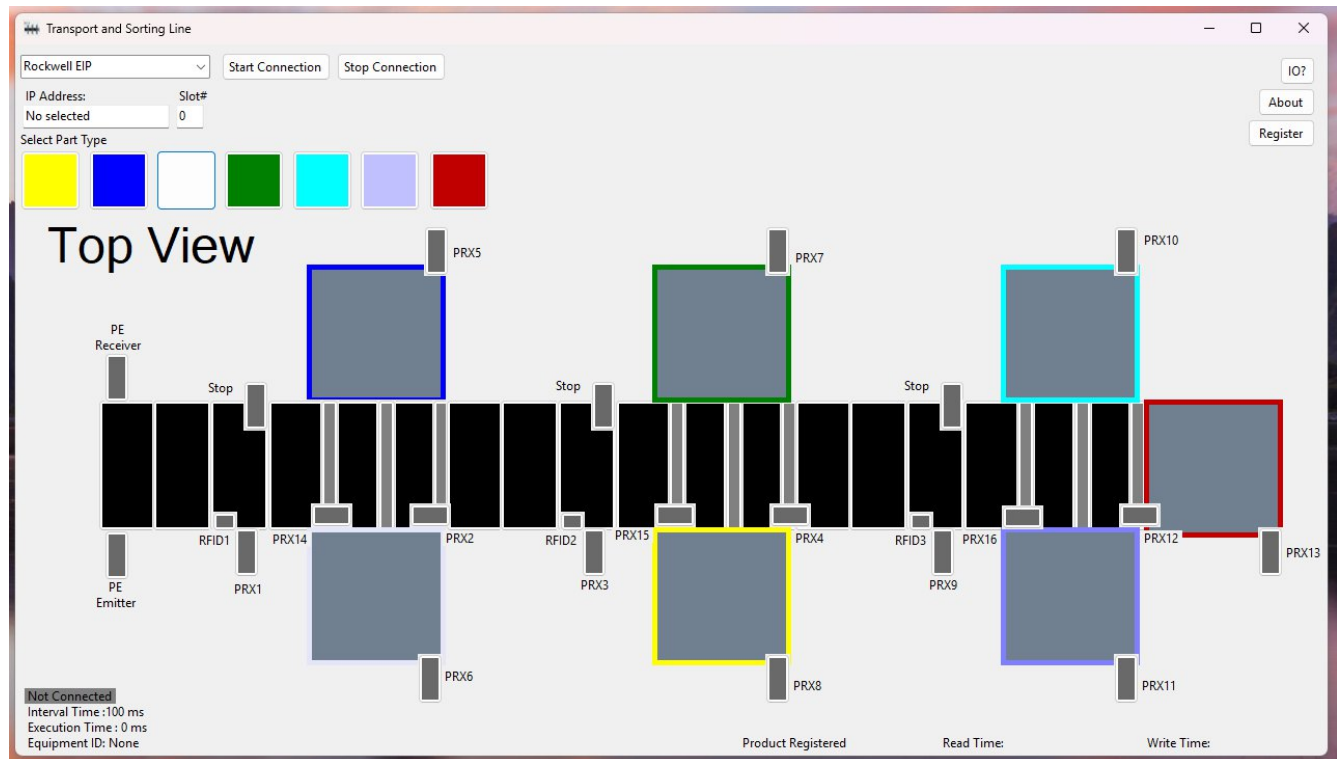


Setup a Project with TwinCAT 4026

On this training we will focus on a transport and sorting line.

The model is a digital representation of this process. Which write and read PLC runtime information. This has the same behavior as a real equipment running base of sensor and output status. The model simulation process consist on sorting seven different boxes. The objective is to sort the box of the color on to matching color table.



Sorting and Storage Line Model

Hardware description:

The model has six horizontal conveyors sections. Three stop cylinders to stop the boxes on position before storage. Three RF controllers to read the part data. Three vertical conveyors to move the parts up and down to the storage location. Total of Seven different tables to deliver the parts in position. It has a total of 14 Part Present Sensors which has a particular purpose.

Programming this digital model, the student will learn basic and advance programming of TwinCAT 4026. The training is with the objective to learn software design for automation systems.

The model can connect to multiple PLC (only one at the time). It support Siemens PLC Sim Advance, Siemens (GET and PUT), Rockwell, Mitsubishi (MX Component 5) and Beckhoff.

Chapter 1 – Setup a Project with TwinCAT 4026

The module requires a license for function over 15 minutes. It can be started again and the configuration settings are save.

