

Setup Instructions for TwinCAT3 with the AKD

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Date of Change	Change
9/8/2022	XML file naming conventions

Overview

Setting up TwinCAT3 for operation with the AKD drive is almost identical to TwinCAT2. Some of the terminology is different and the xml file goes in a different location. But the general process is the same.

There are two XML files for the AKD drive. One is for TwinCAT version 2 and the other is for version 3.

Original Naming Convention:

- TwinCAT3 XML file: “AKD EtherCAT Device Description.xml”
- TwinCAT2 XML file: “AKD_TwinCAT.xml”

New Naming Convention:

- TwinCAT3 XML file: “AKD.xml”
- TwinCAT2 XML file: “AKD_TwinCAT2.xml”

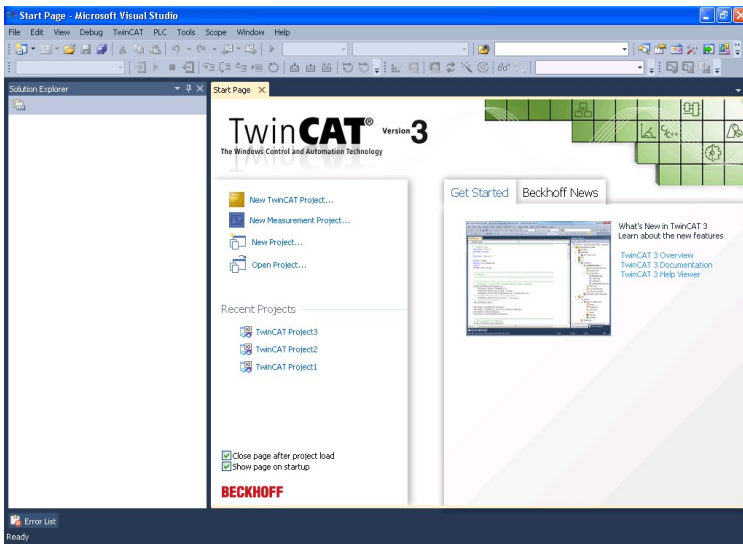
The “AKD.xml” file is also for all currently supported EtherCAT masters. The file for TwinCAT2 is specific to TwinCAT2.

Procedure

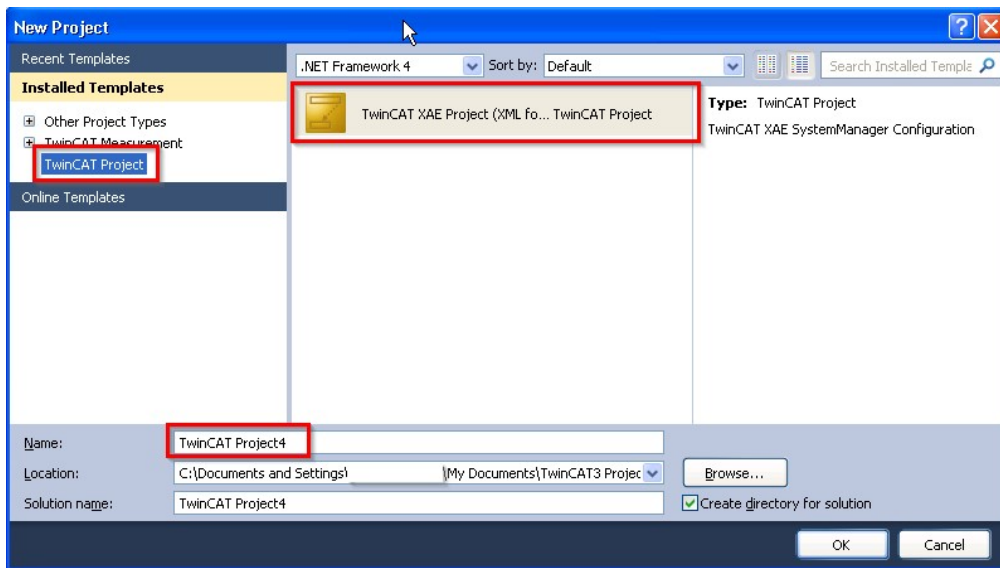
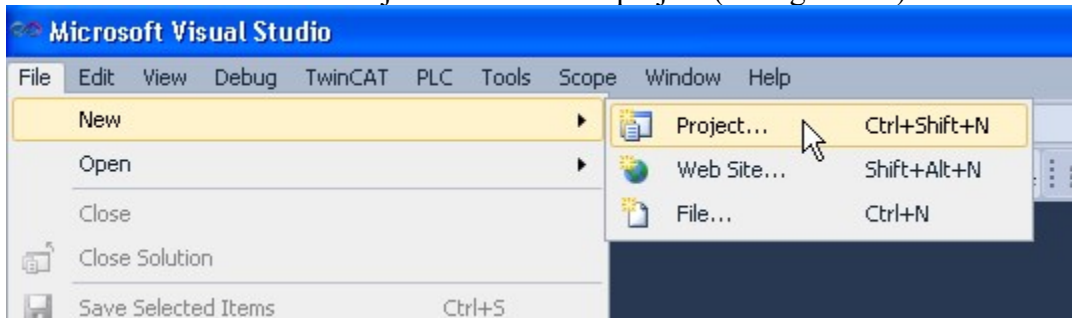
1. Place the xml file called “AKD.xml” or “AKD EtherCAT Device Description.xml” in the directory, “C:\TwinCAT\3.1\Config\Io\EtherCAT.”
2. Click on the TwinCAT icon in the system tray and click “TwinCAT XAE” to start the TwinCAT software. This is equivalent to the System Manager in TwinCAT2.



