC position.
Simulated Startup ID	\$(SimulatedStartUpId)		Returns the simulated startup id.
Simulated Startup Part	\$(SimulatedStartUpPart)		Returns the simulated startup part.
Simulated Startup Position	\$(SimulatedStartUpPosition) mm	Returns the simulated startup position.
Anver 1 Nover 2 Parameters Hardware Position	× +		
Scope Mover • X rik Gargets Mover 1 Mover 2 •	+++ ++	2	
Scope Mover • X R Targets Mover 1 Mover 2	•• • • L E	2	
Scope Mover • 🗙 🔒 Fargets Mover 1 – Parameters	•• • • ⊎ ⊑ × +		
Scope Mover • X 2 Gargets Mover 1 Mover 2 Parameters Variance Position (new 1	•• : • L L I	2	
Scope Move × X j2, fargets Move 2 × Harameters tardware Position (mm)	+ ÷ ↔ L E I × 1 + ×		
Scope Nover • X 2. Fargets Mover 1 Parameters Fardware Position (nm)	•• \$ • 1 1 × +		
Scope Mover × X R. Argets Mover 2 • Parameters Aradware Position (nm)	↔ ÷ ↔ LL LE × + + +		
Scope Mover × X RL Fargets Mover 2 Ararameters tardware Positian (mm) Q	++ + 0.5- ×++	2	
Scope Mover • X 2 Fargets Mover 1 Mover 2 Parameters tardware Position (mm) Q	•• • • • • • • • • • • • • • • • • • •		
Scope Mover × X R fargets Move 2 × Parameters Farebase Postion (nmm) Scope Scope Move 2 × Parameters	+ + • □ □ □ □ × + • □ □ □ □ × + □ □ □ □ × + □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		
Scope Mover × X 22. Fargets Mover 1 Advance Position (nm) G	•• • • • • • • • • • • • • • • • • • •		
Scope Mover • X 12. Fargets Mover 1 Mover 2 Parameters fardware Position (nm) Q			
Scope Move X R fargets Move 2 - Parameters Starware Position (nm) Q	+ + + 0.5 + + 1000 + 1000 + 1000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Scope Mover • X 2 Fargets Mover 1 Parameters Fardware Position (nm)	•• • • • • • • • • • • • • • • • • • •	2	
Scope Mover X R Afargets Mover 1 Mover 2 Parameters faretware Position (nmn)			
Scope Mover × X j2, Fargets Mover 2 Ararameters stardware Position (mm) Q			
Scope Nover × X 2. Fargets Mover 1 Parameters Fardware Position (nm) Q			
Scope Mover X 2 argots Acver 1 Varameters tardware Position (nmr) Q			
Scope Mover × X R Fargets Accer 1 Mover 2 Aranneters tardware Position (mm) Q	•• \$ • 1 1 × + + 1000 000 100 100 100 100 100 100 100 1		
icope Mover × X R Argets Mover 1 Varameters Iradware Position (nm)			
cope Mover × X rik argets Kover 1 Mover 2 Varianteters kardware Position (mm) Q			
cope Mover V 2 argets Mover 2 Arameters Arameters	•• \$ •> 1 1 + + • • • • • • • • • • • • •		
Scope Mover X 2 Aargots Mover 2 Parameters tardware Position (nmr)			
Scope Mover × X ju fargets Wover 1 Mover 2 Parameters sardware Position (mm) 9			

8.7.5 Mover information



			Bunning
rs			- 🗆 ×
Name	Hardware Position [mr	n] NC Position [mm] N	C Modulo Position [mm]
XtsProcessingU	Init 1		
Mover 1	2924.1911	2924.1983	2924.2000
Mover 2	140.0015	139.9947	140.0018
Mover 3	219.9987	219.9990	219.9959
Mover 4	299.9981	300.0070	299.9978
Mover 5	380.0088	379.9995	380.0021
Mover 6	459.9935	459.9979	459.9961
Mover 7	540.0090	540.0033	539.9990
Mover 8	620.0040	619.9970	619.9985
Mover 9	699.9941	700.0014	700.0023
Mover 10	780.0094	779.9938	779.9990

- ▶ Right-click on the background to open the pop-up menu
- Click on Show mover infos in the pop-up menu

The dialog box *Movers* opens.

If required, adjust the positioning and opacity of the dialog box

Further information can be found in chapter "Positioning and opacity", [Page 351].

The positions of the movers are displayed.

If required, click on the button to open the dialog box Select Column Values

You have the possibility to select different parameters from the following categories:

- SoftDrive Scope Variables
- General

The dialog box Select Column Values opens.

Activate the checkboxes of the parameters

OR

- ► Deactivate the checkboxes of the parameters
- ► Confirm with **OK**



Select Mover



Click on a mover in the view

OR

Click on a mover in the dialog box *Movers*

The selected mover is highlighted in color in the *Movers* dialog box and in the view. This function facilitates the search for the corresponding mover and its position on the system.

XTS Tool Window					- 0 >
XtsProject_23 C 🖶 🖓 💭 🔳 Tool Window Then	ie i 🌣				
2 <u>12 4 4 4</u>		Movers			- = ×
*		0			0000000
2		Name	Hardware Position (mm	(NC Position [mm] N	C Madulo Position (mm)
*	0000	A XhiProcessingUnit	e1		
	0.00				
	1.1	Mover 2	0.0000	0.0000	0.0000
	1 Y A	Mover3	0.0000	0.0000	0.0000
		Mover 4		0.0000	0.0000
a		Mover 5	0.0000	0.0000	0.0000
	0000	Mover 6	0.0000	0.0000	0.0000
		Mover 7	0.0000	0.0000	0.0000
		Mover 8	0.0000	0.0000	0.0000
		Mover 9	0.0000	0.0000	0.0000
		Mover 10	0.0000	0.0000	0.0000
000					
	-				

► Click on a mover in the view

OR

- ► Click on a mover in the dialog box *Movers*
- Press and hold the Ctrl key to click on additional movers with the left mouse button

The selected movers are highlighted in color in the dialog box *Movers* and in the view. This function facilitates the search for the corresponding movers and their positions on the system.

Name

XtsProcessingUnit 1
 Part 1

Module 1

Module 2

Module 3

Module 4

Module 5

Module 6 Module 7

Module 8

Module 9

Module 10

Module 11

Module 12

8.7.6 Module information



Length [mm]

250

250

250

250

250

250

250

250

250

250

250

250

Туре

AT2001_0250

AT2000_0250

AT2000_0250

AT2000_0250

AT2050_0500

AT2050_0501

AT2001_0250

AT2000_0250

AT2000_0250

AT2000_0250

AT2050 0500

AT2050_0501

DriveBtn Angle [deg]

0

0

0

0

90

90

0

0

0

0

90

90

- ► Right-click on the background to open the pop-up menu
- ► Click on Show module infos in the pop-up menu

The dialog box Modules opens.

If required, adjust the positioning and opacity of the dialog box

Further information can be found in chapter "Positioning and opacity", [Page 351].

If required, click on the button to open the dialog box Select Column Values

You have the possibility to select different parameters from the following categories:

- Drive CoE I2T Diag Data
- General
- Drive CoE Info Data
- Drive CoE Vendor Data
- Drive CoE General
- Drive CoE Amplifier Settings
- Drive Info

The dialog box Select Column Values opens.

Activate the checkboxes of the parameters

OR

- Deactivate the checkboxes of the parameters
- Confirm with OK

Selecting modules



Click on a module in the view

OR

Click on a module in the dialog box Modules

The selected module is highlighted in color in the dialog box *Modules* and in the view. This function facilitates the search for the corresponding module and its position on the system.



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8.7.7 Diagnostic process



Click on a module in the view

OR

- Click on a module in the dialog box Modules
- Press and hold the Ctrl key to click on additional modules with the left mouse button

The selected modules are highlighted in color in the dialog box *Modules* and in the view. This function facilitates the search for the corresponding modules and their position on the system.

- ▶ Right-click on the background to open the pop-up menu
- Click on Show diagnosis history in the pop-up menu

The dialog box *Diagnosis Messages* opens.

▶ If required, adjust the positioning and opacity of the dialog box Further information can be found in chapter "Positioning and opacity", [Page 351].

Error messages, warning messages and notes are displayed in the dialog box.

- Click on a module to display the associated error messages, warning messages and notes
- ► If required, activate the buttons **Errors**, **Warnings** and **Messages** to display the corresponding messages

OR

 If required, deactivate the buttons Errors, Warnings and Messages to hide the corresponding messages

8.7.8 Save view



- ▶ Right-click on the background to open the pop-up menu
- ► Click on Snapshot in the pop-up menu

The dialog box *Export Image*... opens.

► If required, adjust the positioning and opacity of the dialog box

Further information can be found in chapter "Positioning and opacity", [Page 351].

Select Current View in the drop-down menu Select the view to export to save only one view of the system without borders

OR

- Select Full View in the drop-down menu Select the view to export to save the entire view
- If required, select a color for the background in the drop-down menu Select the background color

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

Click on Copy to copy the view to the clipboard

OR

Click on Save As... to save the view as a png image and select the storage location

OR

► Cancel with Close

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8.7.9 Positioning and opacity

The dialog box opened with the pop-up menu can be positioned as required in the *XTS Tool Window* or in the *XTS Viewer*. You can also use the buttons in the dialog box *Dialog Settings* to position the respective dialog box at the outer edges and set the opacity.

- Right-click on the header of the dialog box to open the context menu
- Click on Dialog Settings

The dialog box Dialog Settings opens.

Configure View × . Dialog Settings ÷ × Close Х ▲ 🗙 🔁 XtsProcessingUnit 1 🗙 😑 Dimensions Þ Þ 🗙 🚞 Part Info Bars × 📥 Parts Þ 4

8.7.9.1 Controls

The list shows the most important controls:

Top left

Aligns the dialog box at the top left of the open XTS tool.

🗖 Тор

Aligns the dialog box at the top across the entire width of the open XTS Tool.

Top right

Aligns the dialog box at the top right of the open XTS Tool.

Left

Aligns the dialog box to the left over the entire height of the open XTS Tool.

Middle

Aligns the dialog box to the middle of the open XTS Tool.

Right

Aligns the dialog box to the right over the entire height of the open XTS Tool.

Bottom left

Aligns the dialog box at the bottom left of the open XTS Tool.

Bottom

Aligns the dialog box at the bottom across the entire width of the open XTS Tool.

Bottom right

Aligns the dialog box at the bottom right of the open XTS Tool.

Opacity slider

Sets the opacity for the dialog box.

- Click on a button to set the orientation for the dialog box
- ► Use the slider **Opacity** to set the opacity for the dialog box



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8.8 Dialog box Options...

		1		
Ontions			-	×
CTS View Themes General			0	
Tool Window Theme 🔹				¥
View				
▶ Module				
Mover				
Track				
Close-Gap				
Station				
Part				
	Save & Close Close Cancel			

The dialog box Options... is valid for all XTS Tools

This chapter describes all the settings that you can make in all XTS Tools in the dialog box *Options...*

In the dialog box *Options...*, you can adjust the settings for the XTS Views using the tabs *XTS View Themes* and *General*.

8.8.1 XTS View Themes

1	Options		
Х	TS View Themes General		
	Configurator Theme		
5	Base Theme		
ľ	XTS Viewer Theme	extured Background	×
	Simulation Builder Theme	TS View Background	-
	Tool Window Theme		
	Configurator Theme		
	Drive Status	-	
L	Mover		

First, a theme must be selected for which the settings are to be adjusted.

- Click on the tab XTS View Themes
- Select the theme you want to adjust from the drop-down menu
- Base Theme
- XTS Viewer Theme
- Simulation Builder Theme
- Tool Window Theme
- Configurator Theme

8.8.1.1 View



- Click on View
- Activate the checkbox Textured Background to display a textured background

OR

- Deactivate the checkbox Textured Background to display a single-color background
- Select a color from the drop-down menu XTS View Background

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

Property	Explanation	Default setting
Textured Background	Textured background, chessboard pattern	Enabled
XTS View Background	Color for the background in XTS View	AliceBlue

8.8.1.2 Mod	lules
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o.o.1.2 Wouldes			
Options		 Expand Module 	
XTS View Themes General Tool Window Theme		Click on of Module Dialog Colum	<i>nns</i> to open the dialog box <i>Se</i> -
View Module Dialog Columns Text Tooltip Drive Status Mover Track Close-Gap Station	100 5 ▼	lect Components	
Select Components	□ ×	The dialog box Select Components op	ens.
X Name Unit Parameter PTCID Parameter Type Drive CoE - 12T Diag Data	^	Activate the parameter checkbox to	select the parameter
Amplifier I2T Temperatures % General	Returns the I2T values for eac	OR	·
X Angle deg Device Name	Returns the angle of the mod Returns the device name of c		
Drive Terminal Name	Returns the name of the com Returns the name of the com	 Deactivate the parameter checkbox 	x to remove the parameter
Gap mm Instance Name	Defines the gap between the Returns the name of the TCor	from the selection	
Islnfeed K Length mm	Returns whether the module Returns the length of the mo	Confirm with OK	
Offset mm	Set the object ID of the corres		
Ok Cancel	· ·		
🍄 Options		Activate the checkbox Show heat	map to display the tempera-
XTS View Themes General Tool Window Theme		ture	
View Module Dialog Columns		OR	
Module Show heat map		Deactivate the checkbox Show he	at map to hide the tempera-
Tooltip Heat map component PCB Temperatures	s v	ture	
Drive Status PCB Temperatures Mover Amplifier 12T Temp	eratures	Set opacity with the slider Tempera	ature heat map trans-
Track DC Link Voltage Close-Gap Max DC link voltag	e - last 500 ms		
Station Max overall current	t - last 500 ms	Select the component in the drop-of nent whose temperature is to be di	splayed
Part			spiayed
Bronorty	Evolopot	ion	Default actting
Property Chave best man	Explanat		Default Setting
Show heat map	Temperal	the an esite of the term endured liveley	
	Silder for	of the component	
	IDT contra		
• Ampliner 121 Temperatures			
	Intect cur	reni voltage	-

_

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Maximum DC voltage of the last 500 ms

Maximum overall current of the last 500 ms

• Max DC link voltage - last

• Max overall current - last

500 ms

500 ms

XTS Tools

Text

Options		
XTS View Themes Gen	eral	
Tool Window Theme	•	
View ▲ Module Text Tooltip Drive Status ▶ Mover Track Close-Gap Station Part	Text Horizontal Alignmen Vertical Alignment Text Baseline Text Brush Font Size Margin	t E = = = T + L T + L T + T ↓ 16 ↓ 0 ↓ 0
Module components		×
Name	Shortout	Unit Description
Drive CoE - I2T Diag Data	\$020	S Batume the UT values for each coll
General	\$(21)	5. Keturns the Lot values for each coll.
Angle Device Name	S(Angle) S(deviceName)	deg Returns the angle of the module. Returns the device name of corresponding EtherGAT master device.
Encoder Terminal Name Gap	S(Unvereminalisame) S(EncoderTerminalName) S(Gap)	Returns the name of the corresponding drive terminal. Returns the name of the corresponding encoder terminal. mm Defines the case between the previous module and this module.
Instance Name Isivifeed	S(Name) S(Infeed)	Returns the name of the TComObject instance. Returns whether the module is an infeed module.
Length MotorTerminalOID	S(Length) S(MotorTerminalOID)	mm Returns the length of the module. Set the object ID of the corresponding motor terminal.
Offset Part Name	S(Offset) S(Part)	mm Define an offset for the module to compensate mechanical tolerances. Returns the instance name of the corresponding part.
ScalingFactor SensorTerminalDID	\$(ScalingFactor) \$(SensorTerminalQID)	Define a ScalingFactor for the module to compensate mechanical tolerances. Set the object ID of the corresponding sensor terminal.
Type Drive CoE - Info Data	S(Type)	Returns the type of the module.
Auxiliary Voltage 10V Auxiliary Voltage 24V	\$(Aux10V) \$(Aux24V)	V Returns the current value of the 10 V auxiliary voltage.
Azoliary Voltage SV Chin ID	S(Aux5V) S(Chink4)	V Returns the current value of the 5 V auxiliary voltage. Botwars the chin ID.
Current Scaling DC Link Voltage	S(CurrentScaling) S(DcUnkVoltage)	Returns the current scaling. V Returns the current DC link voltage.
Device Info DriveBtn	\$(DeviceInfo) \$(BTN)	Returns the device info value. Returns the BTN of the module.
Max DC link voltage - last 500 ms Max overall current - last 500 ms	S(MaxDcLinkVoltageLast500ms) S(MaxOverallCurrentLast500ms)	V Returns the maximum value of the DC link voltage in the last 500 ms. A Returns the maximum value of the overall current in the last 500 ms.
Overall Current PCB Temperatures	S(OverallCurrent) S(pcbTemperatures)	A Returns the overall current value. C Returns the PCB temperatures. *
4	Ck	Canad
Options		
XTS View Themes Gen	eral	
Tool Window Theme	•	
View	Tavt	٩
 Module 	ICAL	
Text	Horizontal Alignmen	t = = =
Tooltin		
Dei Chit	Vertical Alignment	L. 16 P.
Drive Status	Text Baseline	T T I
Mover	Taxt Bruch	Ţ
Track	CAL DIGST	
Close-Gap	Font Size	16 🔹
Station		/目 0 并 0
station	Margin	
Part	-	事 이 븟 이

Click on Text

If required, enter a parameter in the input field *Text* OR

Click on Browse to open the dialog box Module Components

The dialog box *Module Components* opens.

- Click on a parameter
- ► Confirm with **OK**
- Click on the buttons at Horizontal Alignment, Vertical Alignment and Text Baseline to select the alignment of the text
- ▶ Choose a color from the drop-down menu Text Brush

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

- Select the preset value in the drop-down menu Font Size
 OR
- Enter a value in the input field Font Size
- Enter values for the distances between the text and the frame in the input fields *Margin*

XTS Tools

Property	Explanation	Default setting
Text	Input field for a parameter displayed on the mod- ules.	-
Horizontal Alignment	Horizontal alignment of the text to the module	Left
≡ Left	Left aligned	_
≡ Center	Centered	-
≡ Right	Right aligned	-
Vertical Alignment	Vertical alignment of the text to the module	Тор
т Тор	Тор	—
H Center	Centered	—
L Bottom	Bottom	-
Text Baseline	Text baseline	Тор
т Тор	Тор	-
T Middle	Middle	—
I Bottom	Bottom	-
Text Brush	Font color	AliceBlue
Font Size	Font size	16
Margin	Distance of the text to the frame	-
i left	Left	0
≣ Right	Right	0
📅 Тор	Тор	0
\mu Bottom	Bottom	0

ToolTip

Options... XTS View Themes General

Module

Mover

Track

Station

Part

Close-Gap

Name
Drive CoE - UZ Diag Data
Angles CI trepostantes
General
Data Construction
Cons

ive CoE - Info Dat

Auxiliary Voltage 100 Auxiliary Voltage 24V Auxiliary Voltage 24V Auxiliary Voltage 5V Chip ID Curret Scaling DC Link Voltage Device Info DriveBis Max DC link voltage Max overall current -Device

Text

Tooltip

Drive Status

Configurator Theme View

ToolTip Format

Name:

Type:

BTN:

Description

Device Name:

Drive Name:

Encoder Name:

Value

\$(Name)

\$(Type)

\$(BTN)

\$(DeviceName)

\$(DriveTerminalName)

\$(EncoderTerminalName)

caling. IC link

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Use the Tooltip parameters to specify which information is displayed when you move the mouse over the modules.

- Click on Tooltip
- Click on Browse to open the dialog box Module Components

The dialog box Module Components opens.

- Click on a parameter
- ► Confirm with **OK**

Add Tooltip

TS View Themes Genera	d		
Configurator Theme	•		
View Module	ToolTip Format	Value	
Tooltip	Name:	\$(Name)	Q
Drive Status Mover	Type:	\$(Type) \$(DeviceName)	۹ ۹
Track Close-Gap	Drive Name:	\$(DriveTerminalName)	٩
Part	Encoder Name:	\$(EncoderTerminalName)	٩
	BTN:	\$(BTN)	4

Click on the button + to add a new tooltip A new tooltip is added to the list.

Remove tooltip



Click on a tooltip to be removed

► Click on the button **x** to remove the selected tooltip from the list The tooltip is removed from the list.