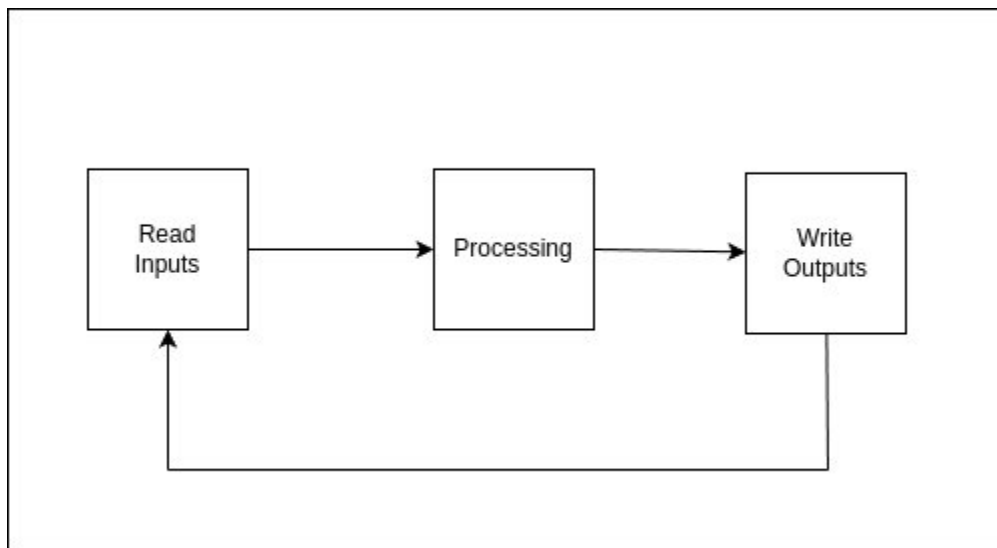
What is a PLC?

PLC means Programmable Logic Controller. It is a computer which automation production system. In a big picture a PLC is an industrial computer designed to run automation process for a long period of time. Typical PLC has a life span at least 10 years.

Exist multiple manufacturers of PLCs the most popular brands are: Siemens, Rockwell, Mitsubishi, Omron and Beckhoff.

In order to automate the process the PLC needs to acquire signals from inputs to the process and write outputs to actuators to automate the process. In order to do that all PLC has a scan cycle. The scan cycle consist on the acquisition of the signals, processing and Writing the Signals to the hardware.

Scan Cycle Process



The beginning of the scan cycle the inputs of the modules are read. The middle of scan cycle the controller execute the logic using the status of the inputs. The end of the scan cycle the Outputs states are written to the real hardware.

Installing TwinCAT 4026.

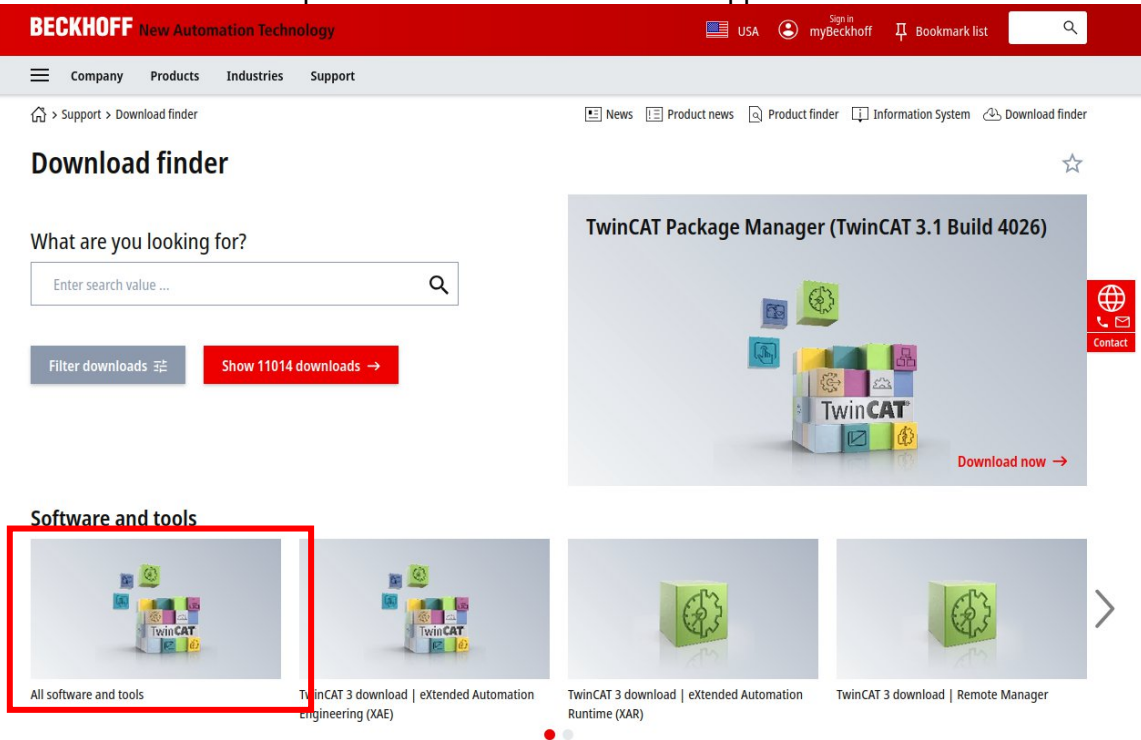
The student need to download the package manager for install TwinCAT 4026.

TwinCAT is royalty free software, which make it very attractive to teach student around the world how to use it.

Chapter 1 – Setup a Project with TwinCAT 4026

Navigate <https://www.beckhoff.com/en-us/support/download-finder/> . Click on the option that shows All software and tools.