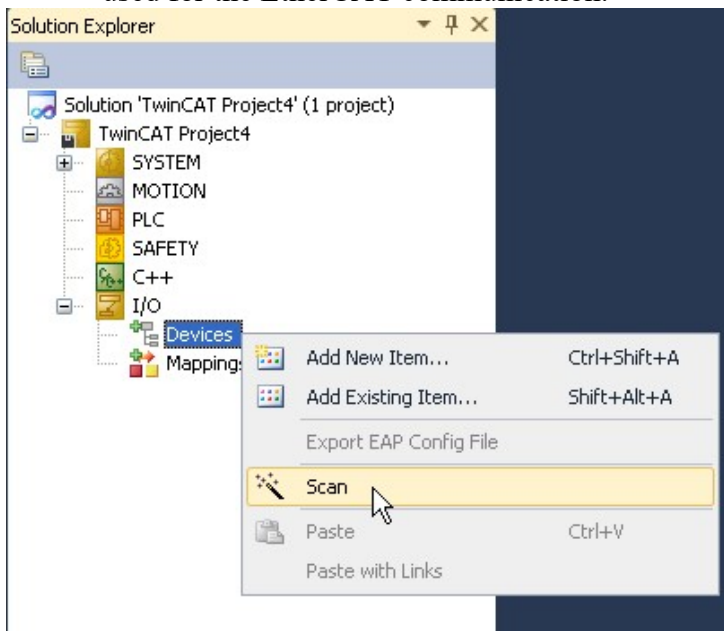
Start screen of TwinCAT3



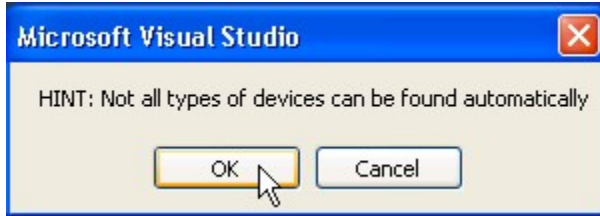
3. Click File / New / Project to start a new project (configuration).



