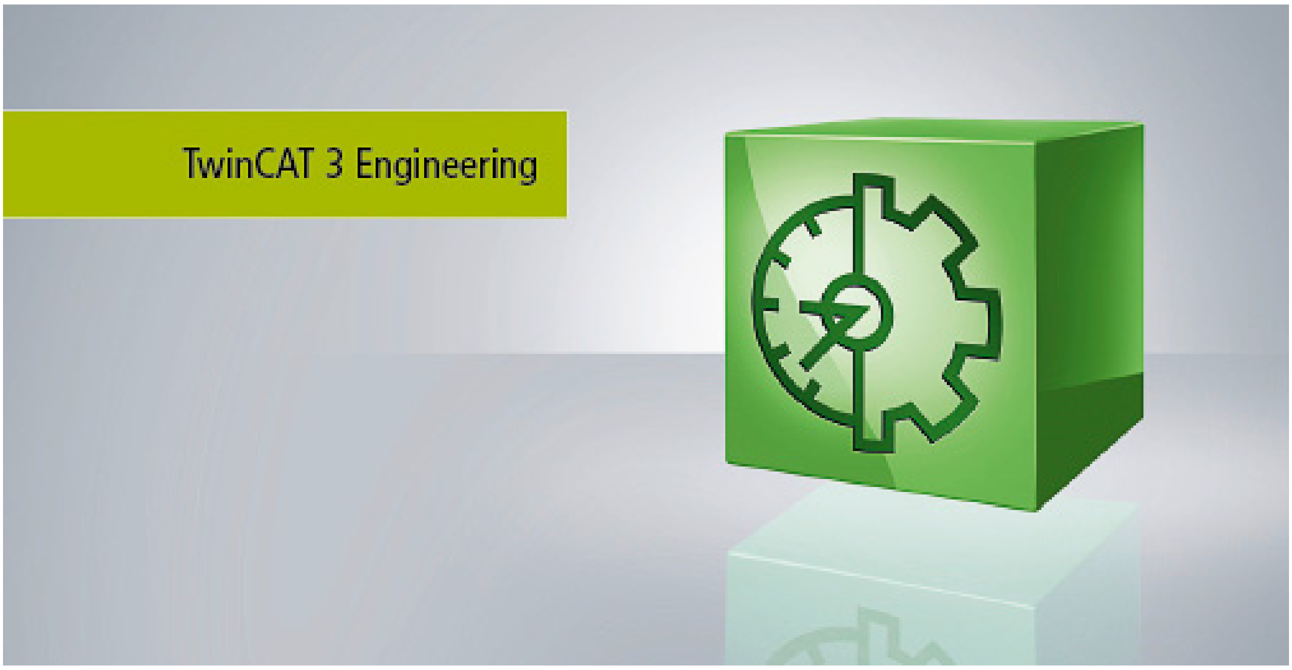

Manual

TC3 XCAD Interface

TwinCAT 3

Version: 1.1
Date: 2015-11-24
Order No.: TE1120

BECKHOFF

Inhaltsverzeichnis

1 Foreword

1.1 Notes on the documentation

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 following notes and explanations are followed when installing and commissioning these components.

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.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.
For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics.
In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning.
No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

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Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents:
EP1590927, EP1789857, DE102004044764, DE102007017835
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1.2 Safety instructions

Safety regulations

Please note the following safety instructions and explanations!
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

Exclusion of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

Description of symbols

In this documentation the following symbols are used with an accompanying safety instruction or note. The safety instructions must be read carefully and followed without fail!

⚠ DANGER	**Serious risk of injury!** Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.
⚠ WARNING	**Risk of injury!** Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.
⚠ CAUTION	**Personal injuries!** Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.
! Attention	**Damage to the environment or devices** Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.
ℹ Note	**Tip or pointer** This symbol indicates information that contributes to better understanding.

2 Overview

The XCAD interface completes the engineering chain: everything happens automatically without user intervention, from electrical design to PLC projects. Ultimately, the resulting minimization of input and transfer errors leads to cost reduction. It thus represents the implementation and consistent enhancement of the ECAD import tool for TwinCAT 3.

From an ECAD program, the required information about the structure of the I/Os and the linkage to PLC variables is exported via XML. Beckhoff uses an XML schema for specifying the structure of the XML file. The XCAD interface reads this data and generates a TwinCAT 3 project, which contains the following elements, among others:

- I/O configuration with all I/O devices, Bus Terminals and Fieldbus Box modules
- NC devices with tasks, axes and I/O variables
- PLC project with global variable lists and/or structured
- links between the PLC program/NC and the I/O

Conversely, the XCAD interface can create a special XML file from an existing TwinCAT 3 project. This enables an ECAD program to read information from I/O configurations and use it to create or amend ECAD construction drawings.

The tool consists of three components:

XCAD Interface

The main component [▶ 7] offers an overview of the CAD files involved and the TwinCAT import file and enables the configuration and access to the other components.

Compilation

The compile component [▶ 14] accumulates the information contained in the CAD files, enhances it with required data from the TwinCAT configuration data and makes it available in the form of a TwinCAT import file for import in TwinCAT.

Import / Export

The import / export component [▶ 17] creates a TwinCAT 3 project from the TwinCAT import file or extends an existing project, as required.

Prerequisites

- Windows XP or higher
- TwinCAT 3.1 (Build 4016) or higher

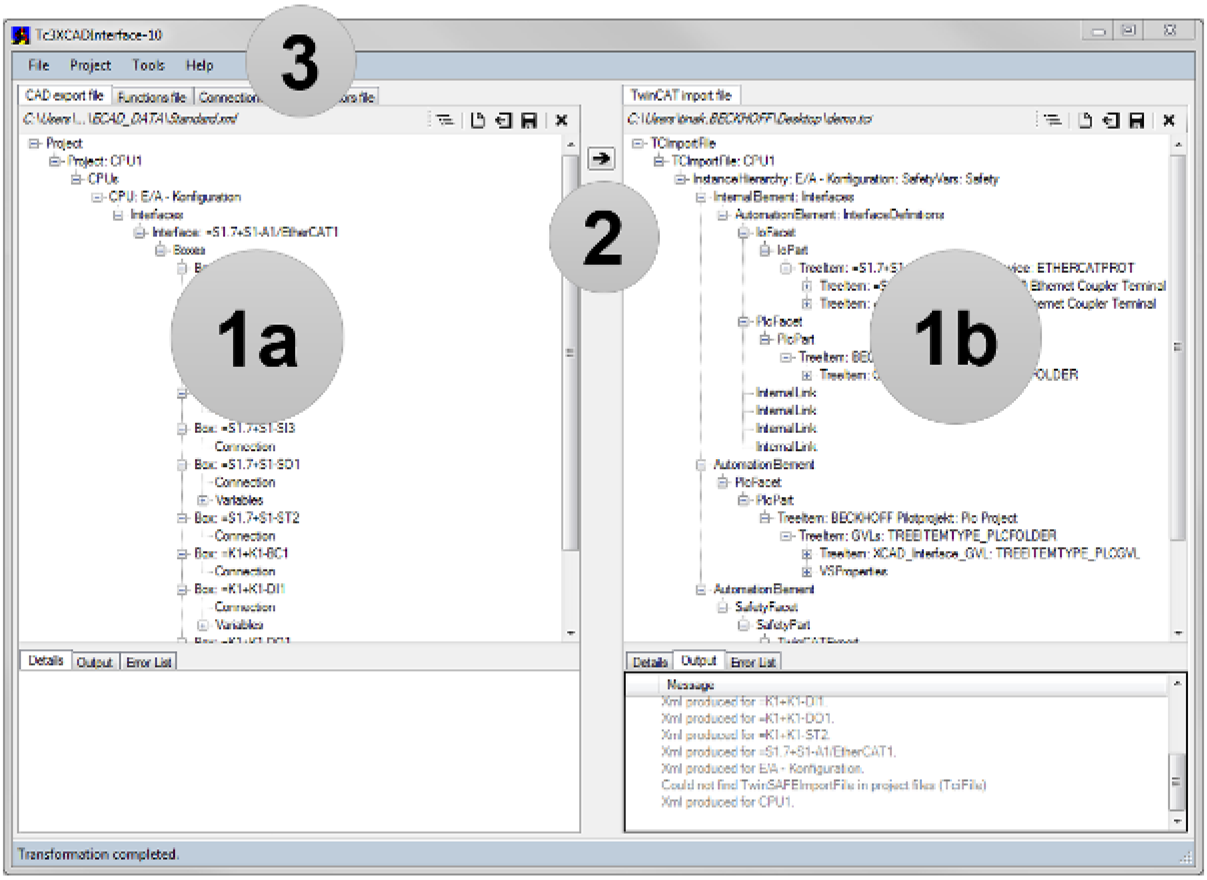
Installation

A separate installer is used for the installation. The license is activated as usual under TwinCAT 3.