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TwinCAT Package Manager (TwinCAT 3.1 Build 4026)

Download now →

Software and tools

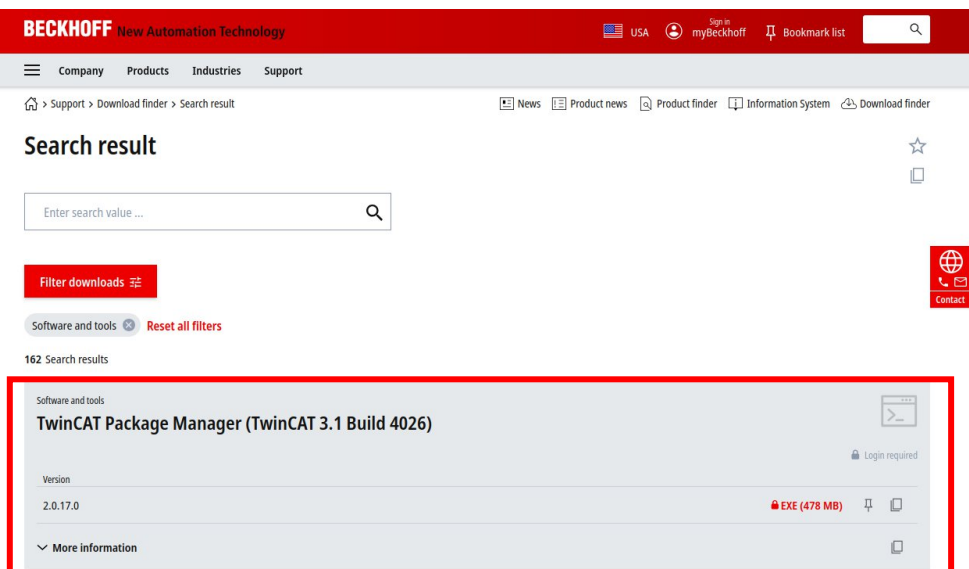
All software and tools

TwinCAT 3 download | extended Automation Engineering (XAE)

TwinCAT 3 download | extended Automation Runtime (XAR)

TwinCAT 3 download | Remote Manager

Find the TwinCAT 4026 package manager. The simulation models only work with the version of TwinCAT 4026.



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162 Search results

TwinCAT Package Manager (TwinCAT 3.1 Build 4026)

Version

2.0.17.0

EXE (478 MB)

More information

Chapter 1 – Setup a Project with TwinCAT 4026

The student is required to create an account to be able to download the software.

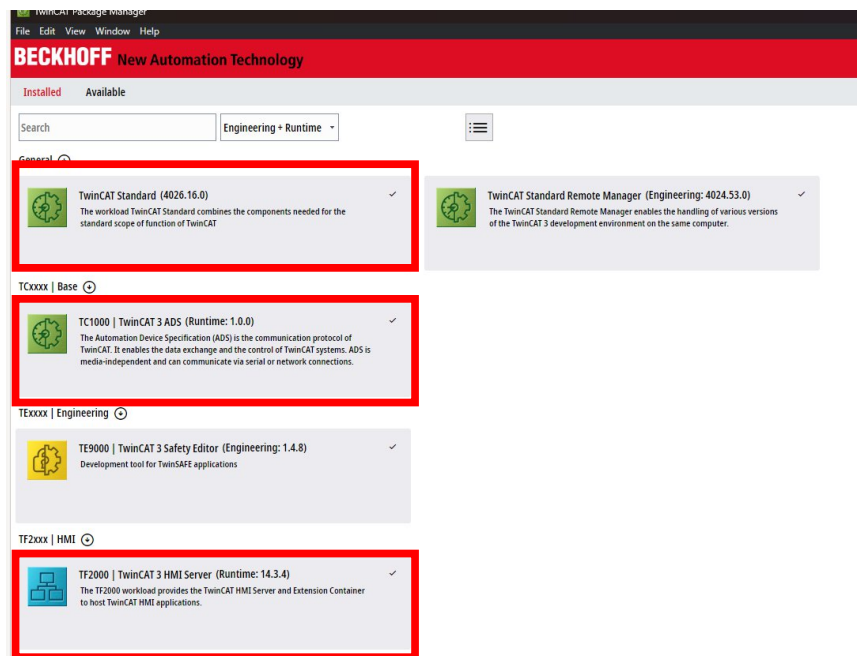
Install the package manager using windows prompt.

Package Manager:



Packages required to be installed.