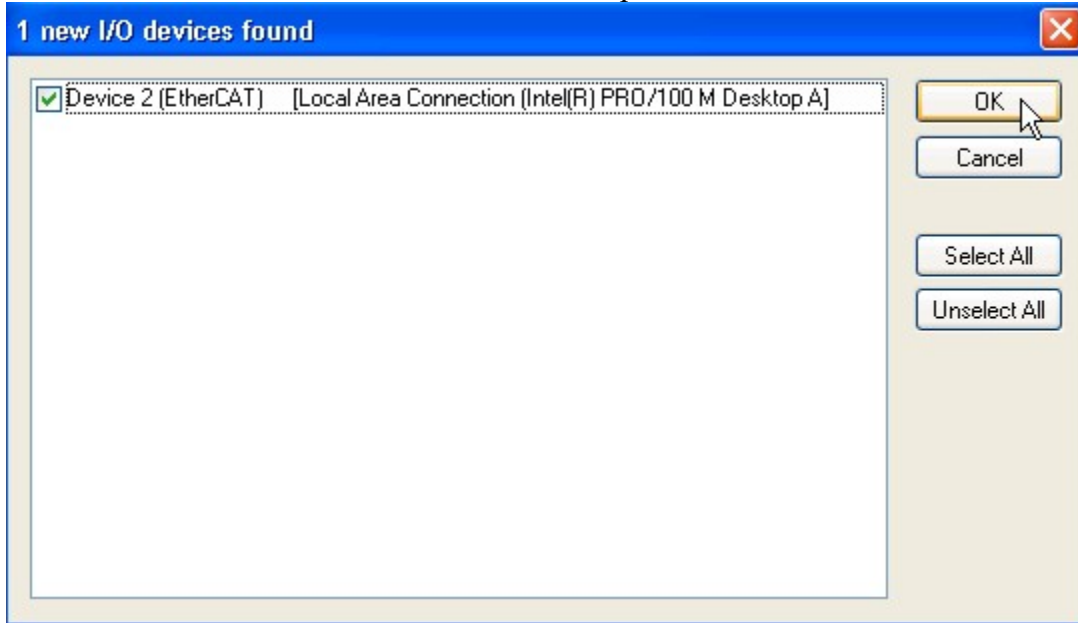
4. Right click on Devices and click Scan to scan for the Ethernet adapter that will be used for the EtherCAT communication.



5. Click OK.



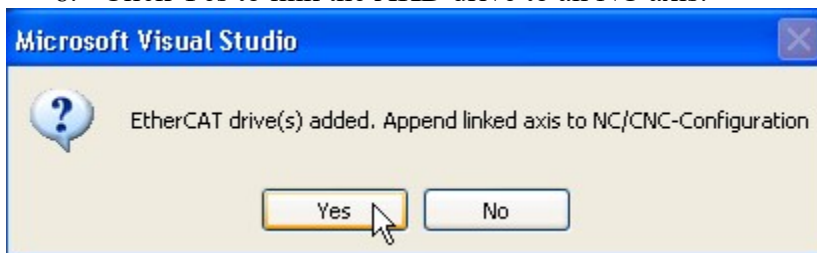
6. Select the Intel® Pro/100M network adapter and click OK.



7. Click Yes to scan for boxes (AKD drives).



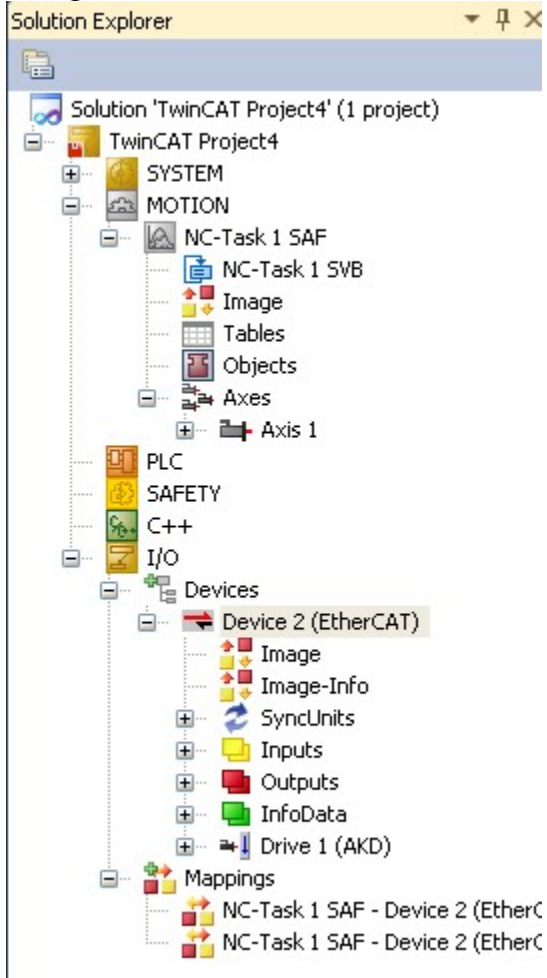
8. Click Yes to link the AKD drive to an NC axis.