Drive Status



- Click on Drive Status
- Activate the checkbox Show Module drive warning to display warnings

OR

- Deactivate the checkbox Show Module drive warning to hide warnings
- Activate the checkbox Show Module drive error to display error messages

OR

- Deactivate the checkbox Show Module drive error to hide error messages
- Click on the buttons of Icon Horizontal Alignment, Icon Vertical cal Alignment, Icon Horizontal Baseline and Icon Vertical Baseline to select the alignment of the icon
- ► Enter values for the distances between the icon and the frame in the input fields *Icon margin*

Property Explanation		Default setting	
Show Module drive warning	Display of the module warning	Enabled	
Show Module drive error	Display of the module error	Enabled	
Icon Horizontal Alignment	Horizontal alignment of the icon	Center	
≡ Left	Left aligned	-	
≡ Center	Centered	_	
≡ Right	Right aligned	_	
Icon Vertical Alignment	Vertical alignment of the icon	Bottom	
т Тор	Тор	_	
🕂 Center	Centered	-	
L Bottom	Bottom	_	
Icon Horizontal Baseline	Horizontal icon baseline	Center	
≡ Left	Left aligned	-	
≡ Center	Centered	_	
∃ Right	Right aligned	_	
Icon Vertical Baseline	Vertical icon baseline	Bottom	
т Тор	Тор	_	
🕨 Center	Centered	-	
上 Bottom	Bottom	-	
Icon margin	Distance icon to frame	-	
i Left	Left 0		
≣∈ Right	ht Right 0		
т Тор	Тор 0		
💾 Bottom	Bottom 0		

8.8.1.3 Mover

XIS View Themes General Tool Window Theme Mover Selection Color Mover Dialog Columns Mover Dialog Columns Text D Tooltip Track Close-Gap Station Part Nume Unte Parameter PCD Parameter Type Mover Selection Returns the dire for the code Gap mm Brune the code of the Cod Returns the code of the Code R	Options				
Tool Window Theme Mover Selection Color Mover Dialog Columns Tooltip Track Close-Gap Station Part More Under Verlage Gelations Barneter PCDP Parameter Type Converting Anglifer CT Imperatures Nover Selection Color Converting Close-Gap Station Part Part Anglifer CT Imperatures Seame Returns the CT values for each of the converting of the model of the converting of the model of the converting of the model of the converting of the converting	TS View Themes Gen	ieral			
View Mover Selection Color Module Mover Dialog Columns Text ID Tooltip Track Close-Gap Station Part Part Angle deg Returns the Cl Values for each concernance Type Drive CoE - 12T Diag Data Angle deg Returns the Cl Values for each concernance to the conce	Tool Window Theme				
Angle Unit Parameter PROD Parameter Type Drive CoE - 12T Diag Data Amplifier I2T Imperatures % Returns the UT values for exc exceeded and exceeded	View Module ✓ Mover ID Tooltip Track Close-Gap Station Part	Mover Selection	Color lumns		
Name Unit Parameter FTCD Parameter Type Amplifier LT Diag Data Amplifier LT Imperatures % Returns the LT values for each interaction of the model interaction of the model Drive Terminal Name deg Returns the digit of the model Returns the adjet of the model Drive Terminal Name Gap mm Defaust the number of the com Interaction					
Anglifer LT Diag Data Anglifer LT Diag Data Anglifer LT Dependures % Returns the LT values for eac Serveral Angle deg Returns the angle of the mod Device Name Returns the angle of the mod Device Name Returns the angle of the mod Gap mm Defines the gap between the Instance Name Returns the angle of the TCG Isoffeed Returns the angle of the TCG Isoffeed Returns the angle of the CCG Isoffeed Returns the length of the mod Marker The modUle Offset mm Define of the CCG Offset mm Define of the CCG	elect Components				
Amplifier 2T Temperatures % Returns the ET values for eace Serveral Angle Angle deg Returns the angle of the mod Device Name Returns the angle of the mod Dive Terminal Name Returns the anne of the com Gap mm Defines the gap between the Instance Name Returns the name of the Con Gap mm Defines the gap between the Instance Name Returns the name of the Con Gap mm Returns the name of the Con Gap mm Returns the name of the Con Instance Name Returns the name of the Con Gap mm Returns the name of the Con Gap mm Returns the name of the Con Gap mm Returns the name of the Con Instance Name Returns the name of the Con Gap mm Returns the length of the node Motor TerminalOD Offset mm Define an offset of the mode	elect Components	a Unit	Parameter PTCID	Parameter Type	٥
Angle Add Search A	elect Components X Name Drive CoE - 12T Diag	a Unit Data	Parameter PTCID	Parameter Type	
Angle deg Returns the angle of the mod Decire Name Returns the decire name of the com Drive Terminal Name Returns the name of the com Cope mm Gap mm Infance Name Returns the name of the com Infance Name Name of the Com Infance Name Returns the name of the Com Infance Name Name of the Com Infance Name Returns the name of the Com Infance Name Name of the Com Infance Name Name of the Com Infance Name Name of the Com	Elect Components X Name Drive CoE - 12T Diag Amplifier 12T Temperatu	s Unit Data ures %	Parameter PTCID	Parameter Type	Returns the I2T values for eac
Perice Name Perice Na	X Name Name Norive CoE - 12T Diag Amplifier I2T Temperatu Seneral	o Unit Data ures %	Parameter PTCID	Parameter Type	Returns the I2T values for eac
Drive Terminal Name Returns the name of the com Encoder Terminal Name Returns the name of the com Gap mm Defines the gap between the Instance Name Instance Name Returns the same of the Com Isidered Returns whether the module kindred Returns whether the module Motor Grannal Name Returns whether the module Offset mm Offset mm Defines the gap between the	X Name X Name X Name Crive CoE - 12T Diag Amplifier I2T temperate Seneral X Angle	n Unit Data ures % deg	Parameter PTCID	Parameter Type	Returns the I2T values for eac
Encoder Terminal Name Returns the name of the corr Gap mm Defines the gap between the Instance Name Returns vibre for Isinfeed Returns vibre the module Kingth mm Returns vibre the module Motor TerminalOD Safe the object ID of the corre Offset mm Define an offset for the module	V Name X Name Drive CoE - 12T Diag Amplifier I2T temperate General X Angle Device Name	n Unit Data ures % deg	Parameter PTCID	Parameter Type	Returns the I2T values for eac Returns the angle of the moc Returns the device name of
Gap mm Defines the gap between the Instance Name Instance Name Returns the name of the Too' Isinfeed Returns whether the module X Length mm MotorTerminaIOD Set the öpted to the correl Offset mm Defines an offset for the module	elect Components X Name Drive CoE - 12T Diagg Amplifier UT Temperatu Seneral Angle Device Name Drive Firminal Name	9 Unit Data wes % deg	Parameter PTCID	Parameter Type	Returns the I2T values for eac Returns the angle of the moo Returns the device name of a Returns the name of the corr
Instance Name Returns the name of the Tcor Isitefaced Returns whether the module X Length mm Motor FerminatIOD Set the biget to the core Offset mm Deline an effset for the module	Angle Drive Core L12T Diag Angle Drive Core I 217 Diag Angle Drive Terminal Name Encode Terminal Name	e Unit Data wres % deg	Parameter PTCID	Parameter Type	Returns the IZT values for ease Returns the angle of the moo Returns the device name of the corr Returns the name of the corr Returns the mane of the corr
Isilized Returns whether the module kergth mm Returns the length of the mode MotorFinalOID Offset mm Define an Offset for the mode	elect Components X Name Prive CoE - 12T Diag Amplifier 12T Temperati Seneral X Angle Device Name Drive Terminal Name Coep	e Unit Data ures % deg e mm	Parameter PTCID	Parameter Type	Returns the I2T values for eace Returns the angle of the moc Returns the device name of the Returns the name of the corr Returns the name of the corr Defines the gap between the
x Length mm Returns the length of the moo MotorTerminalOID Set the object ID of the correct Offset mm Define an offset for the mode	elect Components X Narme Drive CoE - 12T Diag Ampler Ampleter Ample Device Name Drive Coe Name Drive Coe Coe Terminal Name Cap Instance Name Instance Name	e Unit Data deg e mm	Parameter PTCID	Parameter Type	Returns the IZT values for eace Returns the angle of the moo Returns the device name of a Returns the name of the corr Returns the name of the torr Defines the gap between the Returns the name of the Too
MotorTerminalOID Set the object ID of the corres Offset mm Define an offset for the modu	elect Components X Name Drive CoE - 12T Diage Amplifier U2T Diage Amplifier U2T Diage Amplifier U2T Diage Components Angle Drive Farminal Name Encoder Terminal Name Encoder Terminal Name Encoder Same Instance Name Infrared	e Unit Data ures % deg e mm	Parameter PTCD	Parameter Type	Returns the I2T values for eac Returns the angle of the moo Returns the device name of the Returns the name of the corr Returns the name of the corr Defines the gap between the Returns when have of the TCor Returns whether the module
Offset mm Define an offset for the mode	Argel Argel Argel Device Name Device Name Device Name Instance Name I	e Unit Data ures % deg e mm	Parameter PTCiD	Parameter Type	Returns the I2T values for eace Returns the angle of the moo Returns the device name of the Returns the name of the Corr Defines the gap between the Returns the name of the TCO Returns whether the module Returns whether the module
	elect Components X Narm Prive CGE - 12T Diag Amplifier 12T Temperati General C Angle Device Name Drive Terminal Name Drive Terminal Name Gap Instance Name Instance	e Unit Data deg e mm mm	Parameter PTCID	Parameter Type	Returns the I2T values for eace Returns the angle of the moo Returns the device name of Returns the name of the corr Returns the name of the Cor Defines the gap between the Returns whether the module Returns whether the module Returns whether the module Set the object ID of the corre

- Expand *Mover*
- Select a color for selected movers from the drop-down menu Mover Selection Color

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

 Click on ... of Mover Dialog Columns to open the dialog box Select Components

The dialog box Select Components opens.

Activate the parameter checkbox to select the parameter

OR

- Deactivate the parameter checkbox to remove the parameter from the selection
- ► Confirm with **OK**

Text	

Options					
XTS View Themes General					
Tool Window The	eme 🔻				
View ▶ Module ▲ Mover Text ID Tooltip Track Close-Gap Station Part	Text Horizonta Vertical A Text Base Text Brusl Font Size Margin	al Alignment E = = = Vignment T + L etime T T T 1 th th th th th th th th th th			
Mover components		x			
Name	Shortcut	Unit Description			
SoftDrive - Scope Van Aander Senten Fotos Anald Cermitalian Fotos Anald Cermitalian Control (Control (Hables HakComPo) HakComPo HakComPo) HakComPo HakComPo) HakComPo HakCom	mile Relatives the activation possible for HVE, A Relatives the control. Miles and the control of the			

- Click on Text
- If required, enter parameter in the input field *Text* OR
- Click on Browse to open the dialog box Mover Components

The dialog box Mover Components opens.

- ► Click on a parameter
- ► Confirm with **OK**

360 —
Doptions			
XTS View Themes Gen	neral		
Tool Window Theme	<u> </u>		
View Module			
Tout	Horizontal Alignment		
Text	Vertical Alignment II 🕂 🕂		
ID	Text Baseline T -T- T		
Tooltip	Text Brush		
Track	Fact Circ 16		
Close-Gap	Pont Size		
Station	×≣ 0 Ť 0		
Part	iwargin ≣k 0		

- Click on the buttons at Horizontal Alignment, Vertical Alignment and Text Baseline to select the alignment of the text
- ► Choose a color from the drop-down menu Text Brush

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

- Select the preset value in the drop-down menu Font Size
 OR
- Enter a value in the input field Font Size
- ► Enter values for the distances between the text and the frame in the input fields *Margin*

Property	Explanation	Default setting
Text	Input field for parameters displayed on the movers	-
Horizontal Alignment	Horizontal alignment of the text to the module	Left
≡ Left	Left aligned	-
≡ Center	Centered	-
≡ Right	Right aligned	-
Vertical Alignment	Vertical alignment of the text to the mover	Тор
📅 Тор	Тор	-
H Center	Centered	-
L Bottom	Bottom	-
Text Baseline	Text baseline	Тор
т Тор	Тор	-
∓ Middle	Middle	-
I Bottom	Bottom	-
Text Brush	Font color	AliceBlue
Font Size	Font size	16
Margin	Distance of the text to the frame	-
i⊫ Left	Left	0
l≣∈ Right	Right	0
📅 Тор	Тор	0
😃 Bottom	Bottom	0

ID

Options	
XTS View Themes Gen	eral
Tool Window Theme	. •
View ▷ Module △ Mover Text ID Tooltip Track Close-Gap Station Part	Shade Mover IDs X ID 1 Color Other Color

- ► Click on ID
- Activate the checkbox Shade Mover IDs to highlight the Mover IDs

OR

- Deactivate the checkbox Shade Mover IDs to not highlight the Mover IDs
- Select a color for the color highlighting of Mover 1 in the dropdown menu ID 1 Color
- Select a color for the color highlighting of the movers in the dropdown menu Other Color

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

Property	Explanation	Default setting
Shade Mover IDs	Color highlighting of the Mover IDs	Enabled
ID 1 Color	Color for highlighting the selected Movers 1	PaleGreen
Other Color	Color for highlighting the selected movers	Steelblue

XTS Tools

Tooltip

Dptions		Click on Tooltip
XTS View Themes Ger	neral	
Tool Window Theme		Click on Browse to open the dialog box Mover Components
View ▷ Module △ Mover Text ID Tooltip Track Close-Gap Station Part	ToolTip Format Description Value Name: \$(Name) Hardware Position: \$(ActNkPos) mm NC Position: \$(ActNcPos) mm NC Modulo Position: \$(ActNcModuloPos) mm	
Anne Componente Anne Scott Drive - Scope Variab Anata Gramman Pantes Anata Gramman Anata Gramman Anata Gramman Anata Gramman Anata Monte Mathem Mathm Mathem Mathm Mathem Mathm Mathem Mathe	Stortust Unit Description Ist Description Stortust Stortust Landou A Rear to the schad connected on potion for MR. Stortust Stortust Landou A Rear to the schad connected on potion for MR. Stortust Stortust Stortust March to the schad connected on potion for MR. Stortust Stortust Stortust March to the schad connected on potion for MR. Stortust Stortust Stortust March to the schad connected on potion for MR. Stortust Stortust Stortust March the schad working position for MR. Stortust Stortust Stortust March the schad working position. Stortust Stortust Stortust March the schad working position. Stortust Stortust Stortust March the schad working from interpolater. Stortust Stortust Stortust March the schad working from interpolater. Stortust Stortust Stortust March the schad working from interpolater. Stortust Stortust Stortust Marcon the schad working from interpolater.	 The dialog box <i>Mover Components</i> opens. ► Click on a parameter ► Confirm with OK

Add Tooltip

Tool Window Theme	•		
tool window meme			
View	ToolTip Format		
Module	+×		
Mover	Description	Value	
Text	Name:	\$(Name)	٩
ID	Hardware Position:	\$(ActHwPos) mm	Q
Tooltip			
Track	NC Position:	\$(ActNcPos) mm	٩
Close-Gap	NC Modulo Position:	\$(ActNcModuloPos) mm	٩
Station			
Part			
rait			

Click on the button + to add a new tooltipA new tooltip is added to the list.

Remove tooltip



Click on a tooltip to be removed

► Click on the button **x** to remove the selected tooltip from the list The tooltip is removed from the list.

8.8.1.4 Track

Tool Window Themes	eral
View Module Mover Text ID Tooltip Track	Enabled X Show Name X Show name on each segment X Thickness 8 Text Baseline T T T T Text Alignment E = =
Close-Gap Station Part	Text Font Size 48 Text Margin 活 0 前 0

 Activate checkboxes Enabled, Show Name and Show name on each segment

OR

- Deactivate the checkboxes Enabled, Show Name and Show name on each segment
- ▶ If necessary, change the value in the input field *Thickness*
- Click on the buttons at **Text Baseline** and **Text Alignment** to select the alignment of the text
- Select the preset value in the drop-down menu *Text Font Size* OR
- ► Enter a value in the input field *Text Font Size*
- ► Enter values for the distance between the text and the frame in the input fields *Text Margin*

Property	Explanation	Default setting
Enabled	Display of track information	Enabled
Show Name	Track name	Enabled
Show name on each segment	Name of the track for each segment	Enabled
Thickness	Line width	8
Text Baseline	Text baseline	Тор
Т Тор	Тор	-
- T- Middle	Middle	-
I Bottom	Bottom	-
Text Alignment	Text alignment	Left
≡ Left	Left aligned	-
≡ Center	Centered	-
∃ Right	Right aligned	-
Text Font Size	Font size	48
Text Margin	Distance of the text to the frame	-
∍⊫ Left	Left	0
≣⊂ Right	Right	0
т Тор	Тор	0
🗜 Bottom	Bottom	0

8.8.1.5 Close-Gap

Doptions			
XTS View Themes Gen	eral		
Tool Window Theme	•		
View ▶ Module ▲ Mover Text ID Tooltip Track	Track Close-Gap I Thickness Brush Show Text Text Baseline Text Alignment Text Ent Size	nfo × 8 × T ∓ I Ξ Ξ Ξ	
Station Part			

- Click on Close-Gap
- Activate the checkbox Track Close-Gap Info to display the distance from the start point to the endpoint of the track

OR

- Deactivate the checkbox Track Close-Gap Info to hide the distance from the start point to the endpoint of the track
- ▶ If necessary, change the value in the input field *Thickness*
- Choose a color from the drop-down menu *Brush*

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

 Activate the checkbox Show Text to show the text OR

- ► Deactivate the checkbox **Show Text** to hide the text
- Click on the buttons at **Text Baseline** and **Text Alignment** to select the alignment of the text
- Select the preset value in the drop-down menu Text Font Size
 OR
- Enter a value in the input field Text Font Size

Property	Explanation	Default setting
Track Close-Gap Info	Display of the distance from the start point to the endpoint of the track	Enabled
Thickness	Line width	8
Brush	Font color	LightSkyBlue
Show text	Display of the text	Enabled
Text Baseline	Text baseline	Bottom
Т Тор	Тор	-
∓ Middle	Middle	-
I Bottom	Bottom	-
Text Alignment	Text alignment	Center
≡ Left	Left aligned	-
≡ Center	Centered	-
≡ Right	Right aligned	-
Text Font Size	Font size	48

8.8.1.6 Station

Tool Window Theme ▼ View Show Name X ▷ Module Show name on each segment Image: Comparison of the segment ▲ Mover Thickness B Text Image: Comparison of the segment Image: Comparison of the segment
View Show Name Module Show name on each segment Mover Thickness Text Text
ID Text Baseline T + L Tooltip Text Alignment E = = Track Text Font Size 48 Close-Gap Text Margin Text Margin Part ↓ 0

- ► Click on Station
- Activate the checkbox Show Name to display the name of the station

OR

- Deactivate the checkbox Show Name to hide the name of the station
- Activate the checkbox Show name on each segment to display the name of the station on each segment

OR

- Deactivate the checkbox Show name on each segment to hide the name at each station
- ▶ If necessary, change the value in the input field *Thickness*
- Click on the buttons at **Text Baseline** and **Text Alignment** to select the alignment of the text
- Select the preset value in the drop-down menu *Text Font Size* OR
- ► Enter a value in the input field *Text Font Size*
- ► Enter values for the distance between the text and the frame in the input fields *Text Margin*

Property	Explanation	Default setting
Show Name	Display of the name of the station	Enabled
Show name on each segment	Display of the name of the station on each segment	Disabled
Thickness	Line width	8
Text Baseline	Text baseline	Тор
Т Тор	Тор	-
	Middle	-
I Bottom	Bottom	-
Text Alignment	Text alignment	Left
≡ Left	Left aligned	-
≡ Center	Centered	-
∃ Right	Right aligned	_
Text Font Size	Font size	48
Text Margin	Distance of the text to the frame	-
i Left	Left	0
≣⊂ Right	Right	0
т Тор	Тор	0
🖳 Bottom	Bottom	0

8.8.1.7 Part



- Click on Part
- Activate the checkbox Dimensions Enabled to show the dimensions of the part

OR

- Deactivate the checkbox Dimensions Enabled to hide the dimensions of the part
- Choose a color from the drop-down menu Dimensions Brush

Further information can be found in chapter "Drop-down menu Brush | Color", [Page 374].

 Select the preset value in the drop-down menu Dimensions Marker Font Size

OR

- Enter a value in the input field *Dimensions Marker Font Size*
- If necessary, change the values in the input fields Part Dimensions Marker Label Modulo, Dimensions Marker Size and Dimensions Thickness

Property	Explanation	Default setting
Dimensions Enabled	Display of the part dimensions	Enabled
Dimensions Brush	Color of the dimensions	AliceBlue
Dimensions Marker Font Size	Font size for the dimensions at the marker	26
Part Dimensions Marker Label Modulo	Interval for displaying the label of the part dimen- sions at the marker	2
Dimensions Marker Size	Length of the marker of the dimensions	30
Dimensions Thickness	Width of the marker of the dimensions	8

8.8.2 General

8.8.2.1 Common

Doptions..

Common

Configurator

XTS View Themes General

Simulation Builder

General settings can be made in the *General* tab.

NOTICE

Do not change the Common parameter

The parameters *Common* should not be changed in order to avoid communication errors.

Proceed as follows if you need to change the parameters Common:

- Click on the General tab
- Click on Common
- ► If required, change the value in the input field CoE Update Interval [ms]
- Activate the checkbox Cycle Update Info Server

OR

Pictures

- Deactivate the checkbox Cycle Update Info Server
- Enter a storage location for the snapshots in the input field Snapshot Default Path
- OR
- Click on Browse to open the dialog box Browse For Folder and select a storage location for the snapshots

Property	Explanation	Default setting
CoE Update Intervall [ms]	CoE update interval	50
Cycle Update Info Server	Cycle update info server	Disabled

Addition of an EtherCAT Description

CoE Update Intervall [ms] 50

C:\User

Location

C:\TwinCAT\3.1\Config\Io\EtherCAT\Beckhoff ATH2xxx.xml

Cycle Update Info Server

Snapshot Default Path

EtherCAT Descriptions

+ ×

🗣 Options		
TS View Themes General		
Comfigurator Simulation Builder	CoE Update Intervall [ms] Cycle Update Info Server Snapshot Default Path Ether/CAT Descriptions	50 CAUsers\Pictures

Click on the button + to add a file path

368 -

Removing an EtherCAT Description

TS View Themes General	
Common	CoE Update Intervall [ms] 50
Configurator	Cycle Update Info Server
Simulation Builder	Snapshot Default Path CAUsers\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

- Click on a file path that is to be removed
- ► Click on the button **x** to remove the selected file path
- The file path is removed from the list.

8.8.2.2 Configurator

By default, the *Default Configuration* creates a part and a track with all necessary settings. This setting is useful if you want to configure a closed XTS system with the XTS Configurator. If you work mainly with Track Management, this setting should be disabled.



Click on Configurator

 Activate the checkbox Default Configuration to configure a closed system

OR

- Deactivate the checkbox Default Configuration to configure a system with Track Management
- Activate the checkbox Show Advanced Settings to show advanced settings

OR

 Deactivate the checkbox Show Advanced Settings to hide advanced settings

Property	Explanation	Default setting
Default Configuration	Simplifies the configuration of parts and tracks in a closed XTS system in the XTS Configurator	Enabled
Show Advanced Settings	Display of the advanced settings	Disabled

8.8.2.3 Simulation Builder

Default Configuration

Doptions...

XTS View Themes General

Common

Configurator Simulation Builder By default, the *Default Configuration* creates a part and a track with all necessary settings. This setting is useful if you want to configure a closed XTS system with the XTS Simulation Builder. If you work mainly with Track Management, this setting should be disabled.

- ► Click on Simulation Builder
- Activate the checkbox Default Configuration to configure a closed system

OR

- Deactivate the checkbox Default Configuration to configure a system with Track Management
- Activate the checkbox Show Introduction to display the welcome screen

OR

 Deactivate the checkbox Show Introduction to hide the welcome screen

Property	Explanation	Default setting
Default Configuration	Simplifies the configuration of parts and tracks in a closed XTS system in the XTS Simulation Builder	Enabled
Show Introduction	Display of the welcome screen in the Simulation Builder	Enabled

8.8.3 Close Options... dialog box

The dialog box *Options...* can be closed in three different ways.

8.8.3.1 Save & Close



With Save & Close all settings are saved permanently.



Immediate use in the XTS Tool Window The settings are applied after saving in the *XTS Tool Window*. In other tools, the settings are only applied after a restart.

Click on Save & Close to save the settings permanently

The dialog box Options... closes.

8.8.3.2 Close

With *Close*, the updated settings in the dialog box *Options...* are temporarily saved. When you reopen the dialog box *Options...*, these settings are still available.

NOTICE

Save settings securely

Make sure that your settings are not accidentally deleted or saved.

Use the Save & Close button to save the current settings in order to avoid accidental deletion when TwinCAT is closed. Use the Cancel button to delete the updated settings to avoid ac-

cidentally saving them.

Options					×
TS View Themes Gene	eral				
Tool Window Theme	*				
View Module Text Tooltip Drive Status Mover Text ID Tooltip Track Close-Gap Station Part	Tertured Background D	•			
			_		

Click Close to close the dialog box Options...

OR

Click x to close the dialog box Options...

The settings are saved temporarily and are available until TwinCAT is closed.