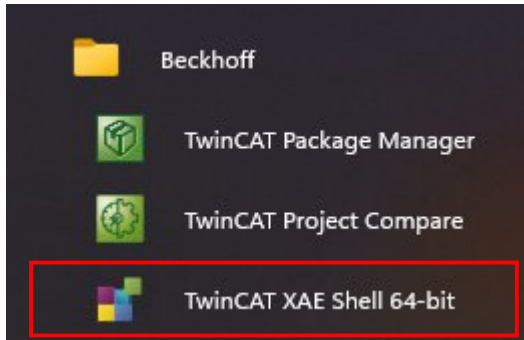
1. TwincCAT Standard 4026.16
2. TwinCAT 3 ADS
3. TF2000 | TwinCAT 3 HMI Server



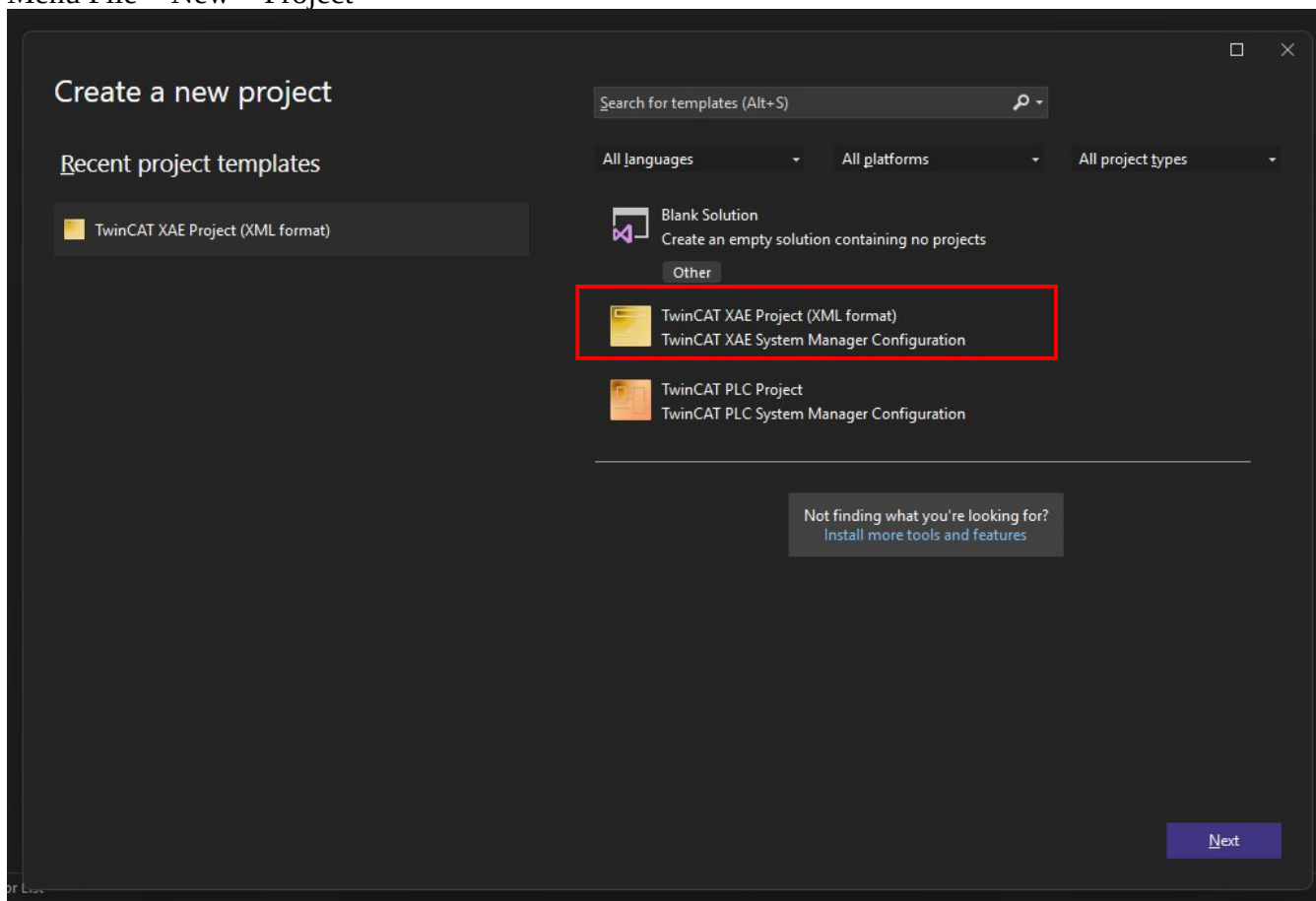
Chapter 1 – Setup a Project with TwinCAT 4026

Setup a new TwinCAT Project

Open TwinCAT XAE Shell 64-bit, navigating on Programs > Beckhoff.