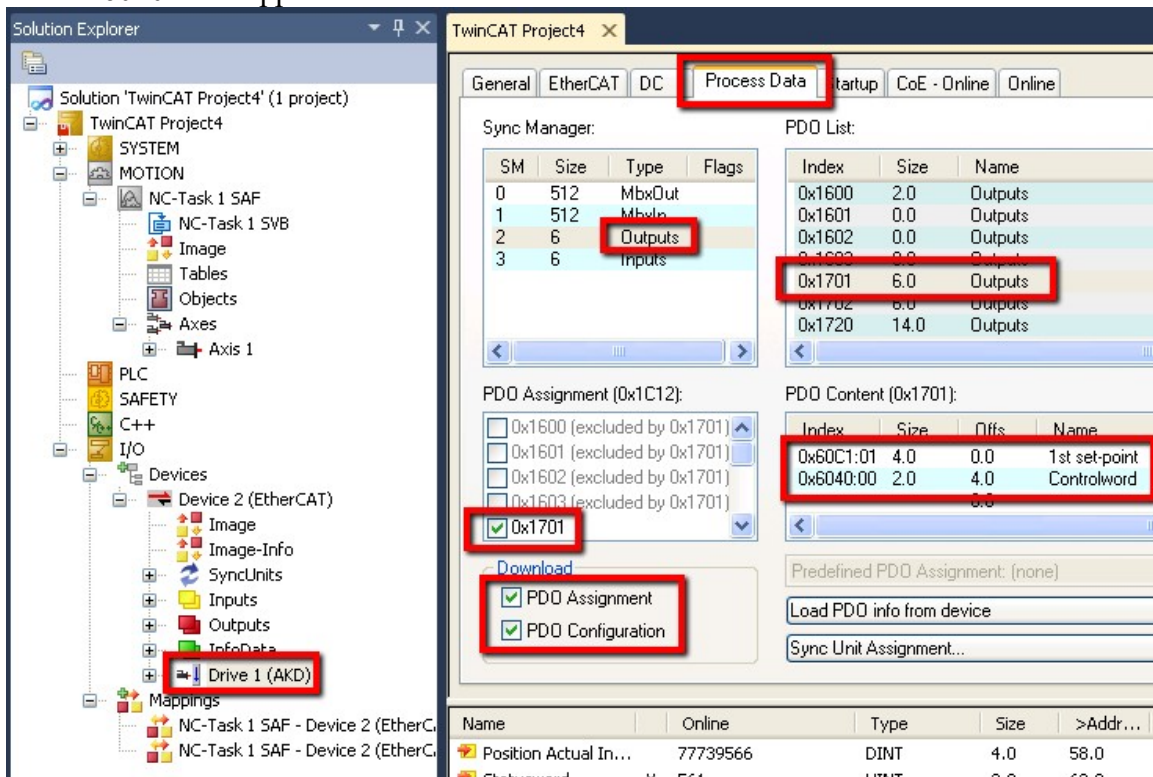
9. Click Yes to activate free run mode.