8.8.3.3 Cancel

					×
S View Themes Ger	eral				
Tool Window Theme	•				
View Module Test View Module Test Test Drive Status Moor Test ID Track Close-Gap Station Part	Roturd Balgnood X XTS Vee Balgnood	×			

With *Cancel*, all updated settings that have not yet been saved with *Save & Close* are deleted.

► Cancel with Cancel

All settings that have not yet been saved with *Save & Close* are deleted and are no longer available when the dialog box *Options...* is opened again.

8.8.4 Drop-down menu Brush | Color

In the drop-down menu *Brush* | *Color*, you have two options for setting a color:

- select a predefined color in the System tab
- define a color in the Custom tab

8.8.4.1 System

1

Show the name of the color

If you move the mouse pointer over the color, the name of the color is displayed.

There are 141 predefined colors to choose from in the System area.

- Open the drop-down menu
- Click on the System tab

Select a color from the drop-down menu System

After selecting the desired color, the drop-down menu closes automatically.



8.8.4.2 Custom



In the Custom area you have the possibility to define a color.

- Open the drop-down menu
- ► Click on the **Custom** tab to display the settings area *Custom*



Position	Explanation
1	Selection tool in the selection area
2	Selection area
3	Color slider
4	Input fields and sliders for RGB color values
5	Input field and slider for the opacity
6	Input field for HEX color code
7	Display area of the defined color

The adjustment range *Custom* is displayed.

Set solid color

- ► Define a color with the selection tool [1] in the selection area [2] and the color slider [3]
- ► Enter values in the input fields *R*, *G* and *B* [4] to define the color OR
- ▶ Use the *R*, *G* and *B* [4] sliders to set values for the color
- ► Enter a value for the opacity in the input field A [5]

OR

▶ Use the A [5] slider to set the opacity

Enter HEX color code

- ▶ Enter a code for the HEX color in the input field [6]
- ▶ Click outside the settings area to close the drop-down menu

8.8.5 Positioning and opacity



By default, the dialog box *Options...* opens in the center of the XTS Tool. You have the option of placing the dialog box with buttons in different places and setting the opacity of the dialog box.

- Right-click on the header of the dialog box to open the context menu
- Click on Dialog Settings

The dialog box *Dialog Settings* opens.

8.8.5.1 Controls

The list shows the most important controls:

Top left

Aligns the dialog box at the top left of the open XTS tool.

🗖 Тор

Aligns the dialog box at the top across the entire width of the open XTS Tool.

Top right

Aligns the dialog box at the top right of the open XTS Tool.

Left

Aligns the dialog box to the left over the entire height of the open XTS Tool.

Middle

Aligns the dialog box to the middle of the open XTS Tool.

▶ Right

Aligns the dialog box to the right over the entire height of the open XTS Tool.

Bottom left

Aligns the dialog box at the bottom left of the open XTS Tool.

Bottom

Aligns the dialog box at the bottom across the entire width of the open XTS Tool.

, Bottom right

Aligns the dialog box at the bottom right of the open XTS Tool.

Opacity slider

Sets the opacity for the dialog box.

- 377

XTS Tools



- Click on a button to set the orientation for the dialog box
- ► Use the slider **Opacity** to set the opacity for the dialog box

9 XTS HMI Controls

To install	and	use	the	XTS	HMI	Controls,	you	need	the	following
software p	backa	ges:								

Software	Version
TE2000 HMI Engineering	1.12.748 or higher
TF2000 HMI Server	1.12.748 or higher
Beckhoff.TwinCAT.HMI.XTS.Controls	3.2107.1 or higher
Beckhoff.TwinCAT.HMI.XTS	3.2107.1 or higher
TF5850 TC3 XTS Extension	3.21.700.0 or higher
TwinCAT 3.1	3.1.4024.0 or higher

System requirements for the XTS HMI Controls

Operating	system	Version
Windows		10 or higher

9.1 Installation of the NuGet package

After you have successfully installed *TF5850 TC3 XTS Extension* and *TE2000 HMI Engineering* and opened a new HMI project, you can add the *XTS HMI Controls* to your project. To add the HMI controls, you need to add and configure the required NuGet packages.

- ► In the *Solution Explorer* right-click on **TcHmiProject** to open the context menu
- ► In the context menu click on Manage NuGet Packages ...

In the project window, the tab NuGet: TcHmiProject opens.

Select TwinCAT XTS Technology in the drop-down menu Package source

olution Explorer	- 4 ×	Desktop.view ⇔ ×
○ ○ 습 🗄 - Ìo - @	¥ -	0 0 0 1 0 1 0 0
Search Solution Explorer (Ctrl+	- Q, (i	a second s
Solution 'TcHmiProject2'	1 project)	RECKH
🔺 🐚 TcHmiProject2		DLUNI
D Server	Build	
P Properties	Rebuild	
b imports	Clean	
Gill Themes	Scope to This	
👂 💼 Fonts 📑	New Solution Explorer View	
Þ 💼 Images	Add	•
KeyboardLayou	Publish to TwinCAT HMI Server	
P Localization	Start TwinCAT HMI Server	
packages.confi E	CodeRebind Sort Order and Theme Arrig	nment
▷ ∬ tsconfig.tpl.jso	Show all missing files	
ž	Mapage NuGet Packages	
1	Set as Stattlin Broject	
~	Dahua	
	Debug	
Å	Cut	Ctrl+X
×	Remove	Del
[L	Rename	
	Unload Project	
C	Open Folder in File Explorer	
5	Properties	Alt+Enter
		0.1
Terralegent + + Existence		Marchael Paralament Marchaeler Tel Jacobertari
anti-chi-ci P 🛛 🖉 🗆 Salada punda		Palapson hatch??? haveleg?
Beddhoff Thein CAT HML Controls to Sector	0 v0.783	Tend AT IN Someone Tend AT IN Conterner Tend AT INA Conterner
 Excit/2144 is a development environment for web faced HMc Okones Mar Backbardt Tacker BT UNU Economistic is to to to to 	incidenticals. This package provides the controls for the Twin Call Hild start.	
B TainGUTHA is a dealopment environment for such based HMs (Human Mac	ine interfaces). This participage provides the direct framework for the Turn Call Hild.	
Beckhoff Thein CAT HML Functions by Technet Tack 22 HM is a development and occurs for units based HMs (Namus Ma expensions.	0 v0.248.	·
ch package is licensed to you by its owner. Hadiet is not responsible for, nor does it p	and any Scenars to third party packages.	-
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Beckhoff.TwinCAT.HMI.XTS by Section TuescAT HMI XTS support for TuescAT HMI server.		+82167.1
Beckhoff.TwinCAT.HMI.XTS.Controls by Recited TwinCAT HM Centrels for XTS		v52107.1

- Click on Browse
- Click on Beckhoff.TwinCAT.HMI.XTS.Controls



You can also find the *HMI XTS* package *and the HMI XTS Controls* package at the following file path in your Explorer: *C:\TwinCAT\Functions\TF5850-TC3-XTS-Technology\TcXtsHmi-Control.*



Confirm with Install to install the Beckhoff.Twin-CAT.HMI.XTS.Controls package

1

With the installation of the *Beckhoff.TwinCAT.HMI.XTS.Controls* package, the *Beckhoff.TwinCAT.HMI.XTS* package is also automatically installed.

The dialog box Preview Changes opens.

► Confirm with **OK**

After installation, the *XTS View* is available at *XTS Controls* in the *Toolbox*.



9.2 Server Extension configuration

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Solution Explorer

To view an XTS system in the XTS View, you must configure a connection to the target PC. On the target PC, an XTS project must be in *Run Mode*. A local connection is preconfigured.

- Expand Solution Explorer > TcHmiProject > Server
- ► Double click on TcXtsHmiServerExtension

	TcHmiProject2	
-	Server	
	> () ADS	
	() TcHmiSrv	
	TcXtsHmiServerExtension	
Þ	& Properties	
Þ	P References	
Þ	1 Imports	
Þ	2 Themes	
Þ	📁 Fonts	
Þ	📒 Images	
Þ	KeyboardLayouts	
₽	Localization	
	Desktop.view	
	packages.config	
Þ	🗊 tsconfig.tpl.json	
AT HMI Ser	ver Configuration 🗢 🗙 Desktop.view	
ini Snu	Publish Configuration: default · Manage Configurations	
tsHmiServe	TcXtsHmiServerExtension	
	ADGET SYSTEMS	

The *TwinCAT HMI Server Configuration* tab opens in the project window.

- Click on TcXtsHmiServerExtension
- ► Expand TARGET_SYSTEMS
- Click + Add

Assign names for better overview

The name for the connection has no function. Beckhoff recommends assigning a name in order to identify the target PC.

The dialog box Add opens.

- Enter a name for the connection in the input field *Name*
- Enter the AMS Net Id of the target PC with which the connection is to be established in the input field NETID
- If necessary, adjust the value in the input field UPDATE_RATE
- Confirm with Add
- Add more connections in the same way

TwinCAT HMI Server Configu	ration 🕫 🗙 Desktop.view
ADS	Publish Configuration: default V Manage Configurations
TcHmiSrv TcXtsHmiServerExtension	TcXtsHmiServerExtension
	Add successful
	TARGET_SYSTEMS XTS target systems. Can be set for specific remote configuration
	> Local
	> XTS Documentation
	+ Add
	Accept .

Confirm with Accept to complete the configuration

9.2.1 Edit entries

You can delete or edit your entries:

	W			
Publish Configuration:	default	*	Manage Configurations	
TcXtsHmiServ Add successful	er <mark>E</mark> xtension			
TARGET_SYSTEMS XTS target systems, Can be Local	set for specific remote co	nfiguration		
			127.0.0.1.1.1	×
in milliseconds			8	
	Publish Configuration: TCXtsHmiServ Add successful • TARGET_SYSTEMS XTS target systems. Can be > Local • XTS Documental NETID UPDATE_RATE In milliseconds + Add Accept	Publish Configuration: default TCXtsHmiServerExtension Add successful TS target systems. Can be set for specific remote of Local TS torget systems. Can be set for specific remote of Local TS torget systems. Can be set for specific remote of TS torget systems. Can be set for specific remote of TS torget systems. Can be set for specific remote of the system s	Publish Configuration: default	Publish Configuration: default Manage Configurations TCXtsHmiServerExtension Add successful Target systems: Can be set for specific remote configuration TS target systems: Can be set for specific remote configuration

- ► Click on the name of the connection to expand the input fields
- ► Click on the button **x** to remove the connection

OR

 Click in the input fields NETID and UPDATE_RATE to edit the entries

TwinCAT HMI Server Configur	ation 🕫 🗙 Desktop.vie	w		
ADS	Publish Configuration:	default ~	Manage Configurations	
TcHmiSrv	TcXtsHmiServ Add successful TARGET_SYSTEMS XTS target systems, Can be > Local	erExtension	n	
	✓ XTS Documentat NETID UPDATE_RATE in milliseconds	ion	127.0.0.1.1.1 8	
	+ Add Accept			

Click on the edit button

The dialog box Rename opens.

- Enter a new name in the input field *New name*
- ► Confirm with **Rename**
- OR
- Click on the button x to cancel the process and close the dialog box



9.3 XTS View configuration

After installing the NuGet package and the Server Extension configuration, an XTS View Control instance can be added and then configured.

9.3.1 Add XTS View



- Expand Toolbox > XTS Controls
- Press and hold the Ctrl key to drag XTS View from the toolbox to Desktop View

•	waldep.view" + X	R xT5 Viewer (Version 3.2107.3.0)	-	0	×
		docab - 🖉 😫 + 单			
L	BECKHOFF	Front • 0 • XTS Viewer Therre • 48			
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When the XTS system is in Run mode, the system is immediately displayed in the same layout as in the *XTS Viewer*. If the XTS system is not in *Run mode*, the Desktop View remains empty.

If you have a connection to another target PC, the system of the target PC will be displayed after the TargetName of the control has been changed. If the XTS system on the target PC is not in *Run mode*, the Desktop View remains empty.

9.3.2 XTS View properties

File Edit	View	Project	Build	Debug	TwinCAT	TwinCAT
0 - 0	\$	Open				- Del
Build 402	24	Open With				2 20 2
Solution Ex		Solution Expl	orer	Ctrl+	Alt+L	- # ×
0.0.4	1	Team Explore	r	Ctrl+	^, Ctrl+M	
	5	Bookmark W	indow	Ctrl+	K, Ctrl+W	
search Solu	t G	Error List		Ctrl+	^, E	<i>p</i> .
Solution	Ð	Output		Ctrl+	Alt+O	
	Ê	Task List		Ctrl+	^, T	
Þ		Toolbox		Ctrl+	Alt+X	
Þ	17	Notifications		Ctrl+	W, N	
	É	Find Results			,	
6		Other Windo	ws		•	
۵ 🎽	1	Toolbars			•	
Þ 0	22	Full Screen		Shift-	Alt+Enter	
4 🛀	Ð	All Windows		Shift-	-Alt+M	
	G	Navigate Bac	kward	Ctrl+	-	
۵ 📁	0	Navigate For	ward	Ctrl+	Shift+-	
Þ 📕	1	Next Task				
P A		Previous Task				
	4	Properties Wi	indow	F4		
⊳ 57	1	Property Pag	es	Shift-	- F4	

In addition to the usual layout properties such as frame, layout and background image, the controller supports some specific properties.

Click on the menu item Properties Window in the menu View

i

XtsView must be selected

The XtsView element must be selected to change the XTS HMI View properties. The *Properties* window remains empty if the XtsView element is not selected.

BECKHOFF	
	Press P
	8
Interface - (Q-Ham) & I of Harry (Q-HARRoup) (Data Materialities -) Interface - April 10	dowis D- low

The Properties Window opens.

Click on the XtsView element in the project window

In the *Properties* window the available properties are displayed and can be adjusted as required.

9.3.2.1 Reset settings

With the *XTS HMI Controller*, you have the option to reset settings made to the preset settings.



Example using the settings under System Layout

The settings under *System Layout* are used as an example to show you which parameters you have changed.

After you have selected settings in a drop-down menu or entered values in the input fields, the font size of the parameter changes and the checkbox behind the input field is activated.

Default settings	Settings changed
	▲ System Layout Layout Infolmages (1 item) PartTransformations
Font normal	Font bold
• no item added	• an item added
Checkbox deactivated	Checkbox activated

System Layout			
Layout	InvertedSy	rstemView	•
Infolmages	(1 item)		
PartTransformations	(1 item)		
Mover Layout			
Pan & Zoom			
Selections			
System Layout			
System Layout Layout	InvertedSy	rstemView	•
A System Layout Layout Infolmages	InvertedSy (1 item)	stemView	•
System Layout Layout Infolmages PartTransformations	InvertedSy (1 item) (1 item)	rstemView	•
System Layout Layout Infolmages PartTransformations Mover Layout	InvertedSy (1 item) (1 item)	rstemView Reset	•
System Layout Layout Infolmages PartTransformations Mover Layout Pan & Zoom	InvertedSy (1 item) (1 item)	stemView Reset Create data binding	• I

- Expand Properties > System Layout
- Click on the activated checkbox PartTransformations
- ► Click on **Reset** in the pop-up menu

The previous settings are deleted and reset to the preset values.

9.3.2.2 Link formula

With the XTS HMI Controller you can convert input fields to enter formulas.



Example using the settings under System Layout The settings under *System Layout* show an example of how you can

convert the input field.

After you have selected settings in a drop-down menu or entered values, the font size of the parameter changes and the checkbox behind the input field is activated.

Default settings		Settings changed		
 System Layout Layout Infolmages PartTransformations 	SystemView (1 item) (no items)	 System Layout Layout Infolmages PartTransformations 	SystemView (1 item)	
 Standard input fie 	ld	 Input field convert 	ed	

System Layout				
Layout	SystemView 👻 🔳			
Infolmages	(1 item) =			
PartTransformations	(no items) 🔳			
System Layout	80.000			
Layout	SystemView 👻 🔳			
Infolmages	(1 item) =			
PartTransformations	(no it ma)			
Mover Layout	Keset			
Pan & Zoom	Create data binding			
Selections	Create function binding			
System Layout				
Layout	SystemView 👻 🔳			
Infolmages	(1 item)			
PartTransformations	/x 8			
Mover Lavout				
Pan & Zoom				
Selections				
Seccons				
Aultiline editor	×			

- Click on the deactivated checkbox
- ▶ Click on Create function binding in the pop-up menu

The previous input field is converted and an input field for a function is inserted.

- ▶ Enter a function in the input field *PartTransformations*
- OR
- ► Click on the button to open the *Multiline editor*

The dialog box *Multiline editor* opens when you click on the button.

- ► Enter a function in the input field
- ► Confirm with **OK**

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9.3.2.3 Colors



- Expand Properties > Colors
- Click in the input field *ModuleSelectionColor* to set the color for the module selection
- Click in the input field *MoverSelectionColor* to set the color for the mover selection

The adjustment range is displayed.

Further information can be found in chapter "Colors", [Page 424].

- Click in the input field *BackgroundColor* to set the color for the background
- Click in the input field *BorderColor* to set the color for the border The adjustment range is displayed.

Further information can be found in chapter "Colors", [Page 424].

The table shows the default parameter settings for the *Colors* properties:

Property	Explanation	Default setting
ModuleSelectionColor	Module selection color	Solid Color
• None	No color	-
• Theme	Graphic	-
Solid Color	Solid color	#FF000000
MoverSelectionColor	Mover selection color	Solid Color
• None	No color	-
Theme	Graphic	-
Solid Color	Solid color	#FF000000
BackgroundColor	Background color	Theme
• None	No color	-
Theme	Graphic	-
Solid Color	Solid color	-
Gradient Color	Color gradient	-
BorderColor	Border color	Theme
• None	No color	-
Theme	Graphic	-
• Solid	Solid color	_
Gradient Color	Color gradient	-

9.3.2.4 Connection

Prope	rties		▼ ₽ ×
	Identifier	XtsView_1	₽ % â
XIS	Туре	TcHmi.Controls.TcXtsHmiControls.XtsView	
Searc	ch Properties		- م
Arran	nge by: Categ	ory 🔻	
• Co	lors		
⊿ Co	nnection		
Tai	rgetName	Local	2
Re	freshRate	16	
> Sy	stem Layout		
► Me	over Layout		
▶ Pa	n & Zoom		
) Se	lections		
> Sta	ation Layout		
Dir	mensions		
▶ Inf	oBars		
▶ Lay	yout		
Co	mmon		
Bo	rder		
Ba	ckground Im	age	

► Expand *Properties* > *Connection*

► Enter the target PC in the input field *TargetName*

OR

- ► Click on the button to open the *Multiline editor*
- ▶ If necessary, adjust the value in the input field *RefreshRate*

The table shows the default parameter settings for the *Connection* properties:

Property	Explanation	Default setting
TargetName	Name of the target PC, specified connection to the XTS system	Local
RefreshRate	Refresh rate for adaptation to end devices	16

9.3.2.5 System Layout

Type TcHmi.Controls.TcXtsHmiControls.XtsView

SystemView

SystemView InvertedSystemView

Custom

SystemView

(no items)

(no items)

D D Properties

Properties

Search Properties

Infolmages

Mover Layout
Pan & Zoom
Selections
Station Layout
Dimensions
InfoBars
Layout
Common
Border
Background Image
System Layout

Layout

Infolmages

XtsView | Infolmages

Iten

PartTransform

PartTransformations

Arrange by: Category '

Colors

Connection

System Layout
Layout

Identifier XtsView_1

With this setting you determine how your XTS system is displayed in the HMI.

Expand Properties > SystemLayout

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 Select the appropriate display option in the drop-down menu Layout

► Click ... from *Infolmages*

XtsInfoImages can be inserted into the controller and can be zoomed and moved with the XTS system. XtsInfoImages are used as an array.

The dialog box XtsView | Infolmages opens.

Click on Add

An *XtsInfoImage* is added. The properties of the XtsInfoImage can be set in the *Properties* area.

- Expand General
- Click on the button **Image** to select a file path for the graphic
- ▶ Select the display in the drop-down menu View

Properties General Image	<u>ok</u> c
Properties	
Properties General Image	
General Image	
Image	
	
View	SystemView 🔻
▶ Layout	SystemView
,,	InvertedSystemView
	Custom



Reference point and origin

The reference point for the graphic is the top left-hand corner. The origin refers to the first module added in the *XTS Configurator*.

Properties		
▶ General		
Layout		
PositionX	0	
PositionY	0	
Width		
Height		
Rotation	0	
Visible	✓	
zIndex	1000	

- Expand *Layout*
- Enter values for the position in the input fields *PositionX* and *PositionY*
- ▶ Enter values for the size in the input fields *Width* and *Height*
- Enter a rotation angle in the input field *Rotation*
- ► Activate the checkbox **Visible** to show the graphic

OR

- Deactivate the checkbox Visible to hide the graphic
- Enter a value in the input field *zIndex*

Further information can be found in chapter "General settings", [Page 422].

Add	ОК	Cancel
 System Layout Layout Infolmages PartTransformations 	SystemView (no items) (no items)	• • • • • • • • • • • • • • • • • • •

► Confirm with **OK**

The dialog box XtsView | Infolmages closes.

Click ... from PartTransformations

Part Transformations can be inserted into the controller and determine the XTS layout. You can define the layout for each XTS part. Part Transformations are used as an array.

The dialog box XtsView | PartTransformations opens.

Click on Add

A *Part Transformation* is added. The properties of the part transformation can be set in the *Properties* area.



		×	Þ	Expand <i>General</i>
ገለ	Properties		► E	Enter values in the input fields PartIndex and Rotation
	General PartIndex O Rotation PartSide X-Transformation Y-Transformation Ba	efault efault ack		Select the appropriate display option in the drop-down menu <i>PartSide</i>
		×	Þ	Expand X-Transformation
P 6	Properties General X-Transformation Offset ValueScale AxisBinding V-Transformation Offset ValueScale AxisBinding			Enter values in the input fields <i>Offset</i> , <i>ValueScale</i> and <i>AxisBind- ing</i> Expand <i>Y-Transformation</i> Enter values in the input fields <i>Offset</i> , <i>ValueScale</i> and <i>AxisBind- ing</i>
Add		OK Cancel	► (The	Confirm with OK dialog box <i>XtsView</i> <i>PartTransformations</i> closes.