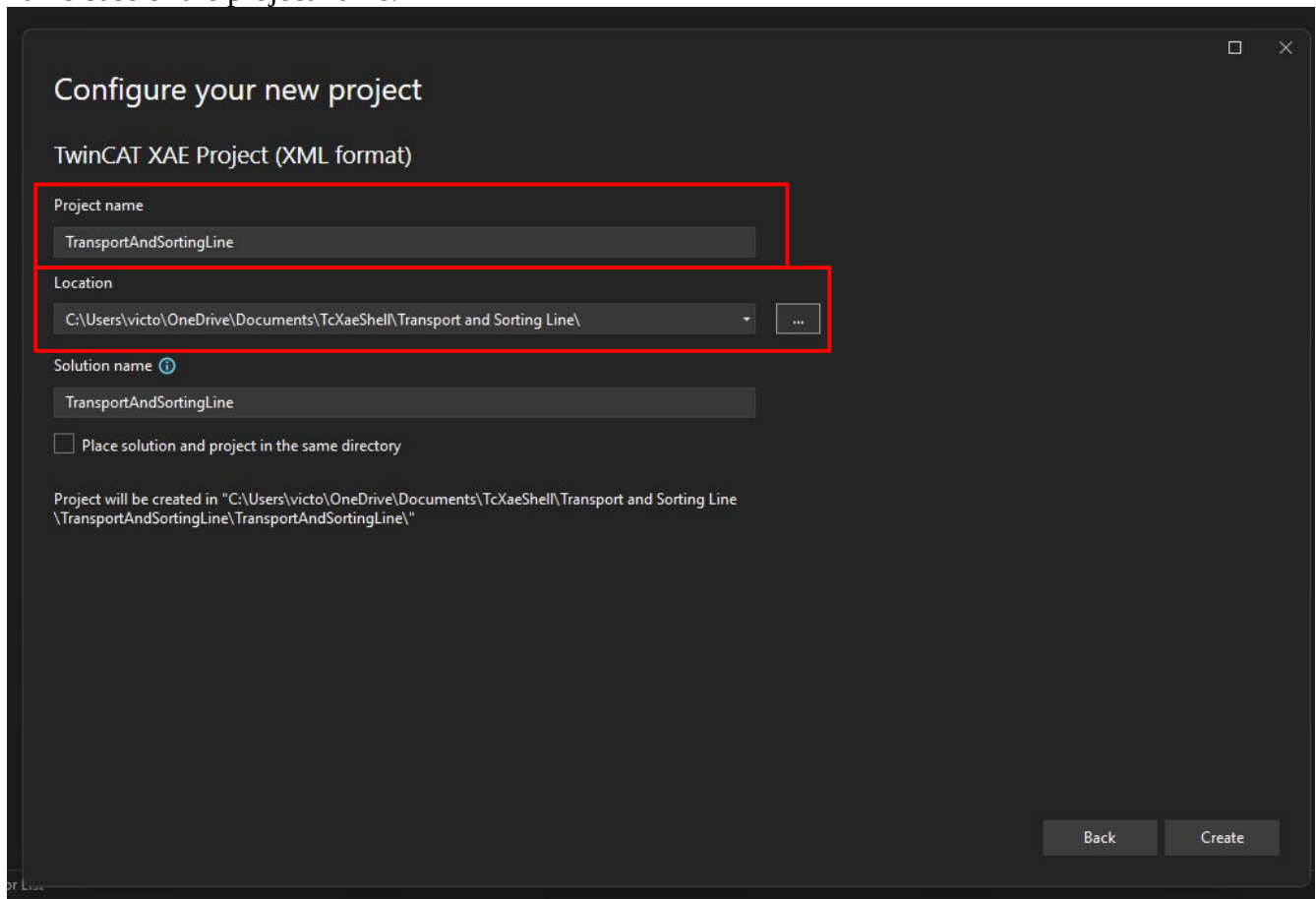
Menu File > New > Project



Select TwinCAT XAE Project, then select next. Give the project a name, select the desired location and give a name to the solution.

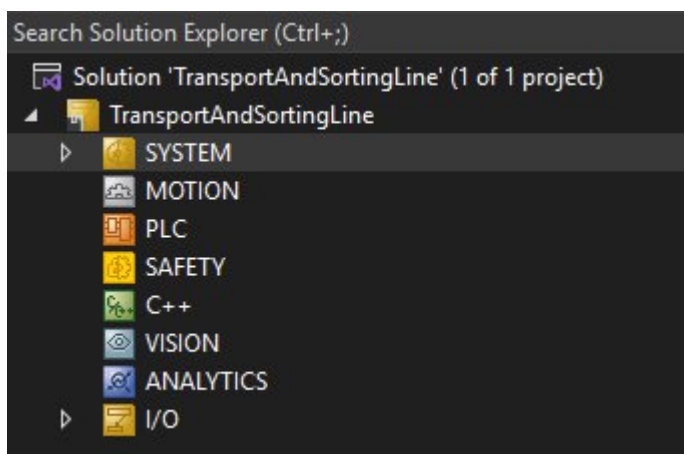
Chapter 1 – Setup a Project with TwinCAT 4026

In this case, we are calling the project name Transport and Sorting Line. Solution name get a default name base of the project name.



Select the create button.

The project has been created. TwinCAT project has multiple items on the tree.