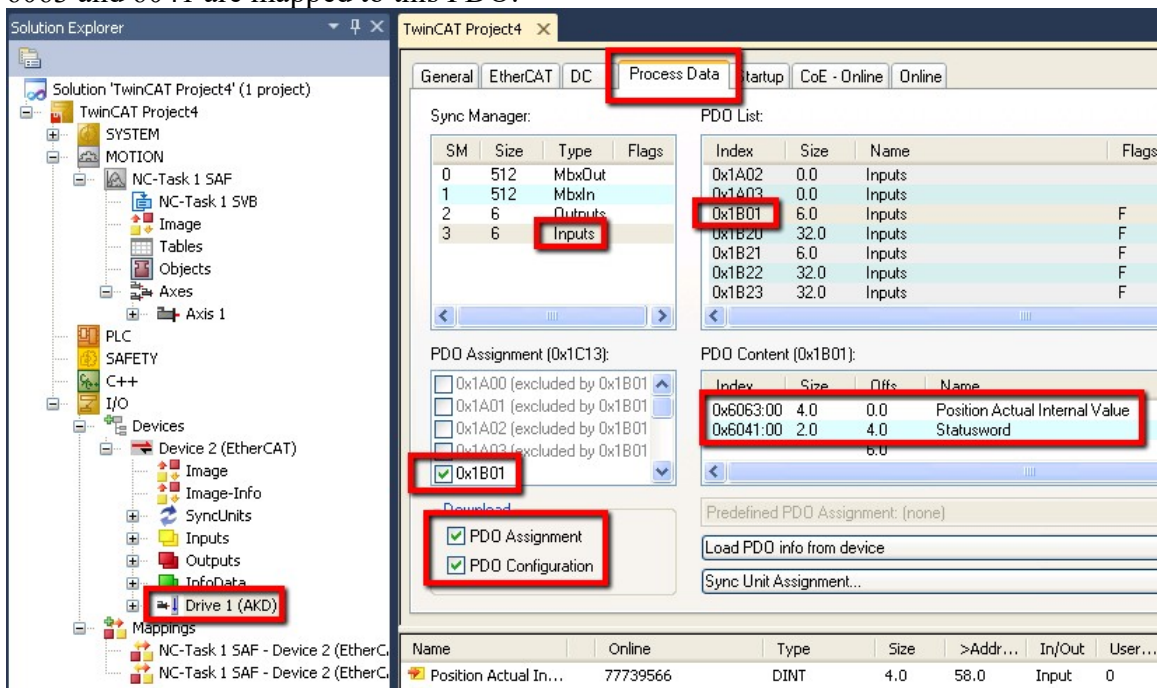
Navigation tree with NC-Task, Axis, and Drive 1 (AKD).



