

Manual | EN

TwinCAT 3

Licensing



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1 Foreword

1.1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.

For installation and commissioning of the components, it is absolutely necessary to observe the documentation and the following notes and explanations.

The qualified personnel is obliged to always use the currently valid documentation.

The responsible staff must ensure that the application or use of the products described satisfies all 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.

We reserve the right to revise and change the documentation at any time and without notice.

No claims to modify 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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EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702
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1.2 For your safety

Safety regulations

Read the following explanations for your safety.

Always observe and follow product-specific safety instructions, which you may find at the appropriate places in this document.

Exclusion of liability

All the components are supplied in particular hardware and software configurations which are 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 technology who are familiar with the applicable national standards.

Signal words

The signal words used in the documentation are classified below. In order to prevent injury and damage to persons and property, read and follow the safety and warning notices.

Personal injury warnings**⚠ DANGER**

Hazard with high risk of death or serious injury.

⚠ WARNING

Hazard with medium risk of death or serious injury.

⚠ CAUTION

There is a low-risk hazard that could result in medium or minor injury.

Warning of damage to property or environment**NOTICE**

The environment, equipment, or data may be damaged.

Information on handling the product

This information includes, for example:
recommendations for action, assistance or further information on the product.

1.3 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed 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.

In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our <https://www.beckhoff.com/secguide>.

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.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at <https://www.beckhoff.com/secinfo>.

2 Quick start

The quick reference guide below describes the standard procedure for TwinCAT 3 licensing:
Use of a TwinCAT 3 license dongle with preactivated licenses for the respective dongle.

With a TwinCAT 3 license dongle, the TwinCAT 3 license is independent of the IPC used, as all required TwinCAT 3 licenses are "on board" the license dongle. This makes it possible to easily replace the IPC or simply use the licenses on different IPCs. However, the TwinCAT 3 license must cover the TwinCAT 3 platform level of the IPC.

The TwinCAT 3 license dongles are available in the form of a C9900-L100 license key USB stick or an EL6070 License Key Terminal. The preactivated TwinCAT 3 licenses for the respective dongle by Beckhoff during production can be freely defined from quantity 1 upwards.



● TwinCAT 3 licenses for non-Beckhoff IPCs

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

● TwinCAT 3.1 Build 4022 or higher

i With a TwinCAT 3 license dongle, TwinCAT 3.1 Build 4022 or higher should be used, in order to have the full functionality available.

Using TwinCAT 3 license dongles

In the project, a TwinCAT 3 license dongle must be configured once for the master image. Automatic recognition and integration of TwinCAT 3 license dongles is not yet available in the current TwinCAT version.

During series production, the TwinCAT 3 license dongle is plugged into the preconfigured position, in order to activate the required TwinCAT 3 licenses on the machine.

See also: [Configuration of a TwinCAT 3 license dongle](#) |▶ 26|

An IPC with a TwinCAT 3 license dongle can be easily replaced, as all required TwinCAT 3 licenses are "on board" the license dongle. Please ensure that the respective [TwinCAT 3 platform level](#) |▶ 12| of the IPCs is covered by the TwinCAT 3 license. TwinCAT 3.1 Build 4022 offers a downgrade of TwinCAT 3 standard licenses to a lower platform level.

TwinCAT 3 license directory

TwinCAT does not work directly with the license files on the license dongle, but rather with a working copy on the hard disk of the IPC in the license folder `c:\twin\cat3.1\target\license`. This is automatically downloaded from the license dongle to the hard disk of the IPC when the TwinCAT 3 Runtime is started, if it is not yet available in the license directory.

● Memory function for systems with Windows Embedded Compact

i For systems with Windows Embedded Compact (formerly Windows CE), automatic download of the license file is only supported with TwinCAT 3.1 Build 4022 or higher.

Ordering TwinCAT 3 license dongles with preactivated TwinCAT 3 licenses for the respective dongle

The easiest way is to order a license dongle with preactivated licenses. The licenses no longer have to be activated by yourself.

The order must be structured in such a way that it is clear which licenses belong to which TwinCAT 3 license dongle.

Order numbers for TwinCAT 3 license dongles with preactivated TwinCAT 3 licenses:

- **EL6070-0033** for the EtherCAT License Key Terminal

- **C9900-L100-0033** for the license key USB stick

The designation "...-0033" in the order number of the TwinCAT 3 license dongle indicates that preactivated TwinCAT 3 licenses are to be installed on this TwinCAT 3 license dongle.

Order numbers for preactivated TwinCAT 3 licenses:

The third from last digit of the TwinCAT order number indicates whether activation for a TwinCAT 3 license dongle is to take place at Beckhoff during production. The last two digits of the TwinCAT order number represent the TwinCAT 3 platform level (in the example: 50).

Example:

- TC1200-0150
- TF5000-0150

Structure of the order:

The hardware for which the licenses are to be preactivated is always listed first in the order, followed by the corresponding TwinCAT 3 licenses.

Example:

- 5 x **EL6070-0033**
- 5 x TC1200-0150
- 5 x TF5000-0150

or

- 3 x **C9900-L100-0033**
- 3 x TC1250-0190
- 3 x TF6100-0190

The example represents five EL6070 EtherCAT License Key Terminals with preactivated license configuration TC1200 + TF 5000 for platform level 50, and three further C9900-L100 license key USB sticks with the preactivated license configuration TC1250 + TF6100 for platform level 90.

The number of individual licenses must always correspond exactly to the number of license dongles (or, in the case of license instances, a multiple thereof).

Ordering TwinCAT 3 licenses with license instances

Some TwinCAT 3 licenses may be required not just once, but several times in a project. Example: Licenses for TwinCAT 3 HMI Client (TF2010, TF2020, ...). The number of such single licenses in the order must always be a multiple of the number of license dongle.

Example:

- 5 x **EL6070-0033**
- 5 x TF2000-0150
- 10 x TF2020-0150 (= 2 client license packs (with 3 license instances each) per dongle)

Important notes:

1. Identical licenses that do **not** contain any license instances (e.g. TC1200) may not be listed several times in succession for the same license dongle.
2. All license instances of a license pack (e.g. TF2040, TC3 HMI Clients Pack 25) can only be used for a single license device and cannot, for example, be divided into several license dongles.

Negative examples (orders in this form are not allowed):

- Multiple single licenses are prohibited:
 - 5 x **EL6070-0033**
 - 10 x TC1200-0150 (NOT ALLOWED; only 5 allowed)
 - 5 x TC1200-0150 (NOT ALLOWED; this license may not be listed a second time.)

- A pack of license instances may not be split:
 - 10 x **EL6070-0033**
 - 1 x TF2030-0150 (TC3 HMI Clients Pack with 10 license instances → NOT ALLOWED!)

Reordering of TwinCAT 3 licenses for TwinCAT 3 license dongles

If additional TwinCAT 3 licenses (e.g. TwinCAT 3 functions) are ordered for an existing TwinCAT 3 license dongle, these cannot be preactivated by Beckhoff for the license dongle. This is only possible if the corresponding license dongle is included in the same order and is therefore physically available for activation by Beckhoff during production. This means that re-ordered licenses must be activated and copied to the license dongle by the client.

See also:

- [Activating standard licenses manually \[► 48\]](#)
- [Saving license files manually on the dongle \[► 38\]](#)

TwinCAT 3 licenses that are not to be preactivated by Beckhoff are marked by "2" as the third from last digit of the order number.

Examples:

- TC1200-0250
- TF5000-0250

Upon receipt of the order confirmation, these licenses can be activated immediately.

To do this, create a so-called "[License Request File](#)" [► 48] with the desired TwinCAT 3 licenses and send it by email to the Beckhoff license server.

● **E-mail address of the Beckhoff TwinCAT 3 license server**

i E-mail address for activation of TwinCAT 3 licenses by the user: tclicense@beckhoff.com

3 Introduction

Licenses for TwinCAT 3 Engineering and TwinCAT 3 Runtime components

TwinCAT 3 consists of the TwinCAT 3 development environment (TwinCAT 3 Engineering, XAE) and the TwinCAT 3 runtime environment (TwinCAT 3 Runtime, XAR). The TwinCAT 3 development environment is usually installed on the development PC, while the TwinCAT 3 Runtime is installed on the control computer, although both may be installed on the same computer. For example, the development computer can be used simultaneously as a test control computer without the need for an independent control computer.



PCs developed for office use do not generally meet the requirements for a platform for hard real-time (low jitter, etc.) and are thus only conditionally suitable for use as control computers.

The core of TwinCAT 3 Engineering (PLC programming) is free of license costs and can be installed on any number of development computers.

Various functions extending beyond pure PLC programming (TwinCAT 3 functions) and all TwinCAT 3 runtime licenses are chargeable, however.

The TwinCAT 3 Engineering and the TwinCAT 3 runtime components can be downloaded free of charge from the [Beckhoff homepage](#).

Licenses for education and training

The free TwinCAT 3 download enables a straightforward, unbureaucratic acquisition for education and training purposes. The TwinCAT 3 development environment can be installed on any number of development computers. The [7-day trial license \[▶ 70\]](#) for TwinCAT 3 products, which can be renewed over and over again, enables TwinCAT functionalities to be used in a straightforward and cost-effective manner in the lab.

Requirements for high-level language programming in TwinCAT 3

Programming in high-level languages (such as C++) with TwinCAT 3 requires the full version of Microsoft Visual Studio, which has to be acquired separately from Microsoft and installed before TwinCAT 3. TwinCAT can then be integrated in the full version of Visual Studio during installation.



TwinCAT 3 licenses for non-Beckhoff IPCs

If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.



For the operation of TwinCAT 3 on virtual machines please refer to the [TwinCAT License Agreement \[▶ 11\]](#) and the notes on the [Beckhoff website](#).

3.1 TwinCAT 3 license agreement

You can find the TwinCAT 3 license agreement [here](#).

3.2 License types

TwinCAT 3 standard license

TwinCAT 3 standard licenses are tied to a unique system ID of a TwinCAT 3 license dongle (or IPC).

From TwinCAT 3.1 Build 4022 or higher, it is possible to downgrade a TwinCAT 3 standard license when using a TwinCAT 3 license dongle. The TwinCAT 3 license can therefore also be used for hardware platform levels that are lower than specified when activating the license.

TwinCAT 3 standard licenses are subject to a fee. The license price depends on the hardware platform level.

See also: [Ordering of TwinCAT 3 standard licenses](#) [► 44]

Special TwinCAT 3 license types

TwinCAT 3 test license

Most TwinCAT 3 Runtime products can be activated in the TwinCAT 3 development environment as often as required free of charge for 7 days for testing purposes. This can be very useful for commissioning or servicing. The trial licenses allow you to run quick tests and bridge the time period until full licenses are available.

The TwinCAT 3 development environment is required to create a trial license. It is not possible to create a trial license in the TwinCAT 3 Runtime.

See also: [TwinCAT 3 test license](#) [► 70]

TwinCAT 3 volume license

TwinCAT 3 volume licenses are linked to the so-called volume system ID of an IPC or TwinCAT 3 license dongle, which consists of a unique customer-specific volume ID for the volume license, the platform level of the IPC and the device type (IPC or TwinCAT 3 license dongle). The volume system ID is the same for all IPCs or TwinCAT 3 license dongles with a volume license and identical hardware platform level. TwinCAT 3 volume licenses are usually preactivated.

The aim of the volume licenses was to enable series machine builders with a large number of similar machines with identical TwinCAT 3 license configurations to use the volume licensing technology for easy handling of the licenses, since IPCs can be easily exchanged and licenses do not have to be activated by the user.

However, TwinCAT 3 license dongles now provide a much more flexible solution. Nowadays, a TwinCAT 3 volume license is therefore only useful in a few special cases.

See also: [TwinCAT 3 volume license](#) [► 73]

3.3 Core components of TwinCAT 3 licensing

This chapter describes the core components and important basic terms of TwinCAT 3 standard licenses.

3.3.1 TwinCAT 3 License ID

The 8-digit TwinCAT 3 License ID is referenced to the order in which the associated TwinCAT 3 license was ordered from Beckhoff Deutschland.

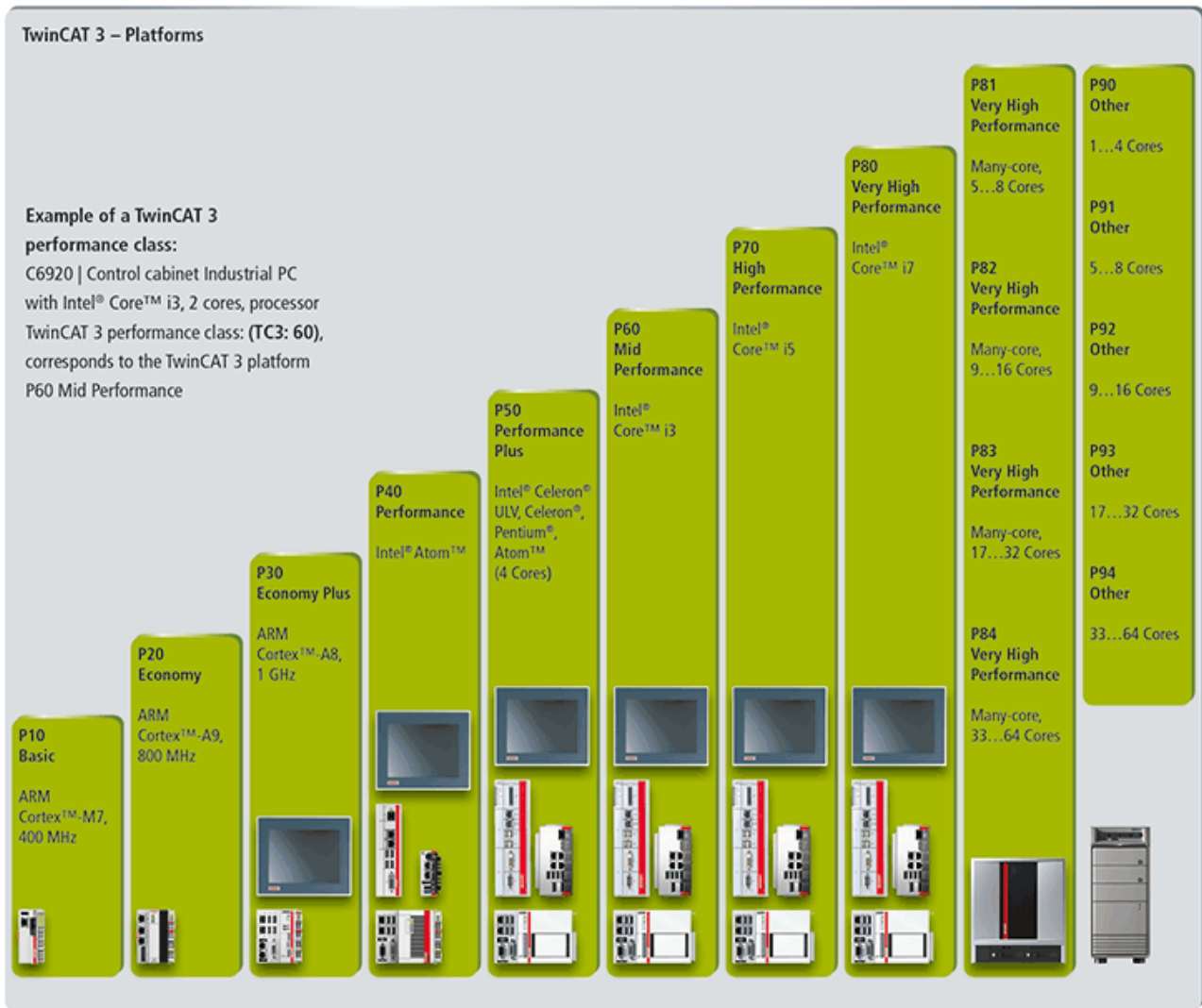
All licenses in the associated order can be activated with the License ID.

If you have not yet received a License ID for your TwinCAT 3 licenses, please get in touch with your Beckhoff sales contact and ask them for a TwinCAT 3 [license certificate](#) [► 45] for the desired licenses.

3.3.2 TwinCAT 3 platform level (performance level)

TwinCAT 3 Runtime components are available for different platforms (performance levels, platform levels). The TwinCAT 3 license price depends on the platform level.

Examples of TwinCAT 3 platform levels:



High-performance platform level

From TwinCAT 3.1 Build 4020.10 or higher, there are four new platform levels (81-84 and 91-94), depending on the computing power above platform levels 80 and 90.

The detection of platform levels of many-core IPCs is version-dependent. Older TwinCAT versions cannot recognize these and output them as 80 or 90.

When updating from a TwinCAT version lower than TwinCAT 3.1 Build 4020.10 to a current version, the original license files are no longer valid. In this case, contact Beckhoff support.

High Performance Sub Levels				
Platform Level Beckhoff Many Core IPC	81	82	83	84
Platform Level Other Many Core IPCs	91	92	93	94
Includes Platform Level (Requires Tc3.1 Build 4022)	<= 81	<= 82	<= 83	<= 84

From TwinCAT 3.1 Build 4022, a platform level downgrade option is available for dongle-related licenses. For level 9x licenses, this includes the corresponding level 8x licenses.

A platform level license 90 therefore does not include all platform level 8x licenses. Level 91 includes 81, 92 including 82 etc.

See also: [Downgrade of TwinCAT 3 standard licenses \[▶ 44\]](#)

i Several system IDs

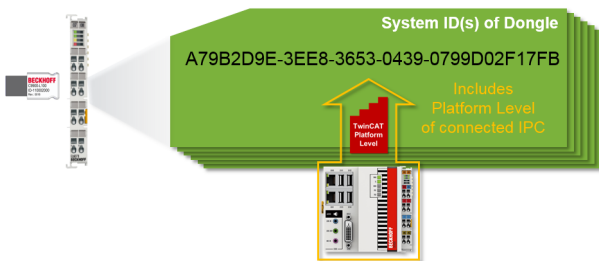
A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles \[▶ 14\]](#)

3.3.3 TwinCAT 3 system ID

The TwinCAT 3 system ID is a general, unique identification code for the respective hardware (TwinCAT 3 license dongle or IPC). Each Beckhoff TwinCAT 3 license dongle or IPC has an individual, unique system ID that cannot be changed.

The system ID of a TwinCAT 3 license dongle contains the TwinCAT platform level. Since a TwinCAT 3 license dongle does not have its own platform level due to the fact that it does not have its own CPU, the platform level is provided by the connected IPC. A TwinCAT 3 license dongle can thus have several system IDs, depending on the connected IPC. In other words, the system ID of a TwinCAT 3 license dongle always depends on the platform level of the connected IPC.



Displaying the system ID in the TwinCAT 3 development environment (XAE)

The system ID of the target system (IPC = target hardware) is displayed on the **Order Information** tab in the TwinCAT 3 Engineering license manager. To open the license manager, double-click on **License** in the **SYSTEM** subtree of the **Solution Explorer**.

Order Information (Runtime) | Manage Licenses | Project Licenses | Online Licenses

License Device: Target (Hardware Id) Add...

System Id: E0A7CC86-A9A0-C565-795F-68B7A8318BC5 Platform: other (90)

License Request

Provider: Beckhoff Automation Generate File...

License Id: Customer Id:

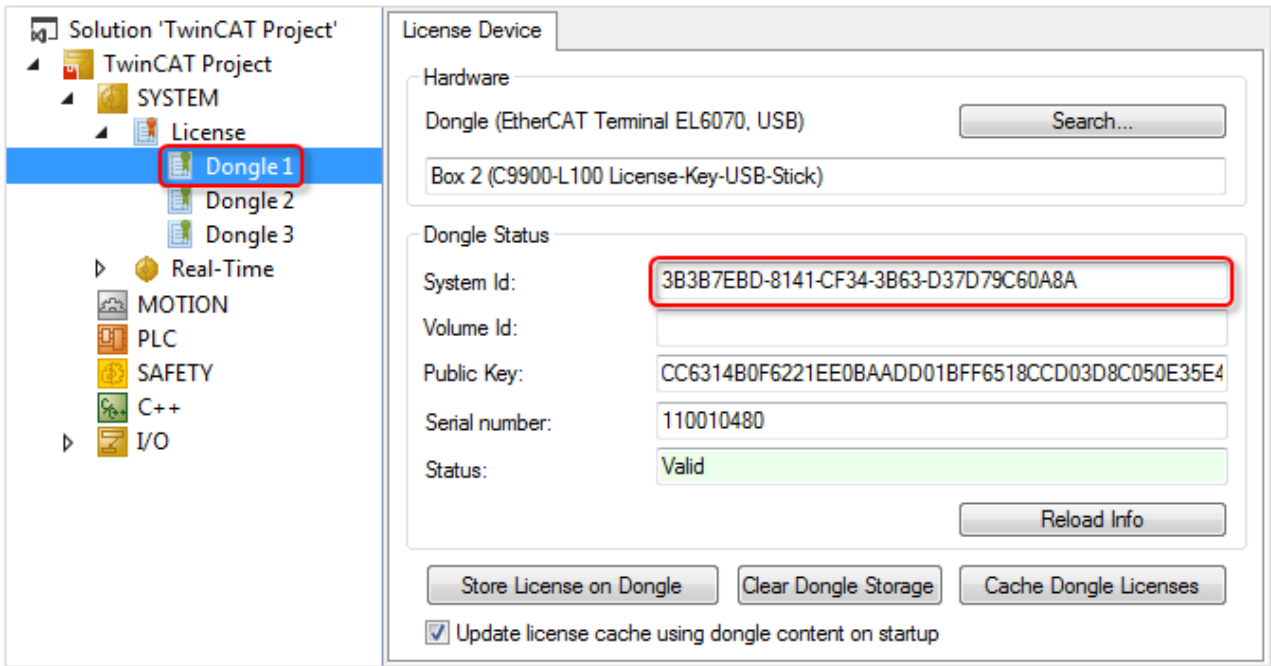
Comment:

License Activation

7 Days Trial License... License Response File...

Order No	License	Instances	Current Status
TC1200	TC3 PLC	cpu license	missing

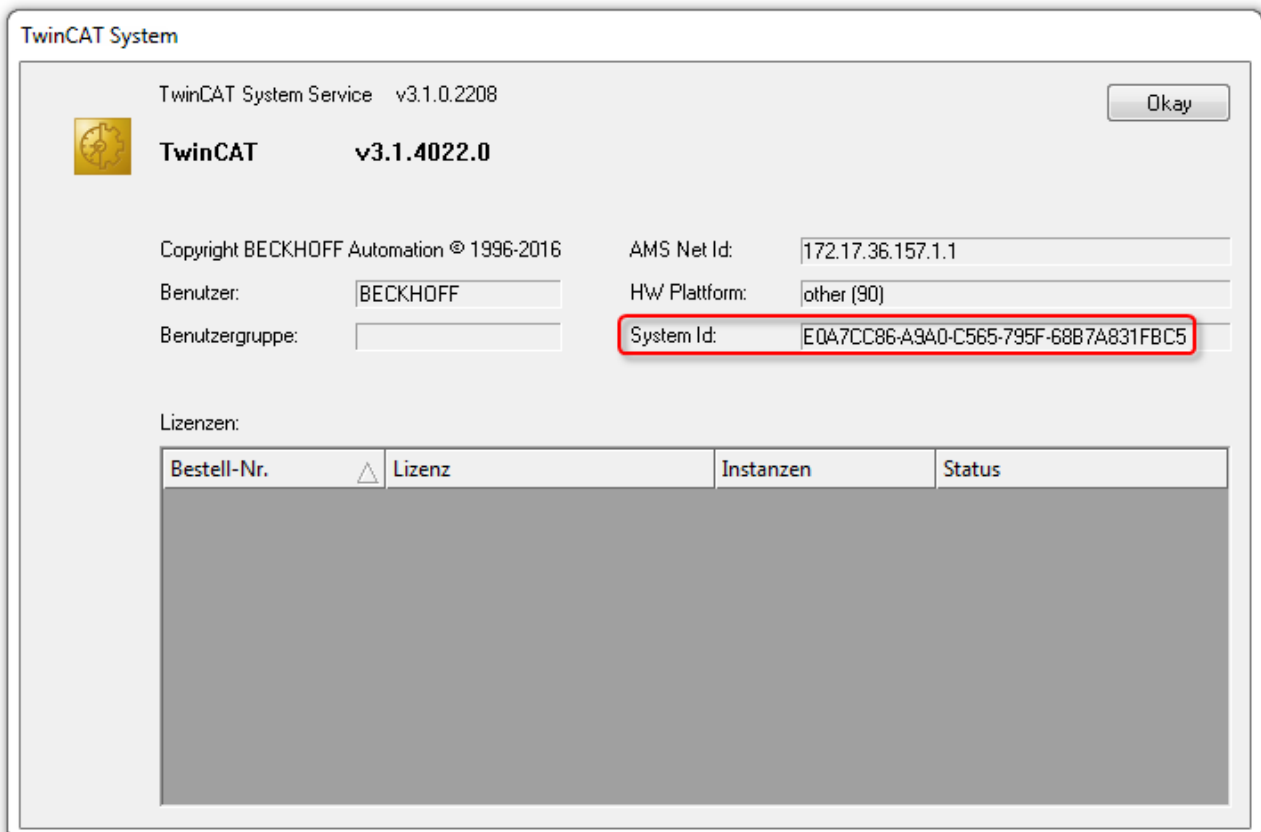
The system ID of a license dongle is displayed in the dongle properties in the **License Device** window. To open this window, double-click on the respective dongle entry in the **SYSTEM > License** subtree in the **Solution Explorer**.



Displaying the system ID in the TwinCAT 3 Runtime (XAR)

In the TwinCAT 3 Runtime (XAR), the system ID of the IPC is displayed after a right-click on the TwinCAT 3 icon in the taskbar and a click on the **About** menu item in the **TwinCAT System** window that opens.

In the current TwinCAT version, the system ID of a connected TwinCAT 3 license dongle can not be displayed in the TwinCAT 3 Runtime.



3.3.4 TwinCAT 3 license dongle

TwinCAT 3 standard licenses are tied to a specific hardware (via their individual TwinCAT 3 system ID). This is usually a TwinCAT 3 license dongle in the form of an EL6070 License Key Terminal or a C9900-L100 license key USB stick or, in special cases, a Beckhoff IPC.



Compared to licensing an IPC, a TwinCAT 3 license dongle offers significantly greater flexibility with regard to the control computer used, since TwinCAT 3 licenses are no longer tied to a specific IPC and only has to match the hardware platform level of the associated TwinCAT 3 license. This is a great advantage when servicing is required, for example.

● TwinCAT 3 licenses for non-Beckhoff IPCs

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

● Several system IDs

i A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles](#) [► 14]

● Coverage of the platform level

i The platform level of the computer must always be covered by the TwinCAT 3 licenses on the license dongle.

See also: [Working with TwinCAT 3 license dongles](#) [► 26]

3.3.5 License Request File and License Response File

● TwinCAT root directory <TwinCAT_ROOT>

i Up to and including TwinCAT 3.1.4024: **C:\TwinCAT**
From TwinCAT 3.1.4026: **C:\ProgramData\Beckhoff\TwinCAT**

License Request File

When activating TwinCAT 3 licenses manually via the Beckhoff licensing server, a "License Request File" must be generated in TwinCAT 3 Engineering.