-

The table shows the default parameter settings for the *System Layout* properties:

Property	Explanation	Default setting
Layout	View of the system	SystemView
• SystemView	View of the system as previously configured in the XTS Configurator	-
InvertedSystemView	View of the system as previously configured in the <i>XTS Configurator</i> , but from the other side of the system	-
Custom	View of the system that is configured manually in the <i>PartTranformation</i> properties	_
Infolmages		
⊿ General		
• Image	File path for the graphic	_
• View	View of the system	SystemView
SystemView	View of the system as previously configured <i>in the XTS Configurator</i>	-
 InvertedSystemView 	View of the system as previously configured in the <i>XTS Configurator</i> , but from the other side of the system	_
Custom	View of the system that is configured manually in the <i>PartTranformation</i> properties	_
▲ Layout		
PositionX	X-position of the graphic	0
	Reference point is the global zero point	
PositionY	Y-position of the graphic	0
	Reference point is the global zero point	
• Width	Width of the graphic	_
	By default, the width of the graphic is indicated in px. Entering a value changes the width, proportionally the height of the graphic changes. Entering values for Width and Height can cause the graphic to be dis- torted.	
	Unit: mm, related to the real system size	
• Height	Height of the graphic.	_
	By default, the height of the graphic is indicated in px. Entering a value changes the height, proportion- ally the width of the graphic changes. Entering val- ues for Width and Height can cause the graphic to be distorted.	
	Unit: mm, related to the real system size	
Rotation	Rotation angle of the graphic.	0
	Unit: degrees	
Visible	Visibility of the tool	✓ True
• 🗹 True	Checkbox activated	
• 🗆 False	Checkbox deactivated	_
• zIndex	Z-position of the graphic. Provides information about updating the graph.	1000

Property	Explanation	Default setting
PartTransformations		
⊿ General		
PartIndex	Index of the configured part	0
Rotation	Rotation angle of the part.	0
	Unit: degrees	
PartSide	Display page of the part	Default
• Default	Default use of the view defined in the layout proper- ties	_
Front	Front side	_
• Back	Rear side	_
▲ X-Transformation		
• Offset	Configuration of the X offset of the part.	0
	Unit: mm, related to the real system size	
• ValueScale	X-scaling of the axis offset when an X-axis binding is used.	1
AxisBinding	Integration of a TwinCAT NC for transformation of an X offset, e.g. in order to represent a switching axis.	-
	Unit: mm, related to the real system size	
▲ Y-Transformation		
• Offset	Configuration of the Y offset of the part.	0
	Unit: mm, related to the real system size	
• ValueScale	Y-scaling of the axis offset when using a Y-axis bind- ing	1
AxisBinding	Integration of a TwinCAT NC for transformation of an Y offset, e.g. in order to represent a switching axis.	_
	Unit: mm, related to the real system size	

9.3.2.6 Mover Layout The Mover Layout allows you to display personalized tools in the form of images or text on a mover. The Mover Layout is used as an array. Properties • I X Expand Properties > Mover Layout xts Identifier XtsView ₽ **7** û Click ... from Tools Type TcHmi.Controls.TcXtsHmiControls.XtsView Q Search Properties Arrange by: Category Colors Connection System Layout Mover Layout Tools (no items) Pan & Zoom Selections Station Layout Dimensions ► InfoBars Layout Common Border Background Image (tsView | Tools The dialog box XtsView | Tools opens. Elements D D Properties Click on Add An XTS Tool is added. The properties of the XTS Tool can be set in the Properties area. × ↑ ↓ XTS Tool Add OK Cancel Expand General × Select the appropriate display option in the drop-down menu Properties Tooltype General ToolType Image Image MoverSide Text ▲ Image Select the appropriate display option in the drop-down menu × MoverSide Properties ▲ General ToolType Image MoverSide Front Front ▲ Image Back ImageSource Expand Image \times Click on the button ImageSource to select a file path for the Properties graphic General 🔺 Image Enter values in the input fields ImageWidth and ImageHeight ImageSource ImageWidth ImageHeight Mover Identificatio

×	Expand Mover Identification
 Properties General Image Mover Identification MoverIdentificati All MoverIdentificati All Text MoverIdex 	Select the appropriate display option in the drop-down menu MoverIdentificationMode
	 Enter the Mover ID or the MoverIndex in the input field <i>MoverI-</i> <i>dentification</i> OR Click on the button to open the <i>Multiline editor</i>
	 Expand <i>Text</i> Select the text type in the drop-down menu <i>TextType</i>
	 Enter a text in the input field <i>CustomText</i> OR Click on the button to open the <i>Multiline editor</i> Click from <i>TextOptions</i> The dialog box <i>TextOptions</i> opens. Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422].
	 Expand <i>Transformation</i> Enter values in the input fields <i>Position X</i>, <i>Position Y</i>, <i>Width</i>, <i>Height</i> and <i>Rotation</i> Activate the checkbox Visible to show the text OR Deactivate the checkbox Visible to hide the text Enter a value in the input field <i>zIndex</i> Further information can be found in chapter "General settings", [Page 422].



Confirm with **OK**

The dialog box *TextOptions* closes.

The table shows the default parameter settings for the *Mover Layout* properties:

Property	Explanation	Default setting
Tools		•••
▲ General		
 ToolType 	Type of tool	Image
• Image	Graphic	_
• Text	Text	_
MoverSide	Side of the mover on which the tool is displayed	Front
• Front	Front side	_
• Back	Rear side	_
⊿ Image		
ImageSource	File path of the graphic, if the ToolType <i>Image</i> is selected	_
• ImageWidth	Width of the graphic, if the ToolType <i>Image</i> is se- lected	_
	By default, the width of the graphic is indicated in px. Entering a value changes the width, proportionally the height of the graphic changes. Entering values for Width and Height can cause the graphic to be compressed.	
	Unit: mm, related to the real system size	
• ImageHeight	Height of the graphic, if the ToolType <i>Image</i> is se- lected	_
	By default, the height of the graphic is indicated in px. Entering a value changes the height, proportion- ally the width of the graphic changes. Entering val- ues for Width and Height can cause the graphic to be compressed.	
	Unit: mm, related to the real system size	
MoverIdentification		
 MoverIdentificationMode 	Determining how a mover or mover group is defined	All
• All	All movers on the system	_
• MoverId	Requires an entry of the Mover ID in the input field of <i>MoverIdentification</i>	-
MoverIndex	Requires an entry of the Mover Index in the input field of <i>MoverIdentification</i>	_
 MoverIdentification 	Input field for the MoverId or the MoverIndex, accord- ing to the selected property at <i>MoverIdentification-</i> <i>Mode</i>	-
Property	Explanation	Default setting
-----------------------------------	--	-----------------
▲ Text		
• TextType	Properties of the text, if the ToolType Text is selected	Custom
	Type of text node, if the ToolType <i>Text</i> is selected.	
Custom	Custom	-
 MoverId 	Mover ID	-
 MoverIndex 	Mover index	_
 MoverPosition 	Mover position	_
• CustomText	Input field for text, if the ToolType <i>Text</i> and the Text- Type <i>Custom</i> are selected	-
TextOptions	Properties for text design	
▲ Transformation		
• OffsetX	X offset	0
	Unit: mm, related to the real system size	
• OffsetY	Y offset	0
	Unit: mm, related to the real system size	
Rotation	Angle of rotation	0
	Unit: degrees	
Visible	Visibility	✓ True
• 🗹 True	Checkbox activated	-
• 🗆 False	Checkbox deactivated	-
• zIndex	Z-position of the graphic, information about the up- date of the graphic.	11000

9.3.2.7 Pan & Zoom

Prope	rties					≁‡×
1.000	Identifier	XtsView				₽ 7 â
XIS	Туре	TcHmi.Cont	rols.TcXtsHmiCon	trols.XtsVie	w	
Searc	h Properties					ρ-
Arran	nge by: Categ	ory 🔻				
• Co	lors					
) Co	nnection					
> Sy	stem Layout					
► Mo	over Layout					
⊿ Pa	n & Zoom					
Lo	ckZoomGest	ure	✓			
Lo	ckPanGestur	e	✓			
_			← 0	рх 🔻	→ 0	рх 💌
Pa	dding		1 0	рх 🔻	↓ 0	рх 🔻
▶ Se	lections					
State	ation Layout					
Dir	mensions					
▶ Inf	oBars					
▶ Lay	yout					
Co	mmon					
Bo	rder					
► Ba	ckground Ima	age				

- ► Expand Properties > Pan & Zoom
- Activate the checkbox LockZoomGesture to enable the zoom function

OR

- Deactivate the checkbox LockZoomGesture to disable the zoom function
- Activate the checkbox LockPanGesture to enable the panning function

OR

- Deactivate the checkbox LockPanGesture to disable the panning function
- Enter values in the input fields *Padding*

The table shows the default parameter settings for the *Pan & Zoom* properties:

Property	Explanation	Default setting
LockZoomGesture	Zoom function	False
LockPanGesture	Panning function	False
Padding	Distance between the displayed XTS system and the edge of the controller. Default zoom when loading the control.	рх
	Unit: px or %	
• +	Left distance	0
• •	Right distance	0
• •	Upper distance	0
• +	Lower distance	0

9.3.2.8 Selections

The Selection properties define how you can select the movers and modules in the controller.

Properties 🔹 म् 🗙	Expand Properties > Selections
Identifier XtsView	Note that the set of the first the last descent of the first the set of the first the set of the
Type TcHmi.Controls.TcXtsHmiControls.XtsView	Select the selection mode in the drop-down menu Selection-
Search Properties P -	Mode
Arrange by: Category *	
Colors	
Connection	
System Layout	
Pan & Zoom	
Selections	
SelectionMode Off -	
MoverSelection Off	
ModuleSelection SingleSelection	
MultiSelection	
Dimensions	
> InfoBars	
▶ Layout	
▶ Common	
Border	
Background Image	
Dresection T	N Click from Mayor Calastian
Hopefues	
xts Table Control ToYor Incontrol Vial Control Vial Contr	
Search Deservation	
Arrange by: Category	
h Celere	
Connection	
System Layout	
Mover Layout	
Pan & Zoom	
▲ Selections	
SelectionMode Off -	
MoverSelection (no items)	
ModuleSelection (no items)	
Station Layout	
Dimensions	
► InfoBars	
Layout	
Common	
Border	
Background image	
XtsView MoverSelection X	The dialog box XtsView MoverSelection opens.
Elements D ch Properties	
Item	Click on Add
	A VTC Mover is added. The properties of the VTC Mover can be est
	A XIS mover is added. The properties of the XIS mover can be set
	in the <i>Properties</i> area.
	If the Calentian Made Single Calentian on MultiCalentian is calented
	If the Selection wode SingleSelection of MultiSelection is selected
	and the list of selected movers is edited by clicking on it, the event
	onSelectedMoverChanged is triggered
	The mover is displayed in the color you have set at MoverSelection-
	Color Further information can be found in chapter "Colors" IPage
	301 j.
X T + XTS Mover - Add	
OK Cancel	

×	Expand General
Properties General MoverIndex	Enter a value in the input field <i>MoverIndex</i>
Add OK Cancel	► Confirm with OK
Properties ↓ ↓ × xrs Identifier XtsView Type TcHmi.Controls.TcXtsHmiControls.XtsView Image: Controls.TcXtsHmiControls.XtsView Search Properties ♪ → Arrange by: Category ★ Colors > > Consection > > System Layout > > Mover Ayout > > Pan & Zoom - Selections > Selections > Selection (no items) > Station Layout > > InfoBars > > Layout > > Common > > Background Image >	Click on from ModuleSelection
Xts/iew ModuleStection* X	The dialog box XtsView ModuleSelection opens.
Elements D coperties	► Click on Add
	An <i>XTS module</i> is added. The properties of the XTS module can be set in the <i>Properties</i> area.
	If the SelectionMode <i>SingleSelection</i> or <i>MultiSelection</i> is selected and the list of selected modules is edited by clicking on it, the event <i>onSelectedModuleChanged</i> is triggered.
X 1 4 XTS Module + Add	The module is displayed in the color that you have set at <i>ModuleSe-lectionColor</i> . Further information can be found in chapter "Colors", [Page 387].
OK Cancel	
×	► Expand <i>General</i>
Properties General PartIndex ModuleIndex	► Enter values in the input fields <i>PartIndex</i> and <i>ModuleIndex</i>

Add		
	ОК	Cancel

► Confirm with **OK**

The table shows the default parameter settings for the *Selections* properties:

Property	Explanation	Default setting
SelectionMode		Off
• Off	Selection of a module or a mover by clicking not pos- sible	_
SingleSelection	Selection of a module or a mover by clicking on it. The selection of the previously selected module or mover is cleared.	-
	Clicking on an empty space deselects modules and movers.	
	Trigger event onSelectedMoverChanged.	
MultiSelection	Selection of further modules or movers by clicking. Modules and movers that have already been se- lected can be removed from the selection by clicking on them again.	_
	Clicking on an empty space deselects modules and movers.	
	Trigger event onSelectedMoverChanged.	
MoverSelection		
▲ General		
MoverIndex	Identification of the selected mover	0
ModuleSelection		
⊿ General		
• PartIndex	Identification of the selected part	0
ModuleIndex	Identification of the selected module	0

9.3.2.9 Station Layout	
9.3.2.9 Station Layout Properties ype TeHmi.Controls.TeXtsHmiControls.XtsView Search Properties Arrange by: Category * Colors Connection System Layout Mover Layout Pan & Zoom Selections StationOptions Object UplayStations StationMarkerOptions Object UplayStation Layout DisplayStations StationMarkerOptions Object UplayStation Layout DisplayStation StationMarkerOptions Object UplayStation Object UplayStation StationMarkerOptions Object UplayStation StationMarkerOptions Object UplayStation StationMarkerOptions Object UplayStation StationMarkerOptions Object UplayStation StationMarkerOption	 Expand Properties > StationLayout Activate the checkbox DisplayStations to show the station OR Deactivate the checkbox DisplayStations to hide the station Click from StationOptions
Layout Common Border Background Image	The dialog box StationOntions opens
Properties 2 ayout Diplakacement 150 Thickness 8 2 index 1000	 Expand Layout Enter values in the input fields Displacement, Thickness and zIndex
OK Cancel	 Expand <i>Text</i> Select the text for the station in the drop-down menu <i>Text</i>
SatisnOptions × Properties Layout L	 Click on a button from TextInfoBarPlacement to select the alignment of the text Enter a value in the input field <i>TextDisplacement</i> Click from <i>TextOptions</i> The dialog box <i>TextOptions</i> opens. Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422]. Confirm with OK

Properties	- ∓ X	Click from StationMarkerOptions
Identifier XtsView	<i>₽ ∓</i> û	
xts Type TcHmi.Controls	-TcXtsHmiControls.XtsView	
Search Properties	0.	
Arrange by: Category T	-	
h Colore		
Colors		
Connection		
System Layout		
Mover Layout		
Pan & Zoom		
Selections		
Station Layout		
DisplayStations	ו	
StationOptions	(Object)	
StationMarkerOptions	(Object) •	
Dimensions		
▶ InfoBars		
▶ Layout		
▶ Common		
▶ Border		
Background Image		
StationMarkerOptions	×	The dialog box StationMarkerOptions opens.
Properties		
∠ Layout		Expand Layout
MarkerType	None	
Size	None .	Select the representation of the station endpoints in the drop-
Thickness	Tick	down monu MarkerTune
zindex	•	down menu <i>warker rype</i>
• lext		
StationMarkerOptions Properties • Layout MarkerType Size Thickness aindex • Text	OK Cance	► Enter values in the input fields <i>Size</i> , <i>Thickness</i> and <i>zIndex</i> Further information can be found in chapter "General settings", [Page 422].
StationMarkerOptions Properties I sayout Peck Text TextDisplacement TextOptions	OK Cancel	 Expand <i>Text</i> Select None in the drop-down menu <i>Text</i> if no text is to be displayed OR Select StopPosition in the drop-down menu <i>Text</i> if the stop position is to be displayed
	OK Cancel	



Enter a value in the input field *TextDisplacement*

► Click ... from *TextOptions*

The dialog box TextOptions opens.

Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422].

The dialog box StationMarkerOptions closes.

The table shows the de	efault parameter	settings for the	Station Lay-
out properties:			

Property	Explanation	Default setting
DisplayStations	Display of the dimensions	True
StationOptions		
▲ Layout		
Displacement	Offset between InfoBar and the center of the stator	150
Thickness	InfoBar thickness	8
• zIndex	Z-position, position of the visual element and infor- mation about the update of the visual element	1000
⊿ Text		
• Text	Text for the station	None
None	No text	_
 StationDescription 	Description of the station	-
StationId	Id of the station	_
TextInfoBarPlacement	Alignment of the InfoBar	⊨ left-justified
• = left-justified	Left aligned	_
• = centered	Centered	-
 = right-justified 	Right aligned	-
TextDisplacement	Offset of the text	10
TextOptions	Properties for text design	
StationMarkerOptions		
▲ Layout		
• MarkerType	Display of the station endpoints	None
None	No endpoints	_
Diamond	Diamond endpoints	-
• Tick	Tick endpoints	-
• Size	Size of the endpoint	20
Thickness	Thickness of the endpoint	8
• zIndex	Z-position, position of the visual element and infor- mation about the update of the visual element	Select Type
▲ Text		
• Text	Text for the station	None
• None	No text	-
StopPosition	Stop position	_
TextDisplacement	Offset of the text	20
TextOptions	Properties for text design	

9.3.2.10 Dimensions

Properties	- ∓ ∓ ×	► Expand <i>Dimensions</i>
Identifier XtsView_1	<i>₽ 7</i> â	Activate the checkhox DisplayDimensions to show the dimen-
Type TcHmi.Contro	ols.TcXtsHmiControls.XtsView ــــــــــــــــــــــــــــــــــــ	sions
Arrange by: Category *		510115
Colors		OR
Connection		Departivate the sheekbey DisplayDimensions to hide the dimension
System Layout Mover Layout		Deactivate the checkbox DisplayDimensions to hide the dimen- tions.
Pan & Zoom		sions
 Selections 		Activate the checkbox InvertDimensions
Station Layout		
Dimensions DisplayDimensions		OR
DimensionOptions	(Object)	Deactivate the checkhox InvertDimensions
InvertDimensions	✓	
InfoBars		Click from DimensionOptions
Layout		
Common Border		
Background Image		
DimensionOntions	~	The dialog hav DimensionOptions analy
Properties	^	The dialog box <i>DimensionOptions</i> opens.
Colors		Expand Colors
InfoBarColor	#FF000000	N. Olish an Info DayO alan an Mankan O alan ta sat tha salan
marKerColor	· · · · · · · · · · · · · · · · · · ·	
	R 0	The adjustment range is displayed.
	G <u>0</u> в <u>0</u>	Further is formation and he formation to all October II (Dama 404)
	A 255	Further information can be found in chapter "Colors", [Page 424].
	#FF000000	
> Text		
	OK Cancel	
DimensionOptions	OK Cancel	Expand Lavout
DimensionOptions Properties	OK Cancel	► Expand <i>Layout</i>
DimensionOptions Properties • Colors	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, Mark-
DimensionOptions Properties Colors Disable coment	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize
DimensionOptions Properties Colors Colors Diplacement Thickness	0K Cancel ×	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Olicher Debet Transformer former fo
DimensionOptions Properties Colors Colors Displacement Thickness MarkerTippe MarkerTikcness	0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex
DimensionOptions Properties Colors Colors Diplacement Thickness MarkerTiple MarkerTiktonss MarkerSize	0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex". [Page 426].
DimensionOptions Properties Colors Colors Diplacement Thickness MarkerTipe MarkerTickness MarkerSize zindex > Test	OK Cancel X 100 8 Tick 5 25 Select Type	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Colors Diplacement Thickness MarkerTipe MarkerTiktonss MarkerSize zindex) Text	OK Cancel X 100 8 Tick 5 25 Select Type.	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Dibplacement Thickness MarkerTipe MarkerTisces MarkerSize zindex } Text	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Displacement Trickness MarkerType MarkerType MarkerSize zindex > Text	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text DimensionOptions	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426].
DimensionOptions Properties Colors Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text DimensionOptions Properties	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Colors Colors Displacement Thickness MarkerType MarkerType MarkerSize zindex > Text DimensionOptions Properties Colors	OK Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Co	OK Cancel 00 0 8 0 Tick 0 25 5 25 5 0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Dibplacement Thickness MarkerType MarkerTickness MarkerSize zindex ToteX DimensionOptions Properties Cofors Cofors Cofors Layout Displacement Thickness	OK Cancel 100 • 8 • Tick • 25 • 25 • Select Type • OK Cancel X • 100 • 8 •	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Cofors Displacement Thickness MarkerType MarkerTickness MarkerSize zindex Totex DimensionOptions Properties Cofors Cofors Cofors Cofors Cofors Layout Displacement Thickness MarkerType MarkerType MarkerType MarkerType	OK Cancel 00 0 8 0 100 0 25 5 25 5 5 5 25 5 0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Cofors Displacement Trickness MarkerType MarkerTickness MarkerSize zindex Text DimensionOptions Properties Cofors	OK Cancel 100 • 8 • 100 • 25 • 25 • Select Type • 0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Cofors Dibplacement Thickness MarkerTipe MarkerTickness MarkerSize zindex Text DimensionOptions Properties Cofors	OK Cancel 100 • 8 • Tick • Select Type • 100 • 8 • Tick • None • Diamond • Ick •	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Dibplacement Thickness MarkerType MarkerTickness MarkerSize zindex Totex DimensionOptions Properties Cofors Cofors Cofors Cofors Cofors Cofors Layout Dipplacement Thickness MarkerTickness MarkerSize zindex From Cofors C	OK Cancel 100 • 8 • Tick • Select Type • Select Type • 100 • 8 • 100 • 8 • Tick • None • Diamond • Tick •	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Cofors Cofors Dibplacement Thickness MarkerType MarkerTickness MarkerSize zindex Totex DimensionOptions Properties Cofors Cofors Cofors Cofors Cofors Cofors Thickness MarkerType MarkerTickness MarkerTickness MarkerTickness Cofors Thickness Cofors	OK Cancel 100 • 8 • Tick • Select Type • 100 • Select Type • 100 • Select Type • 100 • None • Diamond • Tick •	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Co	OK Cancel 100 • 8 • 100 • 25 • 26 • 5 • 25 • 5 • 5 • 25 • 5 • 0K Cancel	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Co	OK Cancel 100 • 8 • 100 • 25 • 26 • 5 • 25 • 5 • 6 • 7 • 6 • 7 • 100 • 8 • 100 • 8 • 100 • 100 • 100 • 100 • 100 • 100 • 100 • 100 • 100 • • • • • • • • • • • • • • • • • • •	 Expand Layout Enter values in the input fields Displacement, Thickness, Marker Size Click on Select Type from zIndex Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType
DimensionOptions Properties Cofors Co	OK Cancel 100 • 8 • Tick • 23 Select Type Select Type • 100 • 8 • Tick • None • Diamond • Tick •	 Expand Layout Enter values in the input fields Displacement, Thickness, MarkerThickness and MarkerSize Click on Select Type from <i>zIndex</i> Further information can be found in chapter "zIndex", [Page 426]. Select the marker type from the drop-down menu MarkerType

DimensionOptions		
Properties		
Colors		
Layout		
Text		
TextPattern	2	
TextDisplacement	10	
TextOntions	(Object)	
		OK Cancel
imensionOptions		>
imensionOptions Properties		>
imensionOptions Properties		>
imensionOptions roperties Colors		>
imensionOptions roperties Colors Layout		>
imensionOptions roperties Colors Layout Text		×
limensionOptions Properties • Colors • Layout • Text		×
imensionOptions roperties Colors Layout Text		×
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imensionOptions Aroperties Colors Layout Text		>
iniensionOptions Properties Colors Layout Text		>
innensionOptions roperties Colors Luyout Text		×
imensionOptions roperties Colors Layout Text		×

► Expand *Text*

Enter values in the input fields TextPattern and TextDisplacement

► Click ... from *TextOptions*

The window *TextOptions* opens.

Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422].

► Confirm with **OK**

The dialog box DimensionsOptions closes.

The table shows the default parameter settings for the *Dimensions* properties:

Property	Explanation	Default setting
DisplayDimensions	Display of the dimensions	False
DimensionOptions		
▲ Colors		
InfoBarColor	Color that can be defined for the In- foBar	#FF000000
MarkerColor	Color that can be defined for the marker	#FF000000
⊿ Layout		
Displacement	Offset of the dimensions	100
Thickness	Thickness of dimensions	8
• MarkerType	Selection of the marker type	Tick
• None	No marker	_
Diamond	Diamond	_
• Tick	Tick	_
 MarkerThickness 	Marker thickness	5
• MarkerSize	Marker size	25
• zIndex	Z-position, position of the visual ele- ment and information about the up- date of the visual element	1200
⊿ Text		
• TextPattern	Text pattern for the description of the scaling of the system. With 1, for example, the scaling takes place in steps of 250.	2
TextDisplacement	Offset of the text	10
TextOptions	Properties for text design	
InvertDimensions		False



XTS HMI Controls

×	Expand Layout
D D Properties	Enter values in the input fields InfoBarThickness and InfoBarDis- placement
Colors General	 Activate the checkbox Visible to show the InfoBar
☐ Layout	
InfoBarThickness 8	OR
InfoBarDisplace 100	Deactivate the checkbox Visible to hide the InfoBar
Visible 🗸 🗆	Enter a value in the input field zIndex
zindex 1000	
Marker	
×	Expand <i>Marker</i>
D Descetion	Click from Marker
Colors	
General	
Layout	
Marker	
Marker (no items)	
▶ Text	
Marker X	The dialog box Marker energy
Elements D D Properties	
ltem	Click on Add
	An XtsInfoBarMarker is added. The properties of the XtsInfoBar-
X Y + XuirfoBarMarker - Add OK Cancel	Marker can be set in the <i>Properties</i> area.
×	Expand Colors
	The adjustment range is displayed
Properties	
▲ Colors	Further information can be found in chapter "Colors", [Page 424].
MarkerColor #FF000000	
R 0 G 0 B 0 A 255 ✓ #FF000000	

General

XTS HMI Controls

×	► Expand <i>General</i>
 Properties → Colors General InfoBarPosition 100 → Layout 	Enter a value in the input field InfoBarPosition
	 Expand Layout Select the marker type from the drop-down menu MarkerType
X Properties Colors General Layout MarkerType Diamond MarkerSize 25 21ndex 1001 Text	 Enter values in the input fields MarkerThickness, MarkerSize and zIndex Further information can be found in chapter "zIndex", [Page 426].
Properties Colors General Layout Text MarkerText TextDisplacement TextOptions (Object)	 Expand <i>Text</i> Enter a text in the input field <i>MarkerText</i> OR Click on the button to open the <i>Multiline editor</i> Further information can be found in chapter "Link formula", [Page 386]. Enter a value in the input field <i>TextDisplacement</i> Click from <i>TextOptions</i> The dialog box <i>TextOptions</i> opens. Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422]. Confirm with OK The dialog box <i>Marker</i> closes
Add	The dialog box marker closes.

OK

Cancel

		×
7 £	Properties	
	Colors	
	General	
	Layout	
	Marker	
	Text	
	InfoBarText	fx 🔁 🗆
	TextPlacement	
	TextDisplacement	15 🗆
	TextOptions	(Object) 🗆

- ► Expand Text
- ▶ Enter a text in the input field *InfoBarText*

OR

- ► Click on the button to open the *Multiline editor*
- Click on a button at **TextPlacement** to select the alignment of the text
- ► Enter a value in the input field *TextDisplacement*
- ► Click ... from *TextOptions*

The dialog box *TextOptions* opens.

Further information can be found in chapter "TextOptions", [Page 422]"General settings", [Page 422].

Add					
			OK	Cancel	

► Confirm with **OK**

The dialog box XtsInfoBars closes.

The table shows the default parameter settings for the *InfoBars* properties:

Property	Explanation	Default setting
InfoBars		
▲ Colors		
 InfoBarColor 	Color that can be defined for the InfoBar	#FF00000
▲ General		
PartIndex		0
PartStartPosition	Point at which the part begins	10
PartEndPosition	Point at which the part ends	200
▲ Layout		
 InfoBarThickness 	InfoBar thickness	8
 InfoBarDisplacement 	Offset of the text	100
Visible	Visibility of the tool	True
• zIndex	Z-position, position of the visual element and infor- mation about the update of the visual element	1000
Marker		
Marker		
MarkerColor	Color that can be defined for the marker	#FF000000
 InfoBarPosition 	Position of the InfoBar	100
• MarkerType	Selection of the marker type	Diamond
None	No marker	-
Diamond	Diamond	-
• Tick	Tick	-
 MarkerThickness 	Marker thickness	5
MarkerSize	Marker size	25
• zIndex	Z-position, position of the visual element and infor- mation about the update of the visual element	1001
 MarkerText 	Text displayed with the marker	-
 TextDisplacement 	Offset of the text	15
 TextOptions 	Properties of the text design	
⊿ Text		
 InfoBarText 	Text that is displayed in the InfoBar	-
 TextPlacement 	Text alignment	Left-justified
• = left-justified	Left aligned	-
 + centered 	Centered	-
• = right-justified	Right aligned	-
 TextDisplacement 	Offset of the text	15
 TextOptions 	Properties of the text design	

9.3.2.12 Layout

Properties	-	▼ ₽ ×	Expand Layout
XtsView_1		P 7 û	Enter values in the input fields Left Ton Pight Bottom Width
Type TcHmi.Con	ntrols.TcXtsHmiControls.XtsView	0 -	and Height
Arrange by: Category *		<i>p</i> •	and Height
Colors			Change the unit in the drop-down menu if required
Connection			· · · · · · · · · · · · · · · · · · ·
System Layout			
Mover Layout			
Selections			
Station Layout			
Dimensions			
► InfoBars			
	448		
Ton	298		
Right		px 🔻 🗆	
Bottom		рх 🔻 🗆	
Width	329	рх 🕶 🔳	
Height	280	px ▼ ■	
	~	рх	
Common		%	
▶ Border			
Background Image			
▲ Layout			Expand menu by clicking on the button
Left	448	px 🔹 🔳	. , , ,
Тор	298	рх 🕶 🔳	
Right		рх 🕶 🗆	
Bottom		рх 🔻 🗆	
Width	329	рх 🕶 🔳	
Height	280	рх • •	
	•		
▲ Layout			Enter a value in the input field Opacity
Left	448	рх 🕶 🔳	
Тор	298	рх 🕶 🔳	Select the visibility in the drop-down menu Visibility
Right		рх 🔹 🗆	
Bottom		рх 🕶 🗆	
Width	329	рх 🕶 🔳	
Height	280	рх 🔹 🔳	
Opacity	^		
Visibility	Visible	•	
WidthMode	Visible		
HeightMode	Hidden		
Transform	Collapsed (no items)		
MaxWidth		рх 🔻 🗆	
MaxHeight		рх 🔹 🗆	
MinWidth		рх 🔹 🗆	
MinHeight		px 🔹 🗆	
GridColumnIndex	0		
GridRowIndex	0		
Zindex	(
DOXONADOW	(no items)		
▲ Layout			Select Value in the drop-down menu WidthMode
Left	448	рх 🕶 🔳	
Тор	298	рх 🕶 🔳	OR
Right		рх 🔹 🗆	Select Parent in the dron down menu Width Mode
Bottom		рх 🔻 🗆	
Width	329	рх 🕶 🔳	Select Value in the drop-down menu HeightMode
Height	280	рх 🕶 🔳	
Onarity	•		UK
Visibility	Vicible		Select Parent in the drop-down menu HeightMode
WidthMode	Value	-	······································
HeightMode	Value		
Transform	Value		
MaxWidth	Parent		
MaxHeight		рх 🔻 🗆	
MinWidth		px 🔹 🗆	
MinHeight		px 🔹 🗆	
GridColumnIndex	0		
GridRowIndex	0		
Zindex			
BoxShadow	(no items)		

414 -----

► Click ... from Transform

Layout		
Left	448	рх 💌
Тор	298	рх 🔻
Right		px 👻
Bottom		px 👻
Width	329	px 👻
Height	280	рх 🔻
	^	
Opacity	1	
Visibility	Visible	-
WidthMode	Value	•
HeightMode	Value	•
Transform	(no items)	
MaxWidth		рх 🕶
MaxHeight		px 👻
MinWidth		px 👻
MinHeight		рх 👻
GridColumnIndex	0	
GridRowIndex	0	
Zindex		
BoxShadow	(no items)	

You can add different transformation types to *XtsView* | *Transform*. When the window opens, *Rotate* is selected by default. The following transformations are available:

- Rotate
- Scale
- Translate
- Skew
- Origin
- · Perspective

The dialog box XtsView | Transform opens.

- In the drop-down menu, select the transformation type to be added
- Click on Add

The selected transformation is added.

Elements		U 01	Properties		
	Transformation				
X T 4	Rotate	- Add			
X 1 4	(양) Rotate 양) Rotate 폐 Scale 년 Vanside	- Add		OK	Cancel

The different properties of the transformations can be set in the *Properties* area.

Rotate



- Expand General
- Enter a rotation angle in the input field Angle
- ► Change the unit in the drop-down menu if required
- ▶ Enter values in the input fields VectorX, VectorY and VectorZ

Scale



- Expand General
- ▶ Enter values in the input fields *X*, *Y* and *Z*

Translate



- Expand General
- ► Enter values in the input fields *X*, *Y* and *Z*
- Change the unit in the drop-down menu if required

Skew



Expand *General*Enter a value for the horizontal angle of inclination in the input

- field XAngleEnter a value for the vertical angle of inclination in the input field
- YAngle
- Change the unit in the drop-down menu if required

Origin

				×
ට ධ	Properties			
	General			
	x		рх 🔻	
	Y		рх 💌	
	Z		рх 🔻	
			рх	
			%	

- Expand General
- ▶ Enter values in the input fields X, Y and Z
- ► Change the unit in the drop-down menu if required

Perspective

		>	<
ට ධ	Properties		
	General		
	Distance		
	OriginX	рх 🔻 🗆	
	OriginY	рх 🔻 🗆	
		рх	
		%	

Expand General

- ► Enter values in the input fields *Distance*, *OriginX* and *OriginY*
- ▶ Change the unit in the drop-down menu if required

Remove or change transformation

XtsView	_1 Transform*			Select the transfo
Elemen	ts	රිරි	Properti	► Click on X to rem
	Transformation		⊿ Gen	OR
۹	Rotate		Dist	
	Scale		Oric	Click on the butto
Z	Translate		Oric	by step
1	Skew			
۲	Origin			
\leq	Perspective			
×	↑ ↓ ← Perspective ▼	Add		
				► Confirm with OK
				The dialog box XtsVi
d				
	ОК	Car	icel	

You can remove individual transformations or change the order of the transformations.

- Select the transformation to be moved or removed
- ► Click on X to remove the transformation
- Click on the buttons to move the transformation up or down step by step

Confirm with OK
 The dialog box XtsView | Transform closes.

XTS HMI Controls





OK

Cancel

The table shows the default parameter settings for the *Layout* properties:

Property	Explanation	Default setting
Left	Left distance.	448
	Unit: px or %	
Тор	Upper distance.	298
	Unit: px or %	
Right	Right distance.	-
	Unit: px or %	
Bottom	Lower distance.	-
	Unit: px or %	
Width	Width.	329
	Unit: px or %	
Height	Height.	280
	Unit: px or %	
Opacity	Value for the opacity	1
Visibility	Drop-down menu for visibility	Visible
• Visible	Visible	
• Hidden	Hidden	
Collapsed	Collapsed	
WidthMode		Value
• Value	Value	-
• Parent	Parent	-
HeightMode		Value
• Value	Value	-
• Parent	Parent	-
Transform	Transformation type	
Rotate	Rotational displacement	
▲ General		
• Angle	Angle of rotation	-
VectorX	Vector X-axis	-
VectorY	Vector Y-axis	-
VectorZ	Vector Z-axis	-
Scale	Scaling	
▲ General		
• X	Value for width	1
• Y	Value for the height	1
•Z	Value for the depth	1
Translate	Translational displacement	
▲ General		
• X	Value for the displacement in the X direction.	-
	Unit: px or %	
• Y	Value for the displacement in the Y direction.	-
	Unit: px or %	
• Z	Value for the displacement in the Z direction.	-
	Unit: px or %	

Property	Explanation	Default setting
Skew	Skew	
▲ General		
• XAngle	Angle for horizontal inclination	-
• YAngle	Angle for vertical inclination	-
Origin	Origin	
▲ General		
• X	Value in X direction	-
• Y	Value in Y direction	-
• Z	Value in Z direction	-
Perspective	Perspective distortion	
▲ General		
Distance	Distance	-
• OriginX	Origin in X-direction	-
OriginY	Origin in Y-direction	-
MaxWidth	Maximum width	-
MaxHeight	Maximum height	-
MinWidth	Minimum width	-
MinHeight	Minimum height	-
GridColumnIndex	Value for the grid column width	0
GridRowIndex	Value for the grid row height	0
Zindex		-
BoxShadow	Value for the shadow	
▲ Colors		
• Color	Color of the shadow	##FF000000
▲ General		
• OffsetX	Offset of the shadow in the X direction.	0
	Unit: px or %	
• OffsetY	Offset of the shadow in the Y direction.	0
	Unit: px or %	
Inset	Inset	False
• Blur	Blurring of the shadow.	0
	Unit: px or %	
• Spread	Spread of the shadow.	0
	Unit: px or %	

General settings

In this chapter you will find more information about the settings *Colors*, *TextOptions* and *zIndex*.

TextOptions

- Expand Colors
- The adjustment range is displayed.

Further information can be found in chapter "Colors", [Page 424].

Define color via the adjustment range

General





► Confirm with **OK** The dialog box *TextOptions* closes.

The table shows the default parameter settings for the *TextOptions* properties:

Property	Explanation	Default setting
▲ Colors		
Color	Text color	Solid Color
• None	No color	-
Theme	Graphic	-
Solid Color	Solid color, RGBA	#FF000000
⊿ General		
FontStyle	Font	Normal
Normal	Normal	-
Italic	Italic font	-
Oblique	Oblique font	-
Auto	Automatic	-
FontWeight	Font weight	Normal
Normal	Normal	-
• Bold	Bold	-
Auto	Automatic	-
FontFamily	Font family	_
HorizontalAlignment	Horizontal text alignment	Left-justified
• = Left-justified	Left aligned	_
• + Centered	Centered	_
• = Right-justified	Right aligned	-
VerticalAlignment	Vertical text alignment	Bottom
• Т Тор	Тор	_
 -I+ Middle 	Centered	_
• L Bottom	Bottom	-
FontSize	Font size	20

Colors

In addition to defining a solid color, some setting areas offer the option of defining a color gradient. An additional tab is then available for defining the color gradient.



Different setting ranges

The setting of the colors is shown as an example in a setting range with a color gradient.



Position	Explanation
1	No color
2	Graphic
3	Solid color
4*	Color gradient
5**	Input field for RGB color values
6**	Input field for opacity
7**	Color slider
8**	Input field for HEX color code
9**	Pipette
10***	Color 1 of the color gradient
11***	Position of color value 1 of the color gradient [%]
12***	Rotation angle of the color gradient [°]
13***	Display area of the defined color 1 of the color gradient
14***	Display area of the defined color 2 of the color gradient
15***	Slider for the rotation angle of the color gradient
16***	Color 2 of the color gradient
17**	Display range of the last colors used
18**	Selection area
19**	Selection tool in the selection area

* not available in every adjustment range

** only visible in the Solid color tab [3] or in the Gradient tab [4]

*** only visible in the Color gradient tab [4]

You have various options for setting a color for the background and the frame.

No color

Click on the button [1] to not select a color

Use graphic

Click on the button [2] to use a graphic

Set solid color

- Click on the button [3] to set a solid color
- Define a color with the selection tool [19] in the selection area [18] and the color slider [7]

OR

- ► Enter the values in the input fields *R*, *G* and *B* [5] to define the color
- Enter a value for the opacity in the input field A [6]
 OR
- Enter a code for the HEX color in the input field [8]
 OR
- ▶ Use the pipette [9] to select a color

Setting the color gradient

- Click on the button [4] to set a color gradient
- Click on Color 1 [17] to set the first color of the color gradient
- Set solid color to set the first color of the color gradient
- Click on Color 2 [16] to set the second color of the color gradient
- Set solid color to set the second color of the color gradient

The defined colors are shown in the display area.

 Left-click outside the adjustment range to close the adjustment range zIndex

The zIndex specifies the Z position where the visual element is located.

The first level has a zIndex of up to 5000, which includes modules with a zIndex of 0, for example. As soon as an interaction occurs, such as changing the padding, the first level is updated. An Infolmage can be placed on this first level.

The next level has a zIndex of 5000-15000, this includes the movers with a zIndex of 10000. An InfoImage can be placed on this level, as it is updated with the movers.

As soon as the zIndex exceeds a value of 15000, the visual elements in this level are updated. An InfoImage that is not updated with the movers can be placed on this level.

10 Tc3 XTS Utility

The Tc3 XTS Utility is installed together with the TF5850 software package. The Tc3 XTS Utility is a PLC library and is used to read or set parameters of the XTS system.

The following diagram shows the structure of the Tc3 XTS Utility:



10.1 Add library

To be able to use the visualization, a Tc3 XTS Utility library must be added to the PLC.

10.1.1 Add standard PLC project



10.1.2 Adding the Tc3 XTS Utility library

Solution Explorer	→ ‡ ×	🕨 🕨 Ex
○ ○ 🏠 🛗 - To - @ 🗡		Un
Search Solution Explorer (Ctrl+ü)	- م	
Solution 'TwinCAT Project' (1 project) Solution 'TwinCAT Project Main Cat Project	dd library aceholders brary repository t to Effective Version tt to Always Newest Version	I ► Rig
Add Library String for a fulltest search Uturary 4 \$25 Application 4 \$25 DataAccess 4 \$21 Intern 4 \$20 DataAccess 4 \$21 Intern 4 \$20 Packaging 4 \$20 Packag	Company Beddroff Automation GmbH	The dia Ex Cliu Co The To
Advanced	OK Cancel	

- Expand Solution Explorer > TwinCAT Project > PLC > Untitled > Untitled Project
- ► Right-click on **References** to open the context menu
- ► In the context menu click on Add library ...

The dialog box *Add Library* opens.

- Expand (Miscellaneous)
- Click on Tc3_XTS_Utility
- ► Confirm with **OK**

The *Tc3_XTS_Utility* library is added.

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10.2 Initialization

The function block *FB_TcloXtsEnvironment* must be configured once for the XTS project so that all parameters of the Processing Unit can be accessed. If XTS objects are to be used in the project, the function block *FB_XtsEnvironment* must also be configured.

The function blocks for accessing the parameters of the InfoServer and CA group are integrated in the Tc3 XTS Utility. You must activate the function blocks for initialization so that the function blocks can be used in the further course via the *FB_Tclo-XtsEnvironment*.

The function block *FB_TcloXtsEnvironment* must be initialized once when starting or during an online change in order to obtain information about all objects. After initialization all parameters are available via *FB_TcloXtsEnvironment*. All parameters can be accessed by calling the corresponding methods. There is no automatic cyclic update of the data.

10.2.1 Sample code

```
// Declaration Part
PROGRAM MAIN
VAR
    fbXtsEnvironment
                                     : FB TcIoXtsEnvironment;
    stXtsEnvironmentConfiguration
                                     : ST XtsEnvironmentConfiguration;
    nEnvironmentState
                                     : INT:=1;
END VAR
//-----
                        _____
// Programm Part
CASE nEnvironmentState OF
    1: //Enable init items
           //Enable init Info Server if needed
           stXtsEnvironmentConfiguration.bEnableInitInfoServer := TRUE;
           //Enable init CA Group if needed
           stXtsEnvironmentConfiguration.bEnableInitCaGroup := TRUE;
           //Set configuration of XtsUtility init
           fbXtsEnvironment.P XtsEnvironmentConfiguration := stXtsEnvironmentConfiguration;
           //Next Step
           nEnvironmentState:=2;
    2://Init
          //Start init
          IF fbXtsEnvironment.Init(TRUE) THEN
                //Stop init
                fbXtsEnvironment.Init(FALSE);
                //Next Step
                nEnvironmentState:=3;
          END IF
    3: //Check if init succeeded
           //Check IsInitialized property
          IF fbXtsEnvironment.P IsInitialized THEN
                //Next Step
                nEnvironmentState:=4;
         END IF
    4: //Init done
         ;
END CASE
```

10.3 PLC access

10.3.1 Call Chain

With the following Call Chain you have the possibility to access the essential parameters of the XTS objects. An overview of the parameters can be found in the chapter "Parameter", [Page 443].



10.3.2 Accessing TcIo parameters

In principle, all Tclo parameters can be accessed in the PLC. Access takes place via the TcCom objects in the Solution Explorer.



