


Convert TC2 Project to TC3

How to convert a TwinCAT2 project on an older Autoflow to TwinCAT3. This needs to be done when updating to Windows 10

 Difficulty **Hard**

 Duration **2 hour(s)**

Contents

Introduction

Step 1 - Get connected to the Camera PC of the machine to be updated

Step 2 - Get a backup of the original TSM file

Step 3 - Get copy of current PLC and Reset project

Step 4 - Convert the TC2 project to TC3

Step 5 - Create the clone to pull the latest tc3Multi and PLC_Reset

Step 6 - Replace the old PLC code with the version control latest

Step 7 - Connect to the Beckhoff Backend PC

Step 8 - Update the EtherCAT Device Adaptor

Step 9 - Add the IO Links

Step 10 - Change the inverterGoFwd links

Step 11 - Copy the Axis Links

Step 12 - Remove the "Interpolate" Axis group

Step 13 - Change V and W axis PLC links

Step 14 - Add the reset link

Step 15 - Ensure the front end has the latest software versions

Step 16 - Update the front end parameters

Step 17 - Update the Control Systems log


Comments

Introduction

The Beckhoff system provides a system for upgrading to TC3 from a TC2 project. This tutorial goes through the steps required to ensure the links and setup of the original TC2 project are copied through to TC3.

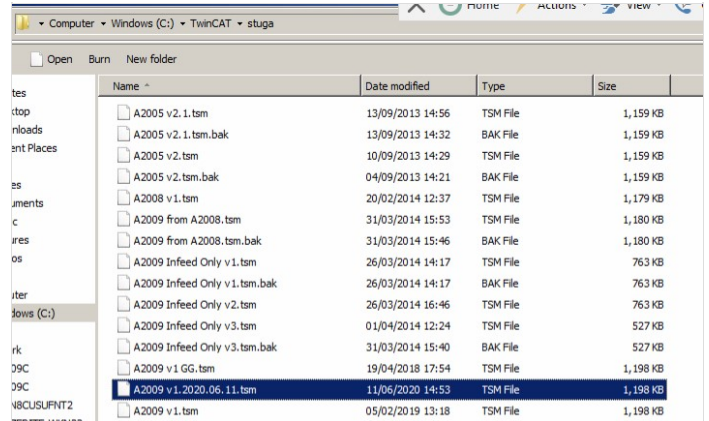
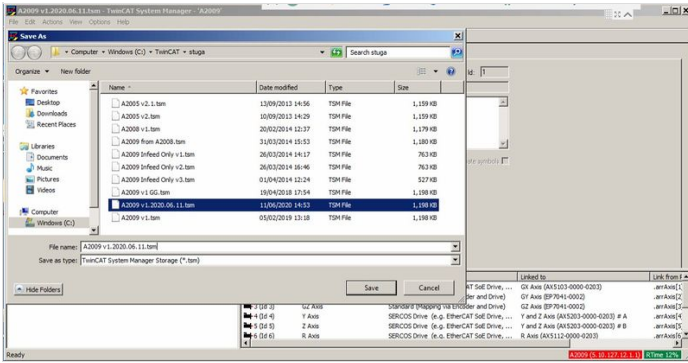
Step 1 - Get connected to the Camera PC of the machine to be updated

You will need to get a backup of the TC2 project from this machine, and use it to set up all the correct IO links in the TC3 project

 ...If you do not have access to the original camera PC, you will need to get hold of an old PC (normally windows 7 or windows 8 PCs) with TwinCAT2 installed on it, and use this to connect to the Beckhoff PLC using "Open From Target". There are a number of old "CNC" Pcs in the setup room that can be used for this