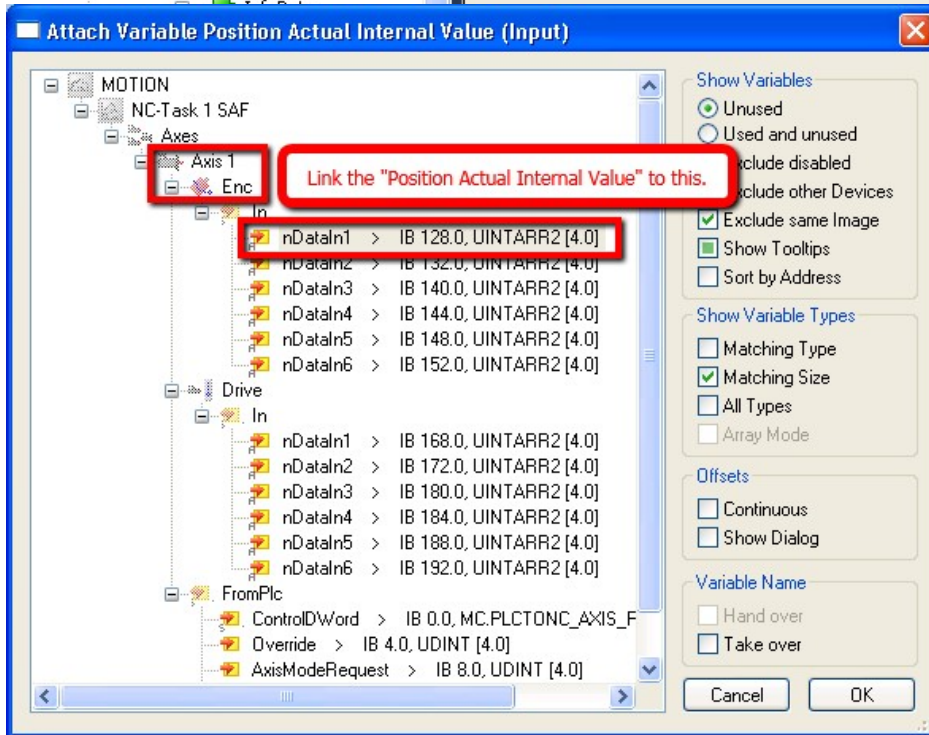
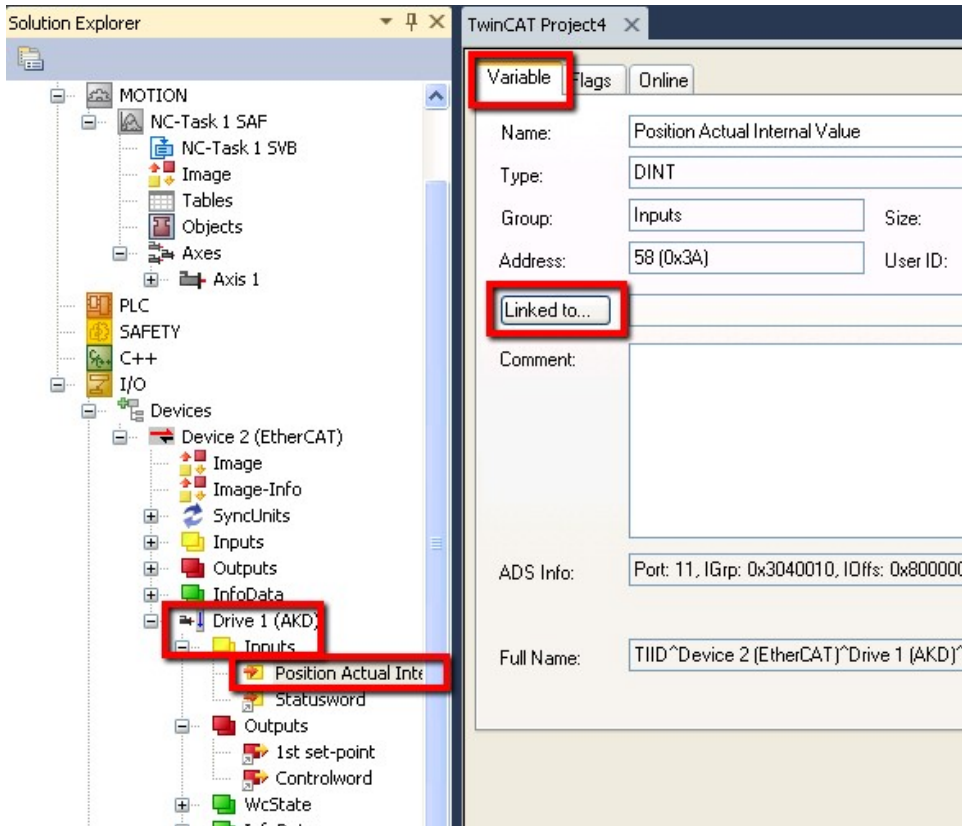
10. Double-click on “Drive 1 (AKD)” and click on the Process Data tab. Check both boxes for PDO Assignment and PDO Configuration. The default output assignment of 0x1701 is the one you need. Notice the objects 60C1sub01 and 6040 are mapped to this PDO.



The default input PDO assignment of 0x1B01 is the one you need. Notice the objects 6063 and 6041 are mapped to this PDO.



11. Link a data word to the Position Actual Internal Value PDO.



12. Link a data word to the 1st set-point PDO.

The image shows two screenshots from the TwinCAT software interface. The top screenshot displays the 'Solution Explorer' on the left and the 'Variable' configuration window on the right. In the 'Solution Explorer', the 'Drive 1 (AKD)' folder is expanded, showing its 'Outputs' sub-folder with '1st set-point' highlighted. The 'Variable' window shows the following configuration:

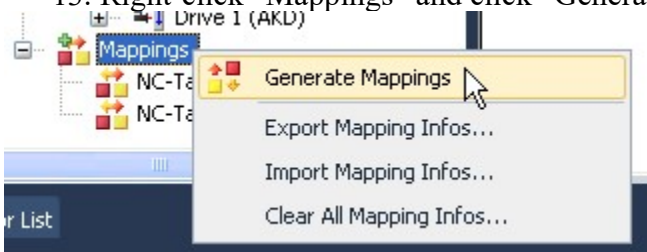
- Name: 1st set-point
- Type: DINT
- Group: Outputs
- Address: 58 (0x3A)
- Linked to...: (empty)
- Comment: (empty)
- ADS Info: Port: 11, IGrp: 0x3040
- Full Name: TIID^Device 2 (EtherCAT)

The bottom screenshot shows the 'Attach Variable 1st set-point (Output)' dialog box. The left pane shows the 'Motion' tree with 'Drive' expanded and 'Out' selected. A red box highlights the 'Out' folder with the text: "Link the '1st set-point' object to this." The right pane contains the following options:

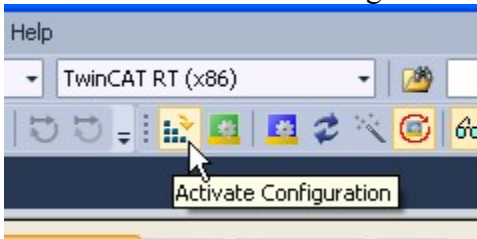
- Show Variables:
 - Unused
 - Used and unused
 - Exclude disabled
 - Exclude other Devices
 - Exclude same Image
 - Show Tooltips
 - Sort by Address
- Show Variable Types:
 - Matching Type
 - Matching Size
 - All Types
 - Array Mode
- Offsets:
 - Continuous
 - Show Dialog
- Variable Name:
 - Hand over
 - Take over

The 'OK' button is highlighted with a red box.

13. Right-click “Mappings” and click “Generate Mappings.”



14. Click Activate Configuration.



15. Click OK to activate the configuration.



16. Click OK to start run mode.



The TwinCAT3 icon in the system tray will turn green for run mode.



Main motion control interface for NC-Task Axis 1.

The screenshot shows the TwinCAT motion control interface for NC-Task Axis 1. The 'Online' tab is selected, displaying the current position (0.0000 mm) and velocity (0.0000 mm/s). The 'Status (log.)' section shows 'NOT Moving' is checked. The 'Status (phys.)' section shows 'In Target Pos.' and 'In Pos. Range' are checked. The 'Controller Kv-Factor' is set to 1 mm/s/mm, and the 'Reference Velocity' is set to 2200 mm/s. The 'Target Position' is set to 0 mm and the 'Target Velocity' is set to 0 mm/s. The 'Jog negative' (F1), 'Jog positive' (F4), and 'Start Position Move' (F5) buttons are highlighted with red boxes. A red box also highlights the 'Click to enable drive' button and the 'Set' button.

17. Disable the position error monitoring.

The screenshot shows the TwinCAT parameter configuration interface for NC-Task Axis 1. The 'Parameter' tab is selected, displaying a list of parameters. The 'Monitoring' section is expanded, showing the following parameters and their values:

Parameter	Offline Value	Online Value
Position Lag Monitoring	FALSE	FALSE
Maximum Position Lag Value	5.0	5.0
Maximum Position Lag Filter Time	0.02	0.02
Position Range Monitoring	FALSE	FALSE
Position Range Window	5.0	5.0
Target Position Monitoring	FALSE	FALSE
Target Position Window	2.0	2.0
Target Position Monitoring Time	0.02	0.02
In-Target Alarm	FALSE	FALSE

The 'Monitoring' section is highlighted with a red box. The 'Position Lag Monitoring', 'Position Range Monitoring', and 'Target Position Monitoring' parameters are highlighted with red boxes. The 'FALSE' values for these parameters are also highlighted with red boxes. The 'Download' button is highlighted with a red box. A red box also highlights the 'Highlight and click Download for each.' text.

18. Enable the drive.



19. Start a position move. Position scaling for 60C1sub01 and 6063 is based on $2^{(FB1.PSCALE)}$ per revolution. Default value is 20, so 2^{20} counts per rev.