See also: [Creating License Request Files](#) [► 48]

License Request Files are hardware-specific. In addition to a list of the requested TwinCAT 3 licenses, they contain the platform level and the system ID of the individual TwinCAT 3 license dongle (or IPC). The created TwinCAT 3 license applies only for the individual hardware on which the licensing is based. It is not transferable.

A License Request File is a normal XML file. You can easily view the content with a suitable editor (e.g. XML Notepad or Notepad++) and edit the License Request File to remove superfluous licenses from the file, for example. Make sure the inner structure is not damaged.

When the License Request File is signed by the Beckhoff licensing server, it becomes a "License Response File".

License Response File

The License Response File is generated by the Beckhoff licensing server in response to a licensing request (i.e. a signed License Request File) and returned to the requester. The signature validates the content and protects against content changes. You can view the content with a suitable editor, but you are not allowed to edit the License Response File, as it becomes invalid when the content changes (signature no longer matches the content of the file). However, you can change the file name.

The License Response File contains one or more individual TwinCAT 3 licenses for an individual TwinCAT 3 license dongle (or Beckhoff IPC). It is hardware-specific and non-transferable. The License Response File only works with the individual hardware on which the licensing is based.

The License Response File is saved in the TwinCAT 3 license folder (`<TwinCAT_ROOT>\3.1\target\license`) of the target system. Any subdirectories in this folder will be ignored by TwinCAT 3.

In this directory TwinCAT 3 automatically creates a copy of the license files contained on a TwinCAT 3 license dongle. TwinCAT 3 only works with license files in the above directory, therefore a working copy of the license files from the license dongle must also be available there.

The most important data from the "License Info" section of the License Request/Response File is shown below:

- System ID [▶ 14] (green)
- Performance Level [▶ 12] (yellow)
- License ID [▶ 12] (blue)
- TwinCAT 3 licenses (red)

```

<LicenseInfo>
  <SystemId Level="40"> 2705D20A-702D-BF0D-4E37-3E8CD90AEA5E </SystemId>
  <PurchaseOrder>
    <![CDATA[VE12345678]]>
  </PurchaseOrder>
  <IssueTime>2015-12-15T09:16:00</IssueTime>
  <License ManuallyAdded="true">
    <LicenseId>{94C91BCC-DC1F-4EBC-AEFD-2DC25DF4708B}</LicenseId>
    <Name>TC3 EtherCAT Simulation</Name>
    <OrderNo>TE1111</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{520DE751-9DB6-47CB-8240-BD5C466E7E64}</LicenseId>
    <Name>TC3 NC PTP</Name>
    <OrderNo>TF5000</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{BF78CFC7-2E63-42C3-8C07-BB6C346BFB8B}</LicenseId>
    <Name>TC3 NC PTP Axes Pack 25</Name>
    <OrderNo>TF5010</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{19E93A3D-90D1-45B9-A28A-32DD8D2A166A}</LicenseId>
    <Name>TC3 PLC / C++</Name>
    <OrderNo>TC1210</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{A0C635DF-5F13-43BE-8D0B-613386AD9A20}</LicenseId>
    <Name>TC3 Condition Monitoring Level 1</Name>
    <OrderNo>TF3600</OrderNo>
  </License>
</LicenseInfo>

```

Representation of the values in the TwinCAT 3 development environment:

Order Information (Runtime) | Manage Licenses | Project Licenses | Online Licenses

License Device: Dongle 1 (Hardware Id) [Add...]

System Id: 2705D20A-702D-BF0D-4E37-3E8CD90AEA5E Platform: performance (40)

License Request

Provider: Beckhoff Automation [Generate File...]

License Id: VE12345678 Customer Id: []

Comment: []

License Activation

[7 Days Trial License...] [License Response File...]

Order No	License	Instances	License Device	Status
TC1210	TC3 PLC / C++	cpu license	Dongle 1 (Hardware Id)	missing
TE1111	TC3 EtherCAT Simulation	cpu license	Dongle 1 (Hardware Id)	missing
TF3600	TC3 Condition Monitoring	cpu license	Dongle 1 (Hardware Id)	missing
TF5000	TC3 NC PTP	cpu license	Dongle 1 (Hardware Id)	missing
TF5010	TC3 NC PTP Axes Pack 25	cpu license	Dongle 1 (Hardware Id)	missing

3.4 TwinCAT 3 LicenseTANs

So-called "LicenseTANs" have been optionally available for the [activation of TwinCAT 3 licenses \[► 48\]](#) since 01/01/2019.

They can be taken from the TwinCAT 3 license certificate and represent a sort of "serial number" of a TwinCAT license with which this license can be clearly identified:

TwinCAT®

BECKHOFF

Page 1 of 2

Software license document

License ID 00450004

Delivery address

OEM Automation Inc.
C/O Mr. Max Roboto
Highspeed Road 200
47110 Cycletown
GREENLAND

Customer

OEM Automation Inc.
Highspeed Road 200
47110 Cycletown
GREENLAND

Customer 96100450
Order 00450004
Date 2019-02-01
Your order 1 CC01101
Your order 2

Line	Software	System ID	Registration key	TAN
10.1	TF6250-0030 137752	BC25B7C6-BB0B-9A4C-33C1-D92BD820C93C		8H24K-ZJHQN
20.1	TC1200-0030 137668	BC25B7C6-BB0B-9A4C-33C1-D92BD820C93C		4BH4K-01BNY
30.1	TF1800-0030 139066	BC25B7C6-BB0B-9A4C-33C1-D92BD820C93C		HQ18C-02BWN

TwinCAT 3 LicenseTANs are used in the activation of TwinCAT 3 licenses by the user [▶ 55] in order to activate a clearly defined license (within an order).

As opposed to that, it is possible in principle to activate any licenses in an order with the help of the TwinCAT 3 License ID (-> reference to the order number).

(This also means that all licenses existing in an order can be activated if the License ID is known; if a TwinCAT 3 LicenseTAN is known, only this one associated license can be activated).

To make the simple and secure management of single TwinCAT 3 licenses possible for users, they can also be ordered in the form of single license certificates (i.e. each single license (and LicenseTAN) has its own license certificate). Please get in touch with your Beckhoff sales contact regarding this.

TwinCAT 3 LicenseTANs for different orders may be mixed and used within a License Request File [▶ 16].

This is not possible with the TwinCAT 3 License ID; a dedicated License Request File must be created for each License ID.

3.5 Determining required licenses

While working in the TwinCAT development environment (XAE), TwinCAT automatically detects all required licenses. For example, as soon as a PLC project is added, a corresponding "TC1200 PLC" license is added to the list of required licenses.

In the **Project Licenses** tab of the TwinCAT 3 license manager you can see which licenses TwinCAT 3 has automatically determined and where the license request comes from. To open the TwinCAT 3 license manager, double-click on **License** in the **System** subtree of the **Solution Explorer**.

Order No	License	Instances	In Use By
TC1000	TC3 ADS	cpu license	SYSTEM
TC1100	TC3 IO	cpu license	Device 1 (EtherCAT)
TC1200	TC3 PLC	cpu license	PLC

On the **Manage Licenses** tab, you can specify the licenses to be transferred to the License Request File. In addition to the licenses that are automatically determined as required, you can also manually add licenses to your project that you may need later.

Order No	License	Add License	System Id
TC1000	TC3 ADS	<input type="checkbox"/> cpu license	
TC1100	TC3 IO	<input type="checkbox"/> cpu license	
TC1200	TC3 PLC	<input type="checkbox"/> cpu license	
TC1210	TC3 PLC / C++	<input checked="" type="checkbox"/> cpu license	
TC1220	TC3 PLC / C++ / MatSim	<input type="checkbox"/> cpu license	
TC1250	TC3 PLC / NC PTP 10	<input type="checkbox"/> cpu license	

Enabling/disabling automatic detection of the required licenses

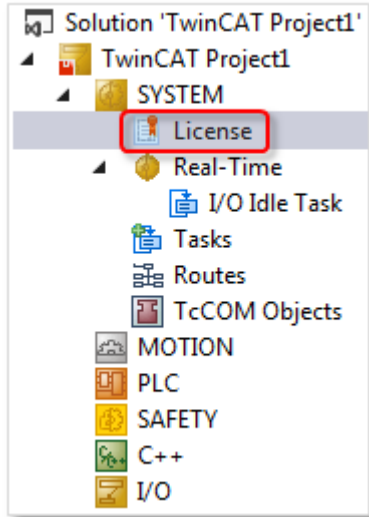
You can use the option **Disable automatic detection of required licenses for project** to disable automatic detection of the licenses required for the project and select or deselect each license individually. If the checkbox is unchecked, you cannot deselect the licenses required for the project.

Order...	License	Provider	Add License
TC1000	TC3 ADS	Beckhoff Automation	<input type="checkbox"/> cpu license
TC1100	TC3 IO	Beckhoff Automation	<input type="checkbox"/> cpu license
TC1200	TC3 PLC	Beckhoff Automation	<input checked="" type="checkbox"/> cpu license
TC1210	TC3 PLC / C++	Beckhoff Automation	<input type="checkbox"/> cpu license
TC1220	TC3 PLC / C++ / MatSim	Beckhoff Automation	<input type="checkbox"/> cpu license

3.6 Checking license dependencies

TwinCAT 3 licenses may contain other licenses or require other licenses. You can determine these dependencies in the TwinCAT 3 license manager.

1. Open the TwinCAT 3 license manager by double-clicking **License** in the **System** subtree of the TwinCAT project tree.



2. Open the **Manage Licenses** tab.
 3. Double-click the corresponding license.
- ⇒ The **License Information** window opens and shows details of the selected license.

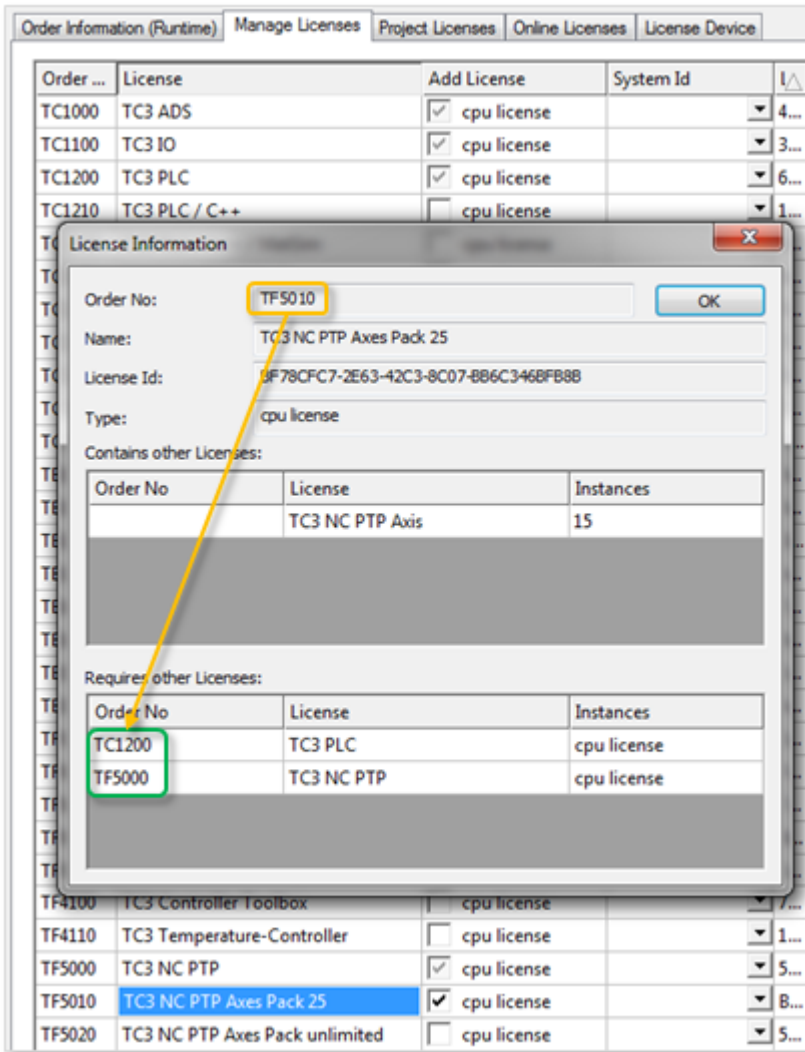
Example for included licenses:

The screenshot shows the 'Manage Licenses' window with a table of licenses. The 'TC1200 TC3 PLC' license is selected. A 'License Information' dialog box is open, showing details for TC1200 and a list of licenses it contains (TC1000 and TC1100).

Order ...	License	Add License	System Id
TC1000	TC3 ADS	<input checked="" type="checkbox"/> cpu license	4...
TC1100	TC3 IO	<input checked="" type="checkbox"/> cpu license	3...
TC1200	TC3 PLC	<input checked="" type="checkbox"/> cpu license	6...
TC1210	TC3 PLC / C++	<input type="checkbox"/> cpu license	1...

Order No	License	Instances
TC1000	TC3 ADS	cpu license
TC1100	TC3 IO	cpu license

Example for required licenses:



3.7 Determining the license status

You can display the TwinCAT 3 license status both in TwinCAT 3 Engineering and in the TwinCAT 3 Runtime.

3.7.1 License overview in TwinCAT 3 Engineering (XAE)

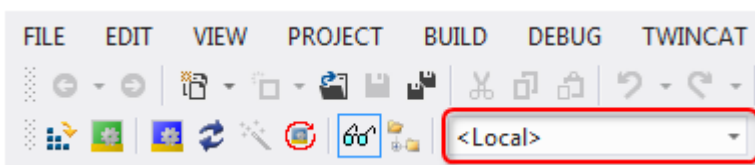
● Correct target system

i Note that the license manager always applies to the target system for the TwinCAT 3 project!

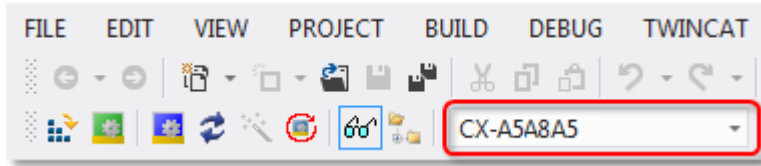
In the TwinCAT 3 development environment, you can determine the license status in the TwinCAT 3 license manager on the **Online Licenses** tab.

✓ The TwinCAT 3 development environment has been started and a project is loaded.

1. Set the desired target system. To do this, select the target system from the **Choose Target System** dropdown list in the **TwinCAT XAE Base Toolbar Options**:
If the target system is the local computer, select <Local>.

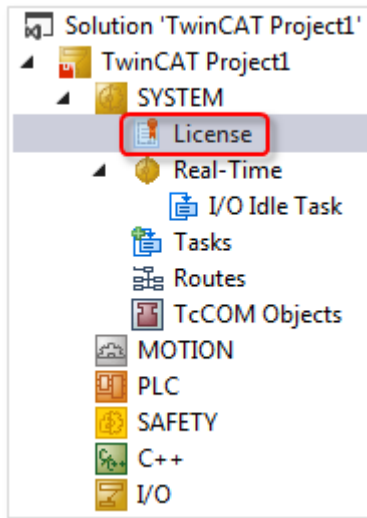


If the target system is a remote computer, select it from the list or select "Choose Target System" and configure the target system. (If necessary, a new ADS route will be created.)



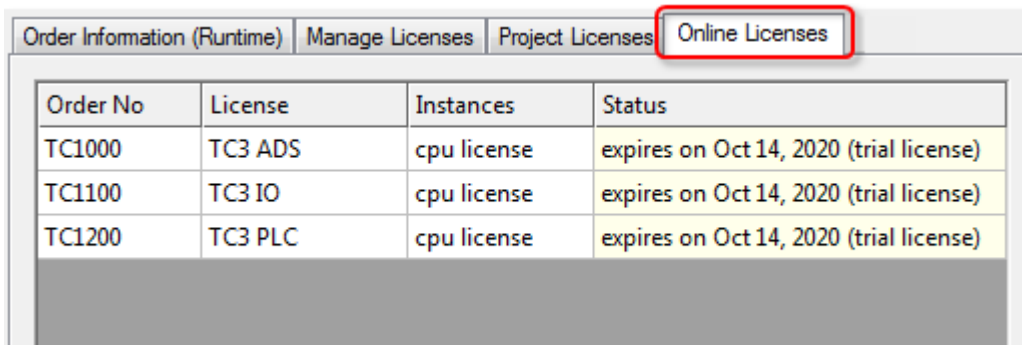
⇒ The licensing settings in the license manager refer precisely to the target system set here. When the project is activated on the target system, the corresponding TwinCAT 3 licenses are automatically copied to this system.

2. Open the TwinCAT 3 license manager by double-clicking **License** in the **System** subtree of the TwinCAT project tree.



3. Open the **Online Licenses** tab.

⇒ The overview shows which licenses are activated for this project (through one or more License Response Files).



If these are License Response Files for TwinCAT 3 license dongles, the status "Pending" may be displayed there (before the TwinCAT 3 Runtime is started). This means that the License Response File has been detected as valid in principle, but the content cannot yet be released because there is no connection to the associated TwinCAT 3 license dongle. The connection to the TwinCAT 3 license dongle is only established when the TwinCAT 3 Runtime is started and the EtherCAT bus has "OP" status, for example.

3.7.2 License overview in the TwinCAT 3 Runtime (XAR)

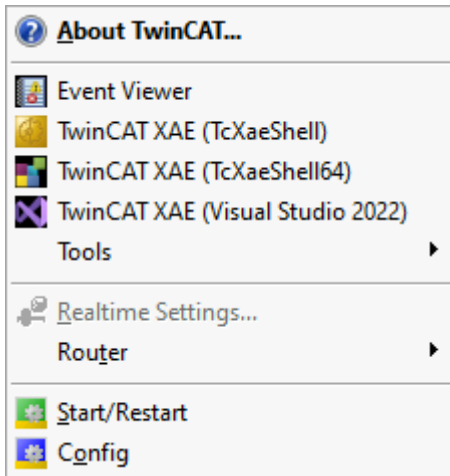
If you do not have access to the TwinCAT 3 development environment and the current project, you can determine the license status of your control computer via the TwinCAT 3 Runtime.

- ✓ You have access to the Windows Desktop (via remote desktop or a connected monitor and mouse) on the control computer.

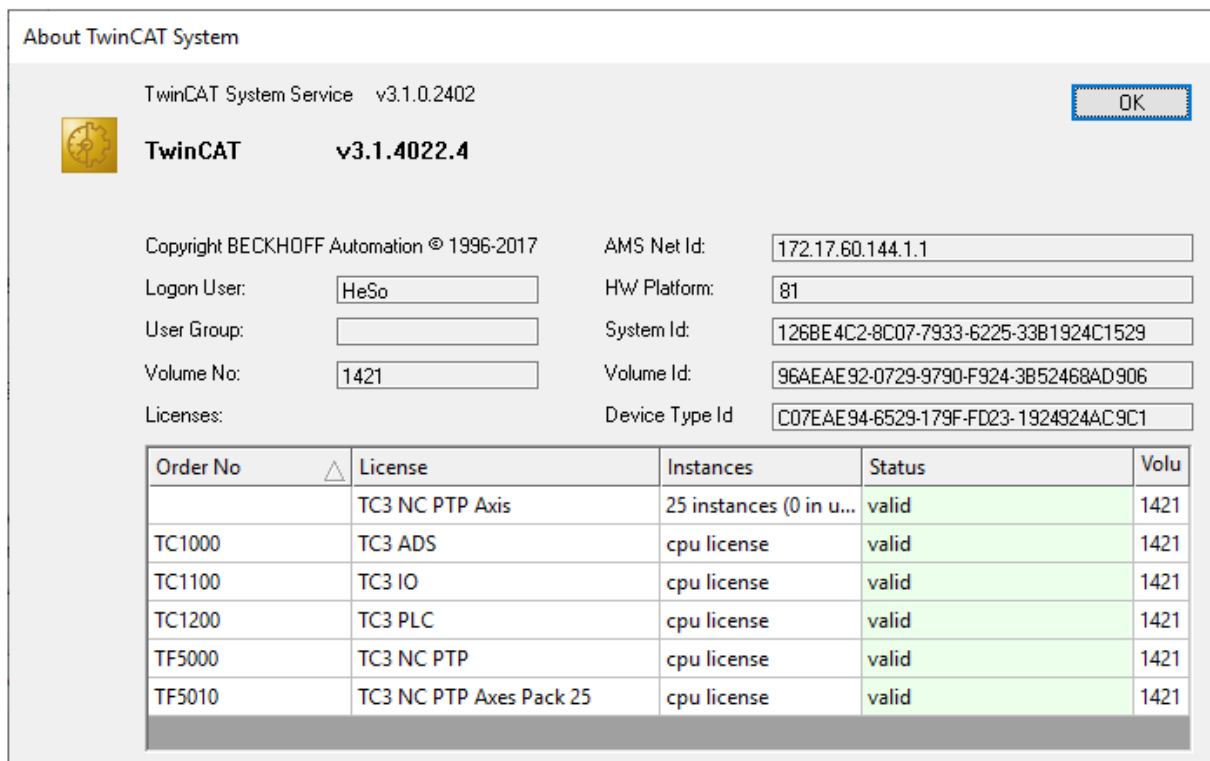
1. Right-click on the TwinCAT Runtime icon in the Windows taskbar.



2. Click on the entry **About TwinCAT** in the menu that opens.



- ⇒ The **About TwinCAT System** window opens, showing a list of the licenses contained in this TwinCAT 3 Runtime, the Hardware Platform Level, the System ID and Device Type ID of the computer. If the computer is equipped with a volume license, the Volume System ID will also be shown here.



With a TwinCAT 3 license dongle the license status is "Pending" if there is no connection to the associated TwinCAT 3 license dongle.

The Device Type ID is displayed from TwinCAT Version 3.1 Build 4022.4. This is an item of internal information that identifies the device type.



Only validated TwinCAT 3 licenses switch the EtherCAT bus to status "OP". If the EtherCAT bus in TwinCAT 3 Run mode is not in "OP" state, the required TwinCAT 3 licenses could probably not be validated. This may be the case if a TwinCAT 3 license dongle is used, for example, and the License Response File does not match the TwinCAT 3 license dongle used.

See also: [TwinCAT 3 license dongle \[▶ 63\]](#)

3.8 Requesting previously issued licenses again from the license server

If for any reason the TwinCAT 3 license file no longer exists (for example, because a new image was loaded to the computer and the license file was not backed up beforehand), the license file can be requested again from the TwinCAT 3 license server.

To do this you have to create a [Request File \[▶ 48\]](#) for the original license device (Beckhoff IPC or TwinCAT 3 dongle) with one of the contained licenses (the TC1000 license is usually the best and simplest choice) and send it to the license server (tclicense@beckhoff.com). It is not necessary to quote a [License ID \[▶ 12\]](#) or a [License TAN \[▶ 18\]](#). (However, as the License ID is a mandatory field in the TwinCAT Engineering, an entry has to be made here. You may enter an arbitrary string).

The license server now sends a License Response File containing all the licenses that have been issued before for the System ID specified in the License Request File.

i In this case the license server always generates a single new License Response File. If, for example, the licenses originate from several orders or have been licensed in two or more requests, they will be combined in the new License Response File. The name of the new License Response File may therefore differ from the name of the original license file.

i A TwinCAT 3 dongle may have different Dongle System IDs depending on the Platform Level of the computer to which it is connected. With the current version of the license server the licenses must be called with the System ID (of the dongle) with which they were originally activated.

4 Working with TwinCAT 3 license dongles

● TwinCAT 3 licenses for non-Beckhoff IPCs

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

● Supported operating systems

i The use of a TwinCAT 3 license dongle always requires the TwinCAT Runtime (XAR), even if only one engineering function is used. The operating systems supported by the TwinCAT Runtime can be found [here](#). (Please note: Windows Server 2012 is not supported by the Runtime!)

● TwinCAT 3.1 Build 4022 or higher

i With a TwinCAT 3 license dongle, TwinCAT 3.1 Build 4022 or higher should be used, in order to have the full functionality available.

● Several system IDs

i A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles](#) [[▶](#) 14]

TwinCAT 3 license dongles with memory function for the TwinCAT 3 license file are the default option for TwinCAT 3 licensing, as they can be used flexibly and are not tied to a fixed license configuration or customer-specific hardware. A TwinCAT 3 license dongle makes it easy to replace the control computer, as the new IPC does not have to be licensed.

The minimum version for the use of TwinCAT 3 license dongles is TwinCAT 3.1 Build 4018.26.

A TwinCAT 3 license dongle can be an EL6070 License Key Terminal or a C9900-L100 license key USB stick.



For technical reasons, the current TwinCAT version does not yet offer fully automatic detection of a license dongle. A license dongle must therefore always be configured in TwinCAT 3 Engineering. The configuration is saved in the project.

● TwinCAT root directory <TwinCAT_ROOT>

i Up to and including TwinCAT 3.1.4024: **C:\TwinCAT**
From TwinCAT 3.1.4026: **C:\ProgramData\Beckhoff\TwinCAT**

Creating a local working copy of the license file

TwinCAT 3 does not work directly with the License Response Files on the license dongle, but with a "working copy" of the files on the hard disk of the IPC (directory: <TwinCAT_ROOT>\3.1\target\license).

Note:

- The license files must be downloaded manually or automatically once when starting the TwinCAT 3 Runtime (if required). Automatic download is preconfigured in TwinCAT 3 Engineering and should not be disabled. The name of the license files downloaded from the TwinCAT 3 license dongle in the license folder begins with "Cache...".

- If automatic downloading is configured in TwinCAT 3 Engineering, TwinCAT 3 checks at Runtime startup whether there are license files on the dongle that are not yet present in the license working directory of the IPC (<TwinCAT_ROOT>\3.1\target\license). If this is the case, the files are copied from the dongle into the license directory of the IPC. The Runtime must then be restarted to validate the newly copied license files.

Initialization and position of the License Key Terminal in the EtherCAT bus

The License Key Terminal is not automatically detected in the current TwinCAT version. It must be initialized and set as license device once in the project.

The License Key Terminal must therefore always be positioned at precisely the location in the EtherCAT bus that was configured for the respective project.

Build initialization and slot for the license key USB stick

The license key USB stick is not automatically detected in the current TwinCAT version. It must be initialized and set as license device once in the project.

However, the license key USB stick is not tied to a specific USB slot.

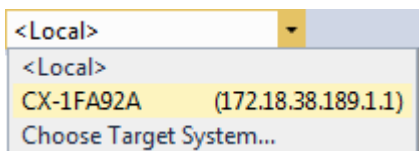
4.1 Commissioning and configuring license dongles

● Use the latest ESI files

i If your ESI files (EtherCAT Description Files for Beckhoff EtherCAT products) currently installed in TwinCAT 3 do not support the dongle version you are currently using, the dongle cannot be detected correctly. You can download the current ESI files here:

<https://www.beckhoff.com/en-us/support/download-finder/configuration-files/>

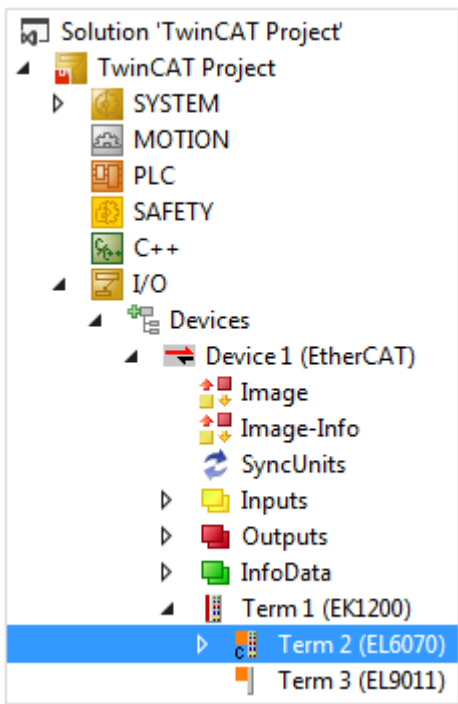
Before working with a TwinCAT 3 license dongle in TwinCAT 3 Engineering, set the target system into which the license dongle is integrated.