Step 2 - Get a backup of the original TSM file

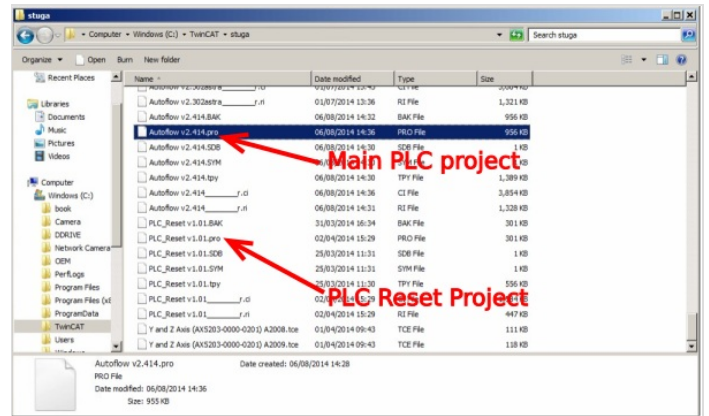
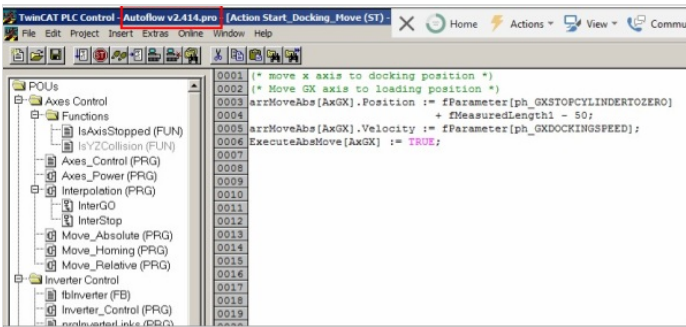
1. Dial in to Camera / VM PC
2. Open System manager
3. File->Save As
4. Rename it to [build number],[todays date]
5. Copy to c:\twinCAT\stuga\ on the "New" camera PC



Step 3 - Get copy of current PLC and Reset project


1. Open the PLC Control program on the camera PC
2. Note the version of software currently running (.pro)
3. Find the .pro file in c:\twinCAT\Stuga\
4. Copy to c:\twinCAT\stuga\ on the "New" camera PC
5. Also copy the latest PLC Reset project

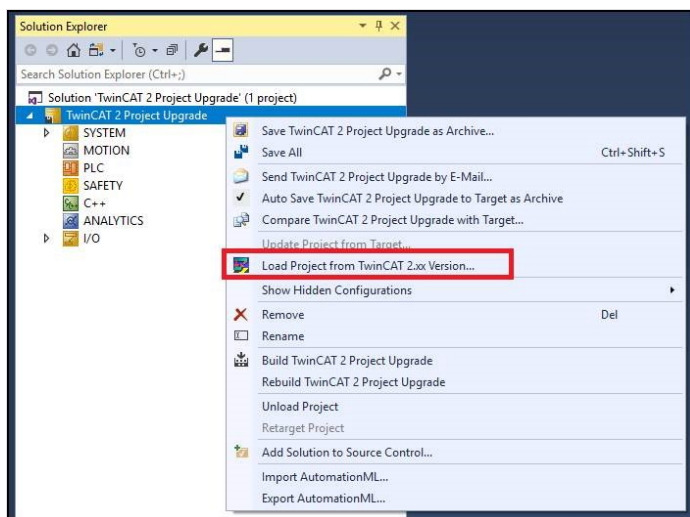
...If the camera PC is not available, you can lookup the last installed version from the Control Systems Log and find the version backup from G:\Design\TwinCAT\Previous Versions



Step 4 - Convert the TC2 project to TC3

1. Open Visual Studio
2. Create a new TC3 project called [BuildNo] in c:\TwinCAT\Stuga\
3. Make sure "Create Directory..." is Unticked
4. Right Click on the project name and select 'Load Project from TwinCAT 2.11 Version...'
5. Click Cancel on the two windows asking to convert the PLC project
6. Ignore or cancel any warnings about libraries (this part will be replaced later)

 ...Once created, you will have a copy of all the devices and boxes in the project with the correct naming.



Step 5 - Create the clone to pull the latest tc3Multi and PLC_Reset

- Create the clone in c:\TwinCAT\[BuildNo]\Source
- If an error is produced after cloning, just use the "Add" function to add the clone

Step 6 - Replace the old PLC code with the version control latest

1. Delete the old PLC projects
2. using Add existing item, add the tc3Multi then PLC_Reset projects from c:\TwinCAT\[BuildNo]\Source.
3. Ensure Use Original project Location is selected
4. Build the solution to create the instances ready for linking
5. Ensure the Port numbers are correct (851=tc3Multi, 852=PLC_Project)