3 Interface

3.1 Overview

The main screen of the XCAD interface shows the project files in a tree structure and offers access to compile, import and parameterization functions.

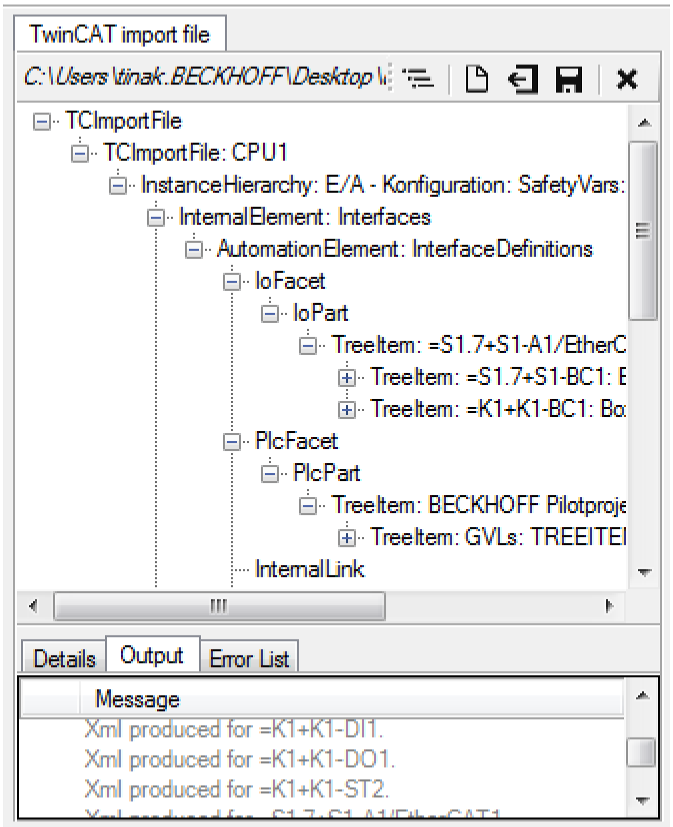


```
Xml produced for =K1+K1-DI1.
Xml produced for =K1+K1-DO1.
Xml produced for =K1+K1-ST2.
Xml produced for =S1.7+S1-A1/EtherCAT1.
Xml produced for E/A - Konfiguration.
Could not find TwinSAFEImportFile in project files (TciFile)
Xml produced for CPU1.
```

Transformation completed.

Project files:		Contains a tree view [▶ 8] of the project files involved
1a		CAD files
1b		TwinCAT import file
2	**Buttons:**	Quick access to the compilation.
3	**Menu:**	Access [▶ 9] to all settings and tools.

Tree view



C:\Users\tinak.BECKHOFF\Desktop\

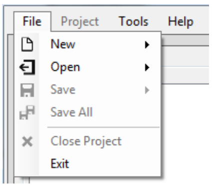
```
⊟ TCImportFile
   ⊟ TCImportFile: CPU1
      ⊟ InstanceHierarchy: E/A - Konfiguration: SafetyVars:
         ⊟ InternalElement: Interfaces
            ⊟ AutomationElement: InterfaceDefinitions
               ⊟ IoFacet
                  ⊟ IoPart
                     ⊟ TreeItem: =S1.7+S1-A1/EtherC
                        ⊞ TreeItem: =S1.7+S1-BC1: E
                        ⊞ TreeItem: =K1+K1-BC1: Bo
               ⊟ PlcFacet
                  ⊟ PlcPart
                     ⊟ TreeItem: BECKHOFF Pilotproje
                        ⊞ TreeItem: GVLs: TREEITEI
               InternalLink
```

```
Xml produced for =K1+K1-DI1.
Xml produced for =K1+K1-DO1.
Xml produced for =K1+K1-ST2.
```

The CAD files are shown at the left of the tool, the associated TwinCAT import file is shown on the right. The upper section shows the path to the currently displayed file and the quick access buttons for Expand tree (☰), Create new file (🗋), Open file (⇐), Save file (💾) and Close file (✖).

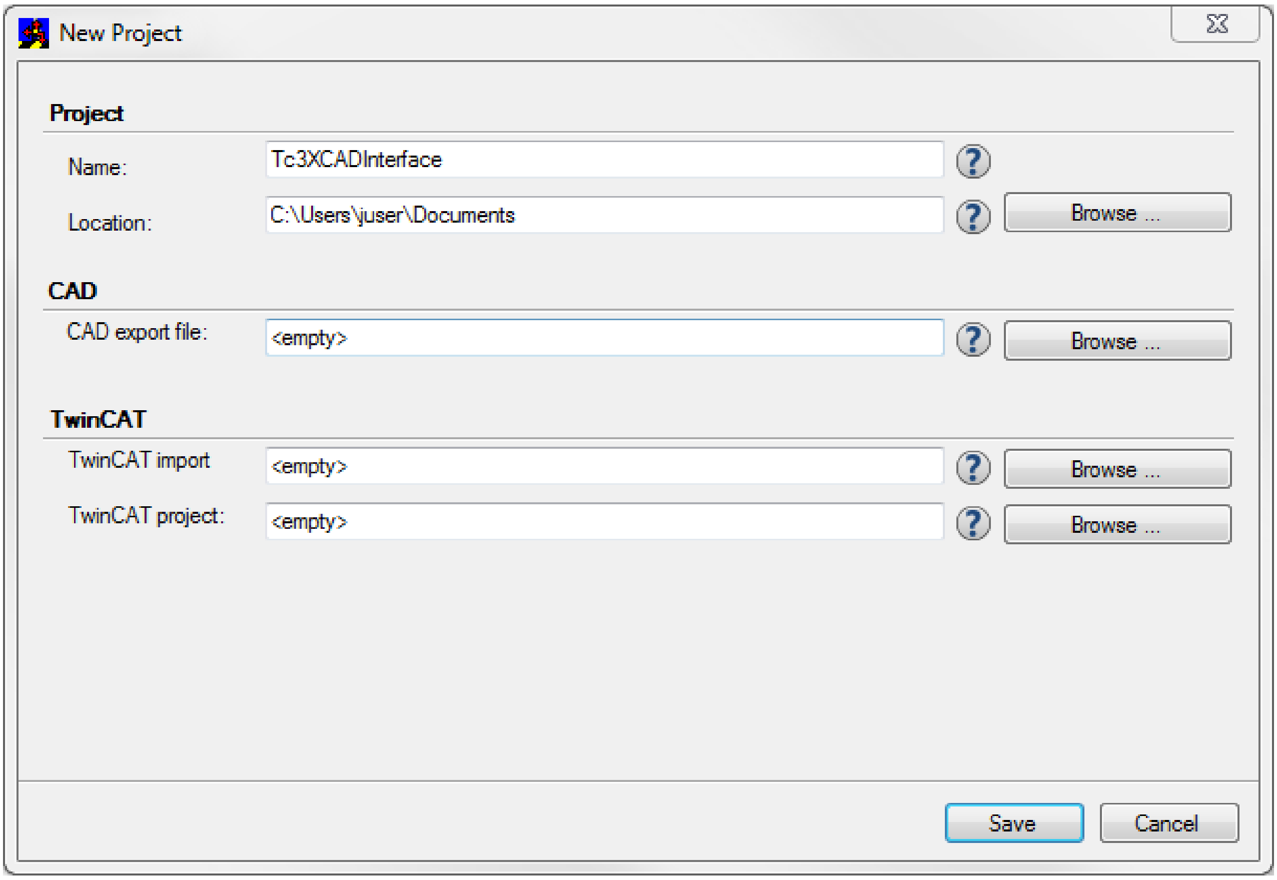
The tree view of the file is shown below. When a node is selected, further information about this node is shown in the "Details" tab. During the compile process, detailed information about the process is shown in the "Output" tab. Any error messages are accumulated separately in the “Error List” tab.

