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Initial Start-Up of an EtherCAT® device

Operating instructions

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1. User instructions

These instructions describe how to integrate an EtherCAT® device in an existing network and is intended to provide support kept as general as possible in integrating EtherCAT® products in a controller environment.

2. Safety Precautions

- Carefully read the operating instructions before working with the products used.
- Assembly, commissioning and maintenance of the products described must be carried out by qualified personnel only.
- The operator must observe the local safety regulations.

3. General note

The purpose of this document is to illustrate the integration of a device with EtherCAT® interface in a controller by means of an example. This description was prepared with the PC based controller software TwinCAT® 3.1.4006.0 by Beckhoff Automation. wenglor sensoric cannot be held liable for the accuracy or completeness of the contents. The sole intention of the instructions is to visualize a common procedure which can be applied to other controllers or sensors/junctions/actuators with EtherCAT® interface, where required. Device-specific adjustments of products by other manufacturers are not covered by this version We refer to the guidelines of the relevant product manufacturer.

4. Integration of an EtherCAT® device in the operating environment

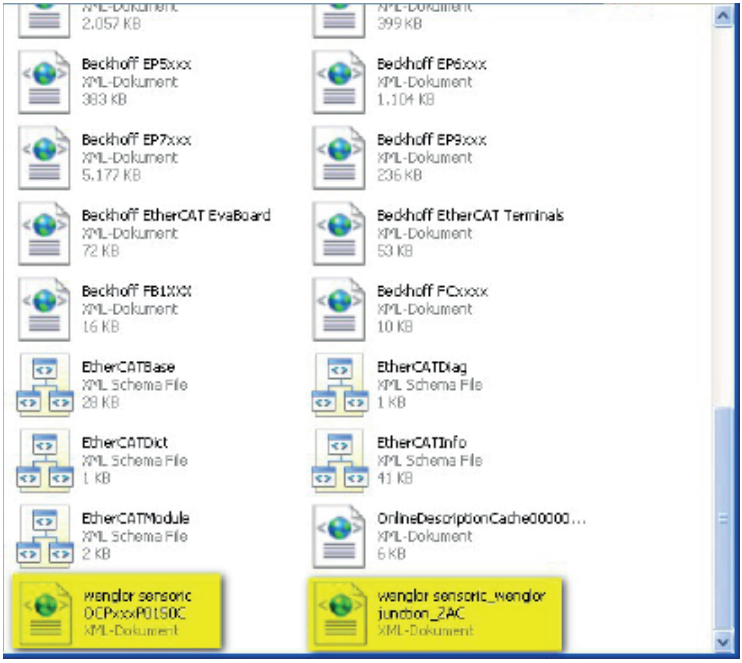
The following steps show an exemplary procedure for integration of an EtherCAT®slave device in an EtherCAT® network using the controller software TwinCAT® (The Windows Control and Automation Technology).

- In the first step, every device type requires a voltage supply which can either be supplied externally or realized by means of PoE (Power over Ethernet). For details on the device-specific connection equipment required for your relevant product refer to the wenglor website (www.wenglor.com).
- Data transmission is made by means of shielded connection cables which are available in a 4 or 8 pin version (4 pin = pure data transmission; 8 pin = data transmission + PoE). Also refer to the wenglor website (www.wenglor.com) details on the device-specific connection equipment.

4.1. Setup and preparation of TwinCAT®

In order to transform a PC based system to a real-time controller the current version of the controller software TwinCAT® by Beckhoff has to be installed in a first step. The most recent version 3.1 now also supports 64bit systems and Windows® 7. If a full version is not available, a demo version can be downloaded from Beckhoff (www.beckhoff.de). In the most current version of TwinCAT® the full System Manager can be found in the Microsoft programming environment Microsoft Visual Studio®.