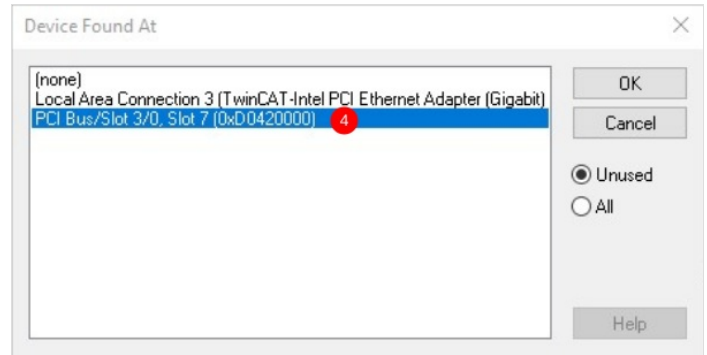
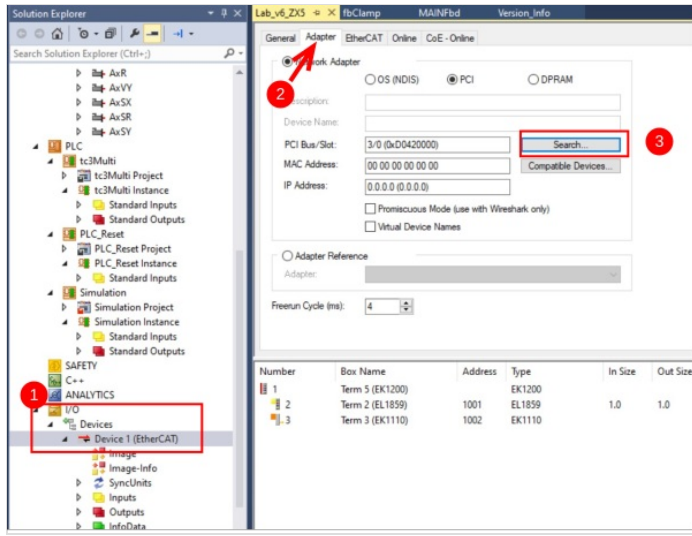
Step 7 - Connect to the Beckhoff Backend PC

Add a new route

Step 8 - Update the EtherCAT Device Adaptor

Navigate to the Adaptor settings and search for the correct one on the new Beckhoff PC

...When you converted the TC2 project, it imported all the etherCAT boxes, but critically, it also imported the "EtherCAT Device". This is the hardware spec of the original Beckhoff PC, with a MAC address, etc. You now need to change this in the project to the EtherCAT device on the new Beckhoff PC



Step 9 - Add the IO Links

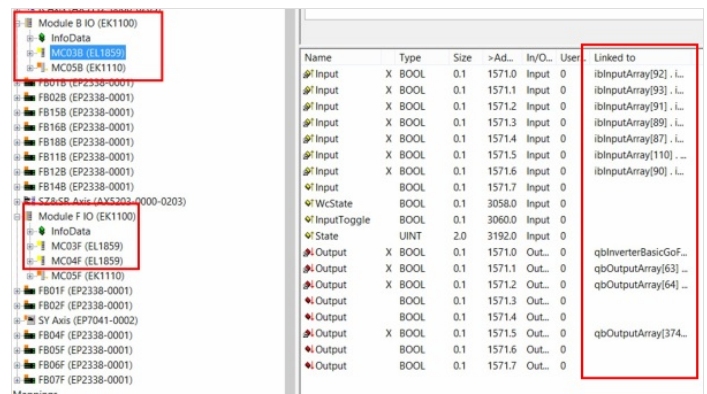
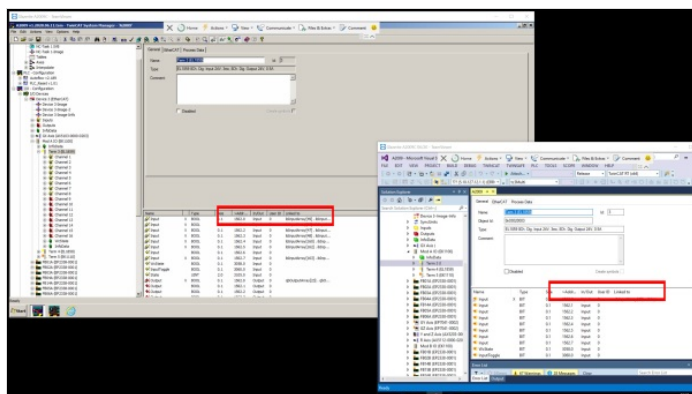
...This is a LOT easier on a dual screen PC!

...Regrettably, the upgrade will not keep all the IO links, so these need to be entered again manually

Using System Manager on the Camera PC, create new copies of all the links on all devices from the System Manager to the new project.

...A lot of the Autoflows have been modified on the EtherCAT network - eg a sensor input may have blown and the sensor has been moved to a different port. Using this method ensures you get exactly the same setup.