Example Number of detected movers

Access to Tclo parameters is illustrated by reading out the number of detected movers. Calling up the online parameters is done in the same way for all Tclo parameters.

lution	explorer			1
0	₲ 🛱 - ™ - ₱ ≯			
arch S	olution Explorer (Ctrl+ü)			ρ-
a] Sol	Iution 'TwinCAT Project' (1 pro TwinCAT Project SYSTEM License Real-Time	jject)		
∆ ∆	MOTION	1		
Þ Þ	KtsProcessingUnit MOTION PLC CATTEX antext Parameter (int) Parameter (Online)	Interfaces Event Classes	Interface Pointer	XPU
Þ Þ	XtsProcessingUnit MOTION PLC CAFETY ontext Parameter (Int) Parameter (Online) Name	Interfaces Event Classes	Interface Pointer	XPU CS
Þ Þ sject Co	P XtSProcessingUnit MOTION PLC carery read Parameter (htt) Parameter (htt) Name Mover Detection	Interfaces Event Classes Online	Interface Pointer	XPU CS
Þ Þ aject Co	CASE A Construction of the construction o	Interfaces Event Qasses Online	Interface Pointer	XPU CS
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Þ Þ aject Co	CASE A Control Co	Interfaces Event Classes Online 1 TRUE 1 1 TRUE 6 6 0 0	Interface Pointer	XPU CS

- Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-COM Objects
- Double click on XtsProcessingUnit

- In the project window click on the Parameter (Online) tab
- Expand *Mover Detection*
- Read out the number of detected movers at DetectedMover-Count

10.3.3 Access to the parameters in the PLC

You need these calls to access various parameters in the PLC:

Reading out the number of detected movers

nDetectedMoverCount := fbXtsEnvironment.XpuTcIo(1).GetDetectedMoverCount();

Reading the DriveState of XPU1

//read the DriveState of XPU1

```
eDrive:=fbXtsEnvironment.XpuTcIo(1).GetDriveState();
```

Reading the module count of XPU1

```
//read the ModuleCount of XPU1-Part2
nModuleCount:=fbXtsTcIo(1)-.PartTcIo(2).GetModuleCount();
```

Reading the length of XPU1

//read the Length of XPU1-Part2-Module3
fLength:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(2).ModuleTcIo(3).GetLength();

Reading the axis ID of XPU1

//read the AxisId of XPU1-Mover3
nAxisId:=fbXtsEnvironment.XpuTcIo(1).MoverTcIo(3).GetAxisId();

Reading the track length of XPU1

//read the Length of XPU1-Track2
fLength:=fbXtsEnvironment.XpuTcIo(1).TrackTcIo(2).GetLength();

Reading the start position of the InfoStation

```
//read the StartPositionOnPart of Infostation2
fPosition:=fbXtsEnvironment.InfoServerTcIo(1).InfoStationTcIo(2). GetStartPositionOnPart();
```

Reading the GabControl mode of the CA group

//read the GapControlMode of CaGroup1

GapControlMode:=fbXtsEnvironment.Mc2CaGroup(1).GetDefaultGapControlMode();

10.3.4 Access to the SoftDrive parameters

You need these calls to access the SoftDrive parameters:

Reading the KP from VelocityControlLoop

//read Kp of velocity control loop

fbXtsEnvironment.XpuTcIo(1).MoverTcIo(1).SoftDrive.VelocityControl.GetKp();

Setting the KP of VelocityControlLoop

//set kp of velocity control loop

fbXtsEnvironment.XpuTcIo(1).MoverTcIo(1).SoftDrive.VelocityControl.SetKp(1.5);
10.3.5 Access to the CoE data

The CoE data is accessed either via the module object or by reading the CoE register.

10.3.5.1 Module object

Solution Explorer

Search Solution Explorer (Ctrl+ü)

The driver offers the possibility to read the CoE data directly via the module object.



Driver interval influences up-to-dateness of CoE data

The driver updates the CoE data at a self-determined interval. It is therefore possible that the information issued is not up to date.



Sample

The access to the CoE data is illustrated by reading the DC Link Voltage. Calling up the CoE data takes place in the same way for all CoE data.

- ▼ ₽ × Expand Solution Explorer > TwinCAT Project > SYSTEM > Tc-○ ○ 🏠 🗄 - 🐻 - 🗗 🎾 🗕 COM Objects > XtsProcessingUnit > Part ρ. Double-click on Module
 - In the project window click on the Parameter (Online) tab
 - Click on + of Drive CoE Info Data
 - Read value at DC Link Voltage

kan Solu ▲ Internet A A A	 Solution 'TwinCAT Project' (1 project) TwinCAT Project SYSTEM License Real-Time Tasks Routes Type System TCCOM Objects XtsProcessingUnit 1 Part 1 						
	Module 1						
	Module 2						
Object Con	text Parameter (Init) Parameter (Online) Int	erfaces Data Pointer					
	Name	Value					
+	Info						
+							
+							
+							
+							
-	Drive CoE - Info Data						
	Auxiliary Voltage 5V	0.0					
	Auxiliary Voltage 10V	0.0					
	Auxiliary Voltage 24V	0.0					
	DC Link Voltage	0.0					
	Current Scaling	0.0					
	Device Info	0					
+	PCB Temperatures	[0.0]					
	Overall Current	0.0					
	Max DC link voltage - last 500 ms	0.0					
	Max overall current - last 500 ms	0.0					
	Chip ID	0					
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+							

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Update of the CoE data via the TcIo module

With the CoE read function via the Tclo module, you can access different CoE data simultaneously. The access takes place via the following call:

```
fDcLink:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).GetDCLinkVoltage();
aI2T REF=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).GetI2TTemperatures();
```

10.3.5.2 Update the CoE data by directly reading the CoE registers



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p.

The *Tc3 XTS Utility* organizes access to the CoE data to avoid communication errors. You can only update using an update method and you can only access one module of a supply segment at a time. In addition, the *Tc3 XTS Utility* offers the possibility to read CoE data via the I/O module.

- Expand Solution Explorer > TwinCAT Project > I/O > Devices > Device 1
- Double-click on Term 1

- In the project window click on the CoE Online tab
- Click on CC I2T Diag Data

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	Fair Term 3 (AT)	2000-0250)		
eneral EtherC.	AT DC Process Data Pl	c Startup CoE - C	Online Diag History Online	
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update	Lisi Auto Update	✓ Single Update	Show Offline Data	
Advance	ed			
Add to Sta	rtup Online Data	Module OD (AoE Port): 0	
		_		1.65
Index	Name	Flags	Value	Unit
1000	Device type	RO	0x00001389 (5001)	
1008	Device name	RO	AT2001-0250	
1009	Hardware version	RO	22	
100A	Software version	RO	14	
± 1011:0	Restore default parameters	RO	>1<	
· 1018:0	Identity	RO	>4<	
H 10F0:0	Backup parameter handling	RO	>1<	
1059	Litagnosis History	RO	> 30 <	
1008	CC PyPDO Map Outputs	RO	ux463107C366873	ns
E 1400-0	CC TyPDO-Map log to	BO	> 16 <	
+ 10000	Sync manager type	BO	244	
+ 1C12:0	BxPDO assign	BO	516	
E 1C13:0	TxPDO assign	RO	>1<	
· 1C32:0	SM output parameter	RO	> 32 <	
± 1C33:0	SM input parameter	RO	> 32 <	
÷ 6000:0	CC Inputs	RO	> 31 <	
+ 7000:0	CC Outputs	RO	> 31 <	
± 8000:0	CC Amplifier Settings	RW	> 46 <	
# 800F:0	CC Vendor data	RW	> 33 <	
+ 9000:0	CC Info data	RO	> 38 <	
EI- A000:0	CC I2T Diag data			
. A001:0	CC Diag data	RO	> 19 <	
F000:0	Modular device profile	RO	>2<	
F008	Code word	RW	0x00000000 (0)	
F010:0	Module list	RW	>1<	
F083	BTN	RO		
+ FB00:0	CC Command	RO	>3<	
+ F840-0	Memory interface	RO	>3<	

```
ware)
Reading out the CoE data via the calls is only possible with con-
nected hardware and only in Run mode.
If no hardware is connected or the system is being operated in simu-
lation, the calls may cause error messages.
The following call prevents the registers from being read if no hard-
ware is connected and the system is being operated in simulation:
IF NOT fbXtsEnvironment.XpuTcIo(1).GetOperationMode() = OperationMode.Simulation THEN
"Methode, die genutzt werden soll"
END_IF
The following calls can be used to read the registers when hardware
is connected and the system is being operated in Run mode:
IF fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.I2TDiagData.Update() THEN
aI2T:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.I2TDiagData.TemperatureCoilCh;
END_IF
```

```
IF fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.InfoData.Update() THEN
    nDcLink:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.InfoData.DcLinkVoltage;
END_IF
```

10.3.5.3 Access to all data of a CoE object

For example, if you need access to all I2T values, you can make the entire object available through the *all* property. The following calls are required for this:

Call to read the registers (only possible with connected hard-

pCoEI2TDiagData : POINTER TO ST_AT2xxxI2TDiagData;

```
IF fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.I2TDiagData.Update() THEN
    pCoeI2TDiagData:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.I2TDiagData.all;
END_IF
```

10.3.5.4 Update and access to all CoE objects

The *Tc3 XTS Utility* allows you to update and access all CoE objects with just one call. The following calls are required for this:

```
stAllCoEData : ST_AT2xxxI2TDiagData;

IF fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.AllCoE.UpdateAllCoEData() THEN
    stAllCoEData:=fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.AllCoE.AllCoEData;
END IF
```

10.3.6 Access to the diagnostic history

You can directly access the diagnostic history from the I/O module as well as other CoE data. The following call is required for this:

```
IF fbXtsEnvironment.XpuTcIo(1)PartTcIo(1).ModuleTcIo(1).CoE.DiagHistoryData.UpdateDiagHistory() THEN
    stAT2xxxI2TDiagHistory:= fbXtsEnvironment.XpuTcIo(1).PartTcIo(1).ModuleTcIo(1).CoE.DiagHistory-
    Data.DiagHistory;
END IF
```

10.3.7 Setting Mover ID detection

The following call is required for Mover ID detection:

```
IF fbXtsEnvironment.XpuTcIo(1).SetMoverIdDetectionMode(MoverIdDetectionMode.Mover1) THEN
    nEnvironmentState:=8;
END IF
```

10.3.8 Save mover commands

The command history function can be used to store up to 25 commands for a mover. Each command contains the command type, the station, a text and a timestamp.



If there is no timestamp, the function will add one automatically.

The following calls are required to manage the command history:

```
stCommand : ST TcIoXtsMoverCommand;
```

```
refCommandHistory : REFERNCE TO ARRAY[1..TcIoXtsEnvironmentParameterList.MaxMessageCommandHistory] OF ST_TcIoXtsMoverCommand;
```

```
//preparing the message to store in command history
//if there is no time stamp in the message, the program will add one automatically
stCommand.sCommandType := 'MoverAbsoluteCA';
stCommand.sStation := ,Station2';
stCommand.sText := ,Pos:1000,Acc/Dec:10000';
//adding message int command history
fbXtsEnvironment.XpuTcIo(1).MoverTcIo(1).AddCommand(stCommand);
```

//read command history
refCommandHistry REF= fbXtsEnvironment.XpuTcIo(1).MoverTcIo(1).P_CommandHistory;

```
//clear all messages in command history
fbXtsEnvironment.XpuTcIo(1).MoverTcIo(1).ClearCommandHistory();
```

10.4 Visualization

The function block *FB_XtsEnvironmentVisu* uses an interface pointer as input, which must refer to the function block *FB_TcloXts-Environment* in order to access the parameters of the XTS objects. The method Cycle of *FB_XtsEnvironmentVisu* must be called for cyclic update of all parameters.

NOTICE

Visualization only serves as support during programming The visualization is only for support during programming of an XTS system and cannot be used for visualization in the plant operator interface.

• Further information can be found in chapter "XTS HMI Controls", [Page 379].

10.4.1 Sample code

```
// Declaration Part
PROGRAM MAIN
VAR
    fbXtsEnvironment
                                      : FB TcIoXtsEnvironment;
                                      : INT:=1;
    nEnvironmentState
END VAR
//----
// Programm Part
CASE nEnvironmentVisuState OF
    1: //Link data pointer
    fbXtsEnvironmentVisu(ipTcIoXtsEnvironment:=fbXtsEnvironment);
    Next Step
    nEnvironmentVisuState:=2;
    2: //Cyclic update of Visu information
    fbXtsEnvironmentVisu.Cycle();
END_CASE
```



- Expand Solution Explorer > TwinCAT Project > PLC > Untitled > Untitled Project
- Right-click on VISUs to open the context menu
- Click Add in the context menu to open another context menu
- ▶ In the context menu click on Visualization...

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Creates a visualization o	bject	
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Visualization		
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- The dialog box Add Visualization opens.
 - Activate the checkbox VisuSymbols (System)
 - Click Open
 - The Visualization is added to VISUs.

- Expand Solution Explorer > TwinCAT Project > PLC > Untitled > Untitled Project > VISUs
- ► Double click on Visualization

The Visualization tab opens in the project window.

10.4.2 Standard visualization

Toolbox	(▼ ₽×
Search	Toolbox	ρ-
IC3_	XTS_Utility	
k	Pointer	
重	CmdHistory_Sub	
.et	EtherCatDiag_Sub	
-	ModuleDiag_Sub	
Ditaj	MoverStatus_Module_Sub	
¥7,	MoverStatus_Sub	
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Ð	VI_AdvancedMotion	
-	VI_CmdHistory	
	VI_EtherCatDiag	
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a second	VI_MoverDiag	
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- 6 j -	VI_XtsEnvironmentVisu	
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- Expand Toolbox > Tc3_XTS_Utility
- Press and hold the left mouse button and drag VI_Xts_EnvironmentVisu into the project window Visualization

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The visualization is displayed in the project window Visualization.

- ► If required, enlarge the visualization for better operability
- ► If necessary, position the visualization in the project window

10.4.3 Update cycle data



To use the visualization, the *Tc3 XTS Utility* must be initialized beforehand.

After the DataPointer has been transferred, the *Cycle* method of the function block *FB_XtsEnvironmentVisu* must be called cyclically in the PLC program to update the parameters of all XTS objects:

```
//Link data pointer
fbXtsEnvironmentVisu(ipTcIoXtsEnvironment:=fbXtsEnvironment);
//Cyclic update of Visu information
```

```
fbXtsEnvironmentVisu.Cycle();
```

10.4.4 Control visualization

In addition to the start page, there are five other tabs for displaying parameters:

- Xpu
- Part
- Modules
- Mover
- Track



Display example

The parameter display is shown as an example on the Mover tab.



Click on the Mover tab

Click on a mover to open detailed information about the mover

	Apu Par	t Moo	sule Mover	i ira	ck			Sett
)	XTS Pro	cess	ing Ur	nit - Mo	ver	
XPU:	1 /1	+	Mo	ver:	2 /2	+		
General		Info		Drive		Positi	on Info	
AdiPod 15	•	AG 0	2	Addnes	0	PartPosition	14E-01	
ALL THRADE 11	18090	ANE OID	83991948	Module NI.		Tiack Postlon	148.01	
Teek 010 29	18020	Distance Driver	0.00	Terrinal OD	56462725	P#100	90842784	
		D.D. In KM	0.80			TIACK CID	1642832	
Simulati	on	Drive Error		Encod	ler	Pathr	4	
Starteo Part 15	•	Encoder Encor		A801100	9	Track Nr	1	
Startup Position 18	942822.08	Marter Netid	171.171.171.171.171	Module Nr.	1			
Sinte D 33	00000	5000 He 00	19842992	Terminal OID	50482726			
		Mover	ID					
		D	10		Cos Made			

- Click on + or to switch between the movers
- OR
- Enter the number of the mover in the input field

10.4.4.1 Single page of visualization

Besides using the default visualization *VI_XtsEnvironmentVisu*, it is also possible to use a visualization as a standalone page. You can drag the desired page into the visualization by pressing and holding the left mouse button and then call the corresponding method in the PLC program to update the data.



In the following example, the *VI_XtsMover* page is added to the visualization to show more detailed information of the mover.

- 🗆 × Toolbox Search Toolbox 0. Tc3_XTS_Utility 1 Pointer CmdHistory_Sub * EtherCatDiag_Sub ModuleDiag_Sub MoverStatus_Module_Sub *** MoverStatus_Sub MoverTuning_Sub VI_AdvancedMotion VI_CmdHistory VI_EtherCatDiag . VI_ModuleDiag VI_MoverDiag VI_MoverTuning VI_NumberHollow ··· VI_NumberSub VI_NumberSubMover s: VI_XtsEnvironmentVisu ---VI XtsHome VI XtsLib -VI_XtsModule VI XtsModuleOverviev E DE VI_XtsMoverOverview rties Toolbox
 - Expand Toolbox >Tc3_XTS_Utility
 - Press and hold the left mouse button and drag VI_XtsMover into the project window Visualization

Home	Xpu Part	Module Mover	Track		Setting
R	%c %d / %d	XTS	Processing U	nit - Mover	
COE	General AdiPot Sid Adi Taskolo Oršik Task CID Oršik	Linfo Axis ID %d Axis OD 0x%x Distance Driven %.2f D.D. in KM %.2f	Modiles %d Address %d Module Nr. %d .Terminal OID 0x%x	Pasition Info Part Position %.21 Track Position %.21 Part3D 0xfix Track OD 0xfix	Com. History Message la %d ≤ ≥ Time Starto %s Staton %s Command Type %s
	Startup Part 0x%x Startup Postton %:21 Startup ID %s	Drive Error 56d Encoder Error 56d Master Nettd 56 SoftDrive OID 02562 MOVER ID ID 56	%S Address %id Module Nr. %id Terminal CID 0x%ix Goto Module	Pant Nr %od Track Nr %od	Text %s

The visualization of the movers is displayed in the project window *Visualization*.

- ► If required, enlarge the visualization for better operability
- ▶ If necessary, position the visualization in the project window

After the DataPointer has been transferred, the *CatMover* method must be called cyclically in the PLC to update the data:

```
//Link data pointer
fbXtsEnvironmentVisu(ipTcIoXtsEnvironment:=fbXtsEnvironment);
```

//cyclic update of Mover Visu information
fbXtsEnvironmentVisu.CatMover ();

10.5 Parameter

10.5.1 FB_TcIoXtsEnvironment – I_TcIoXtsEnvironment

10.5.1.1 Method

Parameter	Group	Return Type	Input Type	Explanation
Init	-	BOOL	BOOL	Initialization
GetXpuCount	-	BOOL	BOOL	Updates the total number of Processing Units that can be get via <i>P_Xpu-</i> <i>Count</i> or <i>P_XpuCountUnit</i> .
GetXpuOids	_	BOOL	BOOL	Updates the object ID list of Processing Units, which can be get via <i>P_XpuOids</i> .
GetInfoServerCount	_	BOOL	BOOL	Updates the total number of InfoServers that can be get via the <i>P_InfoServer-</i> <i>Count</i> .
GetInfoServerOids	-	BOOL	BOOL	Updates the object ID list of InfoServers, which can be get via <i>P_InfoS-</i> <i>erverOids</i> .
GetCaGroupCount	-	BOOL	BOOL	Updates the total number of CA groups that can be get via <i>P_CaGroupCount</i> .
GetCaGroupOids	_	BOOL	BOOL	Updates the object ID list of CA groups, which can be get via <i>P_Ca-</i> <i>GroupOids</i> .
Subitem				
XpuTclo	_	I_TcloXtsProcessing- Unit	UINT	Entering the Processing Unit number selects this Processing Unit for further operation.
InfoServerTclo	-	I_TcloXtsInfoServer	UINT	Entering the InfoServer number selects this server for further operation.
Mc2CaGroup	-	I_Mc2CaGroup	UINT	Entering the CA group number selects this CA group for further operation.

Properties

Parameter	Group	Return Type	Input Type	Explanation
P_XpuCount	_	UDINT	_	Returns the total number of Processing Units.
P_XpuCountUnit	-	UINT	_	Returns the total number of Processing Units in UINT.
P_XpuOids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsProces singUnits] OF OTCID	-	Returns the object ID list of the XPUs.
P_InoServerCount	-	UINT	_	Returns the total number of InfoServers.
P_InfoServerCount- Oids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsInfoSer ver] OF OTCID	_	Returns the object ID list of the InfoServers.
P_CaGroupCount	_	UINT	_	Returns the total number of the CA group.
P_CaGroupCount- Oids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsCaGrou p] OF OTCID	-	Returns the object ID list of the CA group.
P_IsInitialised	_	BOOL	_	Returns the state of the ini- tialization.
P_XtsEnvironment- Configuration	_	ST_XtsEnvironment- Configuration	_	Returns the configuration of the XTS environment. This parameter is used to select the initialization of the XTS environment, such as the initialization of the InfoServer or CA group.

_

10.5.2 FB_TcIoXtsProcessingUnit – I_ TcIoXtsProcessingUnit

10.5.2.1 Method - parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetOperationMode	General	OperationMode	-	Returns the selected oper- ation mode.
GetEtherCatMaster- SyncTaskObjectId	General	OTCID	_	Returns the EtherCAT Master Synchro Task Ob- ject ID.
GetMoverType	Mover	MoverType	_	Returns the selected mover type.
GetMagnetPlateType	Mover	MagnetPlateType	-	Returns the selected mag- netic plate type.
GetMoverSortOrder	Mover	SortOrderEnum	-	Returns the selected sort order of the movers.
GetMoverWidth	Mover	LREAL	-	Returns the minimum dis- tance between the movers.
GetConfiguredDetec- tionCount	MoverDetection	UDINT	-	Returns the specified de- tection count.
SetConfiguredDetec- tionCount	MoverDetection	BOOL	UDINT	Sets the detection count.
TriggerDetection	MoverDetection	BOOL	-	Triggers a mover detec- tion.
TriggerRedetection	MoverDetection	BOOL	-	Triggers mover redetec- tion.
GetExpected- MoverIds	MoverIdDetection	ARRAY[12] OF ST_Expected- MoverIds	-	Returns the expected mover IDs for ID detection with multiple Movers 1.
GetMoverIdDetec- tionMode	MoverIdDetection	MoverIdDetection- Mode	-	Returns the specified Mover ID detection mode
GetMoverPositionAs- signment	MoverIdDetection	MoverPositionAs- signment	-	Returns the mover position assignment.
TriggerMoverIdDe- tection	MoverIdDetection	BOOL	-	Triggers a Mover ID detec- tion.
SetExpected- MoverIds	MoverIdDetection	BOOL	Expected- MoverIds : AR- RAY[12] OF ST_Expected- MoverIds	Sets the expected Mover IDs in ID detection with multiple Movers 1.
SetMoverIdDetec- tionMode	MoverIdDetection	BOOL	MoverIdDetec- tionMode	Sets the Mover ID detec- tion mode.
SetMoverPositionAs- signment	MoverIdDetection	BOOL	MoverPosi- tionAssignment	Sets the assignment of the mover position.
GetTeaching- FileNumber	Teaching	UDINT	-	Returns the numbering/ name of the teaching file.
GetIsAbortOnTeach- ingWarningEnabled	Teaching	BOOL	_	Returns the setting of the teaching warning. If TRUE, the system start may be aborted because of the warning.