Integrating the EL6070 license key terminal

Integrate the EL6070 license key terminal into the EtherCAT network connected to the IPC to be licensed. The license key terminal must subsequently always be plugged into this position in the EtherCAT bus.

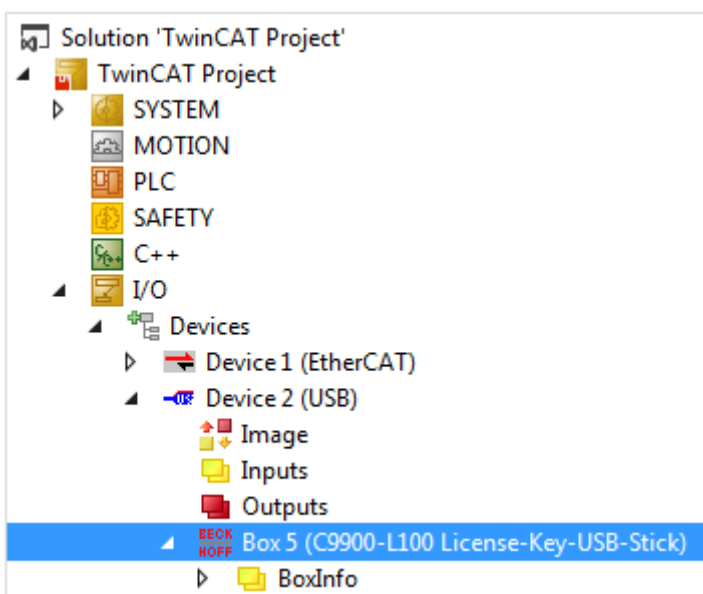
In the TwinCAT System Manager, use a scan of the connected devices to check whether the system finds the EL6070 license key terminal. If the system does not find the EL6070 license key terminal, the license key terminal cannot be selected later.



Connecting the C9900-L100 license key USB stick

Connect the C9900-L100 license key USB stick to a USB port of your IPC. The USB dongle can may subsequently be plugged in to other USB ports.

In the TwinCAT System Manager, use a scan of the devices connected to the USB ports to check whether the system finds the C9900-L100 license key USB stick. If the system does not find the license key USB stick, it cannot be selected later.

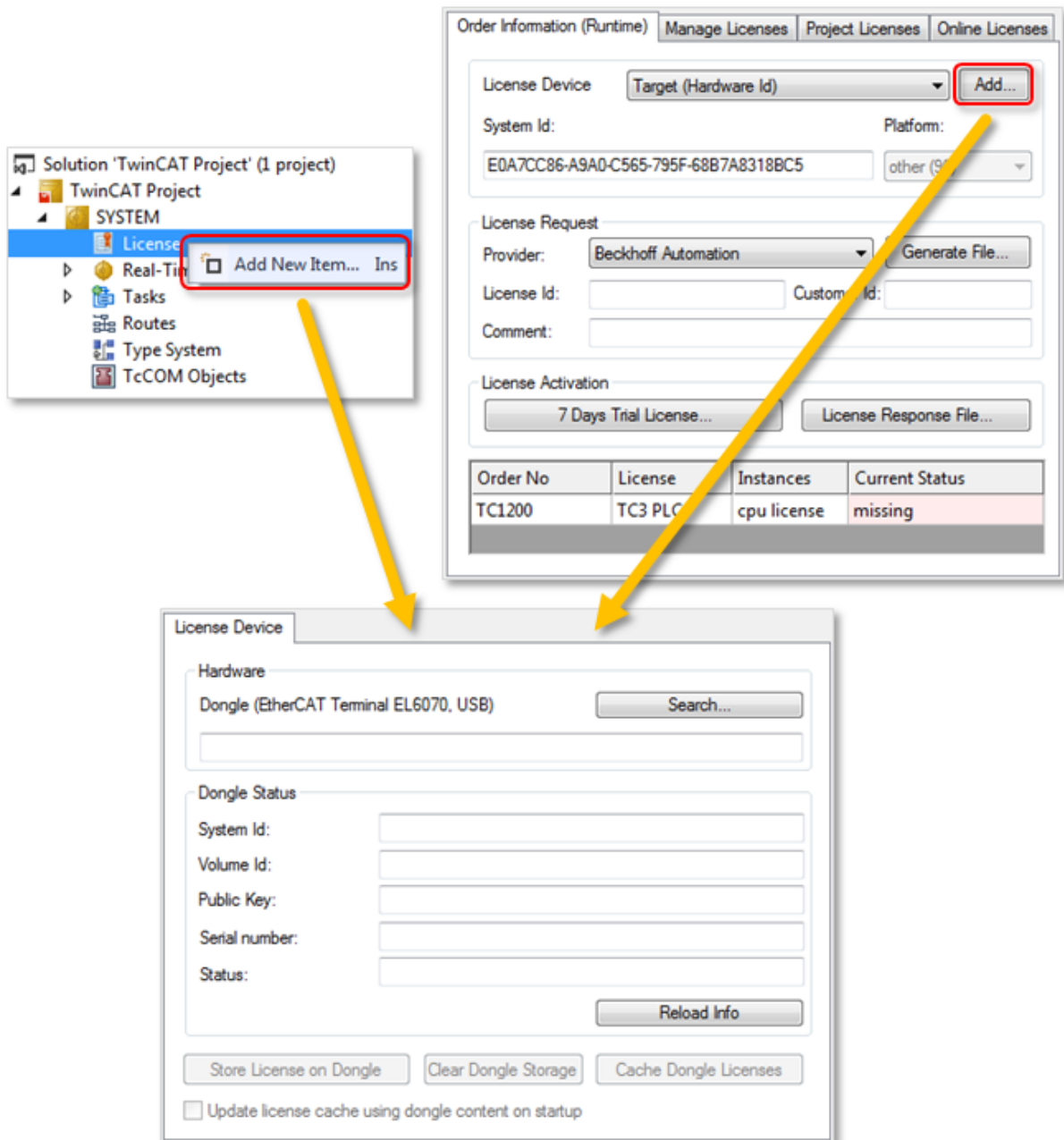


The following configuration is identical for both license dongle types.

Adding a license dongle to the license configuration

1. Add a license dongle to the license configuration:

- In the **Solution Explorer**, select the **License** node in the **SYSTEM** subtree and select **Add New Item** from the context menu.
- To open the license manager, double-click on **License** in the **SYSTEM** subtree of the **Solution Explorer**. Enable the **Order Information** tab and click **Add**.



Differences in the "**Search USB Dongle on Target**" and "**Search in I/O configuration**" buttons:

Search in I/O configuration

This is the standard method. The USB dongle is stored in the configuration of the project. An entry in the "currentconfig.sys" file is used to control that a license file that is not yet in the license folder of the IPC is automatically copied to the license folder of the IPC when TwinCAT Runtime is started. Afterwards, a manual restart of the runtime is required, as this cannot be triggered automatically for security reasons!

The license files can also be copied manually into the license folder via the "Cache Dongle Licenses" button and are then immediately available.

Note that the license files are checked when TwinCAT Runtime is started and then approximately every two minutes. The license status displayed in TwinCAT represents the results of the last license check and does not reflect the current contents of the license directory. The pure (manual) copying of the license files into the license folder therefore does not lead to an immediate change of the license status displayed in TwinCAT.

Search USB Dongle on Target

With this method, a TwinCAT USB dongle can be found in the system and communicated with.

i The USB dongle is NOT stored in the configuration of the project.

There is also no entry in the "currentconfig.sys" file which would cause a license file that is not yet in the IPC's license folder to be automatically copied to the IPC's license folder when TwinCAT Runtime is started.

- So you ALWAYS have to manually download the license files contained on the dongle into the license directory of the IPC once.

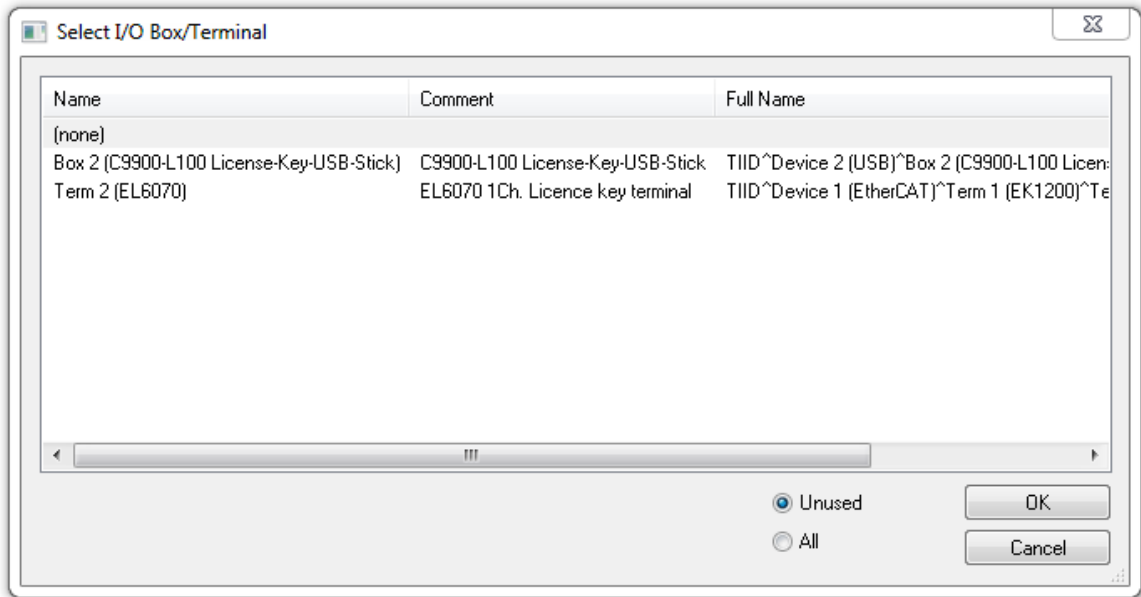
This method of using a USB dongle is therefore not suitable for applications where a USB dongle is to be replaced later and then used automatically, since the license files of the new dongle would have to be copied to the target system manually.

An example application for the **Search USB Dongle on Target** button is its implementation for engineering licenses. **If in doubt, always use the "Search in I/O configuration" button!**

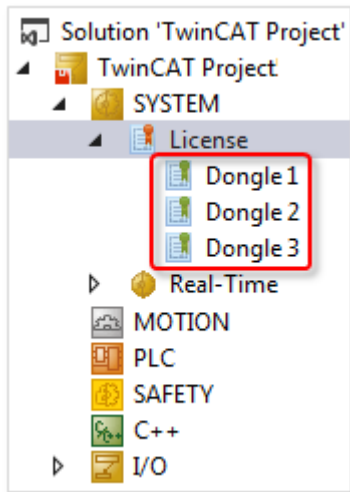
i To use a USB dongle e.g. with engineering licenses, only the corresponding license file must be available in the license directory of the IPC. No further configuration is required in this case.

Configuring the license dongle

1. Click **Search**.
 ⇒ The **Select I/O Box/Terminal** window opens.



2. Select the desired license dongle and accept the selection with **OK**.
 ⇒ Each configured license dongle is displayed below the **License** node in the **Solution Explorer**:

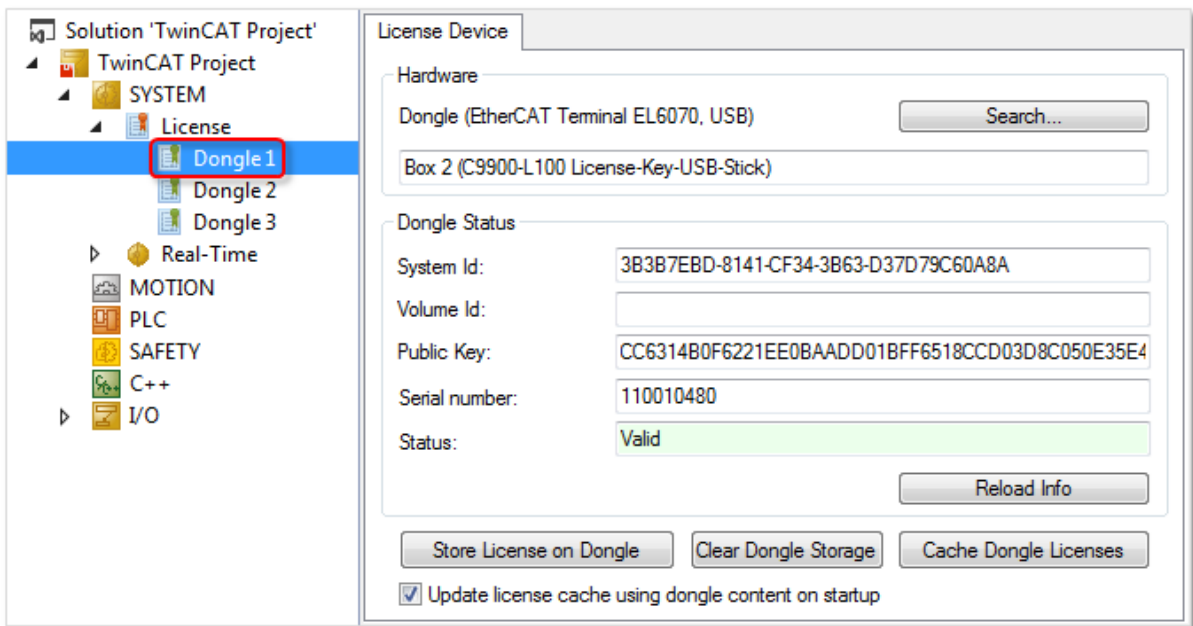


The name of the dongle cannot be changed in the current TwinCAT 3 version.

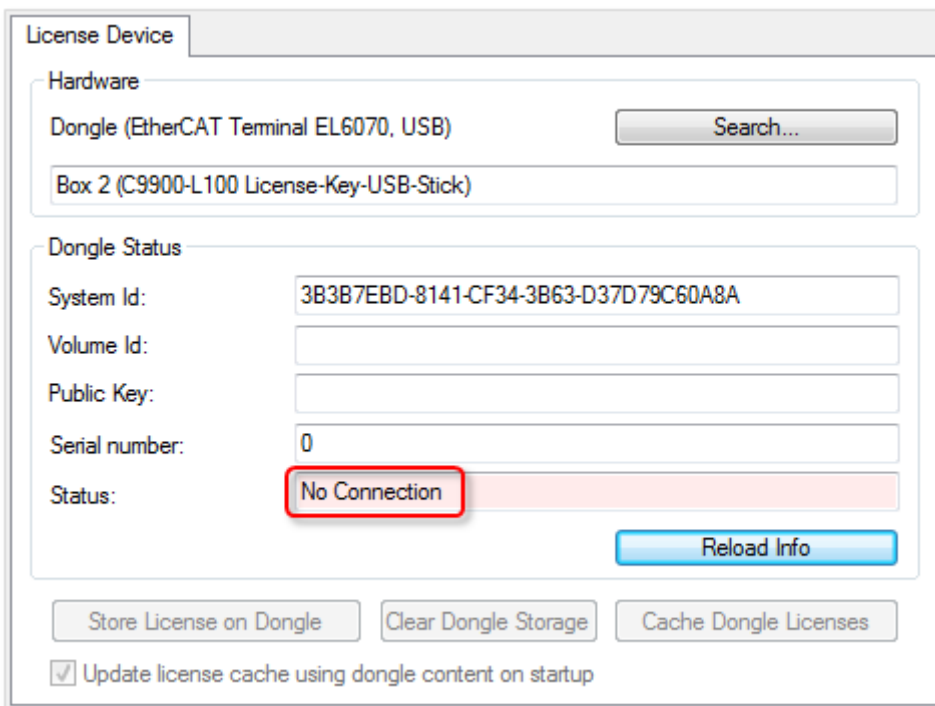
Checking the license dongle status

Double-click on the dongle entry in the project tree to display the dongle properties in the License Device [► 41] window.

- If a connection to the license dongle has been established, the dongle status is "valid". This is also indicated by a green color of the status field.



- If the connection to the dongle could not be established (e.g. because the dongle was disconnected), this is indicated by the dongle status "No Connection" and a red color of the status field.

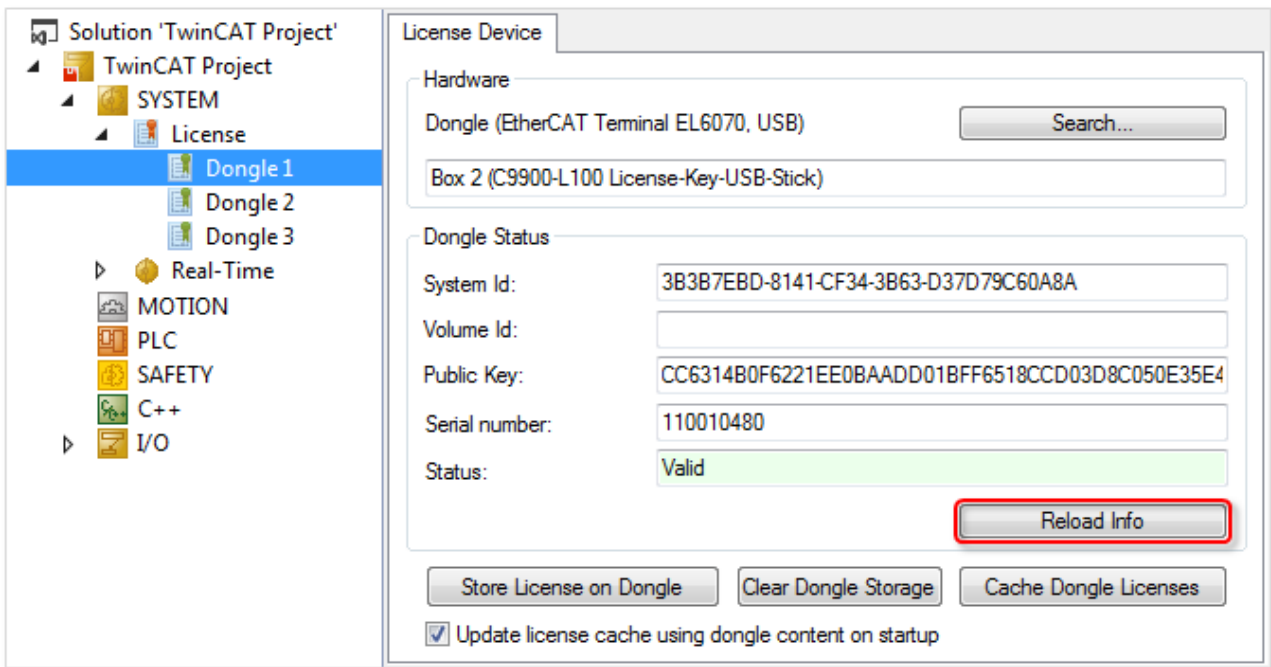


The System ID displayed is the ID from the last contact with the configured dongle. It does not necessarily match the ID of the currently inserted dongle.

Updating the license dongle status manually

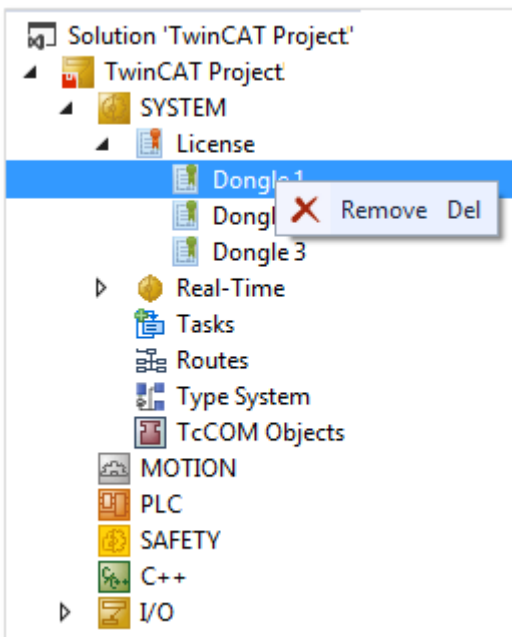
In configuration mode TwinCAT has no connection to the license dongle. The displayed parameters originate from the last contact to this dongle. If you replace the license dongle with a different license dongle, for example, you must manually update the status of the license dongle.

To update the dongle data, click on **Reload Info** under the dongle properties in the License Device [▶ 41] window.



Removing the license dongle from the license configuration

To remove the dongle from the list, select the corresponding dongle entry in the project tree and select **Remove** from the context menu.



When the project is saved, the configuration data is permanently stored in the project.

4.2 Determining the current status of a license dongle

i Outdated information on the license dongle

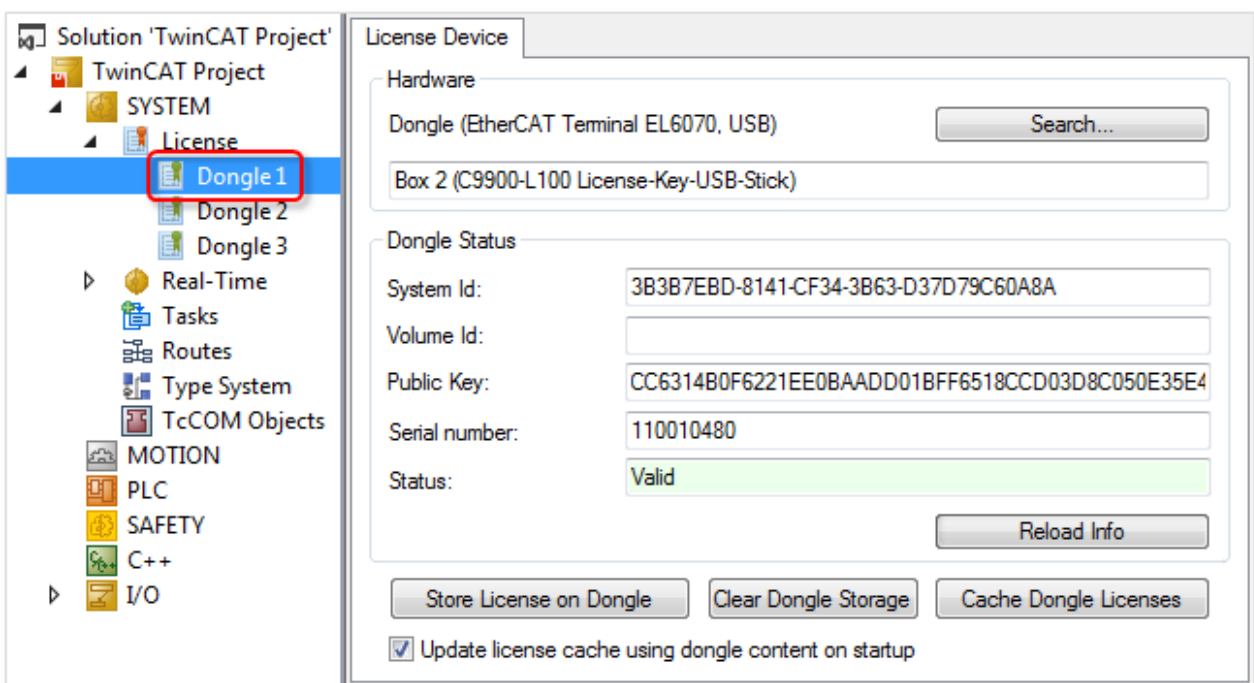
The dongle status is not updated automatically. This update must be triggered manually. The information displayed via the dongle may therefore still originate from the last time that this dongle was accessed and does not necessarily match the dongle currently being used.

- Update the status of the license dongle manually.

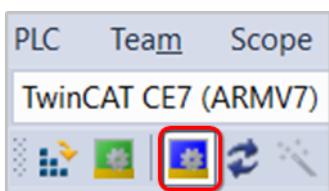
These are the following (normal) TwinCAT 3 system states:

1. TwinCAT is running in Run Mode: In this system state, the dongle window cannot communicate with the dongle
2. TwinCAT runs in Config Mode with "Free Run": In this system state, the dongle window can communicate with the dongle
3. TwinCAT runs in Config Mode without "Free Run": In this system state, the dongle window can only communicate with the dongle if all drivers for the IO devices of the EtherCAT bus are loaded.

To receive information on the current dongle status, open the [License Device](#) [► 41] window by clicking on the corresponding dongle entry in the **License** subtree under **SYSTEM**:

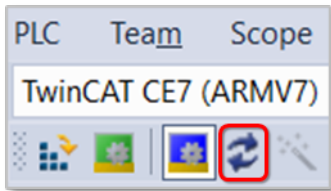


Make sure that TwinCAT 3 is running in Config Mode (blue button in the System Manager toolbar is active):

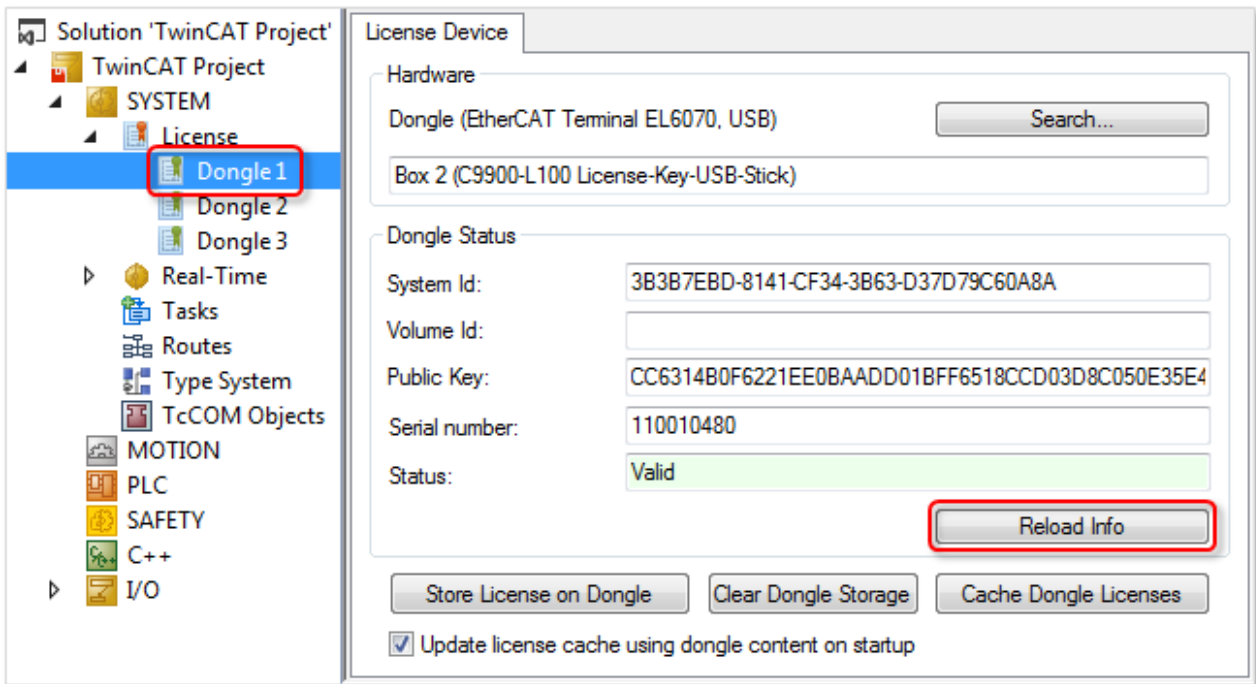


If TwinCAT 3 is not yet running in Config Mode, click on the blue button. **Information: This stops any user program that may be running.**

If the system has been started directly in Config Mode but not in Free Run mode, it may be that not all drivers for the IO devices of the EtherCAT bus have been loaded yet. Click on the **Reload Devices** button in the System Manager to load all drivers:



Now you can click on the **Reload Info** button in the dongle window to read in the current dongle information.