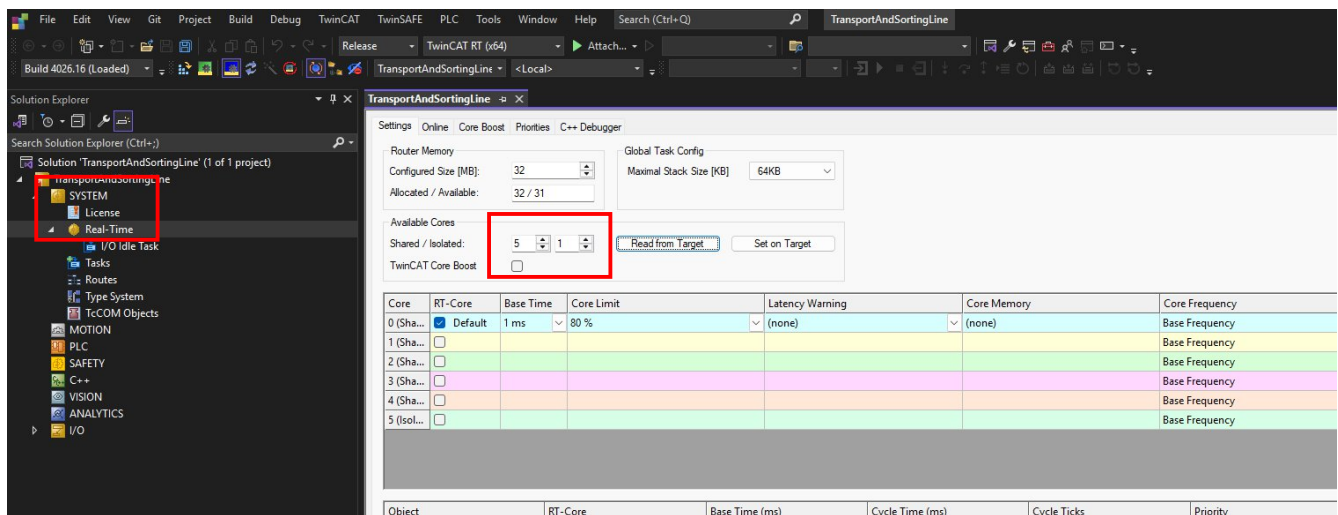


Chapter 1 – Setup a Project with TwinCAT 4026

We are only going to work System and PLC for this training.

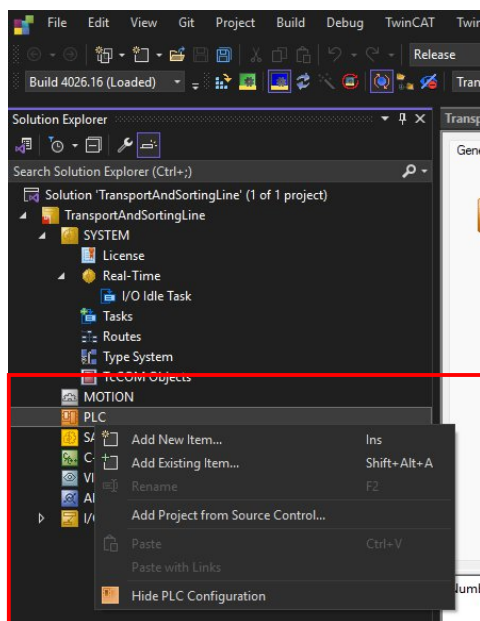
Select System and Real Time.

Make sure to configure your settings with at least one core as isolated. TwinCAT controllers offer multi-core capabilities. Different programs can be executing on different cores of the computer. This convert TwinCAT on a great controller for very high speed process. Typical most of the PLC scan cycles are around 5 ms up to 150 ms, in contrast TwinCAT controller scan cycles are on magnitude of few microseconds (1000 times faster).