Menu

	Menu item	Submenu	Description
 File Project Tools Help New Open Save Save All Close Project Exit	**File**	**New**	New XCAD interface projects can be created via this menu item. The project settings can subsequently be adjusted via Project settings [▶ 9]. If a project is open, this menu item can be used to create empty CAD files or TwinCAT import files and integrate them in the XCAD interface project.
		Open	This menu item can be used to open existing projects. A list of recent projects can be found in the submenu “Recent Projects”. Existing CAD files and TwinCAT import files can also be opened and integrated in the project.
		Save	This menu item can be used to save the XCAD interface project and the CAD and TwinCAT import files individually.
		Save All	Saves the XCAD interface project and the open CAD and TwinCAT import files.
		Close	Closes individual files or the XCAD interface project, without terminating the program.
		Exit	Closes the program.
	Project	**Project Settings**	Opens the dialog for the Project settings [▶ 9].
		Variable Converter	Opens the dialog for configuring the variable converter [▶ 10].
		XML2TCI	Compiles open CAD files into a TwinCAT import file.
	Tools	**ImportExport**	Opens the dialog of the import/export component [▶ 14] for data exchange with TwinCAT 3.
		Settings	The behavior of the XCAD interface can be adjusted via the program settings [▶ 12].
		View Logfile	Shows the log for the current and the last nine program calls.

3.2 Project settings

All project-relevant information can be found in the project settings. It is started automatically when a new project is created and can later be called up under the menu item “Project / Project settings”.



New Project

Project

Name: Tc3XCADInterface

Location: C:\Users\juser\Documents

CAD

CAD export file: <empty>

TwinCAT

TwinCAT import <empty>

TwinCAT project: <empty>

The following settings can be made via the dialog:

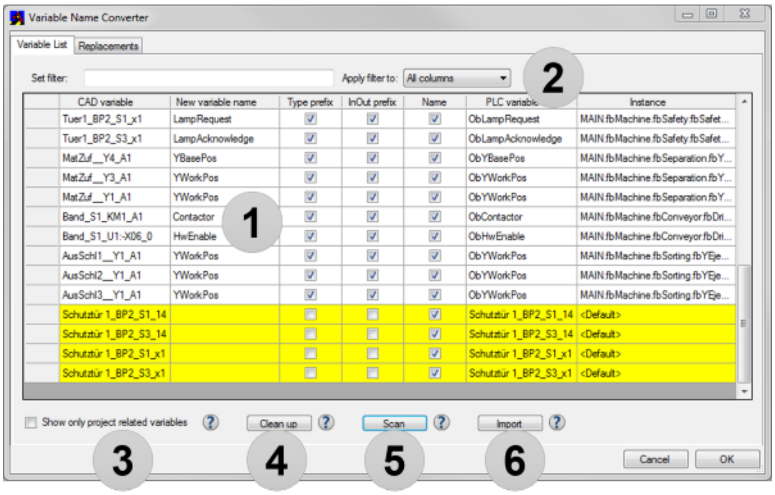
Name	Name of the XCAD interface project
Location	Storage location for the project. Under the specified path a folder is created based on the project name, which contains working copies of the CAD files and the TwinCAT import file. If a directory already exists under the path, the project data are added to the directory.
CAD export file (optional)	Storage location for the CAD file. In the current version only ECAD data that match the Beckhoff export format is supported. It is provided as an export option by the common ECAD programs.
TwinCAT import file (optional)	Storage location for the TwinCAT import file.
TwinCAT project (optional)	Path to the TwinCAT project.

3.3 Variable converter

The variable converter is used for compiling variable names of the CAD world and the PLC world. Two compile modes are available

- 1-to-1 compilation [▶ 11], in which each CAD variable is explicitly assigned a PLC variable, and
- compilation with the aid of regular expressions [▶ 12].