The **Reload Info** button must be pressed after changing the dongle, as the data of the new dongle is not automatically displayed.

4.3 Memory function of the license dongles



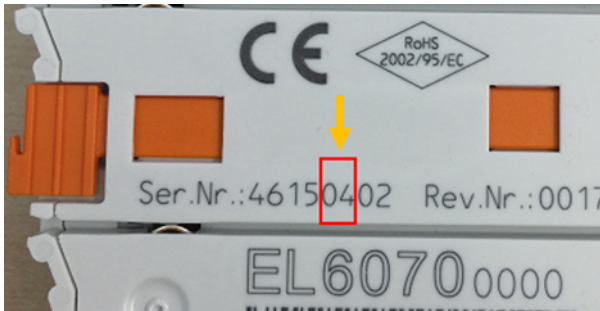
All currently available TwinCAT license dongles have a memory function

The very first version of EL6070 and C9900-L100 did not yet support the memory function. However, the memory function is now standard for TwinCAT license dongles. The following description therefore only applies to the first generation of EL6070 and C9900-L100.

Memory function of the EL6070 License Key Terminal



The EL6070 License Key Terminal supports the function of storing the TwinCAT 3 License Response Files on the terminal (from hardware revision 17 and firmware revision 04). The firmware version can be read from the type number of the terminal.



Older versions cannot be updated.

Memory function of the C9900-L100 license key USB stick



The license key USB stick supports the function of storing TwinCAT 3 License Response Files on the USB stick in all versions.

The license key USB stick is NOT a normal memory USB stick. It can only be accessed via TwinCAT and is therefore not visible in Windows Explorer. Files can only be saved or read from the license key USB stick via TwinCAT 3.

The installation of TwinCAT 3 also includes the installation of the required Windows drivers for the license key USB stick.

The TwinCAT 3 license key USB stick cannot be used without installing the TwinCAT Runtime, since the TwinCAT Runtime is responsible for validating TwinCAT licenses.

The TwinCAT 3 license dongles differ only in the physical interface (EtherCAT or USB). The configuration and operation of the two TwinCAT 3 license dongles is therefore largely identical.

Prerequisite for using the memory function

Use TwinCAT 3.1 Build 4022 or higher (TwinCAT 3 Engineering and TwinCAT 3 Runtime) to utilize the memory function.

For systems with Windows Embedded Compact (formerly Windows CE), automatic download of the license file is only supported with TwinCAT 3.1 Build 4022 or higher.



TwinCAT root directory <TwinCAT_ROOT>

Up to and including TwinCAT 3.1.4024: **C:\TwinCAT**
From TwinCAT 3.1.4026: **C:\ProgramData\Beckhoff\TwinCAT**

Creating a local working copy of the license file

TwinCAT 3 does not work directly with the License Response Files on the license dongle, but with a "working copy" of the files on the hard disk of the IPC (directory: <TwinCAT_ROOT>\3.1\target\license).

Note:

- The license files must be downloaded manually or automatically once when starting the TwinCAT 3 Runtime (if required). Automatic download is preconfigured in TwinCAT 3 Engineering and should not be disabled. The name of the license files downloaded from the TwinCAT 3 license dongle in the license folder begins with "Cache...".

- If automatic downloading is configured in TwinCAT 3 Engineering, TwinCAT 3 checks at Runtime startup whether there are license files on the dongle that are not yet present in the license working directory of the IPC (<TwinCAT_ROOT>\3.1\target\license). If this is the case, the files are copied from the dongle into the license directory of the IPC. The Runtime must then be restarted to validate the newly copied license files.

4.3.1 Copying license files from the dongle to the IPC

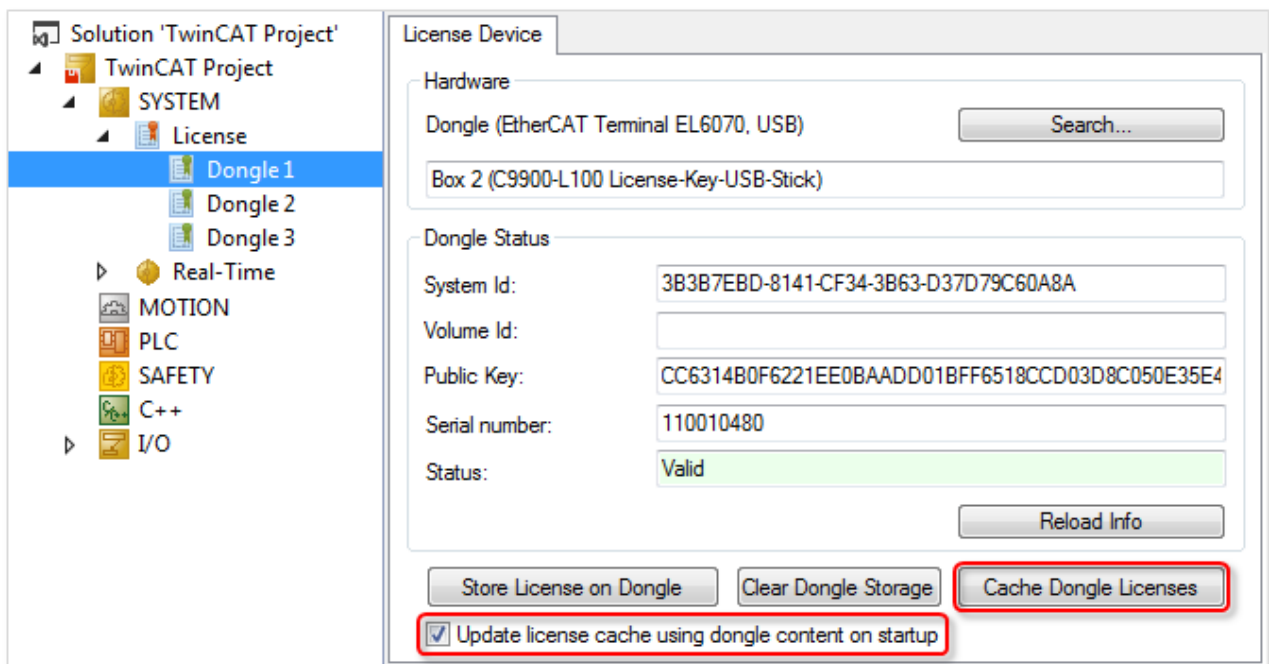
i **TwinCAT root directory <TwinCAT_ROOT>**

Up to and including TwinCAT 3.1.4024: C:\TwinCAT
 From TwinCAT 3.1.4026: C:\ProgramData\Beckhoff\TwinCAT

See also the notes on the working directory for license files in section [Local working copy of license files \[p. 37\]](#).

1. Update the dongle status to ensure that TwinCAT Engineering can access the current dongle (see also [Determining the current status of a license dongle \[p. 34\]](#)).
 2. To copy the license files on the license dongle into the directory <TwinCAT_ROOT>\3.1\target\license on the target system (control computer), click **Cache Dongle Licenses** in the [License Device \[p. 41\]](#) window.
- ⇒ The license files are copied. The copies of the license files on the hard disk of the control computer have the prefix "cache..." to identify them as "cached" copies.

Make sure the checkbox **Update license cache using dongle content on startup** is checked so that any new license files on the dongle are automatically copied to the license working directory of the control computer when the TwinCAT Runtime is started and thus made available to the TwinCAT Runtime. When the dongle is exchanged, for example, the corresponding new license files are automatically copied to the license working directory on the control computer.



i **TwinCAT root directory <TwinCAT_ROOT>**

Up to and including TwinCAT 3.1.4024: C:\TwinCAT
 From TwinCAT 3.1.4026: C:\ProgramData\Beckhoff\TwinCAT

Creating a local working copy of the license file

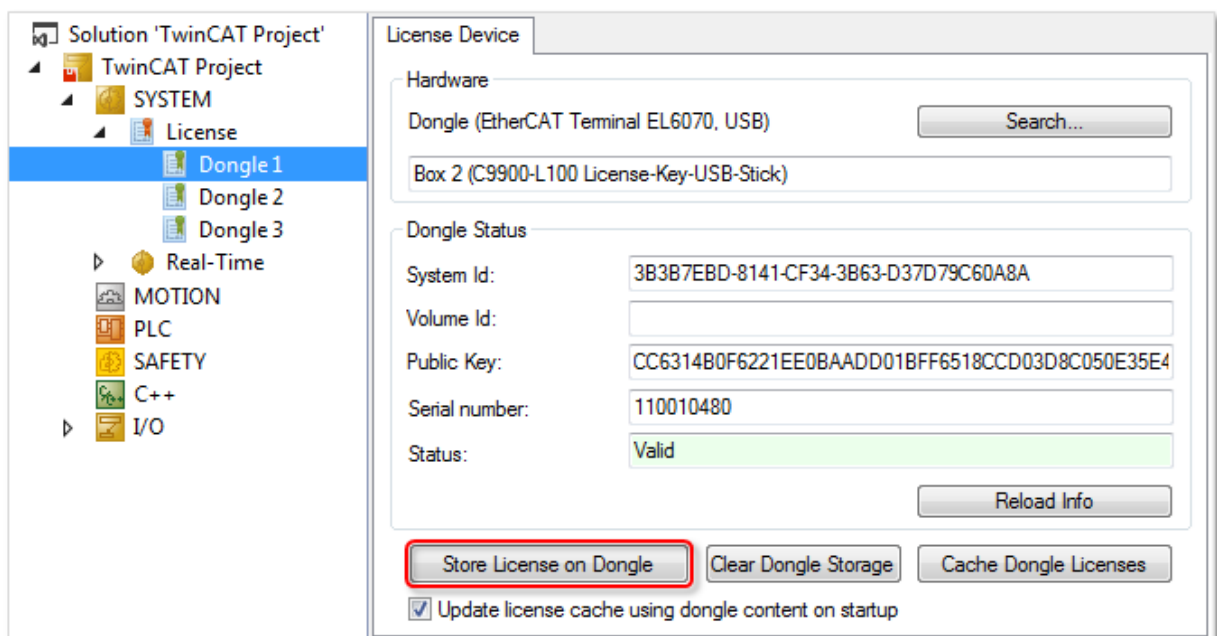
TwinCAT 3 does not work directly with the License Response Files on the license dongle, but with a "working copy" of the files on the hard disk of the IPC (directory: <TwinCAT_ROOT>\3.1\target\license).

Note:

- The license files must be downloaded manually or automatically once when starting the TwinCAT 3 Runtime (if required). Automatic download is preconfigured in TwinCAT 3 Engineering and should not be disabled. The name of the license files downloaded from the TwinCAT 3 license dongle in the license folder begins with "Cache...".
- If automatic downloading is configured in TwinCAT 3 Engineering, TwinCAT 3 checks at Runtime startup whether there are license files on the dongle that are not yet present in the license working directory of the IPC (<TwinCAT_ROOT>\3.1\target\license). If this is the case, the files are copied from the dongle into the license directory of the IPC. The Runtime must then be restarted to validate the newly copied license files.

4.3.2 Saving license files manually on the dongle

- ✓ The license file to be copied to the dongle can be located in any directory.
 - ✓ Up to 20 license files with a total volume of up to 1 MB can be saved on the dongle.
1. Update first the dongle status to ensure that TwinCAT Engineering can access the current dongle (see also [Determining the current status of a license dongle \[▶ 34\]](#)).
 2. To copy a license file to the memory of the license dongle, click on **Store License on Dongle** in the [License Device \[▶ 41\]](#) window.



⇒ An Explorer window appears in which you can select the file to save.

Attention: In order to be able to save a License Response File in a TwinCAT 3 license dongle, the file name must be 32 characters long or less.

The current TwinCAT 3 version does not yet provide an overview of the files or licenses stored on the dongle or a function block for program-controlled saving of the file on the license dongle.

4.3.3 PLC function blocks relating to the storage function of the license dongles



At least TwinCAT 3.1 Build 4022 and PLC Lib: Tc2_Utilities Version 3.3.26.0

The functionalities described require at least TwinCAT 3.1 Build 4022 and the PLC Lib: Tc2_Utilities Version 3.3.26.0

Attention: In order to be able to save a License Response File in a TwinCAT 3 license dongle, the file name must be 32 characters long or less.

Reading the StorageInfo and the file directory of a license dongle

FUNCTION_BLOCK FB_LicFileGetStorageInfo

The function block reads the StorageInfo of the license dongle and the file directory.

The StorageInfo contains administrative data of the storage medium (such as capacity, number of free bytes, number of files,...) and an array of the individual file entries (name, size, attributes,... of the file).

```

VAR_INPUT
    sNetId      : T_AmsNetId; (* Ams net id of dongle (USB: of PC ('' is local PC); EL6070: of
EtherCAT Master (info data of terminal)) *)
    nPort       : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g. 16#7100);
EL6070: ADS Port of EtherCAT terminal (info data)) *)
    bExecute    : BOOL;      (* Rising edge on this input activates the fb execution *)
    dwPassCode  : DWORD;     (* Passcode for file access *)
    tTimeout    : TIME       := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT
    bBusy       : BOOL;      (* True as long as the FB is busy *)
    bError      : BOOL;      (* True in case of an error *)
    nErrorId    : UDINT;     (* Error code in case of an error *)
    nFileEntries : UDINT;    (* Amount of files on dongle *)
END_VAR
VAR_IN_OUT
    stStorageInfo : ST_LicStorageInfo; (* Header + files infos from dongle *)
END_VAR
    
```

Creating a file on a license dongle

FUNCTION_BLOCK FB_LicFileCreate

The function block creates a file on the license dongle. A rising edge at bExecute writes the data from the buffer (pWriteBuff and cbWriteLen) directly onto a new file on the dongle.

```

VAR_INPUT
    sNetId      : T_AmsNetId; (* Ams net id of dongle (USB: of PC ('' is local PC); EL6070: of
EtherCAT Master (info data of terminal)) *)
    nPort       : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g. 16#7100);
EL6070: ADS Port of EtherCAT terminal (info data)) *)
    sFileName    : STRING;   (* File name to write to dongle *)
    pWriteBuff   : PVOID;    (* Buffer address for write *)
    cbWriteLen   : UDINT;    (* Count of bytes for write *)
    bExecute    : BOOL;      (* Rising edge on this input activates the fb execution *)
    dwPassCode  : DWORD;     (* Passcode for file access *)
    tTimeout    : TIME       := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT
    bBusy       : BOOL;      (* True as long as the FB is busy *)
    bError      : BOOL;      (* True in case of an error *)
    nErrorId    : UDINT;     (* Error code in case of an error *)
END_VAR
    
```

Deleting a file from a license dongle

FUNCTION_BLOCK FB_LicFileDelete

The function block deletes a file from the license dongle. The file name and file length are zeroed, and the data bytes of the file to be deleted are released on the dongle but not overwritten.

```

VAR_INPUT
    sNetId      : T_AmsNetId; (* Ams net id of dongle (USB: of PC ('' is local PC); EL6070: of
EtherCAT Master (info data of terminal)) *)
    nPort       : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g. 16#7100);
EL6070: ADS Port of EtherCAT terminal (info data)) *)
    sFileName    : STRING;   (* File name to delete from dongle *)
    bExecute    : BOOL;      (* Rising edge on this input activates the fb execution *)
    dwPassCode  : DWORD;     (* Passcode for file access *)
    tTimeout    : TIME       := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT
    bBusy       : BOOL;      (* True as long as the FB is busy *)
    bError      : BOOL;      (* True in case of an error *)
    nErrorId    : UDINT;     (* Error code in case of an error *)
END_VAR
    
```

Reading a file from the terminal/USB dongle

FUNCTION_BLOCK FB_LicFileRead

The function block reads a file from the license dongle to a buffer (pDestBuff and cbReadLen) via a positive edge at bExecute. The buffer must be large enough for the file, otherwise only the first part of the file is read.

```

VAR_INPUT
  sNetId      : T_AmsNetId; (* Ams net id of dongle (USB: of PC (' is local PC); EL6070: of
EtherCAT Master (info data of terminal)) *)
  nPort      : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g. 16#7100);
EL6070: ADS Port of EtherCAT terminal (info data)) *)
  sFileName   : STRING;   (* File name to write to dongle *)
  pDestBuff   : PVOID;    (* Buffer address for read *)
  cbReadLen   : UDINT;    (* Count of bytes for read *)
  bExecute    : BOOL;     (* Rising edge on this input activates the fb execution *)
  dwPassCode  : DWORD;    (* Passcode for file access *)
  tTimeout    : TIME      := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT
  bBusy       : BOOL;     (* True as long as the FB is busy *)
  bError      : BOOL;     (* True in case of an error *)
  nErrorId    : UDINT;    (* Error code in case of an error *)
END_VAR

```

Copying a file from the hard disk to the terminal/USB dongle

FUNCTION_BLOCK FB_LicFileCopyToDongle

The function block copies a file from the hard disk to the license dongle. If the file is larger than the buffer (cbCopyLen), the file copying procedure is automatically split into several read and write operations until the whole file is copied. Only then does bBusy switch to FALSE.

```

VAR_INPUT
  sNetIdSrc   : T_AmsNetId; (* Ams net id of PC (' is local PC) *)
  sNetIdDest  : T_AmsNetId; (* Ams net id of dongle (USB: of PC (' is local PC); EL6070:
of EtherCAT Master (info data of terminal)) *)
  nPortDest   : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g.
16#7100); EL6070: ADS Port of EtherCAT terminal (info data)) *)
  sFilePathNameSrc : T_MaxString; (* File path name on disk *)
  sFileNameDest : STRING;   (* File name for file on dongle *)
  pCopyBuff   : PVOID;    (* Buffer address for write *)
  cbCopyLen   : UDINT;    (* Count of bytes for write *)
  bExecute    : BOOL;     (* Rising edge on this input activates the fb execution *)
  dwPassCode  : DWORD;    (* Passcode for file access *)
  tTimeout    : TIME      := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT
  bBusy       : BOOL;     (* True as long as the FB is busy *)
  bError      : BOOL;     (* True in case of an error *)
  nErrorId    : UDINT;    (* Error code in case of an error *)
END_VAR

```

Copying a file from the terminal/USB dongle to the HDD

FUNCTION_BLOCK FB_LicFileCopyFromDongle

The function block copies a file from the license dongle to the hard disk. If the file is larger than the buffer (cbCopyLen), the file copying procedure is automatically split into several read and write operations until the whole file is copied. Only then does bBusy switch to FALSE.

```

VAR_INPUT
  sNetIdSrc   : T_AmsNetId; (* Ams net id of dongle (USB: of PC (' is local PC); EL6070:
of EtherCAT Master (info data of terminal)) *)
  nPortSrc    : UINT;      (* Ams port of dongle (USB: ADS Port of ESB Device (e.g.
16#7100); EL6070: ADS Port of EtherCAT terminal (info data)) *)
  sNetIdDest  : T_AmsNetId; (* Ams net id of PC (' is local PC) *)
  sFileNameSrc : STRING;   (* File name for file on dongle *)
  sFilePathNameDest : T_MaxString; (* File path name on disk *)
  pCopyBuff   : PVOID;    (* Buffer address for write *)
  cbCopyLen   : UDINT;    (* Count of bytes for write *)
  bExecute    : BOOL;     (* Rising edge on this input activates the fb execution *)
  dwPassCode  : DWORD;    (* Passcode for file access *)
  tTimeout    : TIME      := DEFAULT_ADS_TIMEOUT; (* ADS timeout *)
END_VAR
VAR_OUTPUT

```

```

bBusy      : BOOL;      (* True as long as the FB is busy *)
bError     : BOOL;      (* True in case of an error *)
nErrorId   : UDINT;     (* Error code in case of an error *)
END_VAR
    
```

See also:

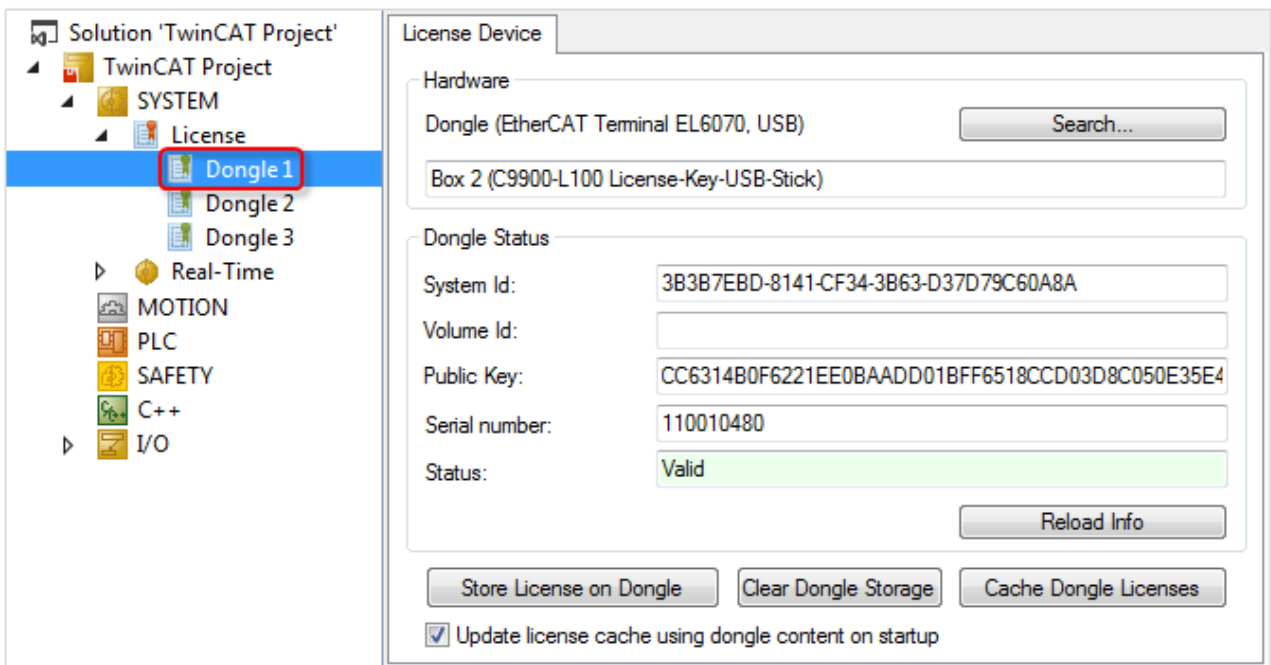
- TE1000 XAE > PLC > Libraries > TwinCAT 3 PLC Lib: Tc2_Uilities

4.4 Removing a license dongle during operation

If a TwinCAT 3 license dongle is removed while a program is running, TwinCAT 3 registers this. For safety reasons the user program is not stopped, in order to avoid unpredictable damage to the machine to be controlled.

4.5 License Device overview window

The **License Device** overview window shows the properties and the status of a license dongle. You open the window by double-clicking on the dongle entry in the TwinCAT project tree.



Hardware group box

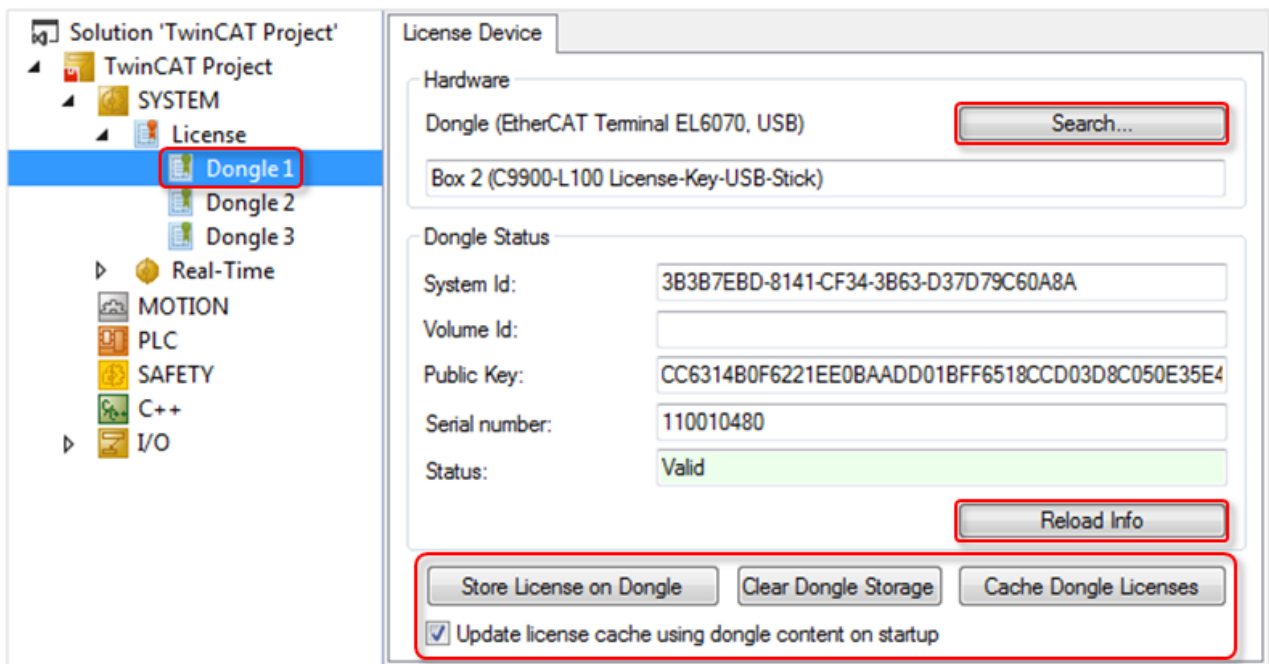
Dongle (EL6070 EtherCAT Terminal, USB)	Name of the license dongle
--	----------------------------

Dongle Status group box

The parameters of the selected TwinCAT 3 license dongle are displayed under **Dongle Status**.

System Id [▶ 14]	System ID of the dongle The system ID depends on the platform level of the connected IPC. A dongle has a different system ID for each of the different platform levels.
Volume Id [▶ 75]	Volume ID (only for volume license dongle) The volume ID depends on the platform level of the connected IPC. A dongle has a different volume system ID for each of the different platform levels.
Public Key	Internal parameter
Status	Result of the last dongle status check The status shows the data from the last contact to the dongle. This may not match the data of a newly inserted dongle. To update, click the Reload Info button. Press this button after changing the dongle, as the data of the new dongle is not automatically displayed in the current TwinCAT version.