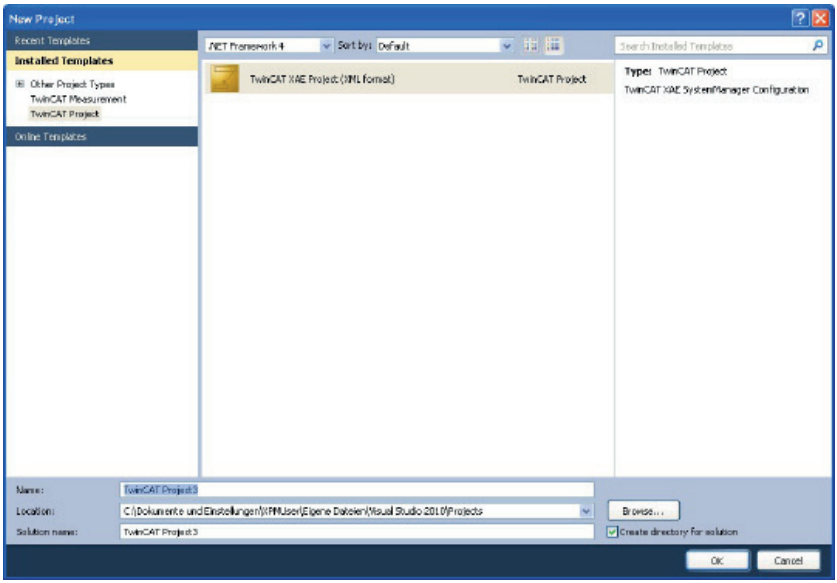
After installation of the software, the product description file (ESI file – EtherCAT® slave information) of the product to be integrated has to be copied to the corresponding folder of TwinCAT®. Depending on the TwinCAT® version, installation location and operating system this is located under the installation path **(C:\TwinCAT\3.1\Config\Io\EtherCAT).** By default, this folder also contains Beckhoff product description files. Depending on the products used you can download the corresponding product description files from the wenglor website under **www.wenglor.com ➔ Download ➔ Product Description Files ➔ Product search**.



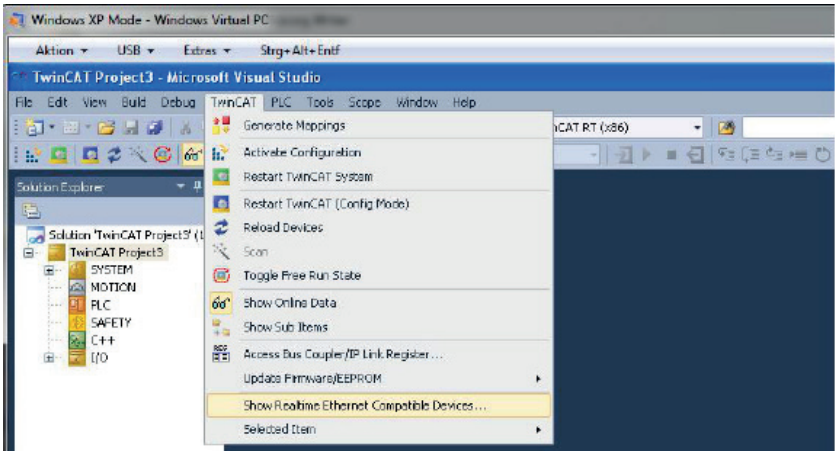
(C:\TwinCAT\3.1\Config\Io\EtherCAT)

After the ESI file has been copied to the correct folder as described, a restart of the TwinCAT® software is required. The TwinCAT® updates the internal data management.

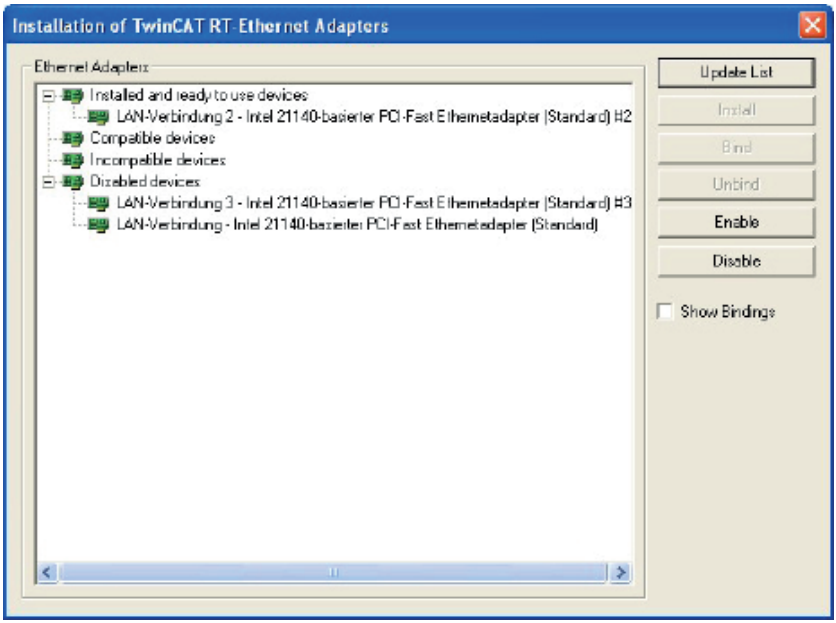
Under Windows 7 it is necessary to start TwinCAT® with the option “Run as administrator”.