...Don't miss the links on the "Slices", these are one level down on the IO Device Tree



Step 10 - Change the inverterGoFwd links

TC2 software used a system of inverter objects to control the spindles, saw blade and extractor. The mapping will show InverterGoFwd mapping.

These need to be changed to the correct output numbers for the outputs in question.

On an Autoflow, these are

Slice MC03B (ModuleB)

Ch0 - Y62 Spindle Inverter

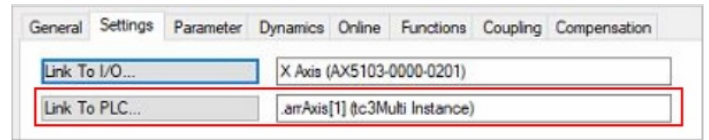
Slice MC2F (module F)

Ch1 - Y97 Saw Blade

Ch 2 - Y98 Extractor

Step 11 - Copy the Axis Links

The PLC links will be missing - reinstate them as per System Manager on old Camera PC

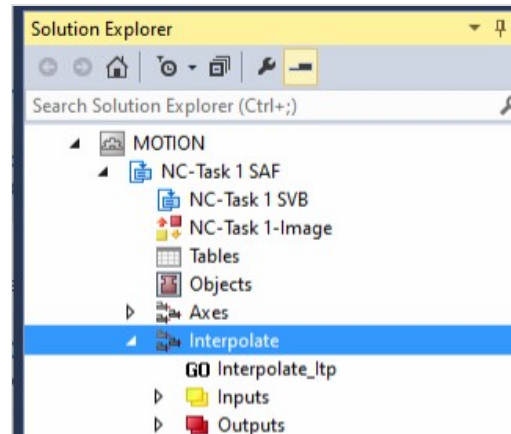


If The 'Link to PLC' field is not viewable on Twincat 2 project use the below guide for the correct links required:

Naming Convention for Axis Drives

Step 12 - Remove the "Interpolate" Axis group

Right click and select delete



Step 13 - Change V and W axis PLC links

When converting for a ZX4 machine, the V and W axis links will need to be changed

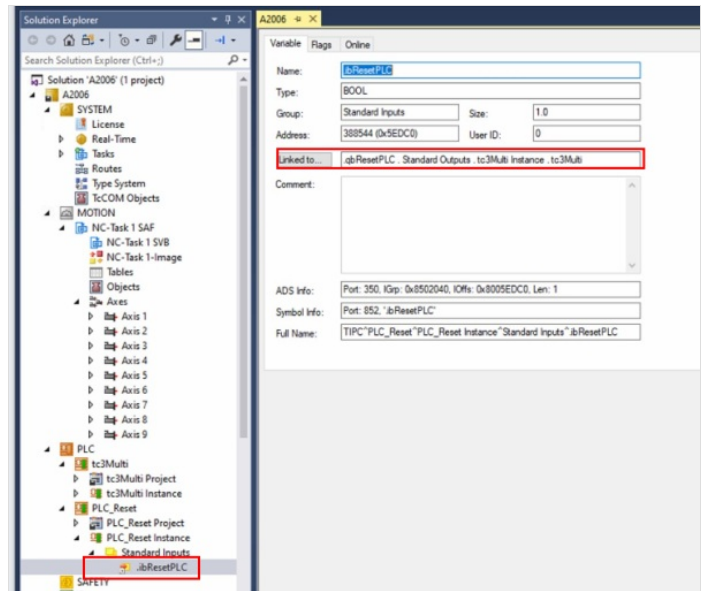
V = arrAxis[11]

W = arrAxis[12]

i ...This is needed because the original ZX4 number designations (7&8) overlapped those used on the SR and SY axis. This created a problem on the ZX5, because it used both a V axis and SR&SZ. Decision was made to give V and W their own axis numbers for future compatibility

Step 14 - Add the reset link

Set a link from ibResetPLC on PLC_Reset to qbResetPLC on tc3Multi



Step 15 - Ensure the front end has the latest software versions

Step 16 - Update the front end parameters

In params.saw, the following parameters must be updated

controllerType=5

amsnetId= [AmsNetId of the new Beckhoff PC]

twinCAT Address=[AmsNetId of the new Beckhoff PC]

AllWasteAtStart=1

useSawForYNotch=1

Step 17 - Update the Control Systems log

Update

- Front End PC and OS
 - Back End PC and OS
 - Software versions
-