Buttons and options



Search [▶ 27]	Select the desired dongle from a list of dongles detected by the system. Requirement: A scan of the IO area must have been carried out beforehand, and the respective dongle must be listed in the IO configuration.
Reload Info [▶ 34]	Reads the data of the displayed TwinCAT 3 license dongle and updates the display of the dongle parameters. If no valid data is displayed under Dongle Status (= no contact to the dongle has yet been established), the data can be read in again and updated using this button. Press this button after changing the dongle, as the data of the new dongle is not automatically displayed in the current TwinCAT version.
Store License on Dongle [▶ 38]	Copies a file to the memory of the TwinCAT 3 license dongle. After clicking on the button, a selection window opens in which the desired file can be selected on the hard disk of the IPC.
Clear Dongle Storage	Deletes all files on the TwinCAT 3 license dongle. (Deleting individual files is not yet available in the current TwinCAT version.)
Cache Dongle Licenses [▶ 37]	Copies all the files of the TwinCAT 3 license dongle to directory c:\TwinCAT\3.1\Target\Licenses on the hard disk of the IPC.

Update license cache using dongle content on startup [▶ 37]

When this checkbox is checked, TwinCAT 3 checks at every start of the Runtime whether the files on the hard disk correspond to those in the memory of the license dongle. If the dongle contains newer or additional files, they are automatically downloaded to the hard disk of the IPC ("cached"). This checkbox should always be checked.

5 Ordering of TwinCAT 3 standard licenses

● TwinCAT 3 licenses for non-Beckhoff IPCs

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

5.1 Preactivation of standard licenses by Beckhoff

TwinCAT 3 licenses must always be activated for a certain hardware (by default a TwinCAT 3 license dongle) before they can be used. Activation can be carried out by Beckhoff during production or by the OEM after delivery.

TwinCAT 3 licenses activated for a dongle by Beckhoff during production

You can order TwinCAT 3 standard licenses together with a TwinCAT 3 license dongle and have these licenses preactivated for this dongle by Beckhoff during production. You then no longer have to activate these licenses yourself. This makes work preparation in series production much easier. A prerequisite is that you order the licenses and the TwinCAT 3 license dongle in the same order. The dongle must be physically present at Beckhoff during production.

Non-preactivated TwinCAT 3 licenses

Ordering non-preactivated TwinCAT 3 licenses usually has one of the following reasons:

- TwinCAT 3 license dongle and licenses are included in different orders.
- Ordering additional licenses for an existing TwinCAT 3 license dongle (e.g. adding a TwinCAT 3 function)
- At the time of ordering the subsequent license combination on a TwinCAT 3 license dongle is not yet known.

5.2 Downgrade of TwinCAT 3 standard licenses

i The downgrading of TwinCAT 3 licenses works only with a TwinCAT 3 license dongle.

The downgrade options for TwinCAT 3 standard licenses depend on the TwinCAT version used.

From TwinCAT 3.1, build 4022

It is possible to downgrade TwinCAT 3 standard licenses. For example, you can use a USB dongle whose licenses have been activated for platform level 80 for lower platform levels (e.g. 20-70).

Platform level 90 covers only platform level 80 and lower, not platform level 81, 82, 83, ...

See also: [TwinCAT 3 High Performance Platform Level \[► 13\]](#)

Up to TwinCAT 3.1 Build 4020 (inclusive)

TwinCAT 3 standard licenses can only be used for exactly the same platform level as the activation. For example, you can use a USB dongle whose licenses have been activated for platform level 80 for lower platform levels (e.g. 20-70).

Specification of the platform level of TwinCAT 3 standard licenses during activation

Note that when activating a TwinCAT 3 standard license, the platform level of this license is permanently set.

The platform level during activation may be lower than the level specified in the order. However, once activated the platform level cannot be changed.

Example:

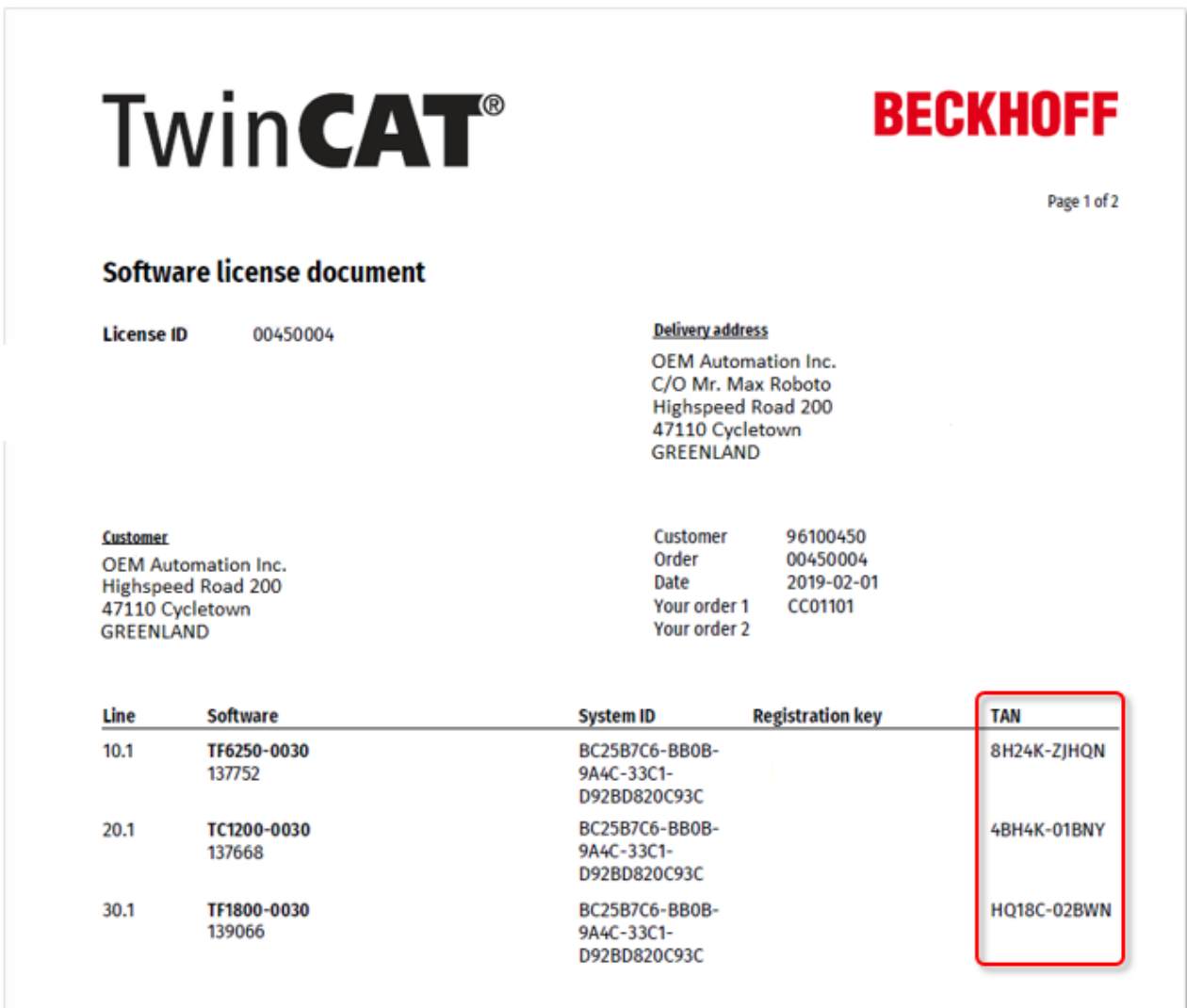
The platform level in the order is 80. Activation takes place for platform level 50. Now the license can only be used for platform level 50 (and lower (build 4022 only)). This cannot be changed retrospectively.

5.3 TwinCAT 3 license certificate

If you have special requirements for the content of a TwinCAT 3 license certificate, you can order it as a PDF file or as a paper document. You can also request custom versions informally at any time from your Beckhoff sales contact.

The corresponding order numbers are:

- TC0210 | TwinCAT License Certificate | PDF
- TC0220 | TwinCAT License Certificate | Paper



You may:

- receive a single license certificate for all licenses included in an order (standard form).
- receive separate license certificates for each license included in the order.
- receive separate license certificates for certain license groups (e.g. licenses relating to machine configuration).

Please get in touch with your Beckhoff sales contact if you require a customized version of the license certificate or to request a license certificate for an order at a later date. Your contact can arrange for any form that may be required (paper document, PDF file) or grouping for a license certificate to be made available to you.

Starting January 1, 2019, TwinCAT 3 license certificates include the new TwinCAT License TANs, i.e. the "serial numbers" of the TwinCAT 3 licenses.

For information on how to use the TwinCAT License TAN, refer to section [Entering License TANs in TwinCAT Engineering](#) [▶ 55].

5.4 Ordering standard licenses

TwinCAT 3 standard licenses are always linked to specific hardware. This is usually a TwinCAT 3 license dongle (EL6070 License Key Terminal or C9900-L100 license key USB stick).

In principle it is also possible to tie a TwinCAT 3 license to a specific Beckhoff IPC. However, this has the severe disadvantage that, if an IPC is replaced, the TwinCAT 3 licenses are no longer valid for the new IPC. If, on the other hand, the TwinCAT 3 licenses are tied to a TwinCAT 3 license dongle, the IPC can easily be replaced. In addition, only the IPC (without licenses) does have to be kept in stock for service purposes.

● TwinCAT 3 licenses for non-Beckhoff IPCs

I If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

● Several system IDs

I A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles](#) [▶ 54]

Ordering TwinCAT 3 standard licenses with and without preactivation

To enable unambiguous assignment of TwinCAT 3 licenses for preactivation and the required licensing platform (dongle or IPC) in the order, please note the following when ordering:

- The order number of the TwinCAT 3 license dongle indicates whether or not to preactivate licenses for the dongle:
 - EL6070-**0033** (or C9900-L100-**0033**) = TwinCAT 3 dongle with preactivated TwinCAT 3 licenses
 - EL6070-**0000** (or C9900-L100) = empty TwinCAT 3 dongle (without preactivated TwinCAT 3 licenses)
- The order number of the TwinCAT 3 license is important for preactivating TwinCAT 3 licenses for a type ...-0033 dongle. In this case, the third from last digit of the TwinCAT 3 article number must be "1". Example:
 - TC1200-0**1**50 = preactivation by Beckhoff for a TwinCAT 3 license dongle in the same order
- When reordering licenses for a TwinCAT 3 license dongle that is already with the customer, the license must be activated by the customer. In this case, the third from last digit of the TwinCAT 3 article number must be "2". Example:
 - TC1200-0**2**50 = no preactivation by Beckhoff (license activation by customer)
- If the preactivation is to be carried out by Beckhoff (for a Beckhoff IPC in the same order), the third from last position of the TwinCAT 3 article number must be "0". Example TC1200-0**0**50.
- Structure the order in such a way that a **unambiguous** assignment of the licenses to the desired licensing platform is given. Example for ordering a TwinCAT 3 license dongle (with preactivated licenses):
 - **Dongle 1**
 - Assigned license A
 - Assigned license B

- **Dongle 2**
 - Assigned license A
 - Assigned license C
 - Assigned license D
 - Assigned license E
 - etc.
- You can combine several license dongles with identical license configurations under the same item.

Ordering TwinCAT 3 licenses with license instances

The vast majority of TwinCAT 3 licenses are so-called "CPU licenses". This means that only one license is required (and allowed) per control computer. Example: TC1200 (PLC).

However, some TwinCAT 3 licenses may be required more than once on a control computer, for example client access licenses for the TwinCAT HMI (TF2000).

Depending on the product, these are offered individually or in bundles, e.g. in a pack of 5.

However, for technical reasons, this pack of 5 is a CPU license (with 5 license instances included), and thus may only be activated once per system. (With the current TwinCAT license technology, a license instance may not contain further license sub-instances; the "main license" must therefore be a CPU license.)

This means that the same packs may not be activated more than once on a system.

Example:

13 HMI Client Access licenses are required. For example, you can activate these as one pack of 10 + one pack of 3 each, but not as 2 x pack of 5 + 1 x pack of 3.

Ordering option for Beckhoff Industrial PCs and Embedded PCs: Pre-installation of the TwinCAT 3 runtime

For Beckhoff IPCs, simply add the "TC1000-1000" ordering option:

TC1000-1000 pre-installation of the TwinCAT 3 Runtime

For Beckhoff Embedded PCs of the CX series, the pre-installation of the TwinCAT 3 Runtime is ordered differently. In order to determine whether a Beckhoff Embedded PC of the CX series should contain a pre-installed TwinCAT 3 Runtime (XAR), the last digit of the order number for the CX must be "5".

Example:

CX5120-012**5** = Beckhoff IPC with pre-installed TwinCAT 3 runtime



TwinCAT 3 licenses always have to be ordered separately. They are not automatically included in the preinstalled TwinCAT 3 runtime.

6 Activating standard licenses manually

TwinCAT 3 licenses, which were not preactivated by Beckhoff for a TwinCAT 3 license dongle (or a Beckhoff IPC) and supplied together with the corresponding hardware have to be activated by the user.

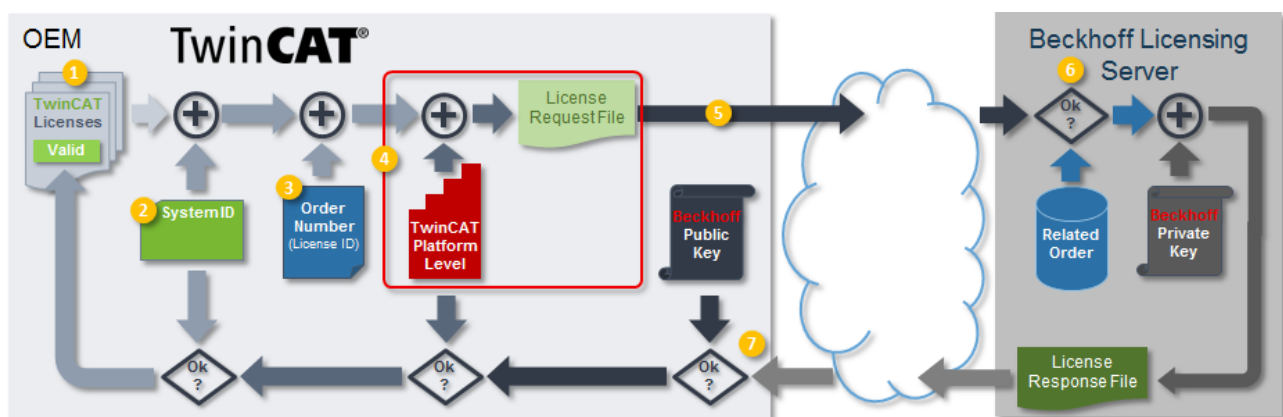
You can activate multiple licenses together if they come from the same order. If the licenses for a device originate from two or more orders, you must activate the licenses for each order individually.

● Only activate licenses for a particular order!

i Check whether the combination of licenses exactly matches the specified order confirmation (license ID)! Licenses that are not included in the order may result in an error message of the license server.

6.1 Licensing process

The TwinCAT 3 licensing process is described below.



Creating License Request Files:

1. Compilation of the desired licenses in the TwinCAT 3 license manager
2. Selecting the TwinCAT 3 license dongle or Beckhoff IPC to be licensed
3. Entering the TwinCAT [LicenseTANs \[▶ 18\]](#) or the order number ([license ID \[▶ 12\]](#)) under which the licenses were ordered
4. Generating a License Request File
(The TwinCAT platform level of the target hardware is automatically added)
5. Sending a license request file by email to the Beckhoff license server (tllicense@beckhoff.com)

Importing and activating a License Response File:

1. The Beckhoff license server checks whether the specified licenses are available in the specified order, signs the License Request File, thereby creating a License Response File, and returns this by email.
2. Importing the License Response File in TwinCAT 3
(When the TwinCAT 3 Runtime starts, TwinCAT checks the platform level and the system ID and switches the licenses to valid.)

6.2 Creating License Request Files

Procedure

- [Choose Target System \[▶ 49\]](#)
- [Creating and checking a license list \[▶ 49\]](#)
- [Specifying the license device \[▶ 51\]](#)
- [Checking and setting the platform level \[▶ 53\]](#)
- [Enter License ID or LicenseTAN \[▶ 55\]](#)

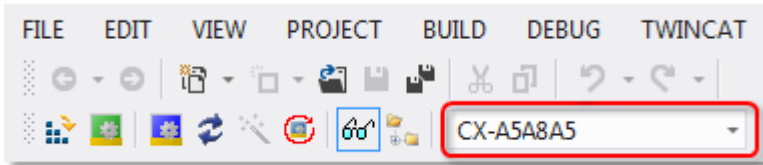
- [Entering a customer Id \[▶ 56\]](#) (optional)
- [Generate and send License Request File \[▶ 57\]](#)

Choose Target System

In TwinCAT 3 Engineering (within a TwinCAT 3 project), a target system must be set for which license activation is to take place.

If a TwinCAT 3 license dongle is used, this is the system to which the license dongle (for the activation process) is connected. The system does not have to correspond to the final system for a license dongle.

Set the target system via the **Choose Target System** drop-down list in the **TwinCAT XAE Base toolbar options** of TwinCAT. If you select **Local**, the license is created based on the data from your TwinCAT Engineering system.

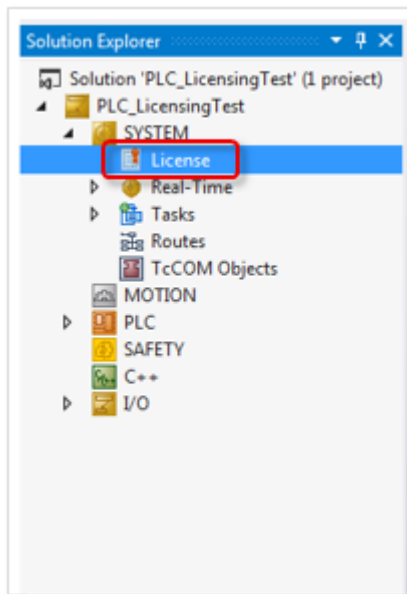


● TwinCAT 3 licenses for non-Beckhoff IPCs

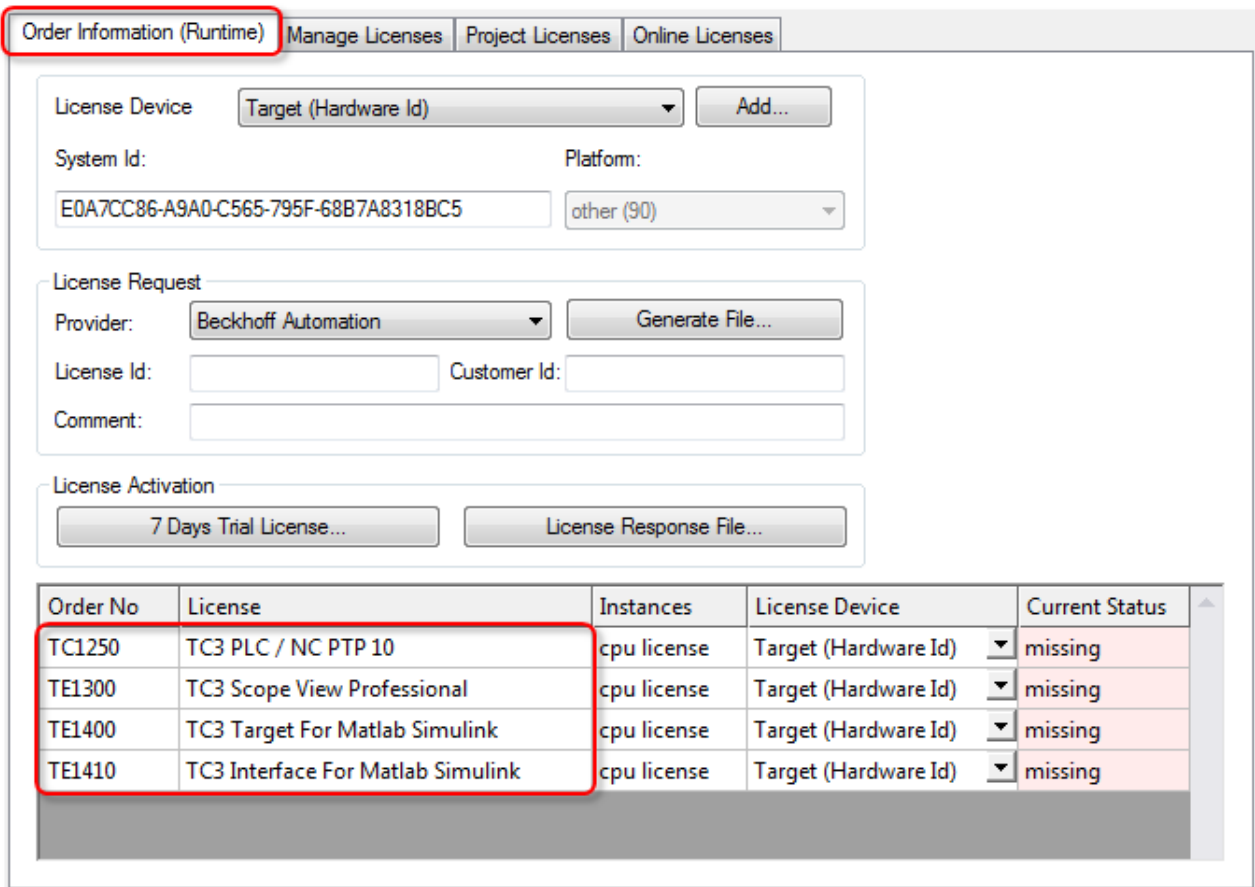
i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level >= 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

Creating and checking a license list

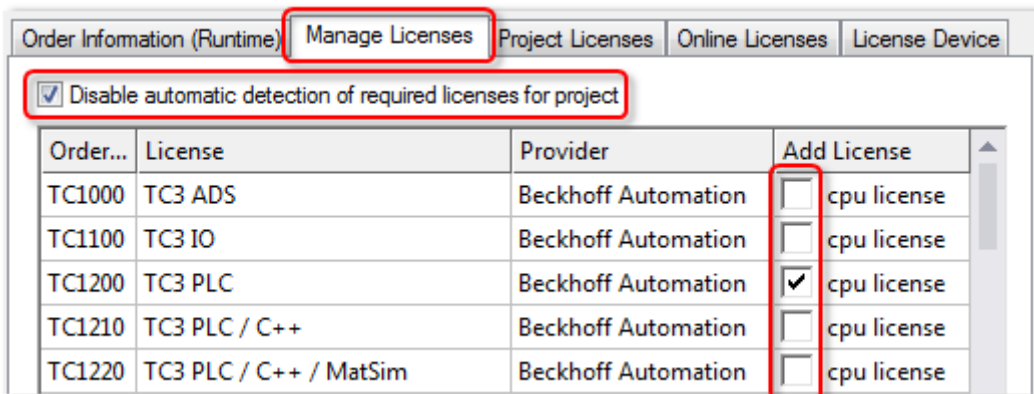
Open the TwinCAT 3 license manager by double-clicking on **License** in the **SYSTEM** subtree of your TwinCAT 3 project.



On the **Order Information** tab in the lower part of the screen, you can see a list of licenses that TwinCAT has automatically determined on the basis of your project. If you have added licenses manually, these are also listed here.



On the **Manage Licenses** tab, manually change the list of licenses to be included in the License Request File. Select only licenses that belong to a common order number. If your licenses originate from two or more orders, you have to create a separate License Request File for each order (and the corresponding licenses).



You can check the checkbox **Disable automatic detection of required licenses for project** to disable automatic detection of the licenses required for the project and select or deselect each license individually. If the checkbox is unchecked, you cannot deselect licenses required for the project.

If you first disable automatic detection of the licenses required for the project, manually add a license detected as required and then re-enable automatic detection, this license is listed twice in the License Request File. The manually set license is added to the automatically determined license and does not replace it.

Specifying the license device

The standard license device is a TwinCAT 3 license dongle. In exceptional cases, the IPC hardware can be used as a licensing basis. In this case, the TwinCAT 3 license is created for the selected, specific target system ("target hardware") and cannot be used on other IPCs. If the IPC licensed in this way is to be replaced, it is necessary to re-license the new IPC, as the licenses cannot be transferred or reused. Using the TwinCAT 3 license dongles avoids this disadvantage.

● TwinCAT 3 licenses for non-Beckhoff IPCs

I If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level >= 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

In order to be able to use a license dongle as a License Device, it must be connected to the target system [► 49] and configured in TwinCAT 3 (see also: Working with TwinCAT 3 license dongles [► 26]).

Update the dongle status to ensure that TwinCAT 3 Engineering also accesses the dongle currently connected to the system and that the data displayed in the system is not from the last dongle to which a connection was established. For technical reasons (e.g. EtherCAT not in OP mode) there is no permanent connection to a TwinCAT 3 license dongle (see also: Determining the current status of a license dongle [► 34]).

If at least one license dongle is configured, an additional **License Device** column is visible in the **Order Information** tab.

Order No	License	Instances	License Device	Current Status
TC1250	TC3 PLC / NC PTP 10	cpu license	Target (Hardware Id)	missing
TE1300	TC3 Scope View Professional	cpu license	Target (Hardware Id)	missing
TE1400	TC3 Target For Matlab Simulink	cpu license	Target (Hardware Id)	missing
TE1410	TC3 Interface For Matlab Simulink	cpu license	Target (Hardware Id)	missing

In the **License Device** column, select the license device for which you want to activate the listed licenses. A License Request File can only be created for a single license device at a time.

Order Information (Runtime) | Manage Licenses | Project Licenses | Online Licenses

License Device: Target (Hardware Id) [Add...]

System Id: E0A7CC86-A9A0-C565-795F-68B7A8318BC5 | Platform: other (90)

License Request

Provider: Beckhoff Automation [Generate File...]

License Id: [] | Customer Id: []

Comment: []

License Activation

[7 Days Trial License...] [License Response File...]

Order No	License	Instances	License Device	Current Status
TC1250	TC3 PLC / NC PTP 10	cpu license	Target (Hardware Id)	missing
TE1300	TC3 Scope View Professional	cpu license	Target (Hardware Id)	missing
TE1400	TC3 Target For Matlab Simulink	cpu license	Target (Hardware Id)	missing
TE1410	TC3 Interface For Matlab Simulink	cpu license	Target (Hardware Id) Target (Hardware Id) Dongle 1 (Hardware Id)	missing

Specify the license device for which the License Request File is to be created.