To be able to establish a connection between PC and slave devices in the following, a network adapter has to be selected as EtherCAT® device to be used. Under the menu item **TwinCAT ➔ Show Realtime Compatible Devices** all network adapters installed in the PC are listed.



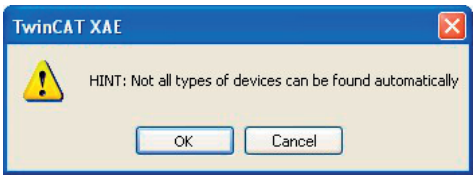
Incompatible network adapters can also be used for the connection. However, the performance will be different from compatible devices. A list of compatible realtime capable network adapters and current drivers can be viewed and/or downloaded on www.beckhoff.de.
Clicking on Install will enable the use of the selected network adapter.



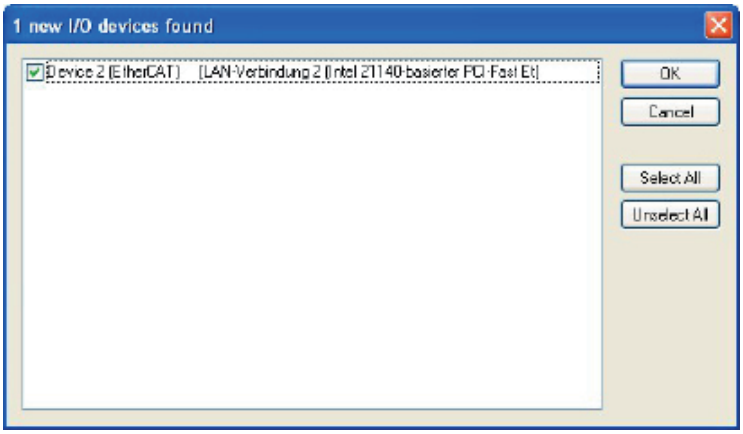
5. Search for new EtherCAT® devices

To start the search for new network devices simply select **Devices** in the Solution Explorer under **I/O** ➔ and click the wand tool in the tool bar or select it by clicking on **Devices** with the right mouse button. This will start the scan for network devices

Subsequently, a pop-up window will appear with a notification of TwinCAT® that not all network devices can be found by means of the automatic scan.



Confirm this window by clicking **OK**. In the following the network adapter to be used has to be selected.

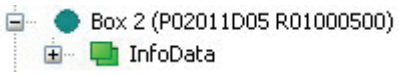


Then the search for new slave devices (boxes) has to be confirmed by selecting **Yes**.

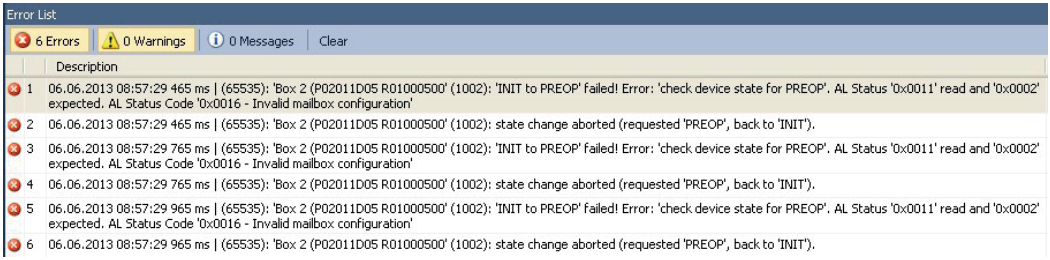
A window appears asking whether you want to activate Free Run. In Free Run mode the slave device works operates autonomously according to its own cycle time, i.e. independently from the EtherCAT® cycle. This window can also be confirmed by selecting **Yes**.

If all connections have been established correctly, the connected slave devices should now appear in the Solution Explorer. In the example a Junction ZAC50CN01 and a reflex sensor with background suppression OCP662P0150C have been integrated.