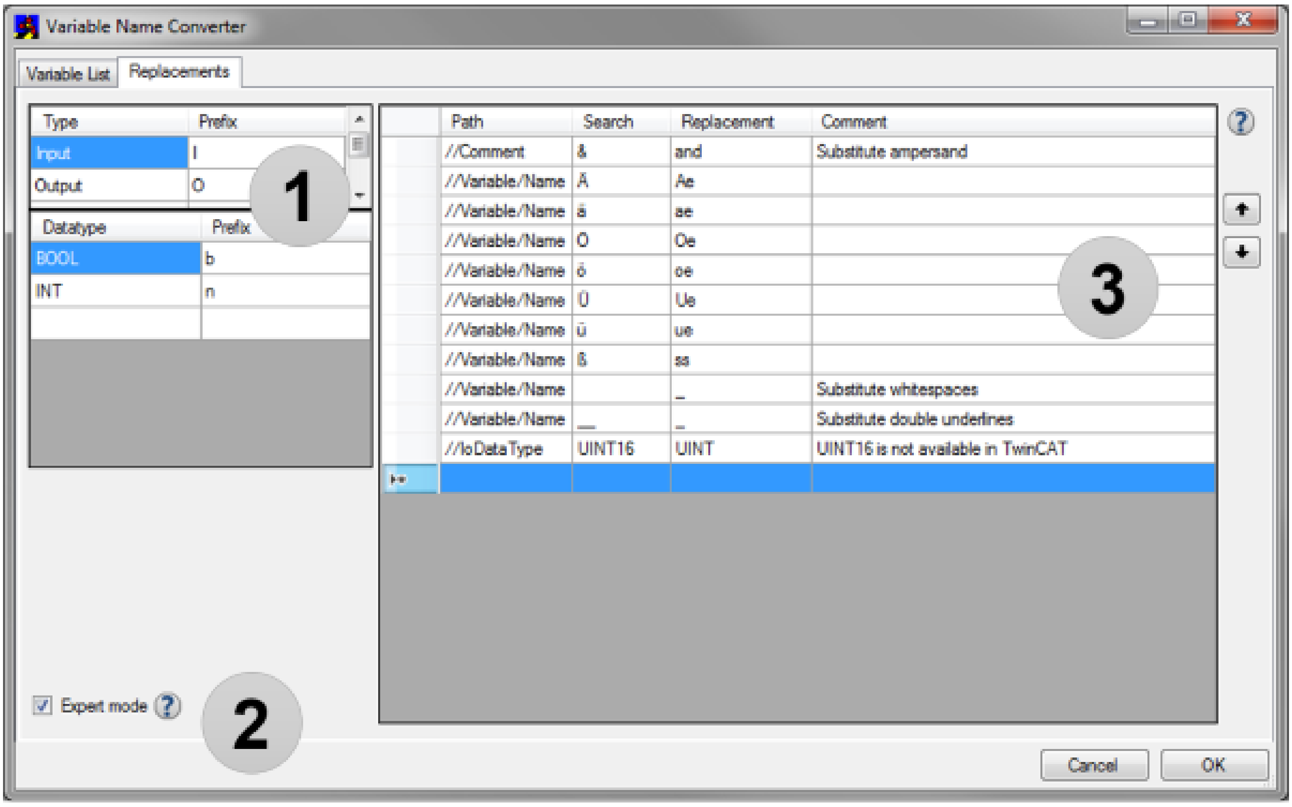
1-to-1 compilation



	CAD variable	New variable name	Type prefix	InOut prefix	Name	PLC variable	Instance
	Tuer1_BP2_S1_x1	LampRequest	☑	☑	☑	ObLampRequest	MAIN.fbMachine.fbSafety.fbSafet...
	Tuer1_BP2_S3_x1	LampAcknowledge	☑	☑	☑	ObLampAcknowledge	MAIN.fbMachine.fbSafety.fbSafet...
	MatZuf__Y4_A1	YBasePos	☑	☑	☑	ObYBasePos	MAIN.fbMachine.fbSeparation.fbY...
	MatZuf__Y3_A1	YWorkPos	☑	☑	☑	ObYWorkPos	MAIN.fbMachine.fbSeparation.fbY...
	MatZuf__Y1_A1	YWorkPos	☑	☑	☑	ObYWorkPos	MAIN.fbMachine.fbSeparation.fbY...
	Band_S1_KM1_A1	Contactor	☑	☑	☑	ObContactor	MAIN.fbMachine.fbConveyor.fbDri...
	Band_S1_U1:-X06_0	HwEnable	☑	☑	☑	ObHwEnable	MAIN.fbMachine.fbConveyor.fbDri...
	AusSchl1__Y1_A1	YWorkPos	☑	☑	☑	ObYWorkPos	MAIN.fbMachine.fbSorting.fbYEje...
	AusSchl2__Y1_A1	YWorkPos	☑	☑	☑	ObYWorkPos	MAIN.fbMachine.fbSorting.fbYEje...
	AusSchl3__Y1_A1	YWorkPos	☑	☑	☑	ObYWorkPos	MAIN.fbMachine.fbSorting.fbYEje...
	Schutztür 1_BP2_S1_14		☐	☐	☑	Schutztür 1_BP2_S1_14	<Default>
	Schutztür 1_BP2_S3_14		☐	☐	☑	Schutztür 1_BP2_S3_14	<Default>
	Schutztür 1_BP2_S1_x1		☐	☐	☑	Schutztür 1_BP2_S1_x1	<Default>
	Schutztür 1_BP2_S3_x1		☐	☐	☑	Schutztür 1_BP2_S3_x1	<Default>

No.	Description	
1	**Variable table** Tabular overview of all CAD variables and the associated PLC variables.	
	CAD variable	Name of the CAD variable
	New variable name	Basic name of the PLC variable. If this field is left empty, the name of the CAD variable is used as basic name.
	InOut Prefix	If this option is selected, a suitable prefix is appended to the basic name. The prefixes are configured on the second tab of the dialog.
	Type Prefix	If this option is selected, a suitable prefix is appended to the basic name. The prefixes are configured on the second tab of the dialog.
	Name	If this option is selected, the basic name is used for generating the PLC variable name.
	PLC variable	Resulting name for the PLC variable (cannot be edited)
	Instance	Instance path, if the variable is not to be created in the GVL. This option can only be selected for import into an existing PLC project.
2	**Filter** Filter setting for the displayed variables. Only variables, which contain the specified text in one of the selected columns, are displayed.	
3	**Only project variables** Only the variables are displayed, which are also included in the current project.	
4	**Cleaning** Permanently delete variables, which are not used in the current project, from the list.	
5	**Scan** Search the current project for further variable names. Any additional variables that are found are highlighted in yellow.	
6	**Import** Import of configured variable lists from other projects.	

Compilation with the aid of regular expressions



Type	Prefix
Input	I
Output	O

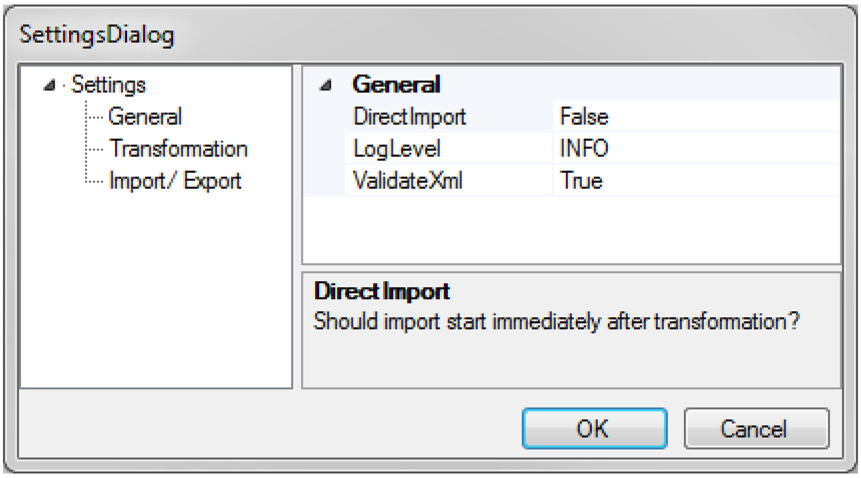
Datatype	Prefix
BOOL	b
INT	n

Path	Search	Replacement	Comment
//Comment	&	and	Substitute ampersand
//Variable/Name	Ä	Ae	
//Variable/Name	ä	ae	
//Variable/Name	Ö	Oe	
//Variable/Name	ö	oe	
//Variable/Name	Ü	Ue	
//Variable/Name	ü	ue	
//Variable/Name	ß	ss	
//Variable/Name		_	Substitute whitespaces
//Variable/Name	__	_	Substitute double underlines
//IoDataType	UINT16	UINT	UINT16 is not available in TwinCAT

No.	Description	
1	**Prefix definition** Tabular overview of the prefixes for input/output and data type.	
2	**Expert mode** Enables configuration of search and replace patterns.	
3	**Pattern definition** Only visible in expert mode	
	Path:	XPATH specification for the element to be compiled. Wildcards are allowed. Example: To change variables, set the path “//Variable/Name”.
	Search:	Searched pattern Example: The instance ID can be captured with “(.*)”, in order to map all variables to instances, based on their names. The pattern “Light_H(.*)”, for example, captures variables with names beginning with Light_H, followed by the instance ID.
	Replacement:	Target of the compilation. The terms in brackets used in the pattern can be referenced by $1 etc. Example: In the context of the previously described pattern, “GVL_Application.fbMachine.fbLamp$1.Lamp” converts “Light__H1.1” to ”GVL_Application.fbMachine.fbLamp1.1.Lamp”.
	Comment:	Used for describing the pattern replacement.

3.4 Program settings

All project-independent program settings can be found under the menu item “Tools / Settings".



SettingsDialog

- Settings
  - General
  - Transformation
  - Import/ Export

General

DirectImport	False
LogLevel	INFO
ValidateXml	True

Direct Import

Should import start immediately after transformation?

Following settings are possible via the dialog:

Component	Option	Description
Main component / general	**LogLevel**	Specifies the degree of detail for the feedback from the compilation and import/export process. SILENT disables the feedback completely. This enhances the performance of the compilation and import/export. VERBOSE enables all messages. In addition to error messages, this also includes notes and status messages.
	Validate XML	Should involved XML files be validated based on their xsd?
	DirectImport	Should the import start immediately after the transformation?

Component	Option	Description
Transformation	**Ignore unknown types**	If unknown hardware components are to be ignored during the import, this can be parameterized here. Alternatively, at the time of the transformation a dialog [▶ 14] offers the option to add information for unknown components.
	Rename IO Variables	Optionally, I/O variables can be renamed according to the linked PLC variables. This option can herewith be switched on or off.
	Default GVL	Specifies the name for the GVL, in which the PLC variables are to be stored by default. This option can be overwritten for individual variables in the variable converter [▶ 10] dialog.
	PLC project type	Specifies which PLC project type is to be used. The integration can take place in an empty PLC project (EMPTY) or in project with a standard structure (STANDARD), which already contains a suitable folder structure and references common libraries. This option is only relevant when a new TwinCAT project is created. During import into an existing project, the project structure is preserved.
	Load PLC libraries	If additional PLC libraries have to be referenced, they can be specified in the form of a comma-separated list. The required standard libraries should also be listed here, particularly if an empty project is used.
	Path to IO Settings	Information about the structure and the configuration options of the devices to be imported is required for creating the TwinCAT import file. This information is provides with each TwinCAT installation and is usually stored under "C:\TwinCAT\3.1\Config\Io\ for TwinCAT 3.1". Deviations from this path can be parameterized here.