Order No	License	Instances	License Device	Current Status
TC1250	TC3 PLC / NC PTP 10	cpu license	Dongle 1 (Hardware Id)	missing
TE1300	TC3 Scope View Professional	cpu license	Dongle 1 (Hardware Id)	missing
TE1400	TC3 Target For Matlab Simulink	cpu license	Target (Hardware Id)	missing
TE1410	TC3 Interface For Matlab Simulink	cpu license	Target (Hardware Id)	missing

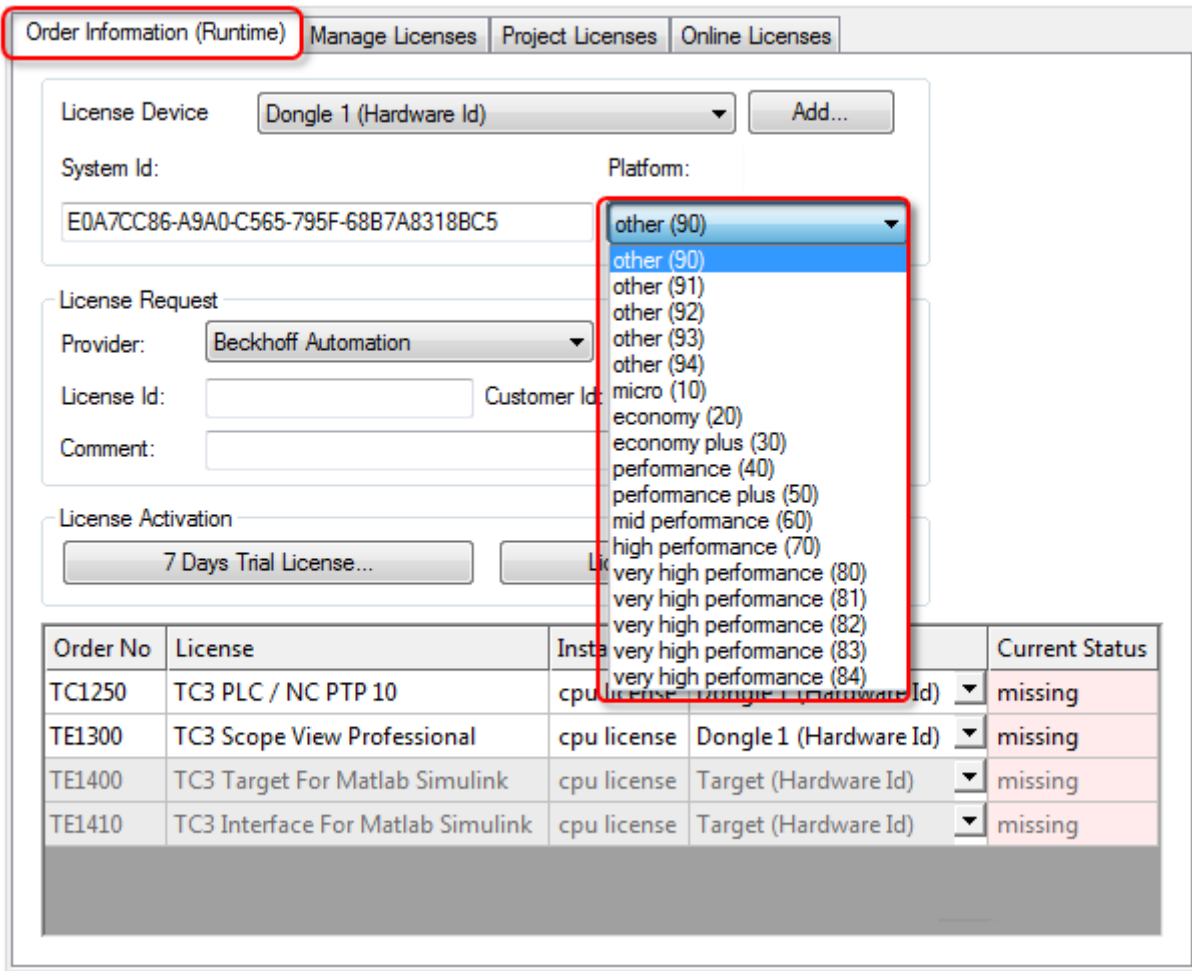
For example, if you select "Dongle 1" here, all licenses that were not selected for dongle 1 will be grayed out and thus not included in the License Request File to be created.

Checking and setting the platform level

To be able to use any computer for generating a License Request File for a license dongle, TwinCAT 3.1 Build 4022 can be used to set the desired platform level [▶ 12] when creating the License Request File. For example, it is possible to create a License Request File for a Beckhoff IPC (= platform level 2x-8x) using a TwinCAT 3 license dongle connected to your notebook or your desktop computer (= platform level 90).

When creating the License Request File [▶ 16], the platform level [▶ 12] must match the final target system.

Select the platform level on the **Order Information** tab.

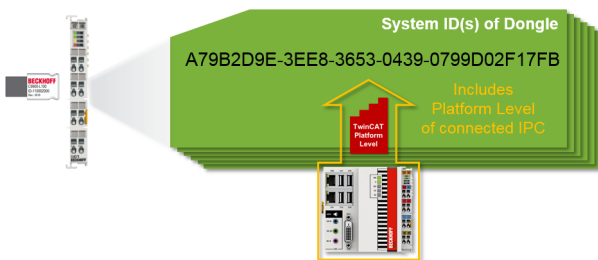


A license downgrade option is available with TwinCAT 3.1 Build 4022 or higher. The platform level set for activating the licenses can therefore be higher than that of the final target system if Build 4022 (or higher) is used on the target system. However, the platform level set must always be included in the order.

When activating, you can specify a lower platform level than the level contained in the order. However, the license is permanently set to this lower platform level upon activation and cannot be used for a higher platform level, even if it is actually included in the order.

The TwinCAT 3 license is issued for the system ID [► 14] specified in the License Request File.

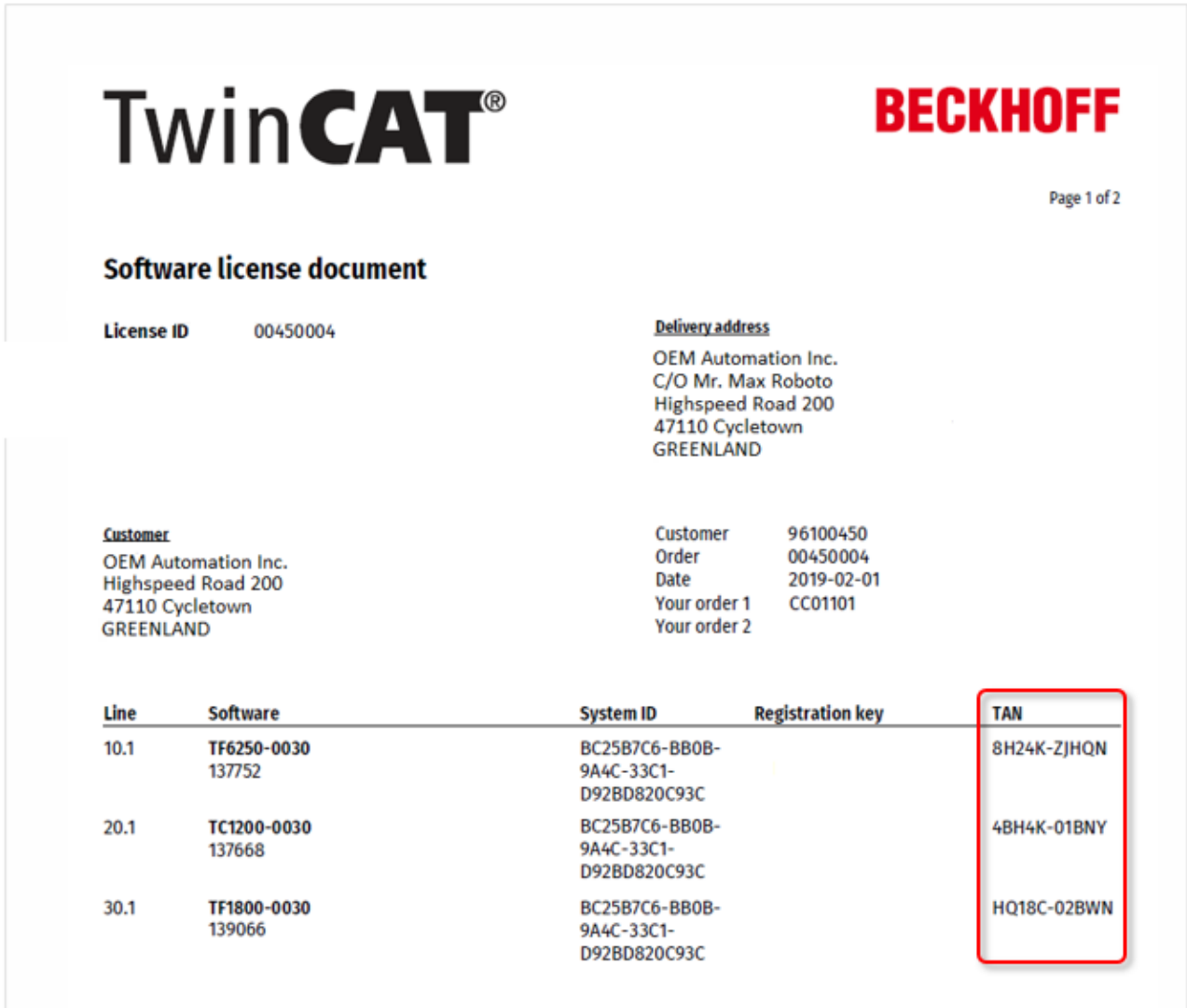
The system ID of a TwinCAT 3 license dongle contains the TwinCAT platform level. Since a TwinCAT 3 license dongle does not have its own platform level due to the fact that it does not have its own CPU, the platform level is provided by the connected IPC. A TwinCAT 3 license dongle can thus have several system IDs, depending on the connected IPC. In other words, the system ID of a TwinCAT 3 license dongle always depends on the platform level of the connected IPC.



Input of the TwinCAT LicenseTAN(s)

Each TwinCAT 3 license has an individual TwinCAT 3 LicenseTAN [▶ 18], a kind of "serial number" for this license. This LicenseTAN can only be used to activate a specific license included in an order. You can combine LicenseTANs from different orders in a License Request File. You can use License Response Files generated with LicenseTANs with any TwinCAT 3 Runtime version. (See Reference via TwinCAT LicenseTANs [▶ 55])

TwinCAT LicenseTANs are listed in the TwinCAT license certificate:



Note: You can request this license certificate from your Beckhoff sales contact if it has not already been sent to you together with the invoice.

Input options for TwinCAT LicenseTANs

1. For all TwinCAT Engineering versions you can specify one or more LicenseTANs in the text field **License Id**. Multiple LicenseTANs are simply separated by a common separator (comma, semicolon, ...).
2. A **LicenseTAN** column was introduced with TwinCAT 3.1 Build 4022.4 in the list of licenses on the **Order Information** tab. Here you can alternatively enter the corresponding LicenseTAN for the licenses to be activated:

Order Information (Runtime) | Manage Licenses | Project Licenses | Online Licenses

License Device: Dongle 1 (Hardware Id) [Add...]

System Id: 00000000-0000-0000-0000-000000000000 | Platform: other (90)

License Request

Provider: Beckhoff Automation [Generate File...]

License Id: [Red Box] | Customer Id: []

Comment: []

License Activation

[7 Days Trial License...] [License Response File...]

Order No	License	Instances	License TAN	License Device
TC1200	TC3 PLC	cpu license	WZVQ-77T4	Dongle 1 (Hardware Id)
TC1320	TC3 C++ / MatSim	cpu license	WXZQ-R7T4	Dongle 1 (Hardware Id)
TE1300	TC3 Scope View Professional	cpu license		Target (Hardware Id)

The table display is clearer, but has the disadvantage that several LicenseTANs cannot be entered in one process by copy & paste.

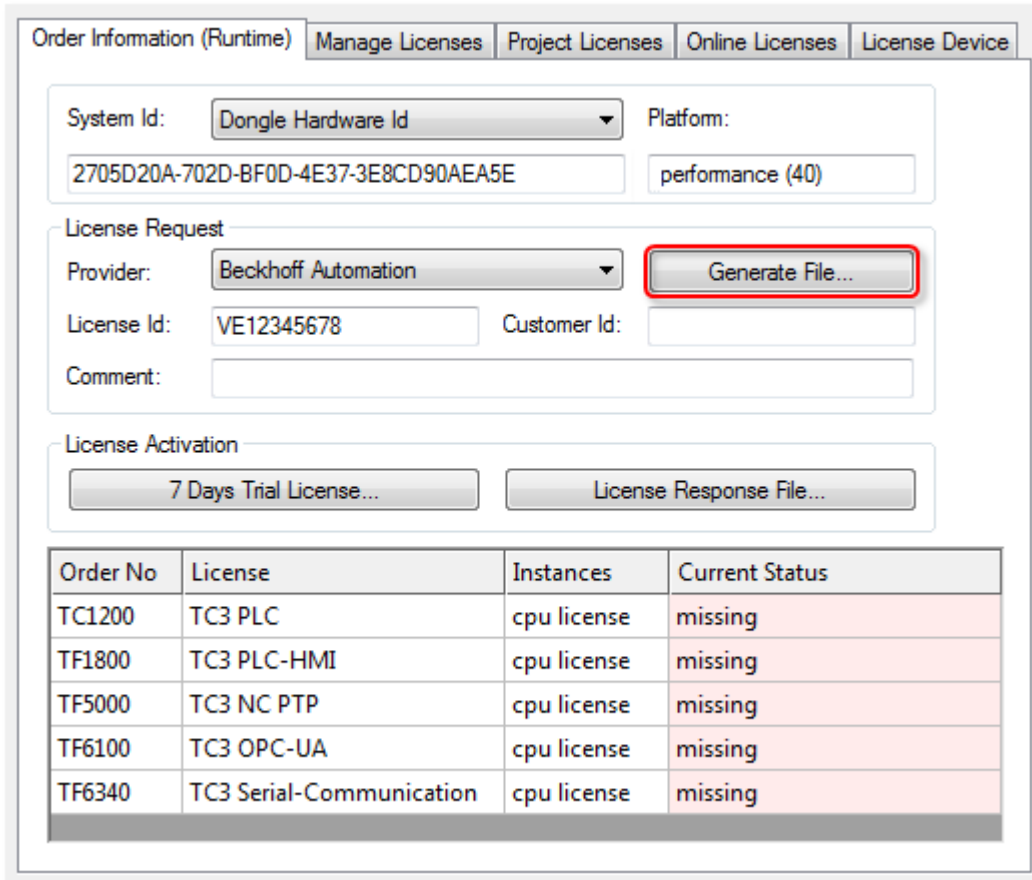
Entering a customer Id (optional)

Optionally you can enter a note in the **Customer Id** field, for example your internal SAP number. This field is a comment field. The information is included in the License Response File but is not evaluated by TwinCAT 3.

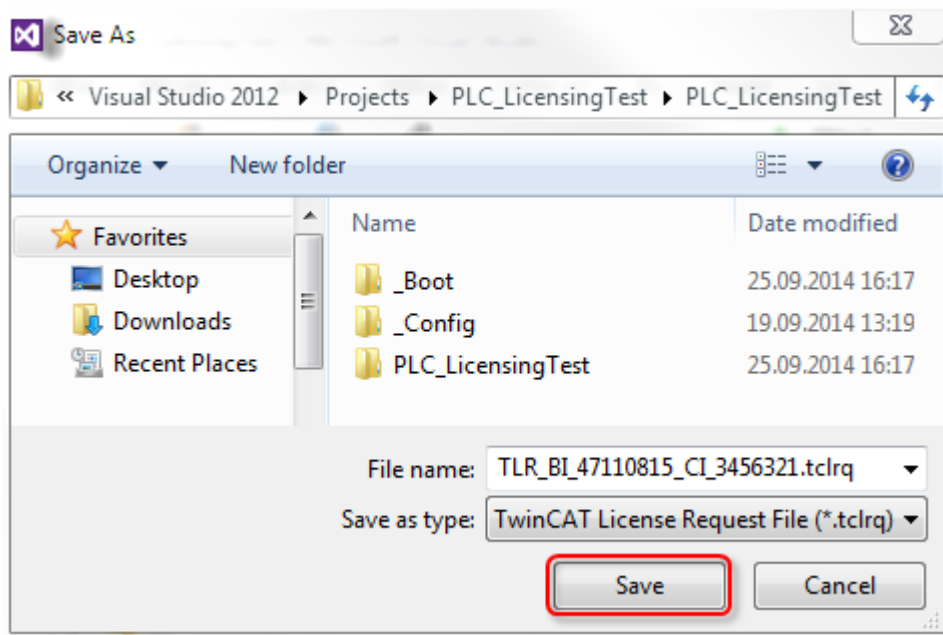
The entry in this field is used in addition to the License Id to generate the name of the License Request File. You can also use it to control a part of the name of the generated License Request File.

Generate and send License Request File

1. On the **Order Information** tab, click **Generate File** to create a License Request File for the listed licenses.



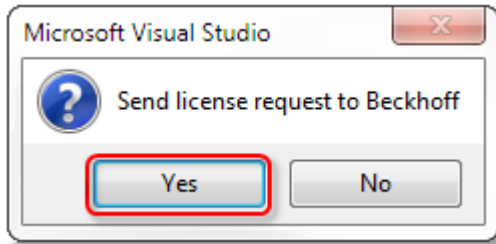
⇒ A window opens, in which you can specify where the License Request File is to be stored. (We recommend accepting the default settings.)



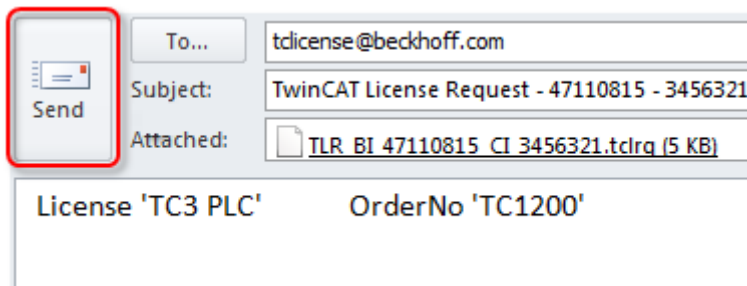
Attention: In order to be able to save a License Response File in a TwinCAT 3 license dongle, the file name must be 32 characters long or less.

1. Select a location and click **Save**.

- ⇒ A prompt appears asking whether you want to send the License Request File directly to the Beckhoff license server:



- If you want to send the License Request File right away, click **Yes**. A prerequisite is that an email program is installed on your computer and that your computer is connected to the internet. When you click **Yes**, the system automatically generates a draft email containing the License Request File with all the necessary information.



- If no email program is installed on your computer or your computer is not connected to the Internet, click on **No**. Then copy the License Request File to a data storage device (e.g. USB stick) and send the file from a computer with Internet access and email program to the Beckhoff license server (tclicense@beckhoff.com).

2. Send the License Request File.

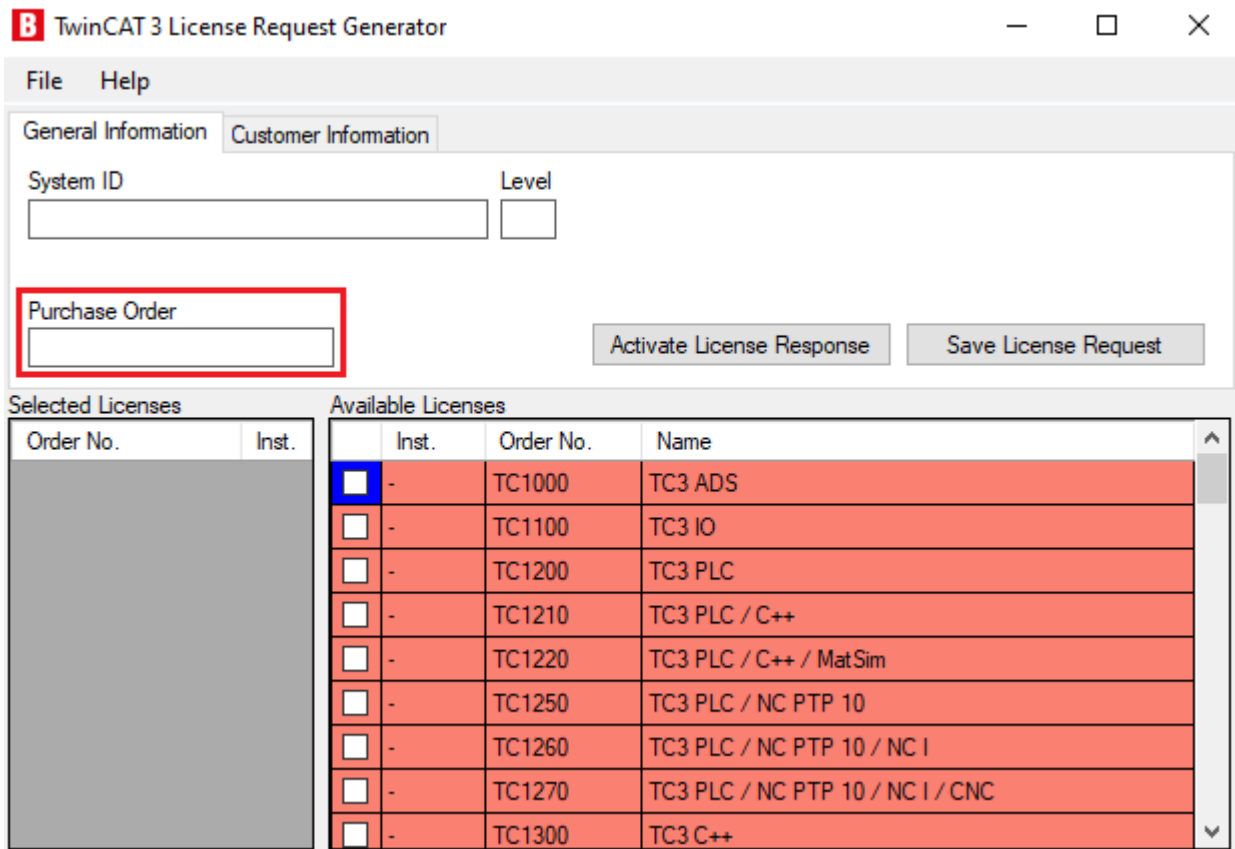
- ⇒ The License Request File is sent to the Beckhoff license server. After receiving the email, the server compares your license request with the specified order number and returns a "License Response File" by email. The Beckhoff license server returns the License Response File to the same email address from which the License Request File was sent.
- ⇒ The License Response File differs from the License Request File only by a signature that documents the validity of the license file content. You can view the [contents of the License Response File](#) [▶ 16] with an editor suitable for XML files (e.g. "XML Notepad").
- ⇒ **Notice** The contents of the License Response File must not be changed, otherwise the license file becomes invalid.
- ⇒ The file name can be changed freely, but please never change the file type (.tclrs), otherwise the license file will not be recognized by TwinCAT.

Also see about this

- [TwinCAT 3 License ID](#) [▶ 12]

6.3 Creating License Request Files without TwinCAT Engineering (XAE)

A small unsupported tool is available for creating a License Request file without using TwinCAT 3 Engineering (XAE).



The tool requires Windows 7 (or its embedded version) or higher and cannot be used on Windows CE-based systems (Windows Embedded Compact).

Download: [Tc3LicReqGen](#)

Note:

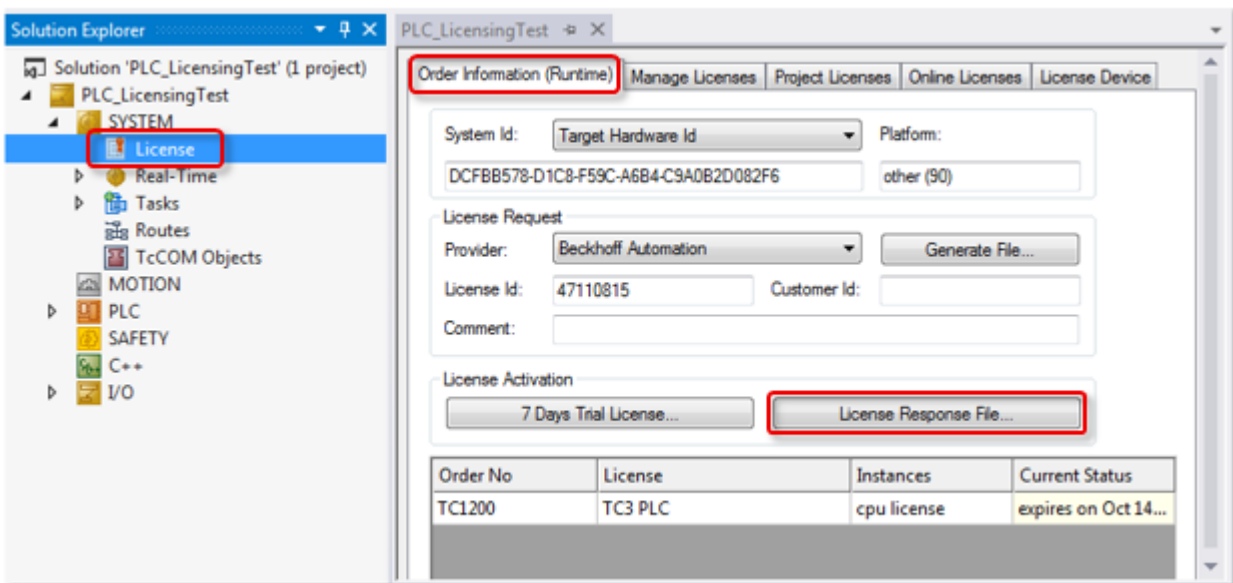
- The tool must be executed directly on the target system.
- The tool can only generate License Request Files for the system on which it is executed.
- The tool cannot generate License Request Files for TwinCAT 3 license dongles connected to the system.
- TwinCAT 3 LicenseTANs are entered in the "Purchase Order" field (marked red). Multiple LicenseTANs are simply separated by a separator such as a comma or semicolon.
- No documentation or support is available for the tool.
- The included TMC files (= license description files) are not kept up to date. Therefore simply copy from a current TwinCAT 3 installation all files with the extension *.tmc from the directory C:\TwinCAT\3.1\Config\lo into the program directory of this tool.

6.4 Importing and activating a License Response File

Activation of the License Response File in the TwinCAT 3 development environment (XAE)

The simplest way to activate a TwinCAT 3 License Response File in the TwinCAT 3 development environment is to import it via the TwinCAT 3 license manager.

1. Open the License Manager and click the **License Response File** button on the **Order Information** tab.



2. Select the desired License Response File from the file directory and import it.

⇒ The license file is automatically loaded onto the target system.

When the license file is imported, the license files are not automatically saved on the dongle. This has to be done manually.

See also: [Saving the license files on the dongle \[▶ 38\]](#)

Activation of the License Response File directly on the target system (TwinCAT 3 Runtime (XAR)) without TwinCAT 3 development environment (XAE)

Copy the License Response File on the target system to the license folder and restart the TwinCAT 3 Runtime.

License folder up to TwinCAT Build **4024** (inclusive): `c:\twinCAT\3.1\target\license`

License folder as of TwinCAT Build **4026**: `C:\ProgramData\Beckhoff\TwinCAT\3.1\License`

Windows Embedded Compact (Windows CE): `\Hard Disk\TwinCAT\3.1\target\license`

The license files are not automatically saved on the dongle. This has to be done manually.

See also: [Saving the license files on the dongle \[▶ 38\]](#)

6.5 Troubleshooting

Problems with TwinCAT 3 licensing can usually be pinpointed and resolved with a few standard checks. In the following section they are divided and described in three categories.