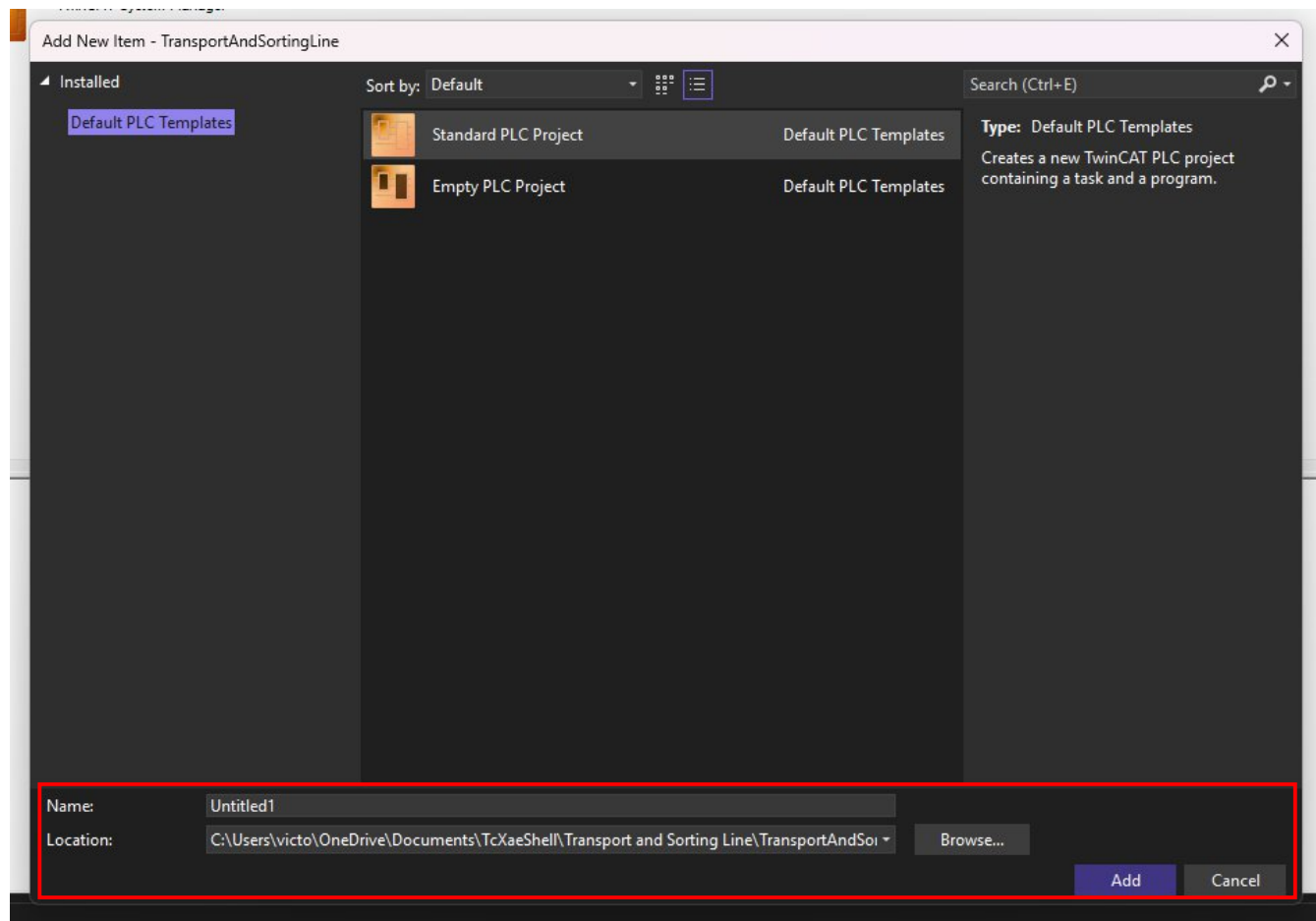
Real Time Settings

Right Click on the PLC and select add a new item.



Chapter 1 – Setup a Project with TwinCAT 4026

Select Standard PLC Project

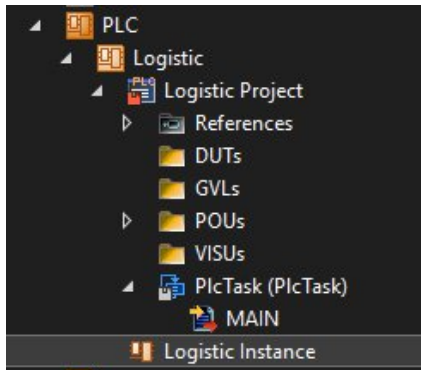


Name the PLC according to the station. We are selecting the name of Logistic PLC. Use the default location which should be under the TwinCAT project created before.

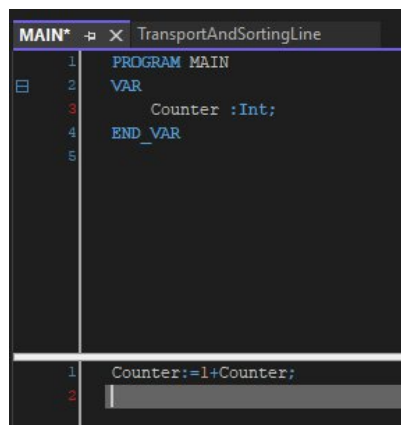
Congratulations your first Beckhoff PLC has been created.

Chapter 1 – Setup a Project with TwinCAT 4026

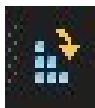
Now expand the Logistic Project to get access to the main program.



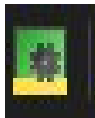
Go to main task and add a variable called Counter and logic as show below.



Icons descriptions



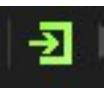
- Used to Activate the Solution on the target controller.



- Start the Runtime on the target controller..



- Put the Runtime on configuration on the target controller.



- Log in on the target controller.