Parameter	Group	Return Type	Input Type	Explanation
GetIsTeachingCheck- SumCheckEnabled	Teaching	BOOL	_	Returns the setting of the teaching checksum check. Returns TRUE if the speci- fied checksum is used to verify that the correct teaching file is loaded and not corrupted.
SetTeaching- FileNumber	Teaching	BOOL	UDINT	Sets the numbering/name of the applied teaching file
GetIsAutoDump- WriteEnabled	Diagnostics	BOOL	_	Returns the setting of auto- matic writing of the dump file. If TRUE, the driver au- tomatically writes a dump file in certain situations like at startup or in case of an error.
GetlsInputCheck- Enabled	Diagnostics	BOOL	-	Returns the settings of the input check. If TRUE, all plausibility checks of all in- put channels in the system are activated.
GetUsedEventLog- ger	Diagnostics	EventMessenger	_	Returns selected specifica- tions how events and mes- sages are transmitted by the driver
WriteDump	Diagnostics	BOOL	-	Writes a dump file.
SetIsInputCheckEn- abled	Diagnostics	BOOL	BOOL	Sets the activation/deacti- vation of the input check
GetlsCycleTime- WarningSuppressed	Advanced	BOOL	_	Returns the setting of the suppressed cycle time warning. If enabled, the warning that the driver is not running at a cycle time of 250 us is disabled.
				ATTENTION: Only avail- able in simulation mode.
GetIsMoverFrozen- ErrorActivated	Advanced	BOOL	_	Returns the setting of the error of a frozen mover. If enabled, the driver will give an error message instead of a warning when a posi- tion of the mover is frozen.
GetIsPositionBased- ErrorForwardingEnab led	Advanced	BOOL	_	Returns the setting of the position-related error for- warding. If enabled, a hardware fault is forwarded to movers located on the faulty modules based on their position.
GetOptimization	Advanced	OptimizationEnum	_	Returns the selected opti- mization.
GetIsPosition- NoiseEnabled	Simulation	BOOL	-	Returns position noise in the simulation.
GetlsRandomStart- UpEnabled	Simulation	BOOL	_	Returns the setting of the random start position of movers.
GetMoverDistance	Simulation	LREAL	-	Returns the mover dis- tance at startup

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Parameter	Group	Return Type	Input Type	Explanation
GetPositionOffset	Simulation	LREAL	_	Returns the position offset of the movers at startup
GetPositionNoise- Bandwidth	Simulation	LREAL	_	Returns the bandwidth of the position noise
GetRandomStartUp- Bandwidth	Simulation	LREAL	_	Returns the bandwidth of the random start
GetPositionStartUp- SimulationMode	Simulation	PositionStartUpSimu- lationMode	_	Returns the selected mode for the start position
GetMoverIdStartUp- SimulationMode	Simulation	MoverIdStartUpSim- ulationMode	_	Returns the selected mode for generating the mover ID
GetRandomInitMode	Simulation	RandomInitMode	_	Returns the selected mode for initialization of random selection
GetRandomInitSeed	Simulation	DINT	-	Returns the start value used for random genera- tion of mover position and mover ID.

10.5.2.2 Method - parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetAreAllPosi- tionsValid	MoverDetection	BOOL	_	Returns the state when all mover positions are valid.
GetDetectionCycle- Count	MoverDetection	UDINT	_	Returns the number of de- tection cycles.
GetDetectedMover- Count	MoverDetection	UDINT	_	Returns the number of movers detected during the last detection process.
GetExpectedMover- Count	MoverDetection	UDINT	_	Returns the number of movers expected on the system.
GetScannedModule- Count	MoverDetection	UDINT	_	Returns the number of modules that were scanned during the last de- tection.
GetMoverPositions	MoverDetection	BOOL	_	Updates the current posi- tion of all movers.
GetActiveMover- Count	MoverDetection	UDINT	-	Returns the number of ac- tive movers.
GetHasMoverIdDe- tectionError	MoverIdDetection	BOOL	_	Returns the state of the Mover ID detection. If TRUE, an error has oc- curred during Mover ID de- tection.
GetIsMoverIdDetec- tionValid	MoverIdDetection	BOOL	_	Returns the state of the Mover ID detection. If TRUE, the Mover ID has been detected.
GetIsMoverIdDetec- tionActive	MoverIdDetection	BOOL	_	Returns the state of the Mover ID detection. If TRUE, the Mover ID detec- tion is running.
GetMoverIds	MoverIdDetection	ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsMovers PerXpu] OF STRING(3);	-	Returns a list of Mover IDs.
GetIsTeach- ingChanged	Teaching	BOOL	_	Returns the state of the teaching. If TRUE, the teaching is running.
GetIsTeachingValid	Teaching	BOOL	_	Returns the state of the teaching. If TRUE, the teaching is valid.
GetDriveState	Info	DriveState	_	Returns the state of the drive system.
GetMoverCount	Structure	UDINT	-	Returns the total number of movers.
GetMoverOids	Structure	BOOL	-	Updates the object ID of all movers.
GetPartCount	Structure	UDINT	-	Returns the total number of all parts.
GetPartOids	Structure	BOOL	-	Updates the object ID of all parts.
GetTaskCount	Structure	UDINT	-	Returns the total number of all tasks.

Parameter	Group	Return Type	Input Type	Explanation
GetTaskOids	Structure	BOOL	-	Updates the object ID of all tasks.
GetTrackCount	Structure	UDINT	_	Returns the total number of all tracks.
GetTrackOids	Structure	BOOL	-	Updates the object ID of all tracks.
Subitems				
MoverTclo	_	I_TcloXtsXpuMover	UINT	Selects a mover for further operation by entering the number of the selected mover.
PartTclo	_	I_TcloXtsXpuPart	UINT	Selects a part for further operation by entering the number of the selected part.
TrackTclo	_	I_TcloXtsXpuTrack	UINT	Selects a track for further operation by entering the number of the selected track.

10.5.2.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_MoverPositions	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsMovers PerXpu] OF ST_XpuMoverPosi- tions	_	Returns the position of the part, the object ID of the part and the object ID of the track on which the mover is located.
P_MoverOids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsMovers PerXpu] OF OTCID	_	Returns the object ID of all movers.
P_PartOids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsPartsP erXpu] OF OTCID	_	Returns the object ID of all parts.
P_TaskOids	-	REFERENCE TO ARRAY [112] OF OTCID	_	Returns the object ID of all tasks.
P_TrackOids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxXtsTracks PerXpu] OF OTCID	_	Returns the object ID of all tracks.
P_IsInitialised	_	BOOL	_	Returns the state of the ini- tialization.

10.5.3 FB_TcIoXtsXpuPart - I_TcIoXtsXpuPart

10.5.3.1 Method - parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetTaskOid	General	OTCID	-	Returns the object ID of the task.
GetModuleSide	General	ModuleSide	_	Returns the side of the module displayed in the <i>XTS Tool Window</i> and <i>XTS Viewer</i> . Selection be- tween <i>Front</i> and <i>Back</i> .
GetOriginTransform	General	ST_OriginTransform	_	Returns the origin transfor- mation for the part dis- played in the <i>XTS Tool</i> <i>Window</i> and <i>XTS Viewer</i> .
SetIsClosed	General	BOOL	BOOL	Sets the part as a closed shape.
SetModuleSide	General	BOOL	ModuleSide	Returns the module side of the part displayed in the <i>XTS Tool Window</i> and <i>XTS Viewer</i> .
SetOriginTransform	General	ST_originTransform	_	Returns the origin transfor- mation displayed in the <i>XTS Tool Window</i> and <i>XTS Viewer</i> .

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10.5.3.2 Method - parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetDriveState	Info	DriveState	-	Returns the state of the drive system.
GetGlobalNumber	Info	UDINT	_	Returns the global number of a part. The global num- ber is used to distinguish all parts managed by the Processing Unit.
GetLength	Info	LREAL	-	Returns the length of the selected part.
GetAreaCount	Structure	UDINT	-	Returns the total number of areas on the part.
GetAreaOids	Structure	BOOL	-	Updates the object ID of the areas on the part.
GetModuleCount	Structure	UDINT	-	Returns the total number of modules on the part.
GetModuleOids	Structure	BOOL	-	Updates the object ID of the modules on the part.
Subitems	·	·		·
ModuleCoE	_	I_AT2xxxXtsMotor	UINT	Selects a module for fur- ther reading of the CoE by entering the number of the selected module.
ModuleTclo	_	I_TcloXtsPartModule	UINT	Selects a module for fur- ther operation by entering the number of the selected module.

10.5.3.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_AreaOids	_	REFERENCE TO ARRAY [1100] OF OTCID	_	Returns the object ID of the areas on the part.
P_ModuleOids	_	REFERENCE TO ARRAY [1TcloXts- EnvironmentParamet erList.MaxModulesP erPart] OF OTCID	_	Returns the object ID of the modules on the part.
P_IsInitialised	-	BOOL	_	Returns the state of the ini- tialization.

10.5.4 FB_TcIoXtsPartControlArea – I__TcIoXtsPartControlArea

10.5.4.1 Method - parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetName	General	STRING(1023)	-	Returns the name of the control area.
GetDescription	General	STRING(1023)	-	Returns the description of the control area.
GetStartPosition	General	LREAL	-	Returns the start position of the control area on the part.
GetEndPosition	General	LREAL	-	Returns the end position of the control area on the part.
GetBlendInLength	General	LREAL		Returns the length from the start of the control area to the position where the control parameters are completely used.
GetBlendOutLength	General	LREAL	_	Returns the length from which the control parame- ters are no longer com- pletely used until the end of the control area.
GetIsEnabled	General	BOOL	-	Returns the activation state of the control area.
SetName	General	BOOL	STRING(1023)	Sets the name for the con- trol area.
SetDescription	General	BOOL	STRING(1023)	Sets the description of the control area.
SetStartPosition	General	BOOL	LREAL	Sets the start position of the control area.
SetEndPosition	General	BOOL	LREAL	Sets the end position of the control area.
SetBlendInLength	General	BOOL	LREAL	Sets the BlendInLength.
SetBlendOutLength	General	BOOL	LREAL	Sets the BlendOutLength.
SetIsEnabled	General	BOOL	BOOL	Sets the activation/deacti- vation of the control area.

10.5.4.2 Method - parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetLength	Info	LREAL	_	Returns the length of the control area.
GetIsValid	Info	BOOL	_	Returns TRUE if all set- tings of the control area are valid.

10.5.4.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	_	Returns the state of the ini- tialization.

10.5.5 FB_TcIoXtsPartModule – I_TcIoXtsPartModule

10.5.5.1 Method - parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetAdsPort	General	WORD	-	Returns the ADS port.
GetTaskOid	General	OTCID	-	Returns the object ID of the task.
GetMotorTermi- nalOid	General	OTCID	-	Returns the object ID of the associated motor ter- minal.
GetSensorTerminal	General	OTCID	-	Returns the object ID of the associated sensor ter- minal.
GetPositionIndex	General	UDINT	_	Returns the index of the module in the XTS system. The first module has the index 0.
GetOffset	General	LREAL	-	Returns the offset of the module to compensate for mechanical tolerances.
GetScalingFactor	General	LREAL	-	Returns the scaling factor to compensate for me- chanical tolerances.
SetAdsPort	General	BOOL	WORD	Sets the ADS port.
SetTaskOid	General	BOOL	OTCID	Sets the task for a part by entering the task object ID.
SetMotorTerminalOid	General	BOOL	OTCID	Sets the object ID of the motor terminal.
SetSensorTerminal- Oid	General	BOOL	OTCID	Sets the object ID of the sensor terminal.
SetPositionIndex	General	BOOL	UDINT	Sets the index of the mod- ule in the XTS system.
SetOffset	General	BOOL	LREAL	Sets the offset of the mod- ule.
SetScalingFactor	General	BOOL	LREAL	Sets the scaling factor of the module.

10.5.5.2 Method - parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetAngle	Info	LREAL	-	Returns the angle of the module in mm.
GetGlobalNumber	Info	UDINT	_	Returns the global number of the module. The global number is used to distin- guish all modules man- aged by the Processing Unit.
GetLength	Info	LREAL	-	Returns the length of the module in mm.
GetMasterNetId	Info	AMSNETID	-	Updates the Net ID of the EtherCAT master.
GetDriveAddress	DriveInfo	UINT	_	Returns the address of the drive terminal.
GetDriveConfigIden- tity	DriveInfo	ST_DriveConfigIden- tity	_	Returns the structure of the configured drive iden- tity with the vendor ID, the code, the revision and the serial number.
GetDriveOnlineIden- tity	DriveInfo	ST_DriveOnlineIden- tity	_	Returns the structure of the online drive identity with vendor ID, the code, the revision and the serial number.
GetDriveState	DriveInfo	DriveState	-	Returns the state of the drive terminal.
GetEncoderAddress	EncoderInfo	UINT	_	Returns the address of the encoder terminal.
GetEncoderConfig- Identity	EncoderInfo	ST_EncoderConfig- Identity	_	Returns the structure of the configured encoder identity with the vendor ID, the code, the revision and the serial number.
GetEncoderOnline- Identity	EncoderInfo	ST_EncoderOnline- Identity	_	Returns the structure of the online encoder identity with vendor ID, the code, the revision and the serial number.
GetEncoderSensor- Values	EncoderInfo	ARRAY[132] OF ST_EncoderSensor- Values	-	Returns the values of the encoder sensor.
GetDriveBTN	General	BTN	-	Returns the Beckhoff Traceability Number (BTN).
GetDriveDevice- Name	General	STRING(15)	-	Returns the device name.
GetDriveDeviceType	General	UDINT	-	Returns the device type.
GetDriveHardware- Version	General	STRING(15)	-	Returns the hardware ver- sion.
GetDriveSoftware- Version	General	STRING(15)	-	Returns the software ver- sion.
GetI2TWarnLevel	AmplifierSettings	USINT	-	Returns the I2T warning level.
Getl2TErrorLevel	AmplifierSettings	USINT	_	Returns the I2T error level.

Parameter	Group	Return Type	Input Type	Explanation
GetTemperature- WarnLevel	AmplifierSettings	UINT	_	Returns the temperature warning level.
GetTemperatureEr- rorLevel	AmplifierSettings	UINT	-	Returns the temperature error level.
GetMaxDcLinkVolt- age	AmplifierSettings	UDINT	-	Returns the maximum of the DC link voltage.
GetMinDcLinkVolt- age	AmplifierSettings	UDINT	-	Returns the minimum of the DC link voltage
GetEnabledBrake- Chopper	AmplifierSettings	BOOL	-	Returns the settings of the brake chopper.
GetBreakAfter- BridgeDisable	AmplifierSettings	BOOL	-	Returns the setting of the interruption after disabling the data transmission.
GetI2TTemperatures	I2T	REFERENCE TO ARRAY [115] OF REAL	-	Returns the I2T value.
GetAuxiliaryVolt- age5V	InfoData	REAL	-	Returns the operating volt- age of 5 V.
GetAuxiliaryVolt- age10V	InfoData	REAL	-	Returns the operating volt- age of 10 V.
GetAuxiliaryVolt- age24V	InfoData	REAL	-	Returns the operating volt- age of 24 V.
GetDCLinkVoltage	InfoData	REAL	-	Returns the DC link volt- age.
GetCurrentScaling	InfoData	REAL	-	Returns the scaling of the current intensity.
GetChipID	InfoData	ULINT	_	Returns the chip ID.
GetDeviceInfo	InfoData	UDINT	-	Returns the device infor- mation.
GetMaxDCLinkVolt- ageLast500ms	InfoData	REAL	-	Returns the maximum DC link voltage of the last 500 ms.
GetMaxOverallCur- rentLast500ms	InfoData	REAL	-	Returns the overall current of the last 500 ms
GetOverallCurrent	InfoData	REAL	_	Returns the overall current.
GetPCBTempera- tures	InfoData	REFERNCE TO AR- RAY [14] OF REAL	-	Returns the temperature of PCB.
GetCode	VendorData	ULINT	_	Returns the code.
GetCoilOvercurrent- Threshold	VendorData	UDINT	-	Returns the overcurrent threshold of the coil.
GetCoilPeakCurrent	VendorData	UDINT	-	Returns the current peaks of the coil.
GetCoilRatedCurrent	VendorData	UDINT	-	Returns the nominal cur- rent of the coil.
GetCoilThermalTime- Constant	VendorData	UINT	-	Returns the thermal time constant of the coil.
GetEnableOverall- CurrentPeakDetec- tion	VendorData	BOOL	_	Returns the setting of the peak current detection.
GetEnableOverall- NegativeCur- rentChangeError	VendorData	BOOL	-	Returns the setting of the error for the negative over- all current change.
GetEnableOverall- NegativepowerError	VendorData	BOOL	-	Returns the setting of the overall negative error.

Parameter	Group	Return Type	Input Type	Explanation
GetOverallCurrentFil- ter	VendorData	UINT	_	Returns the overall current filter.
GetOverallCurrent- Gain	VendorData	UINT	_	Returns the gain of the overall current.
GetOverallCurrent- Offset	VendorData	DINT	_	Returns the offset of the overall current.
GetOverallOvercur- rentThreshold	VendorData	UDINT	_	Returns the overall over- current threshold.
GetPolarity	VendorData	UDINT	-	Returns the polarity.

10.5.5.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
Subitems				
CoE	_	I_AT2xxxXtsMotor	_	Selects the CoE read func- tion for further operation.
P_IsInitialised	_	BOOL	-	Returns the state of the ini- tialization.

10.5.6 FB_AT2xxxXtsMotor (ModuleCoE/CoE) - I_AT2xxxXtsMotor (ModuleCoE/CoE)

10.5.6.1 Method

Parameter	Group	Return Type	Input Type	Explanation
Update	_	BOOL	_	Updates the selected CoE data.
UpdateDiagHistory	_	BOOL	_	Updates the diagnosis his- tory data. (beta version)
UpdateAllCoEData	_	BOOL	_	Updates the data of all CoE objects. The data can be accessed via the <i>Up-</i> <i>dateAllCoEData</i> property.

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10.5.6.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
AllCoE	UpdateAllCoEData	I_AT2xxxAllCoEData	_	Selects all CoE objects.
UpdateAllCoEData	UpdateAllCoEData	ST_AT2xxxAllCoE- Data	_	Returns the data of all CoE objects.
AmplifierSettings- Data	AmplifierSetting	I_AT2xxxAmplifier- Settings	_	Selects the amplifier set- tings.
BrakeAfterBridgeDis- able	AmplifierSetting	BOOL	_	Returns the state of the brake after the bridge has been disabled.
EnableBrakeChopper	AmplifierSetting	BOOL	_	Returns the state of the ac- tivation of the brake chop- per.
I2TErrorLevel	AmplifierSetting	USINT	-	Returns the error level of I2T.
I2TWarnLevel	AmplifierSetting	USINT	-	Returns the warning level of I2T.
MaxDcLinkVoltage	AmplifierSetting	UDINT	_	Returns the maximum of the DC link voltage.
MinDcLinkVoltage	AmplifierSetting	UDINT	_	Returns the minimum of the DC link voltage.
TemperatureError- Level	AmplifierSetting	UINT	_	Returns the error level of the temperature.
TemperatureWarn- Level	AmplifierSetting	UINT	_	Returns the warning level of the temperature.
BtnData	BTN	I_AT2xxxBtn	-	Returns the Beckhoff Traceability Number (BTN).
Btn	BTN	STRING(13)	_	Returns the Beckhoff Traceability Number (BTN).
DeviceNameData	DeviceName	I_AT2xxxDevice- Name	_	Selects the device name.
DeviceName	DeviceName	STRING(17)	-	Returns the device name.
DeviceTypeData	DeviceType	I_AT2xxxDeviceType	—	Selects the device type.
DeviceType	DeviceType	UDINT	_	Returns the device type.
DiagData	DiagData	I_AT2xxxDiagData	_	Selects the diagnostic data.
WarningActual	DiagData	UINT	-	Returns the diagnostic data.
ErrorLatch	DiagData	UINT	-	Returns the memory error.
ErrorActual	DiagData	UINT	_	Returns the current error.
DiagHistoryData	DiagHistory	I_AT2xxxDiagHistory	_	Selects the diagnostic his- tory.
DiagHistory	DiagHistory	ST_AT2xxxDiagHis- tory	_	Returns the diagnostic his- tory.
AmsNetId	Ethercat	T_AMSNETID	-	Returns the Net ID.
DriveAdr	Ethercat	UINT	_	Returns address of the driver.
HardwareVersion- Data	HardwareVersion	I_AT2xxxHardware- Version	_	Selects the hardware ver- sion.
HardwareVersion	HardwareVersion	STRING(2)	_	Returns the hardware ver- sion.

Parameter	Group	Return Type	Input Type	Explanation
I2TDiagData	I2TDiagData	I_AT2xxxI2TDiag- Data	-	Selects the I2T diagnosis.
TemperatureCoilCh	I2TDiagData	ARRAY[115] OF USINT	-	Returns the I2T values of the coils.
IdentityData	IdentityData	I_AT2xxxIdentity	_	Selects the ID.
ProductCode	IdentityData	UDINT	 _	Returns the product code.
Revision	IdentityData	UDINT	-	Returns the revision sta- tus.
SerialNumber	IdentityData	UDINT	_	Returns the serial number.
Vendorld	IdentityData	UDINT	_	Returns the vendor ID.
InfoData	InfoData	I_AT2xxxInfoData	-	Selects the information data.
AuxiliaryVoltage10V	InfoData	UINT	-	Returns the measured auxiliary voltage of 10 V.
AuxiliaryVoltage24V	InfoData	UINT	-	Returns the measured auxiliary voltage of 24 V.
AuxiliaryVoltage5V	InfoData	UINT	-	Returns the measured auxiliary voltage of 5 V.
ChipId	InfoData	ARRAY [116] OF BYTE	-	Returns the ID of the chip.
CurrentScaling	InfoData	INT	-	Returns the scaling of the current.
DcLinkVoltage	InfoData	UINT	-	Returns the DC link volt- age.
DeviceInfo	InfoData	UDINT	-	Returns the device infor- mation.
MaxDCLinkVoltage- Last500ms	InfoData	UDINT	-	Returns the maximum DC link voltage of the last 500 ms.
MaxOverallCurrent- Last500ms	InfoData	DINT	-	Returns the overall current of the last 500 ms.
OverallCurrent	InfoData	DINT	-	Returns the overall current.
PcbTemp	InfoData	ARRAY[14] OF UINT	-	Returns the temperature in the module.
SoftwareVersionData	SoftwareVersion	I_AT2xxxSoftware- Version	-	Selects the software ver- sion.
SoftwareVersion	SoftwareVersion	STRING(2)	-	Returns the software ver- sion.
VendorData	VendorData	I_AT2xxxVendorData	-	Returns the vendor data.
Code	VendorData	ARRAY [116] OF BYTE	-	Returns the software ver- sion.
CoilOvercurrent- Threshold	VendorData	UDINT	-	Returns the overcurrent threshold of the coil.
CoilPeakCurrent	VendorData	UDINT	-	Returns the current peaks of the coil.
CoilRatedCurrent	VendorData	UDINT	-	Returns the nominal cur- rent of the coil.
CoilThermalTime- Const	VendorData	UINT	-	Returns the thermal time constant of the coil.
EnableOverallCur- rentPeakDetection	VendorData	BOOL	-	Returns the setting of the peak current detection.
EnableOverallNega- tivCurrentChangeEr- ror	VendorData	BOOL	-	Returns the setting of the error for the negative over- all current change.