Notice: If all connected products appear in the Solution Explorer without their correct order number and icon, the device description file was not found. TwinCAT® indicates this error as error of the mailbox configuration. If this is the case, please check the installation path and copy the file to the intended folder as described in chapter “4.1. Setup and preparation of TwinCAT®” on page 4.



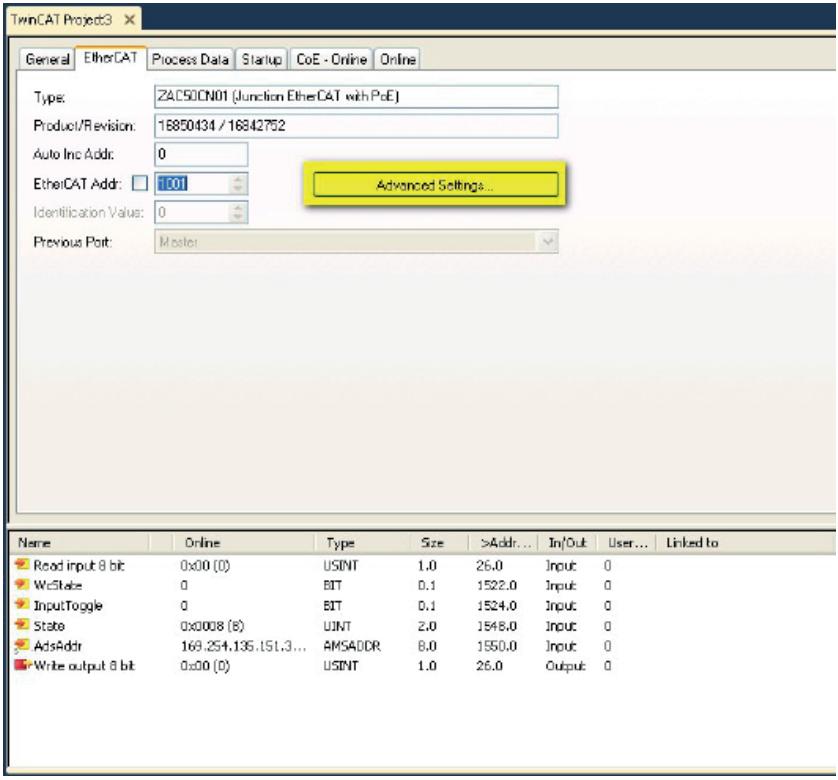
Not correctly detected device in Solution Explorer