● TwinCAT 3 licenses for non-Beckhoff IPCs

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

● Several system IDs

i A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles \[▶ 54\]](#)

6.5.1 License Request file

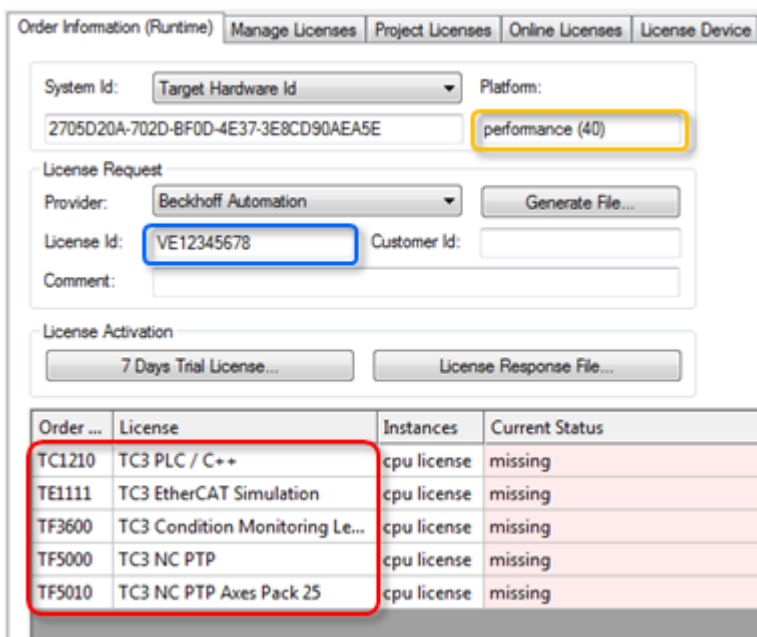
License Request File is rejected by the license server

If the License Request File is rejected by the Beckhoff license server, this is usually because the licenses listed in the License Request File and the order specified in the License Request File (= License Id) do not match.

This is generally due to one of the following reasons:

1. The License Request File contains licenses, which are not included in the specified order number.
2. The order does not contain a sufficient number of licenses.
3. The platform level in the License Request File does not match the platform level of the licenses in the order.
4. The order number is entered in the wrong field (= "Customer Id").

Compare the entries in the **Order Information** tab in the TwinCAT 3 license manager with your order data:



Platform (yellow marking)	Platform level
License Id (blue marking)	Order number (License Id)
Order/License (red marking)	Requested TwinCAT 3 licenses

The order data can also be compared directly with the entries of the License Request File:

```

<LicenseInfo>
  <SystemId Level="40">{2705D20A-702D-BF0D-4E37-3E8CD90AEA5E}</SystemId>
  <PurchaseOrder>
    <![CDATA VE12345678 ]>
  </PurchaseOrder>
  <IssueTime>2015-12-15T09:16:00</IssueTime>
  <License ManuallyAdded="true">
    <LicenseId>{94C91BCC-DC1F-4EBC-AEFD-2DC25DF4708B}</LicenseId>
    <Name>TC3 EtherCAT Simulation</Name>
    <OrderNo>TF1111</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{520DE751-9DB6-47CB-8240-BD5C466E7E64}</LicenseId>
    <Name>TC3 NC_PTP</Name>
    <OrderNo>TF5000</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{BF78CFC7-2E63-42C3-8C07-BB6C346BFB8B}</LicenseId>
    <Name>TC3 NC_PTP Axes Pack 25</Name>
    <OrderNo>TF5010</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{19E93A3D-90D1-45B9-A28A-32DD8D2A166A}</LicenseId>
    <Name>TC3 PLC / C++</Name>
    <OrderNo>TC1210</OrderNo>
  </License>
  <License ManuallyAdded="true">
    <LicenseId>{A0C635DF-5F13-43BE-8D0B-613386AD9A20}</LicenseId>
    <Name>TC3 Condition Monitoring Level 1</Name>
    <OrderNo>TF3600</OrderNo>
  </License>
</LicenseInfo>
    
```

SystemId Level (yellow marking)	Platform level
PurchaseOrder (blue marking)	Order number (License Id)
OrderNo (red marking)	Requested TwinCAT 3 licenses

If licenses are entered in the License Request File that do not exist in the order, you can delete them directly in the License Request File. Always delete the entire area belonging to the license (<License...> to </License...>). The structure of the XML file must not be violated.

Please contact Beckhoff Support (support@beckhoff.com) if the data in the License Request File match the data in your order, but the Beckhoff License Server nevertheless rejects the request. Beckhoff support can check whether sufficient licenses are still available in the order, for example.

Add the License Request File to your support request. The data contained in it (e.g. the order number) enable Beckhoff support to solve your problem.

6.5.2 License Response File

License Response Files are not detected

Under TwinCAT 3 the License Response File is in directory *c:\twincat\3.1\target\license*. (The path for TwinCAT 3 on devices with Windows Embedded Compact (Windows CE) is not *c:\twincat\...*, but *\Hard Disk\TwinCAT\...*.)

This directory may contain one or several License Response files; if possible, it should only contain License Response files that match the respective system (see: System ID).

License Response Files that are not currently required can be moved into a subfolder of this directory, for example, where TwinCAT 3 will no longer detect them.

Carry out the following actions if the TwinCAT 3 licenses cannot be detected correctly:

- Delete all superfluous License Response Files in directory *c:\twincat\3.1\target\license* or move them to a subdirectory.

- Check whether the system ID (including the platform level [[▶ 12](#)]) in the License Response File [[▶ 16](#)] matches the system ID (including the platform level) of your TwinCAT 3 license dongle (or IPC, if the licenses are licensed on the IPC).

Example: System ID and platform level do not match.

The license won't work on this system if the platform level in the license file is smaller than that for the IPC!

The screenshot shows the 'License Device' tab in the TwinCAT 3 license manager. The 'System Id' is set to 'Dongle Hardware Id' with the value '2F1F30E0-9818-9EF4-59BB-BC386EA108F8'. The 'Platform' is set to 'economy plus (50)'. Below this, the 'License Request' section shows the provider as 'Beckhoff Automation'. The XML response file below shows the system ID as '2705D20A-702D-BF0D-4E37-3E8CD90AEA5E' with a level attribute of '40'. A yellow arrow points from the system ID in the interface to the system ID in the XML, and a green arrow points from the platform level in the interface to the level attribute in the XML.

If you are using a TwinCAT 3 license dongle, check whether the license dongle is set as "License Device".

The system ID of the TwinCAT 3 license dongle is shown on the **License Device** tab in the TwinCAT 3 license manager.

Several system IDs

A TwinCAT 3 license dongle has no platform level of its own. This is dependent on the platform level of the connected computer. Since the platform level of the computer goes into the system ID of the dongle, a TwinCAT 3 license dongle can have several system IDs.

See also: [System ID of TwinCAT 3 license dongles \[▶ 54\]](#)

6.5.3 TwinCAT 3 license dongle

No "hot swap"

The TwinCAT 3 license dongles must not be pulled or plugged in during operation.

TwinCAT 3 license dongle is not detected

TwinCAT 3 does not automatically detect a TwinCAT 3 license dongle in the current version. The dongle must be configured in the project.

Check whether the commissioning and configuration of the TwinCAT 3 license dongle [► 26] is error-free in order to exclude possible side effects within the project. Create an empty project if necessary.

If the TwinCAT 3 license dongle is correctly detected in an empty project after an I/O configuration scan, changes may have been made in your project after the TwinCAT 3 license dongle has been configured. Typical errors can be the use of another EtherCAT slot or a change in the AMS NET ID.

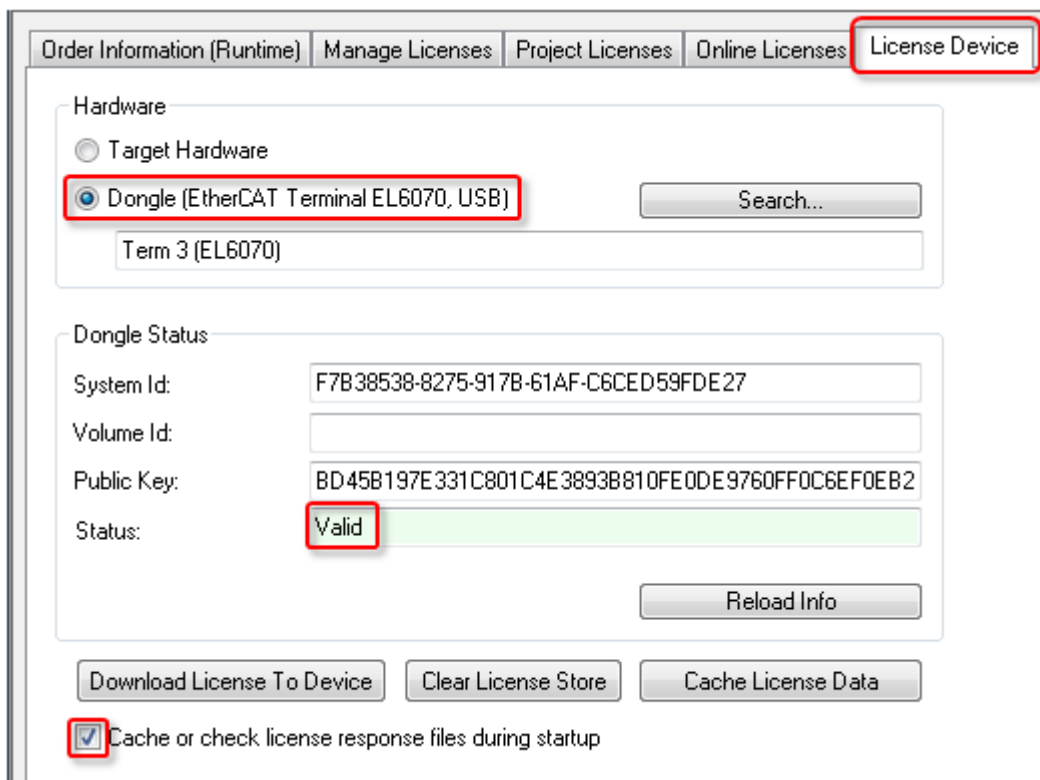
Since the TwinCAT 3 license dongle is not automatically detected in the current TwinCAT 3 version, it may only be inserted at the EtherCAT slot configured in the project after successful configuration. (Note: the TC3 USB dongle can be plugged into any slot.)

The TwinCAT 3 license dongle is only initialized when the TwinCAT 3 Runtime is started.

TwinCAT 3 remembers the "place" (= AMS Net ID) where it finds the license information and not a specific TwinCAT 3 license dongle. The AMS Net ID must therefore no longer change after configuring the license dongle, otherwise the TwinCAT 3 license dongle will no longer be detected.

Licenses are not automatically loaded by the TwinCAT 3 license dongle

The option **Cache or check License Response Files during startup** must be enabled in the **License Device** tab of the TwinCAT 3 license manager. Only then are TwinCAT 3 license files automatically copied (and used) from the TwinCAT 3 license dongle to the hard disk of the IPC when the TwinCAT 3 Runtime is started (if required).



If TwinCAT 3 detects new license files on the TwinCAT 3 license dongle when starting the Runtime, these are downloaded. TwinCAT 3 must then restart the Runtime.

The name of the license files downloaded from the dongle starts with "Cache....".

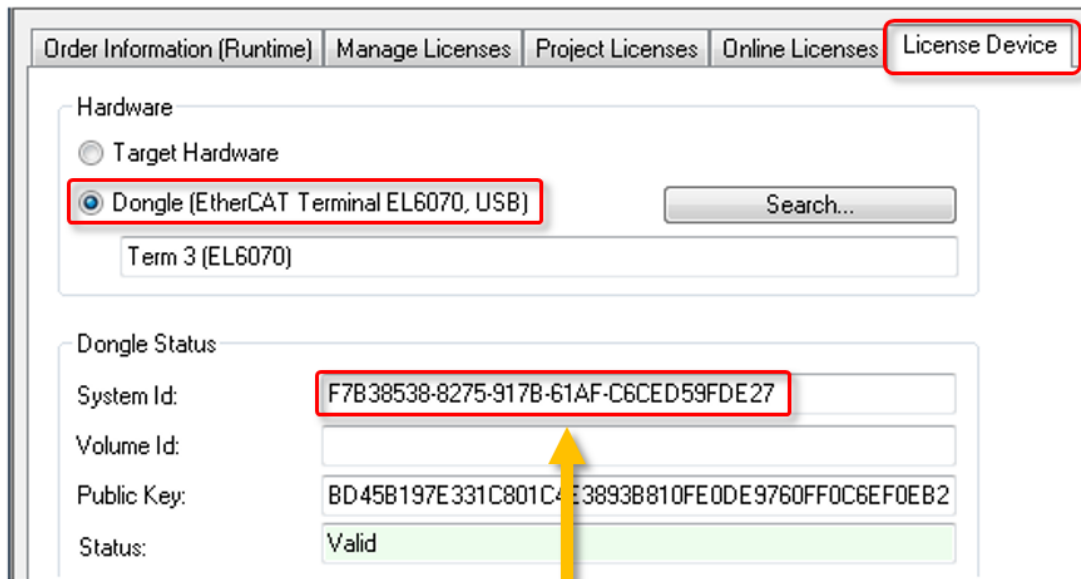
Licenses for the TwinCAT 3 license dongle have the status "Pending"

A two-stage procedure is used for validating License Response Files for TwinCAT 3 license dongles:

1. Is the license file basically valid? (→ file signature is correct)
2. Does the system contain a matching TwinCAT 3 license dongle (at the configured location)?

As long as no license dongle matching the License Response File is found, the status of the TwinCAT 3 license is "Pending".

In TwinCAT Engineering, check whether the system ID of your TwinCAT 3 license dongle [► 22] matches the system ID of your License Response File [► 16]. In the following example, the system IDs do not match.



```

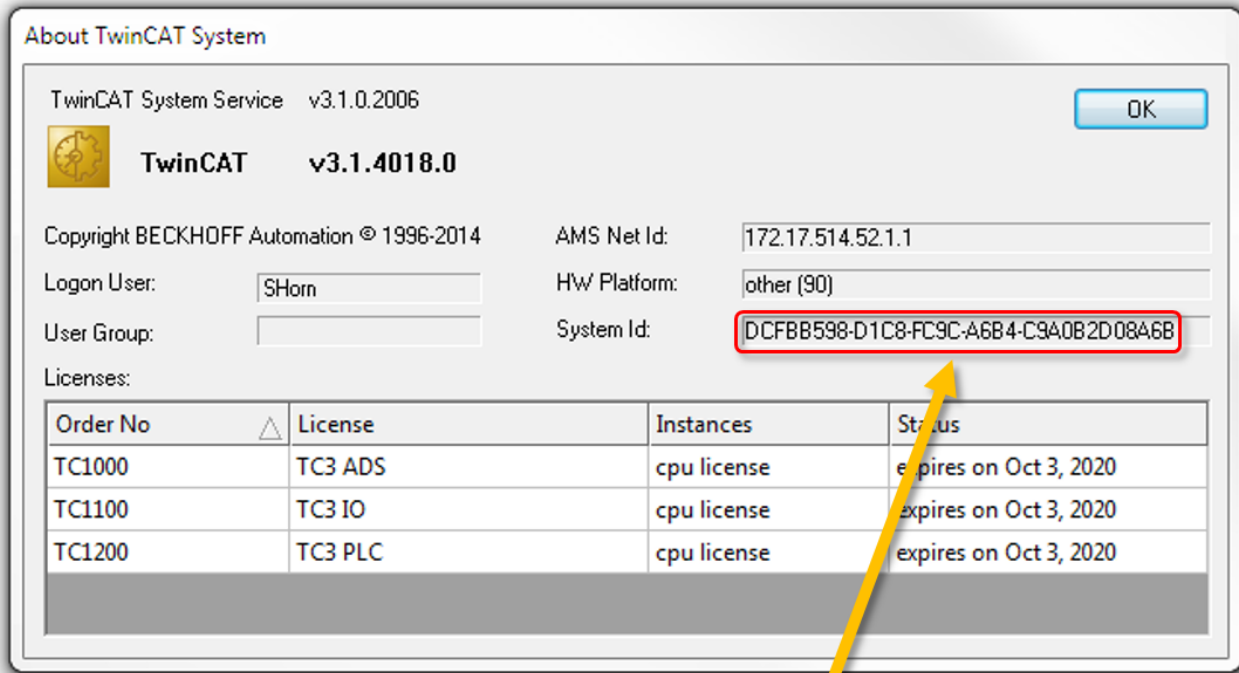
<LicenseInfo>
  <SystemId Level="40">2705D20A-702D-BF0D-4E37-3E8CD90AEA5E</SystemId>
  <PurchaseOrder>
    <![CDATA[VE12345678]]>
  </PurchaseOrder>
  <IssueTime>2015-12-15T10:21:00</IssueTime>
  <License>
    <LicenseId>{66689887-CCBD-452C-AC9A-039D997C6E66}</LicenseId>
    <Name>TC3 PLC</Name>
    <OrderNo>TC1200</OrderNo>
  </License>
</LicenseInfo>
    
```

TwinCAT 3 Runtime: License status is "Valid", but the application is not working

Check whether the EtherCAT bus is in "OP" mode. If this is not the case, the license file in `c:\twinCAT3.1\target\license` probably does not match your TwinCAT 3 license dongle.

Check whether the system ID shown in the runtime [► 23] matches the system ID in the License Response file [► 16].

Example: The system IDs do not match, the licenses are not valid for this license dongle:



```
<LicenseInfo>
  <SystemId Level="40">2705D20A-702D-BF0D-4E37-3E8CD90AEA5E</SystemId>
  <PurchaseOrder>
    <![CDATA[VE12345678]]>
  </PurchaseOrder>
  <IssueTime>2015-12-15T10:21:00</IssueTime>
  <License>
    <LicenseId>{66689887-CCBD-452C-AC9A-039D997C6E66}</LicenseId>
    <Name>TC3 PLC</Name>
    <OrderNo>TC1200</OrderNo>
  </License>
</LicenseInfo>
```

Remove all license files that are not required from the license folder.

6.5.4 Non-Beckhoff IPCs

For IPCs that do not originate from Beckhoff, a TwinCAT 3 license dongle must always be used.

See: [Changing the licensing basis \(device change\)](#) [▶ 68]

7 Retrieving License Response File again from license server

The [License Response File \[▶ 17\]](#) for already activated licenses can be retrieved again from the TwinCAT 3 license server at any time.

To do this, create a [License Request File \[▶ 48\]](#) for the desired device (TwinCAT 3 license dongle or Beckhoff IPC). Use **Restore** as the License ID and just select **TC1000** as the license.

Send this License Request File to the TwinCAT 3 license server (tclicense@beckhoff.com).

The TwinCAT 3 license server then sends a License Response File back to you containing all the licenses already activated for the corresponding system ID.

NOTICE

Name change possible

This License Response File is freshly created by the license server for your request and may therefore have a different file name to the original License Response File.

8 Changing the licensing basis (device change)

● **TwinCAT 3 licenses for non-Beckhoff IPCs**

i If you use an IPC from a manufacturer other than Beckhoff (TwinCAT 3 platform level ≥ 90), a TwinCAT 3 license dongle is always required for licensing TwinCAT 3.

In principle, you can apply to change the licensing basis for a TwinCAT 3 license, e.g. in the case of a device defect (device exchange) or when changing to a license dongle. (A TwinCAT 3 license dongle offers numerous advantages thanks to its flexibility.)

Contact our Service Dept. for this (service@beckhoff.com).

The application form can be found on the Beckhoff website under the sub-item "Changing the licensing basis (device exchange)": [Link](#)

9 Errorcodes of the activation server

The License Request File is automatically handled by the Beckhoff activation server and a corresponding License Response File is created. This will then be sent to the customer by email.

The following table provides an overview of possible error messages from the Beckhoff activation server and offers troubleshooting suggestions.

Error ID	Explanation	Procedure
999	The number of product licenses requested in the Request File is no longer available for the specified order number.	<p>Please ensure that you have ordered the correct number of licenses, and that these have not already been activated on other devices.</p> <p>Make sure that you have not listed any licenses in the License Request File that are not included in the order. The License Request File is an XML file and can easily be opened with suitable editors, e.g. Notepad++.</p> <p>For general queries relating to your order please contact your Beckhoff sales contact, referring directly to the Beckhoff order number.</p> <p>If the licensing attempt is based on hardware replacement, please contact Beckhoff service.</p>
1000	The order number specified in the Request File does not exist.	<p>Make sure you have used the correct order number in the License ID field. Generate another TwinCAT 3 Request File and send it to tlclicense@beckhoff.com. For general queries relating to your order please contact your Beckhoff sales contact, referring directly to the Beckhoff order number (VExxxx).</p>
1100	The licenses requested in the Request File are not included in the specified order number.	<p>Make sure you only request licenses in the Request File that you have actually ordered. In case of queries please contact your Beckhoff sales contact, referring directly to the Beckhoff order number (VExxxx).</p>
1200	The transmitted Request File does not contain an order number.	<p>Create a new Request File. Ensure that the Beckhoff order number (VExxxx) pertaining to your TwinCAT 3 order was entered in the License ID field.</p>
1300	The transmitted Request File does not contain a SystemID.	<p>Check whether you have set the correct target system. Once the target system has been set, generate another Request File and send it to tlclicense@beckhoff.com. If you continue to receive this error message, contact Beckhoff support.</p>
1400	The transmitted Request File does not contain a license.	<p>Check whether the required licenses are listed in the Order Information tab. All the licenses required by TwinCAT 3 solution are automatically entered there by default. If this is not the case, enter the licenses manually using the Manage Licenses tab.</p>
1500	The Request File you sent is not readable.	<p>Create another TwinCAT 3 Request File via TwinCAT XAE and send it to tlclicense@beckhoff.com. If you continue to receive this error message, contact Beckhoff support.</p>

If you receive an error ID that is not listed in the above table, try to resend the Request File after a few minutes.

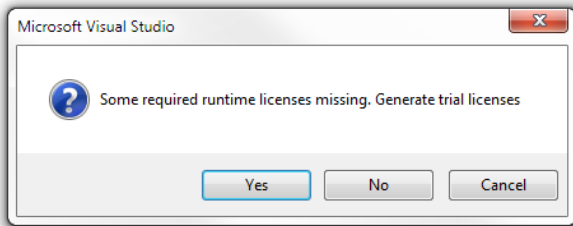
10 Special TwinCAT 3 license types

10.1 TwinCAT 3 test licenses

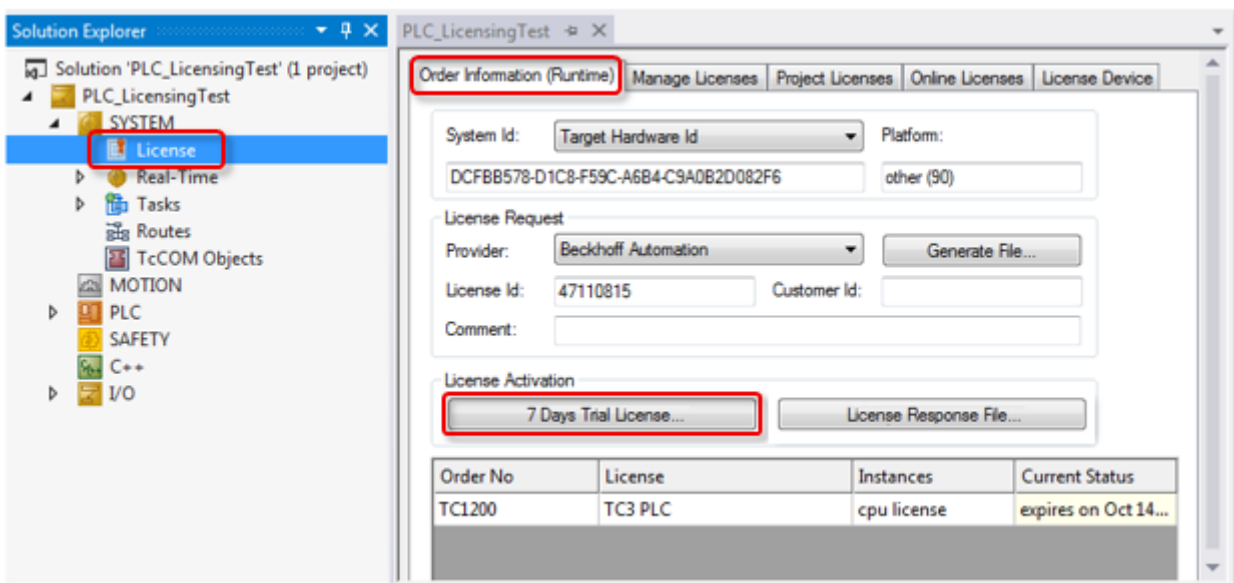
Note: A trial license (7-day test version) cannot be enabled for a [TwinCAT 3 license dongle](#) [▶ 16].

TwinCAT 3 test licenses can be activated as often as required in the TwinCAT 3 development environment (XAE) for a period of 7 days. An internet connection is not required.

The TwinCAT 3 development environment automatically detects any required trial licenses and prompts, e.g. when the project is activated on the target system, whether the required test licenses (for the target system) should be activated.



You can also select TwinCAT 3 test licenses in the [TwinCAT 3 License Manager](#) [▶ 48] on the "Manage Licenses [▶ 49]" tab and then manually create them on the "Order Information" tab.

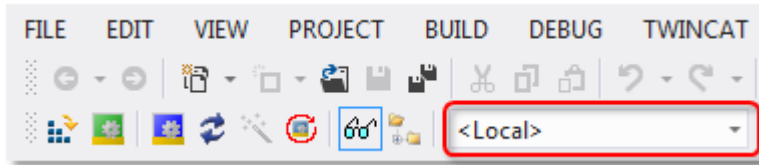


TwinCAT 3 test licenses cannot be generated with the TwinCAT 3 Runtime (XAR). They cannot be generated for TwinCAT 3 license dongles either, but only for the set target system (IPC or Engineering computer).

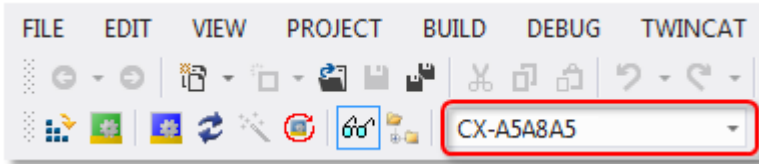
10.1.1 Creating trial licenses manually

You can manually generate TwinCAT 3 test licenses in the TwinCAT 3 development environment.

- ✓ The TwinCAT 3 development environment has been started and a project is loaded.
- 1. Set the desired target system. To do this, select the target system from the **Choose Target System** dropdown list in the **TwinCAT XAE Base Toolbar Options**:
If the target system is the local computer, select <Local>.

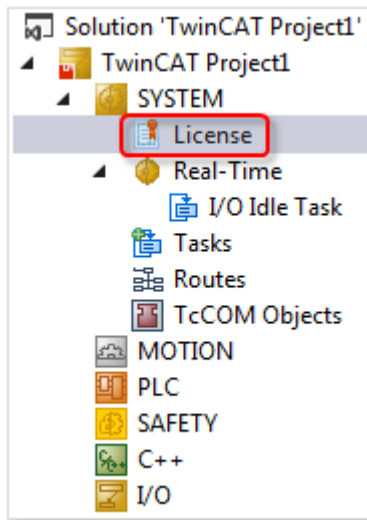


If the target system is a remote computer, select it from the list or select "Choose Target System" and configure the target system. (If necessary, a new ADS route will be created.)