Chapter 1 – Setup a Project with TwinCAT 4026

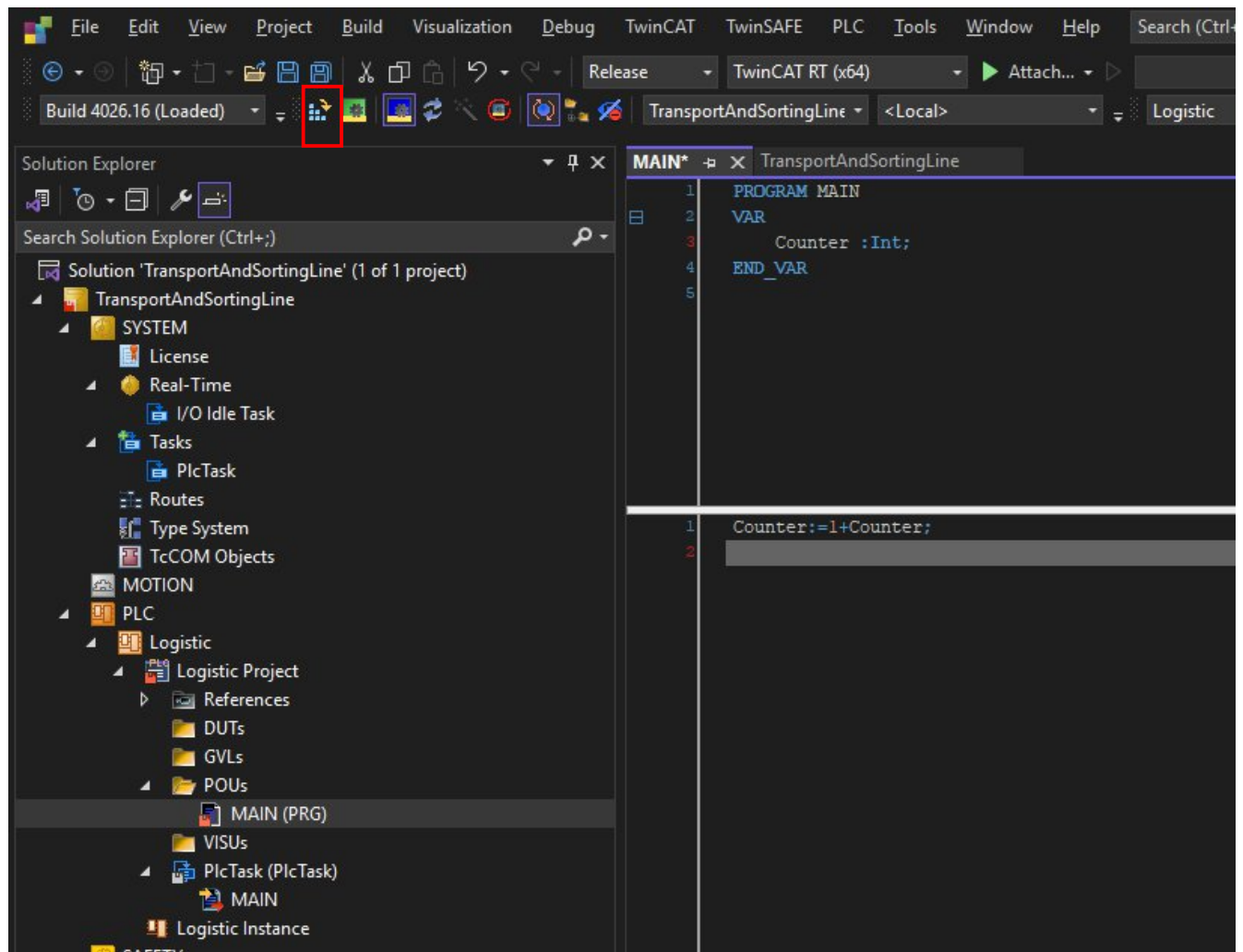


- Stop the Runtime execution on the target controller.

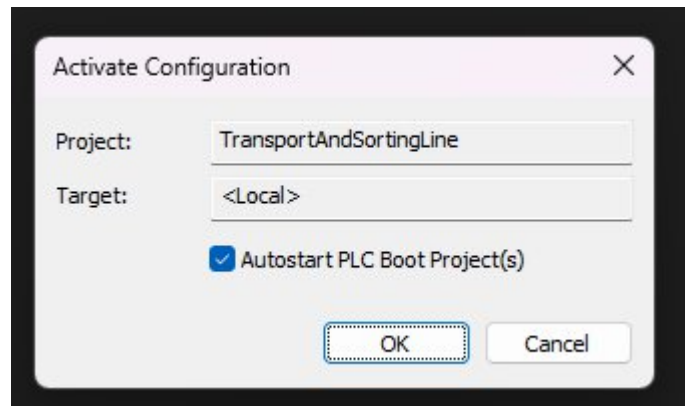


- Logout from the target controller.

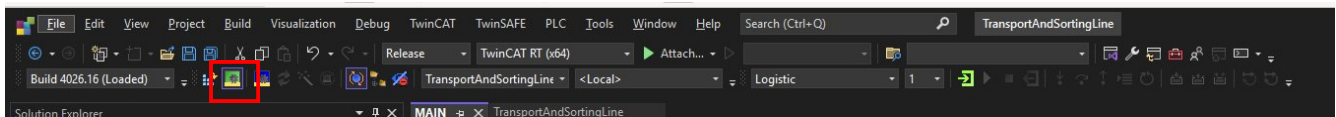
Activate the project using the blue brick square.



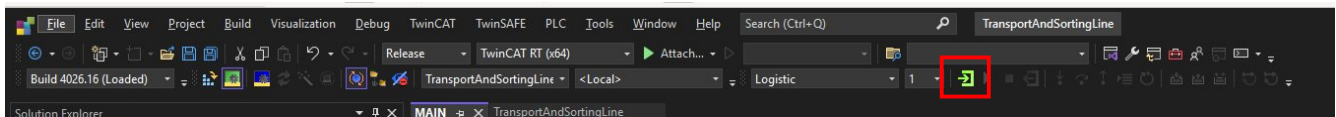
Chapter 1 – Setup a Project with TwinCAT 4026



Restart the runtime on run. Selecting the gear with green color.



Now attach the PLC project to the controller with the green arrow.



We finished our first program. Please watch how the counter is incrementing.