Component	Option	Description
Import / Export	**Auto correct variable names**	The auto-correction function for variable names rectifies name clashes and illegal characters.
	Keep VS open	By default Visual Studio is closed when the import/export component [▶ 17] is terminated. This option is available for changing this behavior, if required.
	VS Version	If several Visual Studio versions are installed, the version to be used can be selected here.
	TcOriented Export	Enables data export from TwinCAT, based on the structure of the referenced TwinCAT import file. This is of interest for some CAD tools, which expect the elements in a certain order.
	Optimized Export	If this option is selected, only data are exported from TwinCAT, which differ from the default values. The resulting TwinCAT import file is significantly more compact. However, additional time is required during export for optimization.

3.5 Compile component

The compile component accumulates the information contained in the CAD files, enhances it with required data from the TwinCAT configuration data and makes it available in the form of a TwinCAT import file for import in TwinCAT.

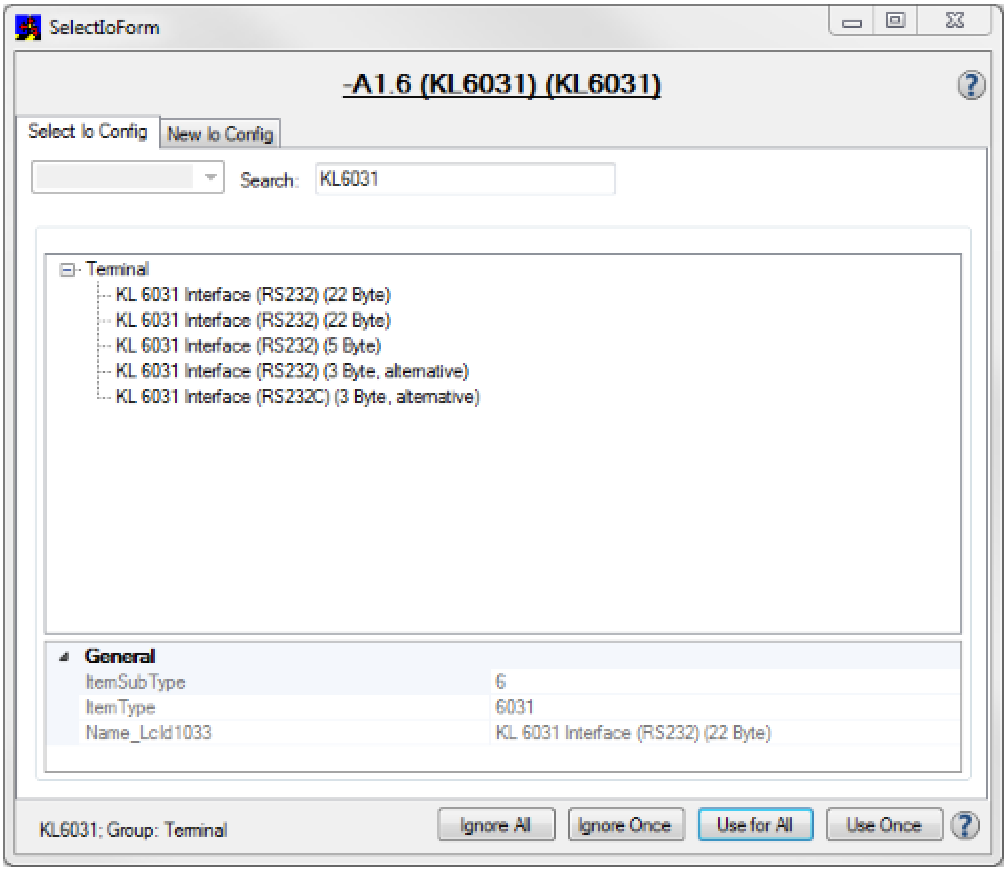
Settings

The settings for the compile component can be found in the dialog for the program settings [▸ 12] and the dialog for the variable converter [▸ 10].

User query

A query dialog appears if the compile component is unable to allocate data from the CAD files unambiguously, or if information required for the compilation is missing.

The first page of the query dialog shows a selection of all known configurations. The Search field can be used to limit the selection. Detailed information on the selected items can be found below the tree view.



SelectIoForm

-A1.6 (KL6031) (KL6031)

Select Io Config | New Io Config

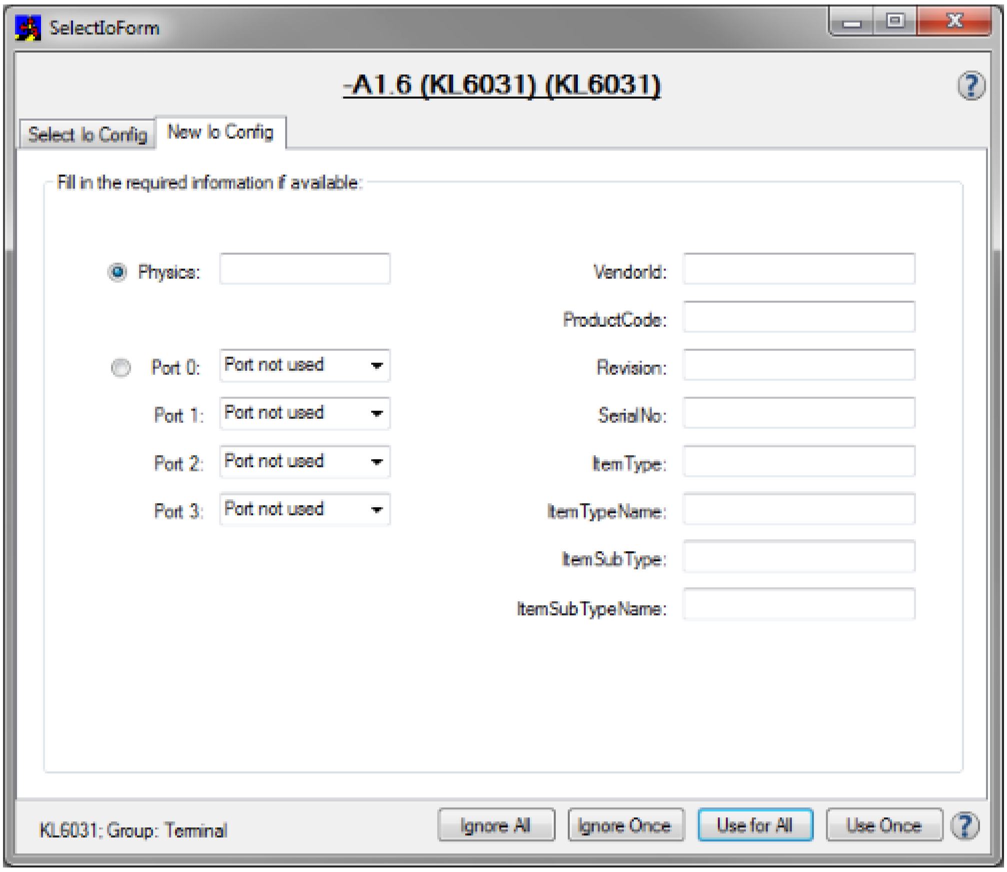
Search: KL6031

- Terminal
  - KL 6031 Interface (RS232) (22 Byte)
  - KL 6031 Interface (RS232) (22 Byte)
  - KL 6031 Interface (RS232) (5 Byte)
  - KL 6031 Interface (RS232) (3 Byte, alternative)
  - KL 6031 Interface (RS232C) (3 Byte, alternative)