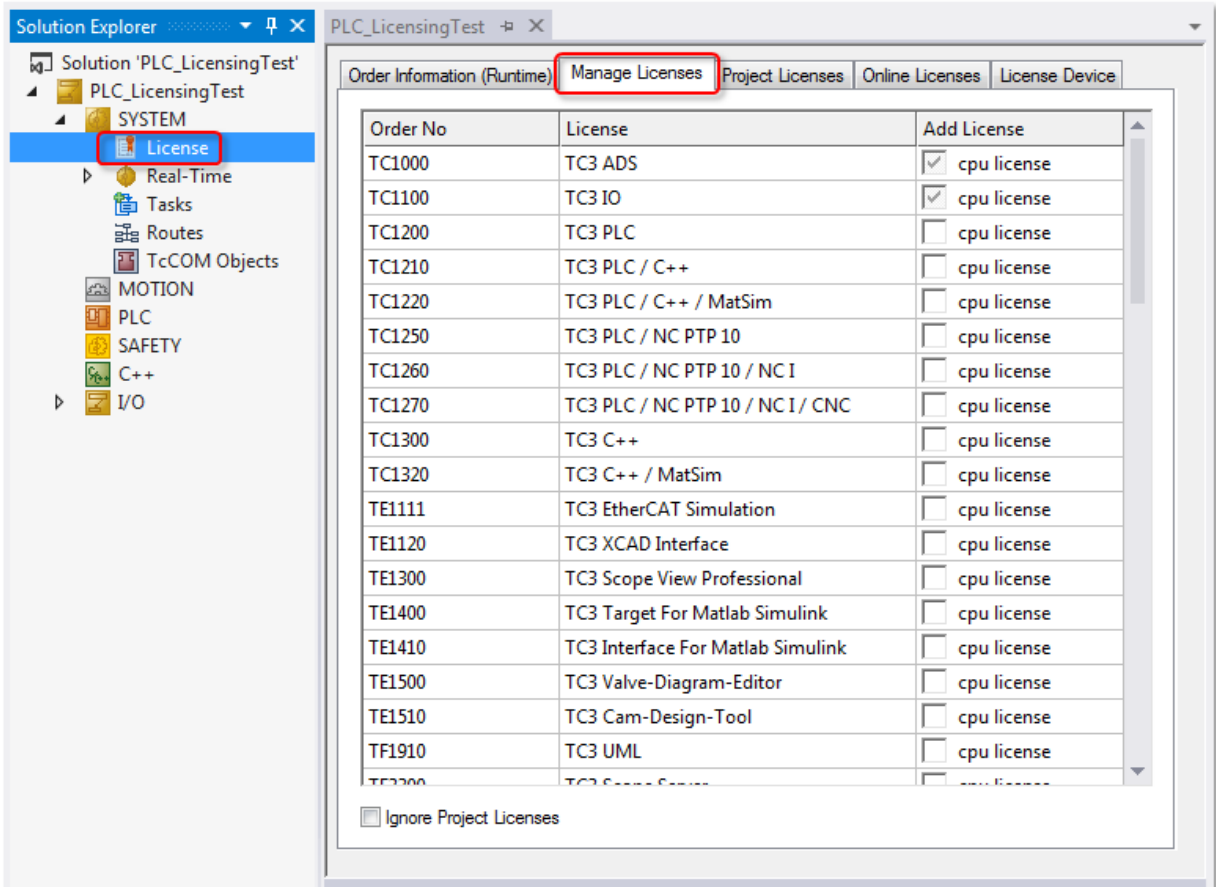


⇒ The licensing settings in the license manager refer precisely to the target system set here. When the project is activated on the target system, the corresponding TwinCAT 3 licenses are automatically copied to this system.

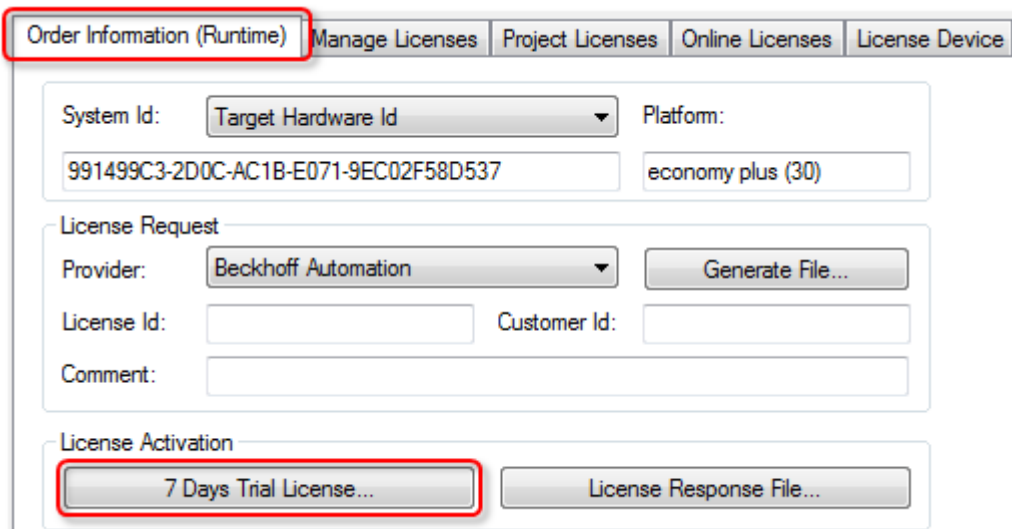
- Open the TwinCAT 3 license manager by double-clicking **License** in the **System** subtree of the TwinCAT project tree.



3. Open the **Manage Licenses** tab

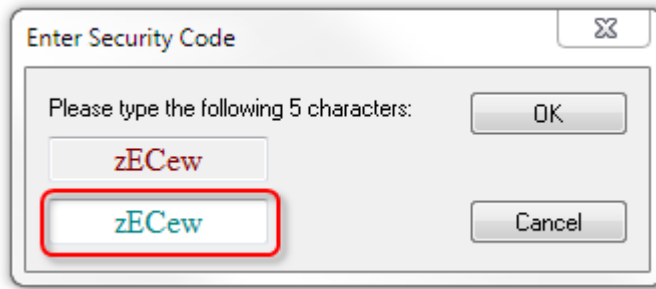


4. Select all licenses you want to add to your TwinCAT 3 project.
To do this, select the **Ignore Project Licenses** checkbox. This disables automatic detection of the required licenses and allows you free license selection. If you do not check the checkbox, the licenses required for the project are automatically selected and cannot be deselected.
5. Then open the **Order Information (Runtime)** tab.



6. Click on **7 Days Trial License...** to activate the TwinCAT 3 trial licenses.

⇒ A dialog box opens, prompting you to enter the security code displayed in the dialog.



7. Enter the code exactly as it is displayed and click on **OK**.

⇒ The licenses marked in the **Manage Licenses** tab are activated as trial licenses for 7 days.

10.2 TwinCAT 3 volume licenses

Requirements for TwinCAT 3 volume licensing:

- Only available for Beckhoff IPCs/ePCs or Beckhoff TwinCAT 3 license dongles
- High number of identical Beckhoff IPCs with identical (or lower) TwinCAT 3 platform level.
- Only available for TwinCAT 3 Runtime licenses (i.e. not for the TwinCAT 3 development environment)
- Identical TwinCAT 3 volume license for all Beckhoff IPCs

For customers requiring simple license handling for a large number of identical Beckhoff IPCs, the only option available in the past was volume licensing for the TwinCAT 3 Runtime (XAR).

The TwinCAT 3 license dongles in the "... -0033" version (e.g. EL6070-0033) now offer a licensing option that has the technical advantages of volume licenses (no activation, easy replacement of the IPC) without their technical disadvantages (no flexibility in license configuration, customer-specific production).

● Adding TwinCAT 3 standard licenses

i If required, TwinCAT 3 standard licenses (e.g. for TwinCAT 3 functions) can be added on each IPC individually in addition to the TwinCAT 3 volume license, although they are not included in the volume licensing. They are subject to the normal restrictions for standard licenses, e.g. in the event of a replacement of an IPC. Additional standard licenses are tied to the individual system ID of the respective IPC or the respective TwinCAT 3 license dongle in the conventional way.

10.2.1 Core components

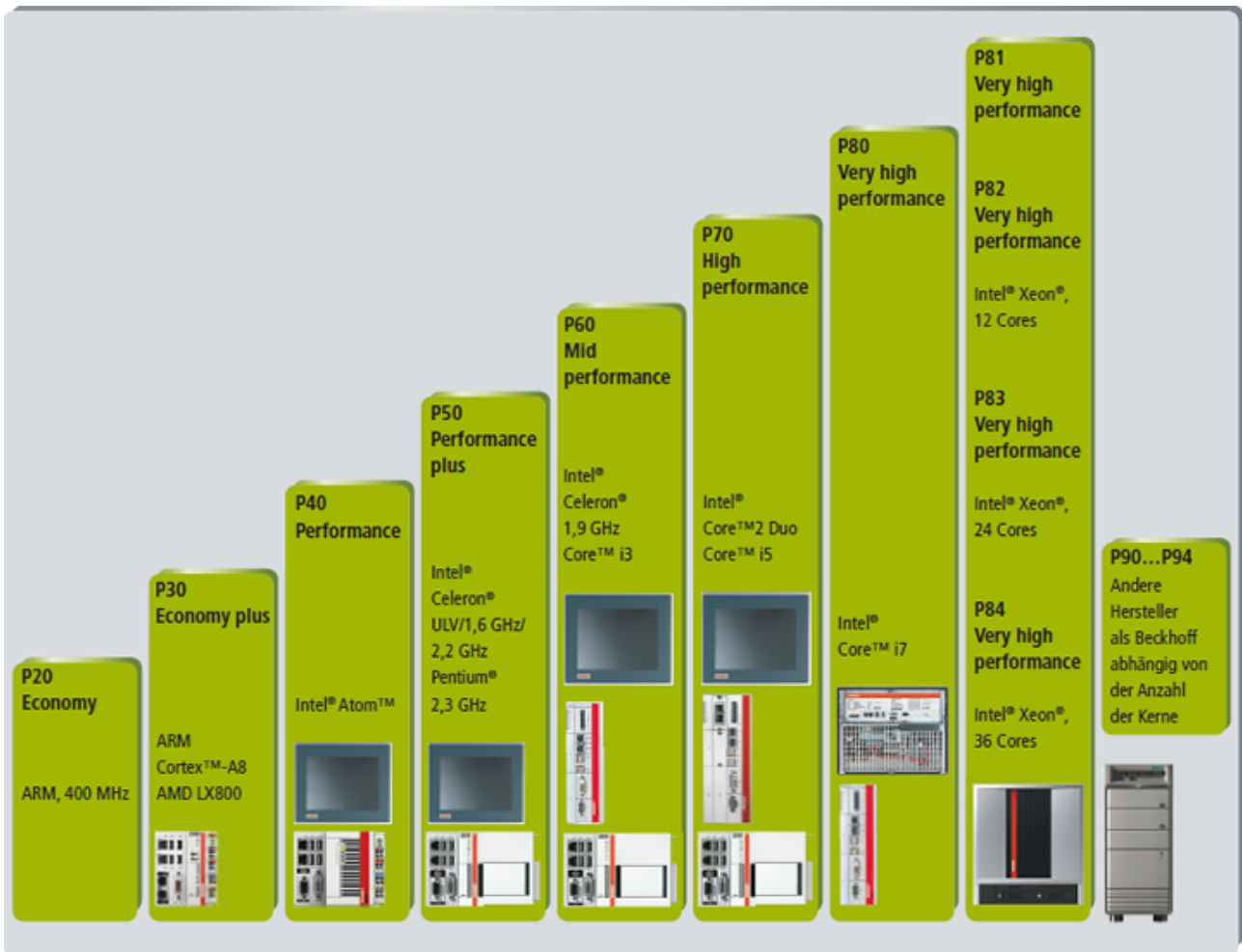
This chapter explains important basic terms for volume licensing of TwinCAT 3.

10.2.1.1 TwinCAT 3 platform level (performance level)

TwinCAT 3 platform level (performance level)

TwinCAT 3 Runtime components are available for different platforms (performance levels, platform levels). The TwinCAT 3 license price depends on the platform level.

Examples of TwinCAT 3 platform levels:



High-performance platform level

From TwinCAT 3.1 Build 4020.10 or higher, there are four new platform levels (81-84 and 91-94), depending on the computing power above platform levels 80 and 90

High Performance Sub Levels				
Platform Level Beckhoff Many Core IPC	81	82	83	84
Platform Level Other Many Core IPCs	91	92	93	94
Includes Platform Level	<= 81	<= 82	<= 83	<= 84

With a TwinCAT 3 volume license, license downgrades have always been possible. An activated TwinCAT 3 license for a higher platform level can be used on a target system with a lower performance level.

For example, you can license and activate platform level 80 and then use the licenses on all systems with platform levels 20-70.



For TwinCAT standard licenses, this option is only available with Build 4022.

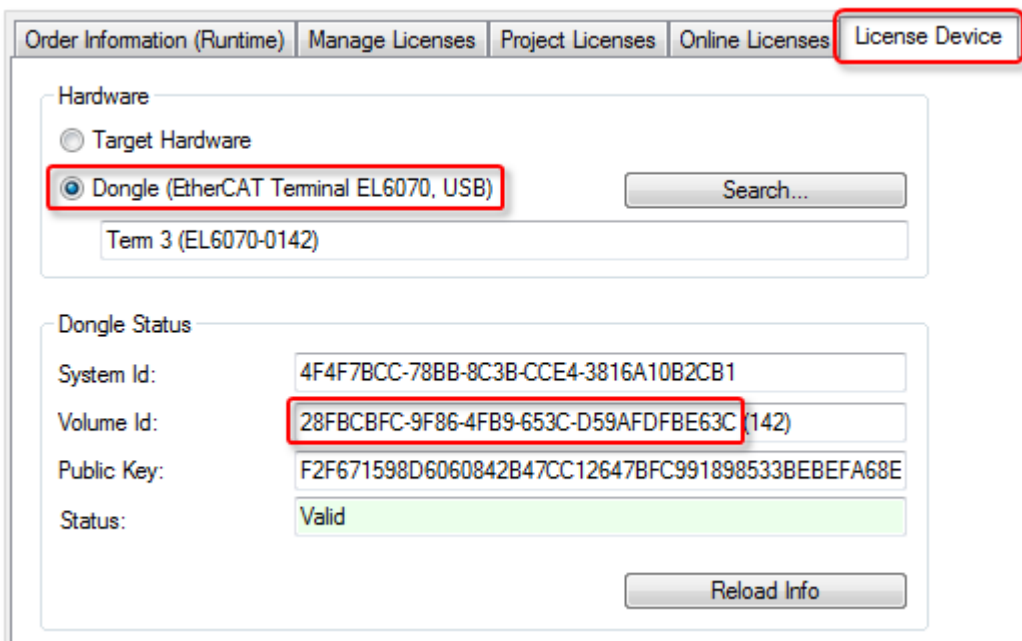
10.2.1.2 Beckhoff volume system ID

With a TwinCAT 3 volume license a Beckhoff IPC or TwinCAT 3 license dongle is assigned a unique, customer-specific volume ID, in addition to the system ID. The volume system ID is assigned to the individual volume license for a particular customer, and the unique licensing reference refers to precisely this volume license for this customer. The volume system ID includes the volume ID of the corresponding volume license, the platform level of the IPC, the device type (IPC/dongle) and other components.

- The volume system ID is assigned to an individual volume license, not to individual hardware.
- The volume system ID is the same for all IPCs or license dongles with a volume license and identical platform level. Devices with a different platform level but the same volume license have a different volume system ID.
- The volume license can only be used in conjunction with the appropriate volume system IDs.
- The volume system ID is not transferable. It cannot be transferred to another customer or to another TwinCAT 3 license combination other than that specified in the volume license.
- The volume system ID and system ID can be used in parallel on a system. Volume licenses and standard licenses can therefore be used in parallel on a control computer, for example to extend the volume license with individual TwinCAT 3 functions on the respective computer.
- During the production of an IPC the volume system ID is stored on the mainboard (not on the hard disk) and cannot be changed later.
- During the production of the license dongles (in this case always customer-specific), the volume system ID (except the platform level) is stored permanently in the license dongle and cannot be changed later. The platform level of the connected IPC is later automatically added by TwinCAT.
- A TwinCAT 3 license dongle with a volume license is customer-specific and always has a customer-specific order number. The TwinCAT 3 license dongle is included in the customer-specific order number of the volume license and is not ordered separately.

Displaying the volume system ID in the TwinCAT 3 development environment (XAE)

In TwinCAT 3 Engineering the volume system ID of a TwinCAT 3 license dongle is displayed in the **License Device** tab of the license manager. To open the license manager, double-click on **License** in the **SYSTEM** subtree of the **Solution Explorer**.



Displaying the volume system ID in the TwinCAT 3 Runtime (XAR)

In the TwinCAT 3 Runtime (XAR), the volume system ID of an IPC that was produced for a volume license is displayed next to the system ID of the IPC by right-clicking on the TwinCAT 3 icon in the taskbar and then clicking on the **About** menu item in the **About TwinCAT System** window that opens.

Under TwinCAT version 3.1 Build 4020, display of the system ID of the TwinCAT 3 license dongle in the TwinCAT 3 Runtime is not yet available.

10.2.1.3 TwinCAT 3 license dongle

TwinCAT 3 volume licenses cannot be ordered without a corresponding (reference) hardware, which is used as a reference for the volume ID of the TwinCAT 3 volume license. TwinCAT 3 volume licenses are therefore always ordered and delivered in conjunction with a Beckhoff IPC or a TwinCAT 3 license dongle in the form of an EL6070 license key terminal or a license key USB stick.

Compared to licensing an IPC, a TwinCAT 3 license dongle offers significantly greater flexibility with regard to the control computer used, since TwinCAT 3 licenses are no longer tied to a specific IPC and only has to match the hardware platform level of the associated TwinCAT 3 license. This is a great advantage when servicing is required, for example.



Note that a TwinCAT 3 volume license terminal requires a suitable ESI file belonging to this EtherCAT Terminal. This is not supplied with TwinCAT as standard, since a TwinCAT 3 volume license terminal is a custom product. The ESI file must be downloaded once from the Beckhoff website.

See also: [Configuring the license key terminal with volume licenses](#) [► 79]

10.2.1.4 License Response File

License Response File

The Volume License Response File is stored in the TwinCAT 3 license dongle or in the Beckhoff IPC with this volume license.

If you have lost the Volume License Response File for your volume license (e.g. due to a hard disk crash), you can request it again from Beckhoff support.

The License Response File contains a general TwinCAT 3 license for all IPCs or EL6070 license key terminals with the corresponding volume system ID. It can thus be transferred to all systems with the same volume system ID if they meet the requirements (operating system and TwinCAT 3 platform level of the respective volume license).

The License Response File is stored on the target system in directory `c:\twincat\3.1\target\license`.



For a dongle-based volume license, License Response Files have been delivered on license dongles since mid-2017.

Storing the license information (License Response File)

TwinCAT 3 license dongles have a memory function so that the license file can be stored on the license dongle and easily transported together with the dongle.

TwinCAT 3 does not access the license file on the license dongle directly, but creates a working copy on the hard disk of the IPC. The name of this working copy starts with "Cache...".

The license information (License Response File) is always stored on the hard disk of the IPC (directory: `c:\twincat\3.1\target\license`).

Prerequisite for using the memory function

Use TwinCAT 3.1 Build 4022 or higher (TwinCAT 3 Engineering and TwinCAT 3 Runtime) to utilize the memory function.

For systems with Windows Embedded Compact (formerly Windows CE), automatic download of the license file is only supported with TwinCAT 3.1 Build 4022 or higher.

i All currently available TwinCAT license dongles have a memory function

The very first version of EL6070 and C9900-L100 did not yet support the memory function. However, the memory function is now standard for TwinCAT license dongles. The following description therefore only applies to the first generation of EL6070 and C9900-L100.

Memory function of the EL6070 License Key Terminal



The EL6070 License Key Terminal supports the function of storing the TwinCAT 3 License Response Files on the terminal (from hardware revision 17 and firmware revision 04). The firmware version can be read from the type number of the terminal.



i Older versions cannot be updated.

Memory function of the C9900-L100 license key USB stick



The license key USB stick supports the function of storing TwinCAT 3 License Response Files on the USB stick in all versions.

The license key USB stick is NOT a normal memory USB stick. It can only be accessed via TwinCAT and is therefore not visible in Windows Explorer. Files can only be saved or read from the license key USB stick via TwinCAT 3.

The installation of TwinCAT 3 also includes the installation of the required Windows drivers for the license key USB stick.

The TwinCAT 3 license key USB stick cannot be used without installing the TwinCAT Runtime, since the TwinCAT Runtime is responsible for validating TwinCAT licenses.

10.2.2 Ordering volume licenses

TwinCAT 3 volume licenses cannot be ordered without a corresponding (reference) hardware. TwinCAT 3 volume licenses are therefore always ordered and delivered in conjunction with a TwinCAT 3 license dongle or a Beckhoff IPC.

Please note that, if a volume license is required for a Beckhoff IPC, this Beckhoff IPC must be ordered together with the volume license, because only then can the volume ID required for the volume license be entered in the EPROM of the Beckhoff IPC during production.

Even a TwinCAT 3 license dongle with a volume license cannot be ordered separately (without license). It can only be ordered together with a corresponding TwinCAT 3 volume license, since otherwise the TwinCAT 3 license dongle cannot be used for a volume license.

Ordering process for TwinCAT 3 volume licenses

- Contact your local Beckhoff branch to request a TwinCAT 3 volume license.
- Your Beckhoff branch will create an individual TC3 Volume Bundle for you after consultation which is tailored exactly to your licensing requirements and has its own customer-specific article number in this format: "TC12xx-0000-yyyy" (calculation of one-off creation costs).
The TC3 Volume Bundle contains a precisely defined selection of TwinCAT 3 licenses for a defined TwinCAT 3 platform level. TwinCAT 3 volume licenses can be downgraded, i.e. they can also be used on IPCs with a lower performance level than the one specified in the license.
- **TwinCAT 3 license dongle as licensing basis:**
For dongle-based volume licenses, the associated dongle is the leading item.
This dongle is a customer-specific item and can only be ordered by the approved customer.

Examples:

EL6070-yyyy (volume license with an EL6070 EtherCAT license dongle)

C9900-L100-yyyy (volume license with a C9900-L100 USB license dongle)

Information: The TwinCAT 3 license dongle cannot be ordered separately (individually) without a volume license.

- **Beckhoff IPC as a licensing basis**
Order the required batch size of Beckhoff IPCs using this format
IPC order number + TC3 Volume Bundle.

Example: CX5030 + TC12xx-0000-yyyy

Information: In this case, the IPC is not included in the order number for the TwinCAT 3 volume license.

10.2.3 Activating volume licenses

TwinCAT 3 volume licenses no longer have to be activated by the OEM due to the technical procedure used (volume ID in the hardware). However, the volume licenses are always tied to a corresponding hardware for this volume license and can only be ordered together with this hardware. The corresponding License Response File (identical for all devices with this volume license) is stored on the target hardware ordered with the volume license (TwinCAT 3 license dongle or Beckhoff IPC) during the production.

You can request your Volume License Response File at any time from Beckhoff Support by specifying the order number for your volume license.

Manual installation and activation of volume licenses on the control computer

By default, no manual installation of the License Response File is required, as this is done by Beckhoff during production. If, for example, you are using your own image that does not yet contain this License Response File, or if it is not yet in the license directory for other reasons, a manual installation may be necessary.

The License Response File must be copied to the control computer in directory `c:\twincat\3.1\target\license`.

See also: [Ordering volume licenses](#) [► 77]

10.2.4 TwinCAT 3 volume license dongles

From TwinCAT 3.1 Build 4022 or higher, any number of license dongles with standard licenses can be included in the system. Furthermore, only one license dongle with volume license is supported in the system.

10.2.4.1 Configuring the license key terminal with volume licenses

For TwinCAT 3 volume license dongles, a special, customer-specific ESI file must be used for the volume license dongle.

A ZIP file with all ESI files for TwinCAT 3 volume licenses can be downloaded from the Beckhoff FTP server: https://download.beckhoff.com/download/configuration-files/io/ethercat/xml-device-description/Beckhoff_EtherCAT_ESI_EL6070-1xxx.zip

i Special ESI file for TwinCAT 3 volume license terminal

For a TwinCAT 3 volume license terminal you need the matching ESI file. This is not supplied with TwinCAT as standard, since a TwinCAT 3 volume license terminal is a custom product.

11 TwinCAT 3 OEM certificates

A TwinCAT OEM certificate signed by Beckhoff is required in order to be able to use the application software protection functions.

The TwinCAT OEM certificate is exclusively intended for use together with TwinCAT.

With TwinCAT Build 4024, the TwinCAT OEM certificate version TC0008 can additionally be used to sign TwinCAT *.tmx files created with TwinCAT 3 in C++.

With the launch of TwinCAT 3.1 Build 4024, several new features relating to TwinCAT OEM certificates were introduced, compared to Build 4022:

- Update to a newer encryption version for the internal certificate data
- Introduction of an extended certificate version TC0008, with which C++ TwinCAT driver software created in TwinCAT 3 can also be signed
- This certificate version requires secure validation of the applicant data, since it is used in the Windows environment.
- The process of applying for a TwinCAT OEM certificate was modified for this purpose. **All OEM certificates must** be officially **ordered** to validate address and contact information. (However, the issuing of a TwinCAT OEM certificate remains free of charge.)
- TwinCAT OEM Certificates Extended Validation (TC0008) are only issued to existing Beckhoff customers.

Details on TwinCAT3 OEM certificates can be found [here](#).

You can also obtain information about [TwinCAT 3 OEM Software Protection \(PLC\) \[▶ 82\]](#).

12 OEM application licenses

With the help of TwinCAT 3 license technology a PLC application can be protected against cloning through binding to hardware (Beckhoff IPC or TwinCAT dongle). Also, additional functions of the application can be licensed to end users through the creation of so-called "feature licenses".

Here you can find the [Quick start](#).

Details are described [here](#).

This functionality is part of the [Introduction to software protection](#), which can be used to encrypt the source code and the binaries of application programs created with TwinCAT 3 PLC and to manage access to the encrypted code.

13 TwinCAT 3 OEM Software Protection (PLC)

The TwinCAT 3 Engineering is equipped with various functions for the protection of the PLC application software:

- Configurable access restrictions to the PLC source code through the definition of user groups and the assignment of access levels ("Object Protection Level")
- Know-how protection through encryption of PLC source code and boot file
- Cloning protection through the use of the TwinCAT 3 license technology for the OEM application software (requires a Beckhoff IPC/EPC or TwinCAT 3 dongle)

Through the use of the TwinCAT 3 license technology the OEM can additionally generate licenses himself for functional extensions of his application software and market them (requires a Beckhoff IPC/EPC or TwinCAT 3 dongle).



These functions are currently only available for the PLC area of TwinCAT 3.

An OEM certificate signed by Beckhoff is required in order to be able to use the functions to protect the application software. You can find details [here](#).

The central switching point of the access protection is a user database.

More details about TwinCAT 3 Software Protection can be found [here](#).

14 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Download finder

Our [download finder](#) contains all the files that we offer you for downloading. You will find application reports, technical documentation, technical drawings, configuration files and much more.

The downloads are available in various formats.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for [local support and service](#) on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on our internet page: www.beckhoff.com

You will also find further documentation for Beckhoff components there.

Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

Hotline: +49 5246 963-157
e-mail: support@beckhoff.com

Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

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