



Twincat Library: Defining cyclic telegrams

Application Note AN104

Version	Date	Editor	Comment
000	2017-11-21	mvx	Cyclic data as available with firmware 3.2.0
001	2019-12-13	mvx	Simplify description

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1 Target and Purpose

This [application note](#) describes how data can be cyclically exchanged with EtherCAT devices. For Tri-Link devices, refer to AN105. The axis module of an EtherCAT device [already exchanges](#) basic information of a drive, such as states and actual positions. Further extensions are available for two situations.

- An extended axis module contains additional information when using TwinCAT touch probes. [This is not part of this application note.](#)
- This application note describes further extensions to publish flexible cyclic PDO data [from between](#) the device [to and](#) TwinCAT, as available since FW 3.2.0

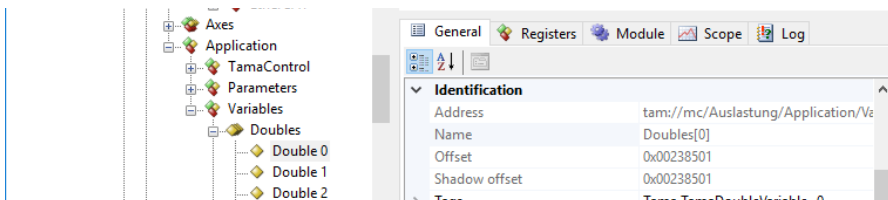
[Please note that currently only 32 bit registers can be exchanged with this method.](#)

2 Find the COE address

First we have to find the COE address of the register that should be cyclically exchanged with TwinCAT.

Triamec EtherCAT drives support two register ranges. The first set is published to TwinCAT by the standard COE-Information method. As a consequence, these are shown in the TwinCAT tab “COE-Online”. A second range is not shown directly. This large set of registers is usually accessed using the TAM System Explorer when tuning the axis-motor-drive system. Nevertheless, the registers can be accessed from TwinCAT by the same method as those published by the COE-Information method.

Open the TAM System Explorer and select the register in the tree view to your left. Use the tab “General” and find the entry “Offset”. The 16 bits [23:8] are the index and the lower 8 bits are the subIndex.



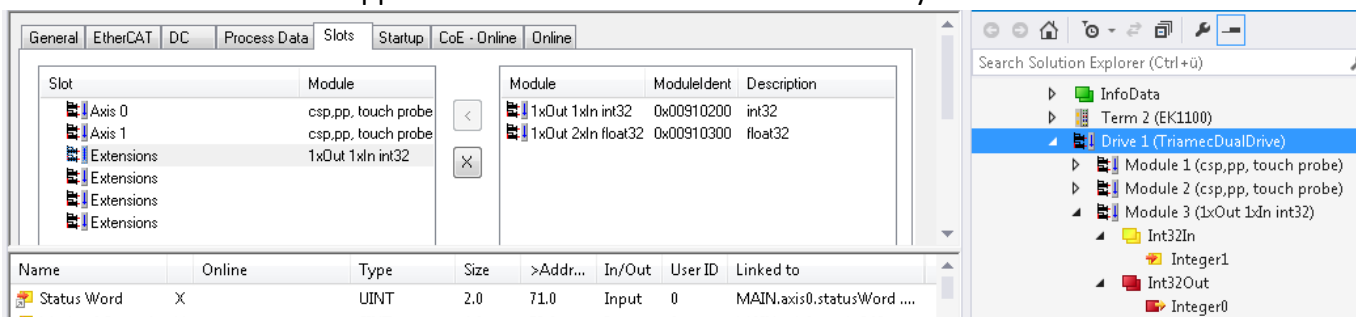
~~Note: Most registers are 32-Bit wide. Some registers are 64Bit wide (mainly positions). The concept of arrays is~~

- ~~REAL or INT array — indices {0, 1, 2, ...} — use subIndices = {1, 2, 3, ...}~~
- ~~LREAL array — indices {0, 1, 2, ...} — use subIndices = {1, 3, 5, ...}~~

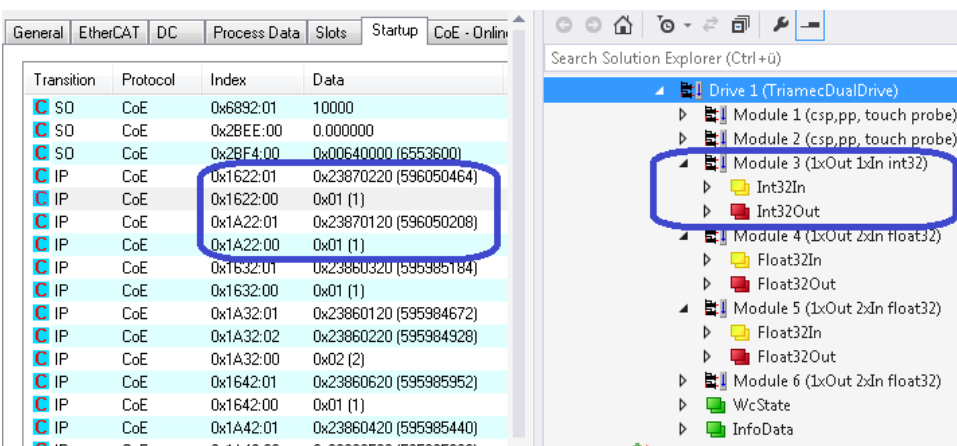
3 Configuration of the cyclic data

We will be using the slot mechanism of TwinCAT for PDO assignment. In the background of TwinCAT, this will fill the PdoAssign registers 0x1C12 and 0x1C13. We specified 6 slots in the ESI file. Indices k=0 and 1 correspond to axis 0 and 1 modules. ~~Tand~~ the four extensions correspond to indices k=2..5. The following example shows how to use the first extension (k=2). The remaining extensions may be used similarly.

- Open *Slots* (see figure below),
- Select the first extension,
- Select one choice from the right list for integer or float variables.
- Use "<" to add this choice to the extension.
- The new variables will appear as an additional module k+1 of the cyclic interface of the drive.



Next we must specify, which ~~The~~ drive registers are to be published and received. C~~are chosen in~~ the TAB "startup". Highlighted is the module k=2, which configures Module 3=k+1 in the IO-section to your right.



- 0x16k2:01 configures the an integer register for direction TwinCAT → drive
- 0x1Ak2:01 configures the an integer register for direction drive → TwinCAT

In this sample, w~~We~~ chose the word 0x23870220 for 0x1622:01. The upper 16bits (here 0x2387) are the COE index. Bits 15:8 (here 0x02) are the COE subIndex. Use chapter 2 to find the COE index of your application. The lowest 8 bits (here 0x20) are the length of the register. Currently, only 32Bit registers are supported. Choose the value zero 0x00000000 if no value should be published from TwinCAT to the drive. Repeat the same for 0x1A22 for the other direction.

After activating the project, the cyclic data will be exchanged.