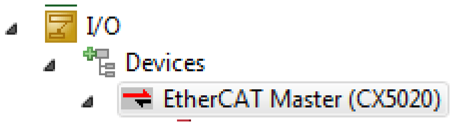
General	
ItemSubType	6
ItemType	6031
Name_LcId1033	KL 6031 Interface (RS232) (22 Byte)

KL6031; Group: Terminal

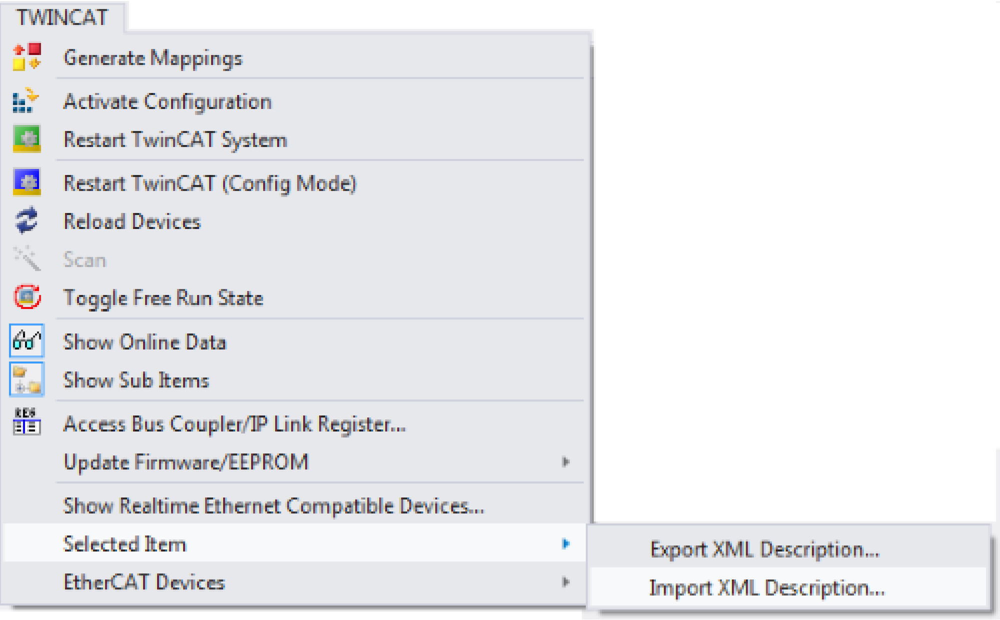
On the second page of the query dialog the required data can be entered explicitly. Information on passing through of the EtherCAT frame (physics) and the port assignment can be found in the hardware documentation.



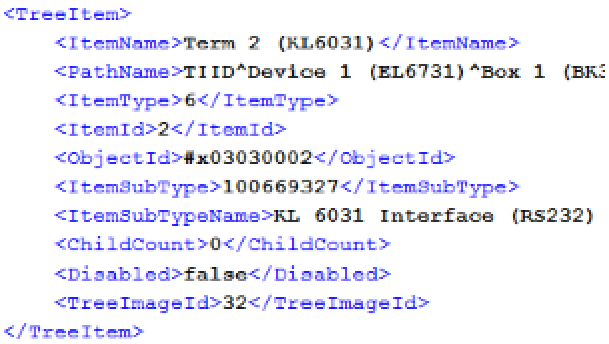
To obtain the data for the right-hand side, consult the documentation for your hardware (Vendor, ProductCode, Revision, SerialNo), or use the function ”Export XML Description” in TwinCAT XAE (item data). To this end, create the corresponding hardware manually once in a TwinCAT 3 project and then select it in the I/O configuration.



The data can be exported to an XML file via the corresponding menu item.



The resulting XML file can be opened with any text editor, and the data can be extracted.



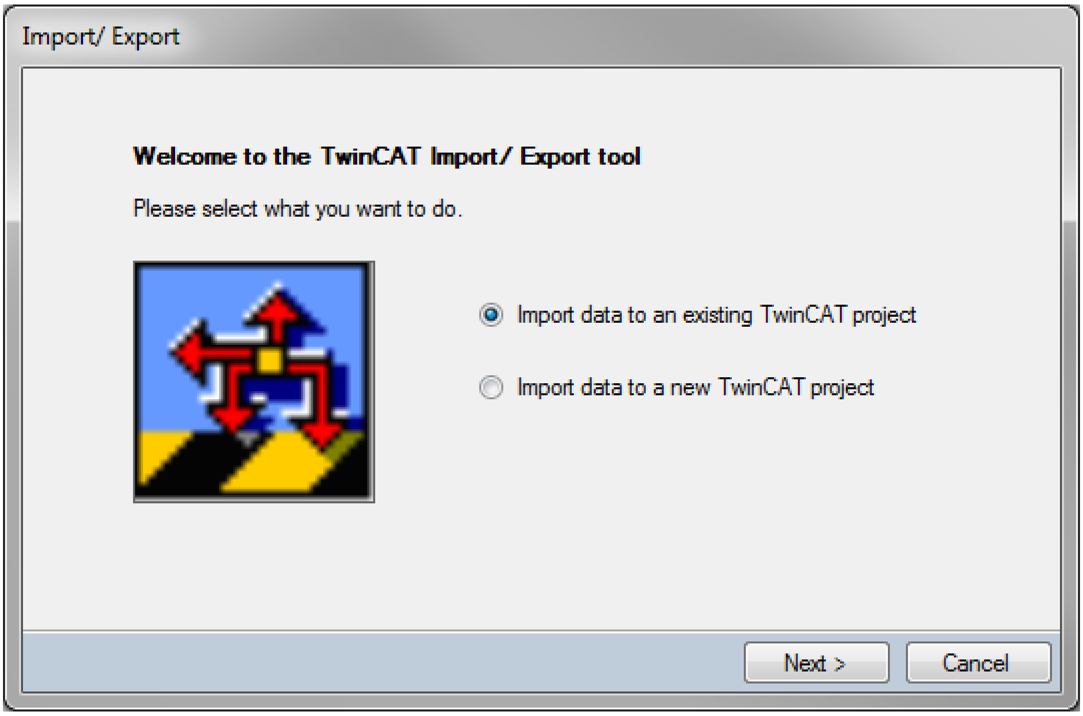
```
<TreeItem>
    <ItemName>Term 2 (KL6031)</ItemName>
    <PathName>TIID^Device 1 (EL6731)^Box 1 (BK3
    <ItemType>6</ItemType>
    <ItemId>2</ItemId>
    <ObjectId>#x03030002</ObjectId>
    <ItemSubType>100669327</ItemSubType>
    <ItemSubTypeName>KL 6031 Interface (RS232)
    <ChildCount>0</ChildCount>
    <Disabled>false</Disabled>
    <TreeImageId>32</TreeImageId>
</TreeItem>
```

Use the buttons to specify how to handle the hardware component.

Button	Meaning
Ignore All	Ignores each occurrence of the hardware component during creation of the TwinCAT import file.
Ignore Once	Ignores the hardware component once during creation of the TwinCAT import file. If the component occurs again, the user is asked again.
Use for All	Uses the selected settings for all occurrences of the hardware component.
Use One	Uses the selected settings once and asks again if the component occurs again.

3.6 Import/export component

During import the user can choose between import into an existing project or creation of a new project.



Import/ Export

Welcome to the TwinCAT Import/ Export tool

Please select what you want to do.

● Import data to an existing TwinCAT project

○ Import data to a new TwinCAT project

s

4 Examples / workflow

Projects, which in the past were imported into TC2 with the aid of the ECAD import, can also be imported into TC3 with the aid of the XCAD interface, without modifications. Information on the procedure and more detailed examples can be found in the documentation for the ECAD import.

4.1 EtherCAT components in ePLAN

The example shows the configuration of EtherCAT devices in ePLAN P8 2.4. It includes a CX1100-0004 and a connected EL1004.