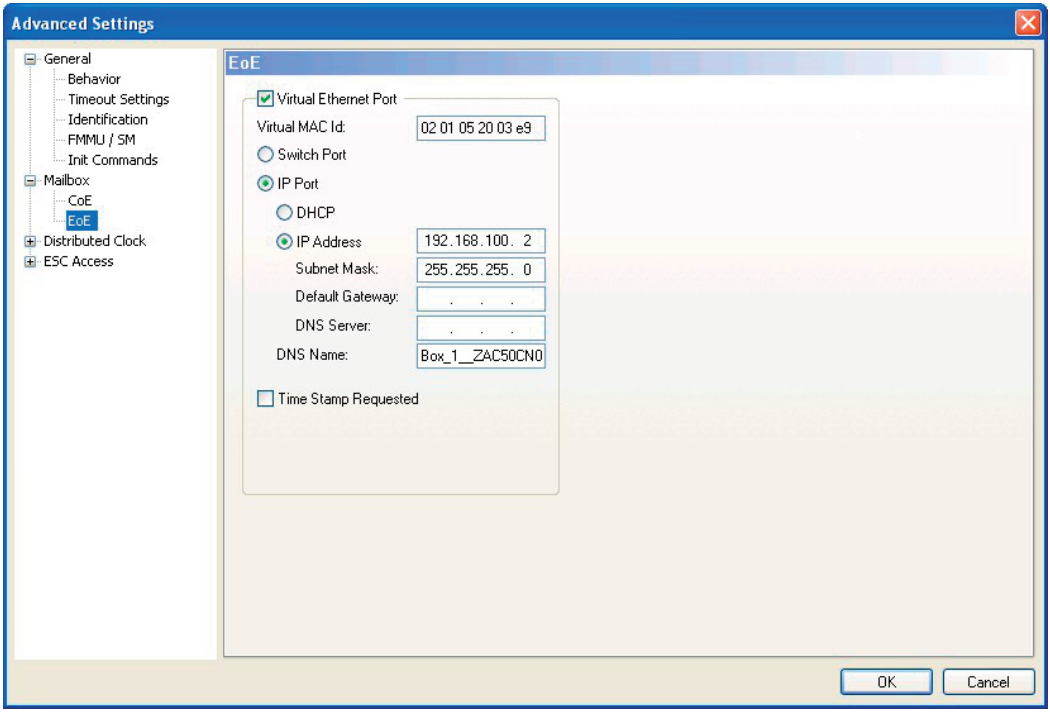
Error mailbox configuration

6. Displaying and working with the integrated web server

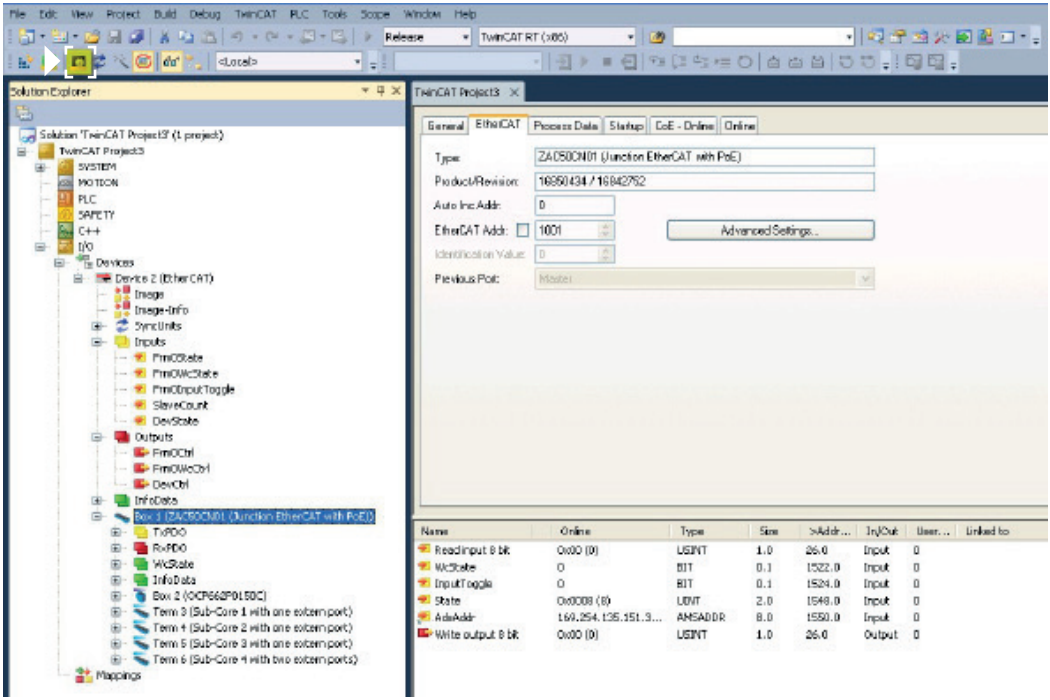
Every wenglor EtherCAT® device has an integrated web server which can be used to make settings for the product itself, to view product information and to implement test assemblies. Before you can access the web server of the product, the IP address and the subnet mask of the device have to be specified in the mailbox communication. To do so, double click on the relevant product in the Solution Explorer. This will open the product options. The Advanced Settings can be found under the tab “EtherCAT”.



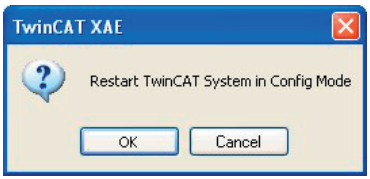
The IP address can be set by means of the option EoE under the menu item **Mailbox**. The use of EoE (Ethernet over EtherCAT) allows the transmission of TCP/IP data packets via the EtherCAT® network. The IP address and subnet mask can be freely selected. The default gateway and the DNS server do not have to be assigned. After entry the window is closed by clicking **OK**.



In the next step, TwinCAT® has to be started in configuration mode. To do so, click the corresponding icon in the tool bar (see screenshot – highlighted symbol).



Confirm the restart of the system.



Confirm reloading of the IO device and activate Free Run.

A web browser can then be opened in the system and the IP address of the products previously specified entered. The web server of the product should now be loaded. For all setting options refer to the operating instructions of the connected product.

Notice: It is only possible to select all web server settings, if the product is in PreOP mode.