Parameter	Group	Return Type	Input Type	Explanation
EnableOverallNega- tivePowerError	VendorData	BOOL	-	Returns the setting of the overall negative error.
OverallCurrentFilter	VendorData	UINT	_	Returns the overall current filter.
OverallCurrentGain	VendorData	UINT	_	Returns the gain of the overall current.
OverallCurrentOffset	VendorData	DINT	_	Returns the offset of the overall current.
OverallCurrent- Threshold	VendorData	UDINT	-	Returns the overall over- current threshold.
Polarity	VendorData	UDINT	_	Returns the polarity.
All	All	PVOID	_	Returns all data of a sub- range, for example Ven- dorData and SoftwareVer- sion.

10.5.7 FB_TcIoXtsModuleMotorTerminal - I_TcIoXtsModuleMotorTerminal

10.5.7.1 Method

Parameter	Group	Return Type	Input Type	Explanation
GetObjectName	_	STRING(21)	_	Returns the name of the motor terminal.

10.5.7.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_lsInitialised	_	BOOL	_	Returns the state of the ini- tialization.

10.5.8 FB_TcIoXtsModuleSensorTerminal – I_TcIoXtsModuleSensorTerminal

10.5.8.1 Method

Parameter	Group	Return Type	Input Type	Explanation
GetObjectName	_	STRING(20)	_	Returns the name of the sensor terminal.

10.5.8.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	-	BOOL	-	Returns the state of the ini- tialization.

10.5.9 FB_TcIoXtsXpuTrack – I_TcIoXtsXpuTrack

10.5.9.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetTaskOid	General	OTCID	_	Returns the object ID of the task for the track.
GetIsClosed	General	BOOL	_	Returns the state if the track is closed.
GetIsIncludedInDe- tection	General	BOOL	_	Returns the state whether the track is integrated into the detection mode.
GetPolarity	General	Polarity	-	Returns the polarity.
GetOffset	General	LREAL	-	Returns the offset.
GetPartConfigItems	General	ARRAY[1TcloXts- EnvironmentParamet erList.MaxPartsPerTr ack] OF ST_Part- ConfigItems	_	Returns the information of the part in this track.
SetIsClosed	General	BOOL	BOOL	Sets the state if the track is closed.
SetIsIncludedInDe- tection	General	BOOL	BOOL	Sets the state whether the track is integrated in the detection mode.
SetPolarity	General	BOOL	Polarity	Sets the polarity.
SetOffset	General	BOOL	LREAL	Sets the offset.
SetTaskOid	General	BOOL	OTCID	Sets the task for the track by entering the object ID.

10.5.9.2 Method – parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetLength	Info	LREAL	_	Returns the length of the track.
GetModuleCount	Info	UDINT	_	Returns the number of modules.
GetPartCount	Info	UDINT	_	Returns the number of parts.
GetPartInfoltems	Info	ARRAY[1TcloXts- EnvironmentParamet erList.MaxPartsPer- Track] OF ST_PartIn- foltems	_	Returns an array of part in- formation containing the part object ID, the polarity of the part, the offset of the part in the track and the current length of the part.

10.5.9.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	-	Returns the state of the ini-

10.5.10 FB_TcIoXtsXpuMover – I_TcIoXtsXpuMover

10.5.10.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetAdsPort	General	WORD	_	Returns the ADS port.
GetActiveTrackOb- jectId	General	OTCID	-	Returns the object ID of the active track.
GetTaskOid	General	OTCID	_	Returns the object ID of the task.
SetActiveTrackOb- jectId	General	BOOL	OTCID	Sets the active track by en- tering the object ID of the track.
GetIsActivated	General	BOOL	_	Returns the activated state of the mover.
SetIsActivated	General	BOOL	BOOL	Sets the activated state of the mover.
GetSimulatedStart- UpPart	Simulation	OTCID	-	Returns the object ID of the start part in the simula-tion.
GetSimulatedStart- UpPosition	Simulation	LREAL	-	Returns the position at startup.
GetSimulatedStart- UpId	Simulation	STRING(3)	-	Returns the ID of the mover.
SetSimulatedStart- UpPart	Simulation	BOOL	OTCID	Sets the start part by en- tering the object ID of the part.
SetSimulatedStart- UpPosition	Simulation	BOOL	LREAL	Sets the start position.
SetSimulatedStart- UpId	Simulation	BOOL	STRING(3)	Sets the ID of the mover.

10.5.10.2 Method – parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetMoverId	MoverIdDetection	STRING(3)	-	Returns the ID of the mover.
GetAxisId	Info	UDINT	_	Returns the ID of the axis.
GetAxisObjectId	Info	OTCID	-	Returns the object ID of the axis.
GetDistanceDriven	Info	LREAL	_	Returns the value of the absolute travel distance.
				Unit: mm
GetDis- tanceDrivenInKm	Info	LREAL	-	Returns the value of the absolute travel distance.
				Unit: km
GetDriveAddress	Info	UINT	-	Returns the address of the module on which the mover is located.
GetDriveModu- leNumber	Info	UDINT	-	Returns the number of the module on which the mover is located.
GetDriveTerminalOid	Info	OTCID	-	Returns the object ID of the module on which the mover is located.
GetEncoderAddress	Info	UINT	-	Returns the address of the encoder terminal on which the mover is located.
GetEncoderModu- leNumber	Info	UDINT	-	Returns the number of the encoder terminal on which the mover is located.
GetEncoderTerminal- Oid	Info	OTCID	-	Returns the object ID of the encoder terminal on which the mover is located.
GetHasDriveError	Info	BOOL32	-	Returns the error state of the drive.
GetHasEncoderError	Info	BOOL32	-	Returns the error state of the encoder terminal.
GetMasterNetId	Info	AmsNetId	-	Returns the Net ID of the module.
GetPositionInfo	Info	REFERENCE TO ST_PositionInfo	-	Returns the position infor- mation of the part and the track
GetSoftdriveOid	Info	OTCID	_	Returns the object ID of the SoftDrive.

10.5.10.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_AxisOid	Info	REFERNCE TO OTCID	_	Returns the object ID of the axis.
P_SoftdriveOid	Info	REFERENCE TO OTCID	_	Returns the object ID of the SoftDrive.
P_IsInitialised	Info	BOOL	_	Returns the state of the ini- tialization.
Softdrive	Softdrive	I_McXtsMoverSoft- drive	_	Selects the SoftDrive for further operation.

$10.5.11 \quad FB_McXtsMoverSoftdrive-I_McXtsMoverSoftdrive$

10.5.11.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetAdsPort	General	WORD	-	Returns the ADS port of the SoftDrive.
GetHardwareModulo	General	LREAL	-	Returns the hardware modulo factor.
GetOperationMode	General	UDINT	-	Returns the operation mode.
GetMaxCurrentOut- put	General	LREAL	-	Returns the maximum out- put current.
GetEmergencyRamp	General	LREAL	_	Returns the emergency brake function.
GetEmergencyTime- Out	General	LREAL	-	Returns the total emer- gency downtime.
GetStandstill- SwitchTime	General	LREAL	-	Returns the switching time required by the mover to switch to standstill.
				Control parameters after standstill.
GetStandstillSwitch- Mode	General	TcSdStandStill- SwitchMode	_	Returns the mode in which the mover switches to standstill.
GetControlAreas	ControlAreas	REFERENCE TO ARRAY[1TcloXts- EnvironmentParamet erList.MaxAreasPerP art] OF ST_Contro- IAreas	_	Returns the settings for the control areas.
GetAreaOwner	ExternalIO	OTCID	-	-
GetloChildAreaLoca- tion	ExternalIO	REFERNCE TO AR- RAY[12] OF ST_loChildAReaLo- cation	_	-

10.5.11.2 Method -	parameter (Online)
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Parameter	Group	Return Type	Input Type	Explanation
GetEncoderOid	General	OTCID	-	Returns the object ID of the encoder.
GetFeedForwardOid	General	OTCID	-	Returns the object ID of the feed forward control.
GetFilter1Oid	General	OTCID	-	Returns the object ID of fil- ter 1.
GetFilter2Oid	General	OTCID	-	Returns the object ID of fil- ter 2.
GetInterpolatorOid	General	OTCID	-	Returns the object ID of the interpolator.
GetMoverOid	General	OTCID	-	Returns the object ID of the mover.
GetPositionControl- Oid	General	OTCID	-	Returns the object ID of the position control.
GetSoftdriveOid	General	OTCID		Returns the object ID of the SoftDrive.
GetTcNc3ActData	General	REFERENCE TO ST_TcNc3ActData	-	Obsolete parameter.
GetTuningAssistOid	General	OTCID	-	Returns the object ID of the tuning assistant.
GetVelocityControl- Oid	General	OTCID	-	Returns the object ID of the velocity control.

10.5.11.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
Encoder	_	I_SoftdriveEncoder	_	Selects the encoder for fur- ther operation.
FeedForward	-	I_SoftdriveFeedFor- ward	-	Selects the feed forward for further operation.
Filter1	_	I_SoftdriveFilter1	_	Selects the filter 1 for fur- ther operation.
Filter2	-	I_SoftdriveFilter2	_	Selects the filter 2 for fur- ther operation.
Interpolator	-	I_SoftdriveInterpola- tor	-	Selects the interpolator for further operation.
PositionControl	-	I_Softdriveposition- Control	_	Selects the position control for further operation.
VelocityControl	_	I_SoftdriveVelocity- Control	_	Selects the velocity control for further operation.
P_IsInitialised	_	BOOL	-	Returns the state of the ini- tialization.
10.5.12 FB_SoftdriveEncoder – I_SoftdriveEncoder

10.5.12.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetVelocityFeed- backMode	General	TcSdVelocityFeed- backMode	-	Returns the feedback mode of the velocity.
GetPositionFeed- backMode	General	TcSdPositionFeed- backMode	-	Returns the feedback mode of the position.
GetPositionLowPass- Filter	General	LREAL	-	Returns the frequency of the position low-pass filter.
GetVelocityFilter- Bandwidth	General	LREAL	-	Returns the bandwidth of the velocity filters.
GetStartUpPosition	General	TcSdStartUpPosi- tionType	-	Returns the type of the start position.
SetVelocityFeed- backMode	General	BOOL	TcSdVeloci- tyFeedback- Mode	Sets the feedback mode of the velocity.
SetPositionLowPass- Filter	General	BOOL	LREAL	Sets the frequency of the position low-pass filter.
SetVelocityFilter- Bandwidth	General	BOOL	LREAL	Sets the bandwidth of the velocity filter.
GetCorrectionFactor	Advanced	LREAL	_	Returns the correction fac- tor of the monitoring model.
GetSimulationOffset	Advanced	LREAL	_	Returns the offset of the start position in the simula- tion.
GetCommutation- ErrorVelocity	Advanced	LREAL	_	Returns the threshold value of the communica- tion error velocity.
SetCorrectionFactor	Advanced	BOOL	-	Sets the correction factor.
SetSimulationOffset	Advanced	BOOL	-	Sets the offset of the start position in the simulation.
SetCommutation- ErrorVelocity	Advanced	BOOL	_	Sets the threshold value of the communication error velocity.

10.5.12.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	_	Returns the state of the ini-

10.5.13 FB_SoftdriveFeedForward – I_SoftdriveEncoder

10.5.13.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetFeedForward- Type	General	TcSdFeedForward- Type	-	Returns the type of feed forward control.
GetKpAccFFT	General	LREAL	-	Returns the acceleration feed forward gain.
GetKpAccFFTArea	General	LREAL	_	Returns the acceleration feed forward gain of the area.
GetFrictionCompen- sation	General	LREAL	-	Returns the current feed forward to compensate for static friction.
GetFrictionCompen- sationArea	General	LREAL	_	Returns the current feed forward to compensate for the static friction of the area.
GetAreaCurrentLimit	General	LREAL	-	Returns the current limit of the area.
SetFeedForward- Type	General	BOOL	TcSdFeedFor- wardType	Sets the feed forward type.
SetKpAccFFT	General	BOOL	LREAL	Sets the acceleration feed forward gain.
SetKpAccFFTArea	General	BOOL	LREAL	Sets the acceleration feed forward gain of the area.
SetFrictionCompen- sation	General	BOOL	LREAL	Sets the current feed for- ward to compensate for static friction.
SetFrictionCompen- sationArea	General	BOOL	LREAL	Sets the current feed for- ward to compensate for the static friction of the area.
SetAreaCurrentLimit	General	BOOL	LREAL	Sets the current limit of the area.
GetDetectionMin- Movement	MoverIdDetection	LREAL	_	Returns the minimum movement of Mover 1 dur- ing Mover 1 detection.
GetDetectionFilter	MoverIdDetection	LREAL	-	Returns the low-pass filter of the Mover 1 detection.
GetDetectionCurrent- Ramp	MoverIdDetection	LREAL	-	Returns the current rise of the Mover 1 detection.
GetDetectionMax- Current	MoverIdDetection	LREAL	-	Returns the maximum cur- rent for Mover 1 detection.
SetDetectionMin- Movement	MoverIdDetection	BOOL	LREAL	Sets the minimum move- ment for Mover 1 during Mover 1 detection.
SetDetectionFilter	MoverIdDetection	BOOL	LREAL	Sets the low-pass filter of the Mover 1 detection.
SetDetectionCurrent- Ramp	MoverIdDetection	BOOL	LREAL	Sets the current rise of the Mover 1 detection.
SetDetectionMaxCur- rent	MoverIdDetection	BOOL	LREAL	Sets the maximum current of the Mover 1 detection.
GetOpenloopMove- Current	Advanced	LREAL	-	Returns the motion current of the open loop.

Parameter	Group	Return Type	Input Type	Explanation
SetOpenloopMove- Current	Advanced	BOOL	LREAL	Sets the motion current of the open loop.

10.5.13.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	-	BOOL	-	Returns the state of the ini-
				tialization.

10.5.14 FB_SoftdriveFilter1/ FB_SoftdriveFilter2 - I_SoftdriveFilter1/ I_SoftdriveFilter2

10.5.14.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetConfigurationFil- ter	General	REFERENCE TO ST_ConfigurationFil- ter	_	Returns the configuration of the filter.
SetConfigurationFil- ter	General	BOOL	ST_Configura- tionFilter	Sets the configuration of the filter.

10.5.14.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	_	Returns the state of the ini-
				tialization.

10.5.15 FB_SoftdriveInterpolator – I_SoftdriveInterpolator

10.5.15.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetInterpolatorType	General	TcSdInterpola- torType	_	Returns the interpolator type.
SetInterpolatorType	General	BOOL	TcSdInterpola- torType	Sets the interpolator type.

10.5.15.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	-	BOOL	-	Returns the state of the ini-
				tialization.

10.5.16 FB_SoftdrivePositionControl – I_SoftdrivePositionControl

10.5.16.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetPositionLoop- Type	General	TcSdPositionLoop- Type	-	Returns the control mode of the control loop.
GetKp	General	LREAL	-	Returns the proportional gain of the position control.
GetKpStandstill	General	LREAL	-	Returns the proportional gain of the position control at standstill.
GetKpArea	General	LREAL	-	Returns the proportional gain of the position control in the area.
GetKpAreaStandstill	General	LREAL	-	Returns the proportional gain of the position control in the area at standstill.
SetpositionLoopType	General	BOOL	TcSdPosition- LoopType	Sets the control mode of the control loop.
SetKp	General	BOOL	LREAL	Sets the proportional gain of the position control.
SetKpStandstill	General	BOOL	LREAL	Sets the proportional gain of the position control at standstill.
SetKpArea	General	BOOL	LREAL	Sets the proportional gain of the position control in the area.
SetKpAreaStandstill	General	BOOL	LREAL	Sets the proportional gain of the position control in the area at standstill.
GetPosLoopFilter	Advanced	LREAL	-	Returns the setting of the low-pass frequency of the position filter.
SetPosLoopFilter	Advanced	BOOL	LREAL	Sets the low-pass fre- quency of the position fil- ter.

10.5.16.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	_	Returns the state of the ini-
				tialization.

10.5.17 FB_SoftdriveVelocityControl – I_SoftdriveVelocityControl

10.5.17.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetVelocityLoopType	General	TcSdVelocityLoop- Type	-	Returns the control mode of the velocity control.
GetKp	General	LREAL	-	Returns the proportional gain of the velocity control.
GetKpStandstill	General	LREAL	-	Returns the proportional gain of the velocity control at standstill.
GetKpArea	General	LREAL	_	Returns the proportional gain of the velocity control in the area.
GetKpAreaStandstill	General	LREAL	-	Returns the proportional gain of the velocity control in the area at standstill.
GetTn	General	LREAL	-	Returns the integer time constant of the velocity control.
GetTnStandstill	General	LREAL	-	Returns the integer time constant of the velocity control at standstill.
GetTnArea	General	LREAL	_	Returns the integer time constant of the velocity control in the area.
GetTnAreaStandstill	General	LREAL	_	Returns the integer time constant of the velocity control in the area at standstill
SetVelocityLoopType	General	BOOL	TcSdVelocity- LoopType	Sets the control mode of the velocity control loop.
SetKp	General	BOOL	LREAL	Sets the proportional gain of the velocity control.
SetKpStandstill	General	BOOL	LREAL	Sets the proportional gain of the velocity control at standstill.
SetKpArea	General	BOOL	LREAL	Sets the proportional gain of the velocity control in the area.
SetKpAreaStandstill	General	BOOL	LREAL	Sets the proportional gain of the velocity control in the area at standstill.
SetTn	General	BOOL	LREAL	Sets the integer time con- stant of velocity control.
SetTnStandstill	General	BOOL	LREAL	Sets the integer time con- stant of the velocity control at standstill.
SetTnArea	General	BOOL	LREAL	Sets the integer time con- stant of the velocity control in the area.
SetTnAreaStandstill	General	BOOL	LREAL	Sets the integer time con- stant of the velocity control in the area at standstill.
GetMaxVelocity	Advanced	LREAL	-	Returns the setting for the maximum velocity.

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Parameter	Group	Return Type	Input Type	Explanation
SetMaxVelocity	Advanced	BOOL	LREAL	Sets the maximum veloc-
				ity.

10.5.17.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	_	BOOL	_	Returns the state of the ini-
				tialization.

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10.5.18 FB_TcIoXtsInfoServer – I_TcIoXtsInfoServer

10.5.18.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetAdsPort	General	WORD	_	Returns the ADS port of the InfoServer.

10.5.18.2 Method – parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetInfoStationCount	Info	UDINT	_	Updates and returns the total number of InfoSta-tions.
GetInfoStationOids	Info	BOOL	_	Updates the object IDs of all InfoStations.
Subitems				
InfoStationTclo	-	-	-	Selects the InfoStation for further operation by enter- ing the number of the Info- Station.

10.5.18.3 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_InfoStationCount	_	UINT	_	Returns the total number of InfoStations.
P_InfoStationOids	_	REFERENCE TO ARRAY[1TcloXts- EnvironmentParamet erList.MaxXtsInfoStat ion] OF OTCID	-	Returns all object IDs.
P_lsInitialised	_	BOOL	_	Returns the state of the ini- tialization.

$10.5.19 \quad FB_TcIoXtsInfoServerInfoStation-I_TcIoXtsInfoServerInfoStation$

10.5.19.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetAdsPort	General	WORD	-	Returns the ADS port of the station.
GetStationId	General	UDINT	-	Returns the ID of the sta- tion.
GetStationColor	General	UDINT	-	Returns the color of the station.
				Unit: ARGB
GetStartPositionOn- Part	General	LREAL	-	Returns the start position of the station on the part.
GetEndPositionOn- Part	General	LREAL	-	Returns the end position of the station on the part.
GetStopPosition	General	LREAL	-	Returns the stop position on the part.
GetStopPositions	General	ARRAY[1TcloXts- EnvironmentParamet erList.MaxXtsStopPo sitionPerStation] OF LREAL	_	Returns the stop positions on the part.
GetPartObjectIds	General	ARRAY[1TcloXts- EnvironmentParamet erList.MaxXtsStopPo sitionPerStation] OF OTCID	-	Returns all part information of the station.
GetIsEnabled	General	BOOL	-	Returns the state of the station.
GetDescription	General	STRING(1023)	_	Returns the description of the station.

10.5.19.2 Method – parameter (Online)

Parameter	Group	Return Type	Input Type	Explanation
GetPartCount	Structure	UDINT	_	Returns the number of parts that belong to this station.
GetStopPosition- sCount	Structure	UDINT	_	Returns the total number of stop positions.

10.5.19.3 Properties

Name	Group	Return Type	Input Type	Explanation
P_IsInitialised	-	BOOL	_	Returns the state of the ini-
				tialization.

10.5.20 FB_Mc2CaGroup – I_Mc2CaGroup

10.5.20.1 Method – parameter (Init)

Parameter	Group	Return Type	Input Type	Explanation
GetRailLength	Geometry	LREAL	_	Returns the length of the guide rails.
GetRailsRing	Geometry	BOOL	_	Returns that the guide rails are closed.
SetRailLength	Geometry	BOOL	LREAL	Sets the length of the guide rails.
SetRailsRing	Geometry	BOOL	BOOL	Sets that the guide rails are closed.
GetDefaultGapCon- trolMode	Gap Control	MC_DE- FAULT_GAP_CON- TROL_MODE	-	Returns the gap control mode.
GetGapControlDirec- tion	Gap Control	MC_GAP_CON- TROL_DIRECTION	_	Returns the direction of the gap control.
GetStandbyGapCon- trol	Gap Control	BOOL	_	Returns the standby state of the gap control.
GetDefaultGap	Gap Control	LREAL	_	Returns the default value of the gap.
GetDefaultVelocity	Gap Control	LREAL	_	Returns the default velocity of the gap control.
GetDefaultAccelera- tion	Gap Control	LREAL	_	Returns the default acceleration of the gap control.
GetDefaultDecelera- tion	Gap Control	LREAL	_	Returns the default decel- eration of the gap control.
GetDefaultJerk	Gap Control	LREAL	_	Returns the default jerk of the gap control.
SetDefaultGapCon- trolMode	Gap Control	BOOL	MC_DE- FAULT_GAP_ CON- TROL_MODE	Sets the gap control mode.
SetGapControlDirec- tion	Gap Control	BOOL	MC_GAP_CON TROL_DIREK- TION	Sets the direction of the gap control.
SetStandbyGapCon- trol	Gap Control	BOOL	BOOL	Sets the standby state of gap control.
SetDefaultGap	Gap Control	BOOL	LREAL	Sets the default value of the gap.
SetDefaultVelocity	Gap Control	BOOL	LREAL	Sets the default velocity of the gap control.
SetDefaultAccelera- tion	Gap Control	BOOL	LREAL	Sets the default accelera- tion of the gap control.
SetDefaultDecelera- tion	Gap Control	BOOL	LREAL	Sets the default decelera- tion of the gap control.
SetDefaultJerk	Gap Control	BOOL	LREAL	Sets the default jerk of the gap control.

10.5.20.2 Properties

Parameter	Group	Return Type	Input Type	Explanation
P_IsInitialised	-	BOOL	_	Returns the state of the ini-
				tialization.

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