Note	**ePLAN macros** Macros are available for Beckhoff products. In addition to settings, they contain a graphic representation of the hardware-components for single- and the all-pole display. Only the system-specific settings have to be adjusted.

Explanation

The complete project can be downloaded from http://infosys.beckhoff.com/content/1033/TE1120_XCAD_Interface/Resources/zip/9007200697461003.zip.

The following system-specific names used in this example may have to be adapted to your system structure:

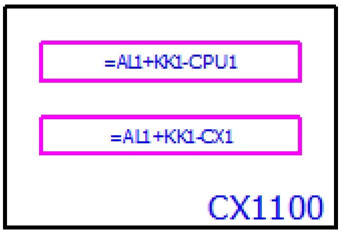
Name	Description	Values used
Device tag (DT)	Unique name for each hardware component. This is often composed of the system (e.g. AL1), the location (e.g. junction box 1 – KK1) and an acronym for the hardware component (e.g. CX1).	=AL1+KK1-CPU1 =AL1+KK1-CX1 =AL1+KK1-DI1
CPU Name	Name for the CPU project	CPU1
Rack	Allocation to a rack / backplane bus.	-BT:0
At position/ slot	Order of the hardware components on export (BoxNo). The order directly influences the hierarchy of the components in the I/O configuration. The information is optional. If it is omitted, the order is determined implicitly via the EtherCAT address.	0 1 2
At position / bus address	EtherCAT address of the hardware component. This information is mandatory for EtherCAT components.	0 1000 1001

Step 1: Project settings

The name of the PLC project matches the ePLAN project property “Project description”.

Step 2: Creating the CPU

In ePLAN an EtherCAT master consists of two components, the CPU (=AL1+KK1-CPU1) and the Bus Coupler (=AL1+KK1-CX1).



First, the CPU is configured. To this end create a PLC box and make the following settings in the tab for the PLC box:

Property	Value
Visible DT	*=AL1+KK1-CPU1*
PLC type ID	ETHERCATPROT

The PLC type ID ETHERCATPROT is mandatory for the CPU. The following information is required in the PLC structure data tab:

Property	Value
Configuration project	*CPU1*
At position/ slot	*0*
Rack	*-BT:0*
CPU	Yes
CPU name [1]	*CPU1*
Bus coupler	No
Bus system	EtherCAT

The CPU defines the name of the rack and the CPU name. In the configuration of the EtherCAT master and the terminals these are referenced via “Module is plugged into rack” and “Configuration project”.

Step 3: Bus Coupler

The Bus Coupler installed in the EtherCAT master is represented by a further PLC box. The following settings are required for this:

Tab	Property	Value
PLC box	Visible DT	*=AL1+KK1-CX1*
	PLC type ID	CX1100-0004
PLC structure data	Configuration project	*CPU1*
	At position / slot	*1*
	Module is plugged into rack	*-BT:0*
	CPU	No
	CPU: Name [1]	*CPU1*
	Bus coupler	Yes
	Bus system	EtherCAT
	At position / bus address	*1000*

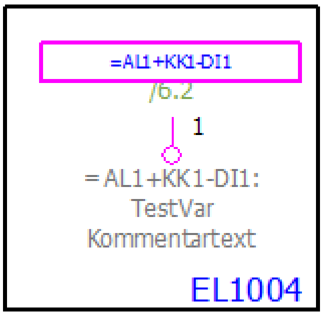
The specification of the version and revision in the PLC type ID is optional (e.g. CX1100).

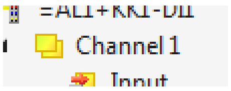
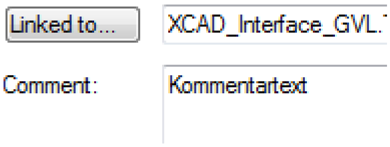
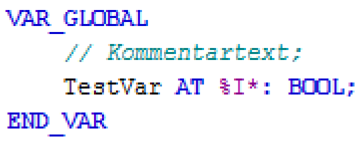
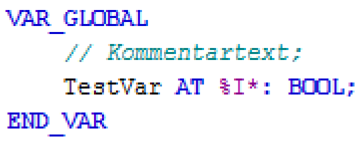
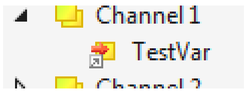
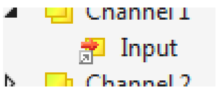
Step 4: Terminal

Tab	Property	Value
PLC box	Visible DT	*=AL1+KK1-DI1*
	PLC type ID	EL1004
PLC structure data	Configuration project	*CPU1*
	At position / slot	*2 (higher than EtherCAT master)*
	Module is plugged into rack	*-BT:0*
	CPU	No
	CPU: Name [1]	*I/O - configuration*
	Bus coupler	No
	Bus system	EtherCAT
	At position / bus address	*1001 (higher than EtherCAT master)*

Step 5: Create/link variable

For variables a PLC connection must be created.



Property	Value	Explanation
Visible DT	*=AL1+KK1-DI1*	
Connection ID	1	For first terminal point at the terminal.
Channel name	Channel 1	Channel name in TwinCAT in English or in the installation language  =AL1+KK1-DI1 Channel 1 Input
Function text	*Comment text*	Comment at the IO variable:  Linked to... XCAD_Interface_GVL. Comment: Kommentartext Comment at the PLC variable:  VAR_GLOBAL // Kommentartext; TestVar AT %I*: BOOL; END_VAR
Symbolic address	*TestVar*	Name of the variable:  VAR_GLOBAL // Kommentartext; TestVar AT %I*: BOOL; END_VAR Alternatively, the IO variable can be renamed during import:  Channel 1 TestVar Channel 2
Data type	BOOL	Data type of the variable
Process object	Input	Name of the IO variable to be linked:  Channel 1 Input Channel 2 This property may have to be added to the property list first.

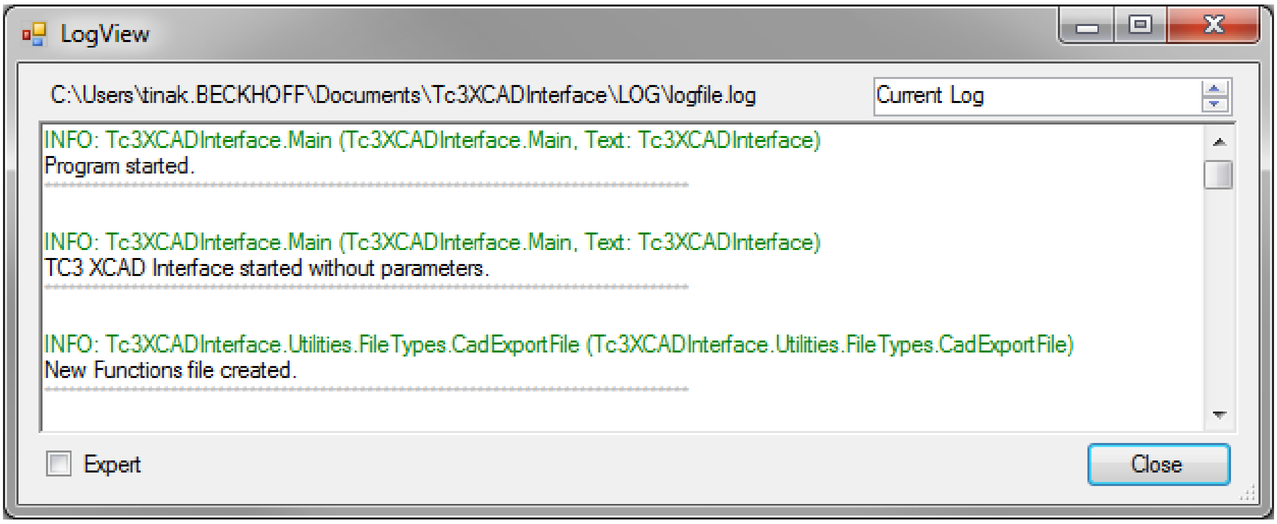
5 Appendix

5.1 Documents

Document	Description
http://infosys.beckhoff.com/content/1033/TE1120_XCAD_Interface/	List of settings required in ePLAN P8 2.2
http://infosys.beckhoff.com/content/1033/TE1120_XCAD_Interface/Resources/pdf/1442724235.pdf	List of settings required in ePLAN P8 2.4
http://infosys.beckhoff.com/content/1033/TE1120_XCAD_Interface/Resources/zip/9007200697461003.zip	Project example for manual configuration of hardware components in ePLAN P8 2.4. A detailed project guide can be found here [▶ 18].
http://infosys.beckhoff.com/content/1033/TE1120_XCAD_Interface/Resources/zip/1984108811.zip	Project example for manual configuration of hardware components in ePLAN P8 2.5.

5.2 Log file / messages

Use the menu item “Tools / View log file” to obtain detailed information about the current and the last nine program runs. Which messages are written to the log file can be specified via the settings [▶ 12].



C:\Users\tinak.BECKHOFF\Documents\Tc3XCADInterface\LOG\logfile.log

```
INFO: Tc3XCADInterface.Main (Tc3XCADInterface.Main, Text: Tc3XCADInterface)
Program started.

INFO: Tc3XCADInterface.Main (Tc3XCADInterface.Main, Text: Tc3XCADInterface)
TC3 XCAD Interface started without parameters.

INFO: Tc3XCADInterface.Utilities.FileTypes.CadExportFile (Tc3XCADInterface.Utilities.FileTypes.CadExportFile)
New Functions file created.
```

The descriptions listed here provide some clues for troubleshooting. Since most errors can have different causes, if in doubt we recommend looking in the log file and perhaps also using the expert mode, in order to obtain further information about the cause and possible solutions.

General errors

No	Description
10000	Uncategorized error
10001	The project file could not be interpreted. For further information activate the validation in the settings [▶ 12].

File access

No.	Description
20000	General error during access to a file or directory.
20001	The specified file / directory does not exist.
20002	The file / directory cannot be accessed. Check whether another program has opened the file or whether it is write protected.
20003	The specified path is too long.
20004	Error during the copy process.
20005	The directory could not be deleted. Check whether another program has opened the directory or whether it is write protected.
20006	The data from the IoConfig could not be interpreted correctly.

Build Error

No.	Description
30000	General error during compilation
30001	The rule file could not be loaded.
30002	No file was specified for the compilation.
30003	The substitution could not be carried out (see variable converter [▶ 10])
30004	Not all data required for this node required data are available in XML.
30005	Error during loading of the compilation table. Check the information you entered in the variable converter [▶ 10].
30006	The specified property does not exist for the TreeItem type.
30007	The IoConfig could not be loaded.

Import error

No.	Description
40000	General import error
40001	The project could not be created at the specified location.
40002	The child node could not be created.
40003	The parent node does not exist.
40004	The specified additional information for the TreeItem could not be fully processed.
40005	The linking between PLC variable and IO has failed.
40006	The library could not be added.
40007	Error during creation of the PLC variable.
40008	Error during setting of the variable comment.
40009	Error during creation of the global variable list.
40010	Error during creation of the POU.
40011	The parent node is of a different type than specified.
40012	The parent node does not allow a child node with specified subtype.
40013	The child node to be created already exists.
40014	The PLC project could not be compiled.
40015	Visual Studio could not be closed. It may be blocked by dialogs that are still open.

Validation error

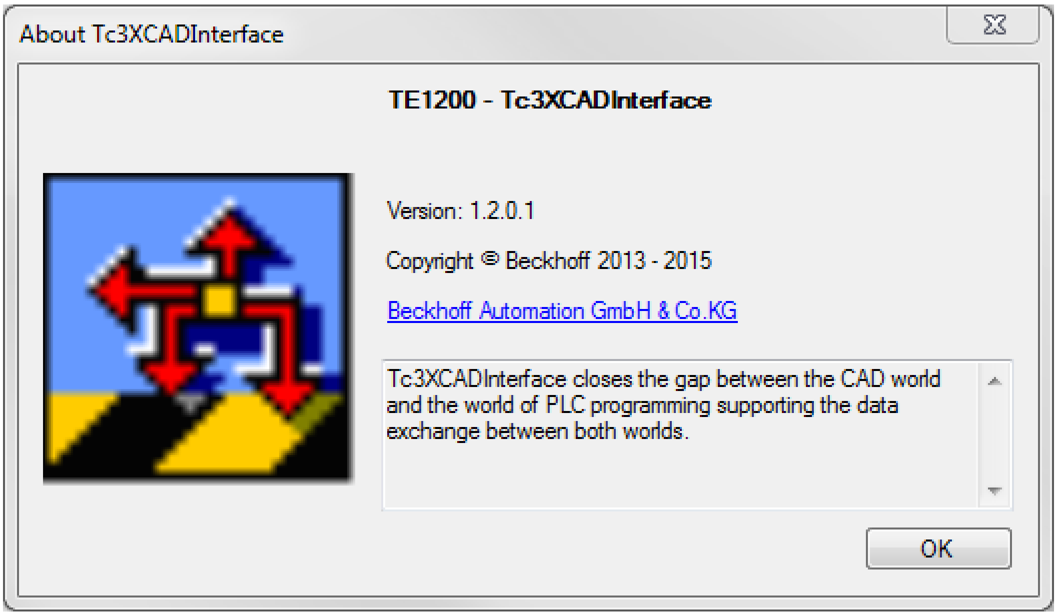
No.	Description
50001	General validation error
50002	The xml is not valid with regard to the xsd provided.

Safety

No.	Description
60000	General error during import of the safety project.
60001	Error during setting of the safety parameters
60002	No export file for the CAD program was selected. Select an appropriate file in the project dialog or in the tree view [▶ 8] on the left.
60003	No file with exported “functions” was selected. Select an appropriate file in the project dialog or in the tree view [▶ 8] on the left.
60004	The safety file used does not meet the specifications.
60005	Safety file not found. Restart the compile process to generate the safety file. Should this not rectify the problem, select the option “Integrated Safety File” in the Settings [▶ 12] and use it for the compilation.
60006	The safety file could not imported, or errors occurred during the compile process.

5.3 Questions regarding the XCAD interface

Please do not hesitate to contact us should you have questions regarding the functionality of the XCAD interface. Please always specify the version number of your current XCAD interface. You will find it under *Help > About...*in the menu bar of the XCAD interface.



About Tc3XCADInterface

TE1200 - Tc3XCADInterface

Version: 1.2.0.1

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Beckhoff Automation GmbH & Co.KG

Tc3XCADInterface closes the gap between the CAD world and the world of PLC programming supporting the data exchange between both worlds.

Questions regarding a specific project

For questions and problems regarding a specific project we also require the corresponding LogFile.

1. In the settings set the LogLevel to VERBOSE
2. Run the program up to the problematic point
   ⇨ The log for the program sequence can be found under the menu item “Tools / View log file”
3. copy the text from the log window or send us the file specified in the log window

In addition you can help us by providing some general information:

- Which operating system do you use?
- Which TwinCAT version and build do you use?
- Which Visual Studio version do you use?

FAQs

The following XCAD interface FAQs address some frequently asked questions.

Is it possible to import CAD files, which were created for the ECAD import tool, into TwinCAT 3 with the XCAD interface?

Yes, the XCAD interface fully supports the existing format.

Which fields are required in ePLAN for data exchange with the aid of the XCAD interface?

The same data are required as for the ECAD import tool. A detailed example for the configuration of hardware components in ePLAN can be found in section EtherCAT components in ePLAN [▶ 18].

Is it possible to import from different ePLAN projects into a common TwinCAT 3 project?

Yes. To import further data select the option “Import to existing project”.

To what extent is a module-oriented development application supported?

Thanks to the use of patterns for the compilation, a whole range of options are available for mapping CAD modules to different instances in the PLC project, for example. All the developers have to do is agree on a uniform naming scheme for mapping the modularization.