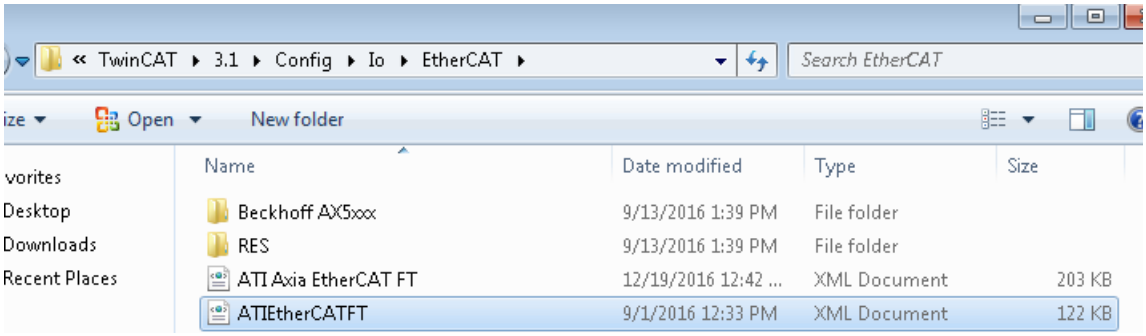
Document last edited: 11/17/2017 by Robert Rainey

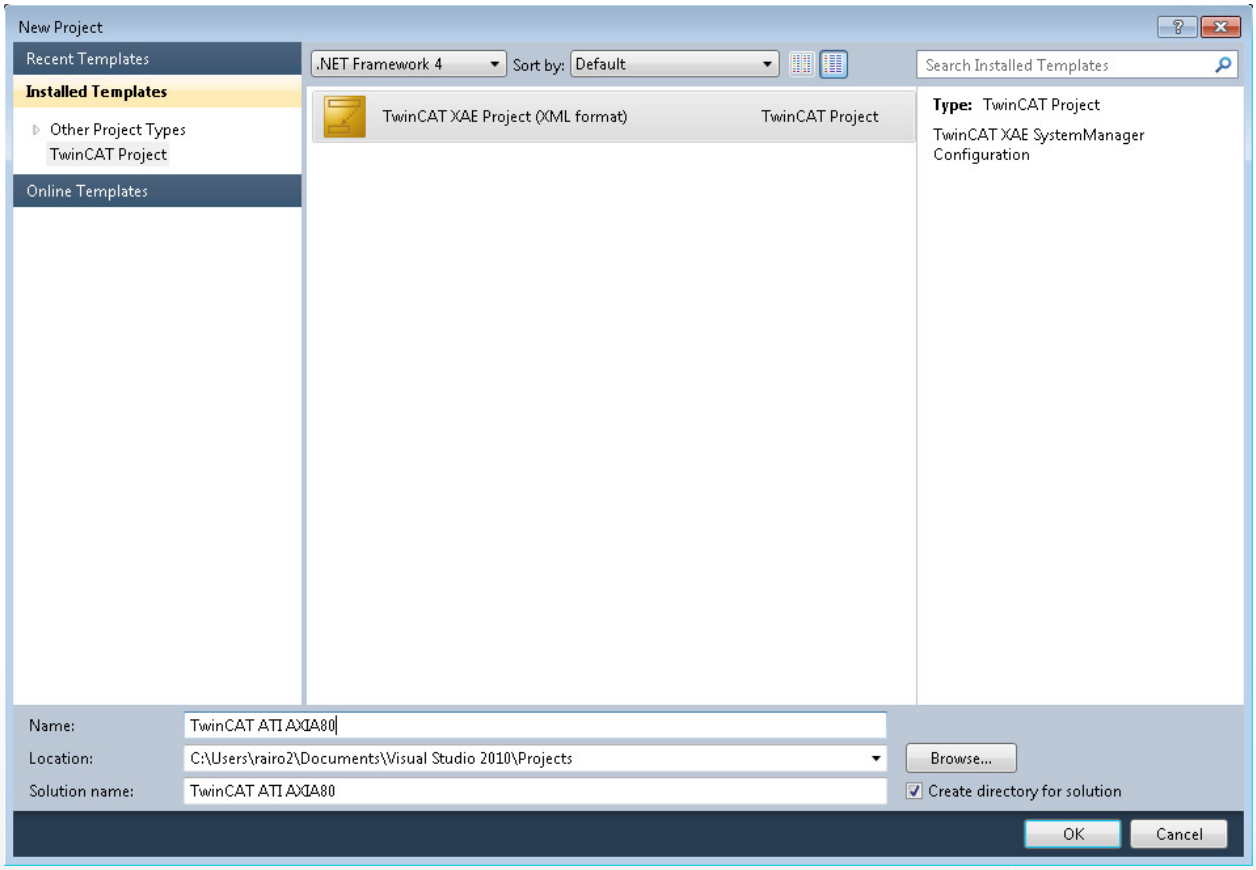
Using TwinCAT 3.1 to communicate with the ATI EtherCAT F/T Sensor:

1. Copy the ESI ("EtherCAT Slave Information") .xml file into TwinCAT's ESI folder, usually "C:\TwinCAT\3.1\Config\Io\EtherCAT"

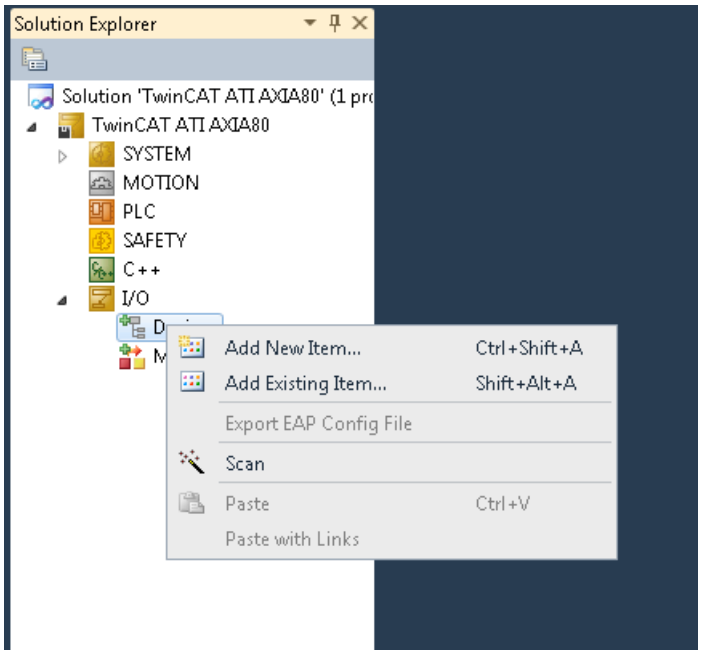


Note: Axia80 and ECATOEM/ECAT sensors have a different ESI file

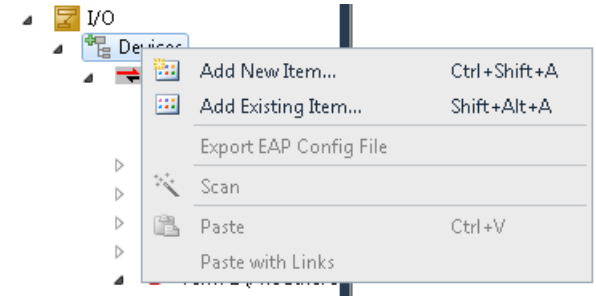
Create new project



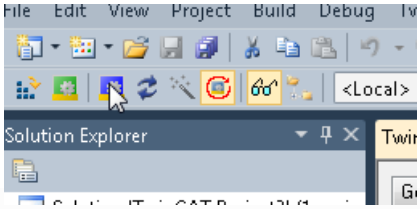
Scan Devices



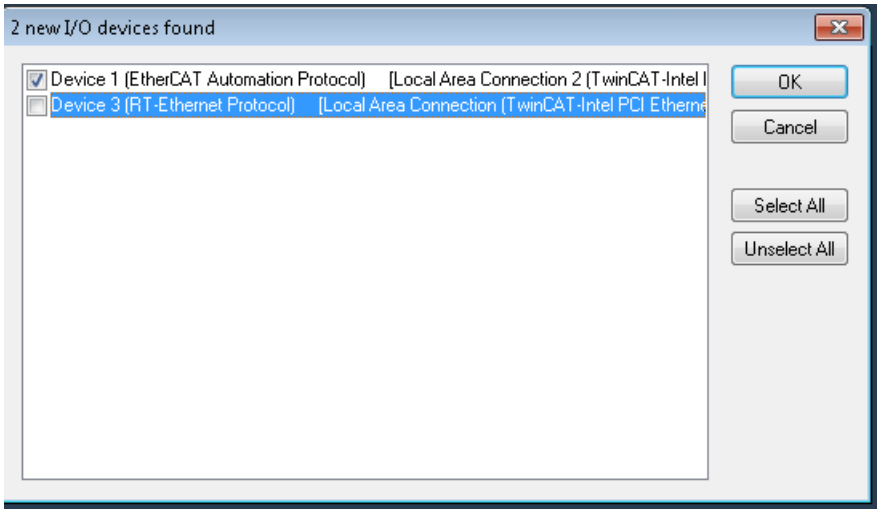
If Scan is not available(greyed out)



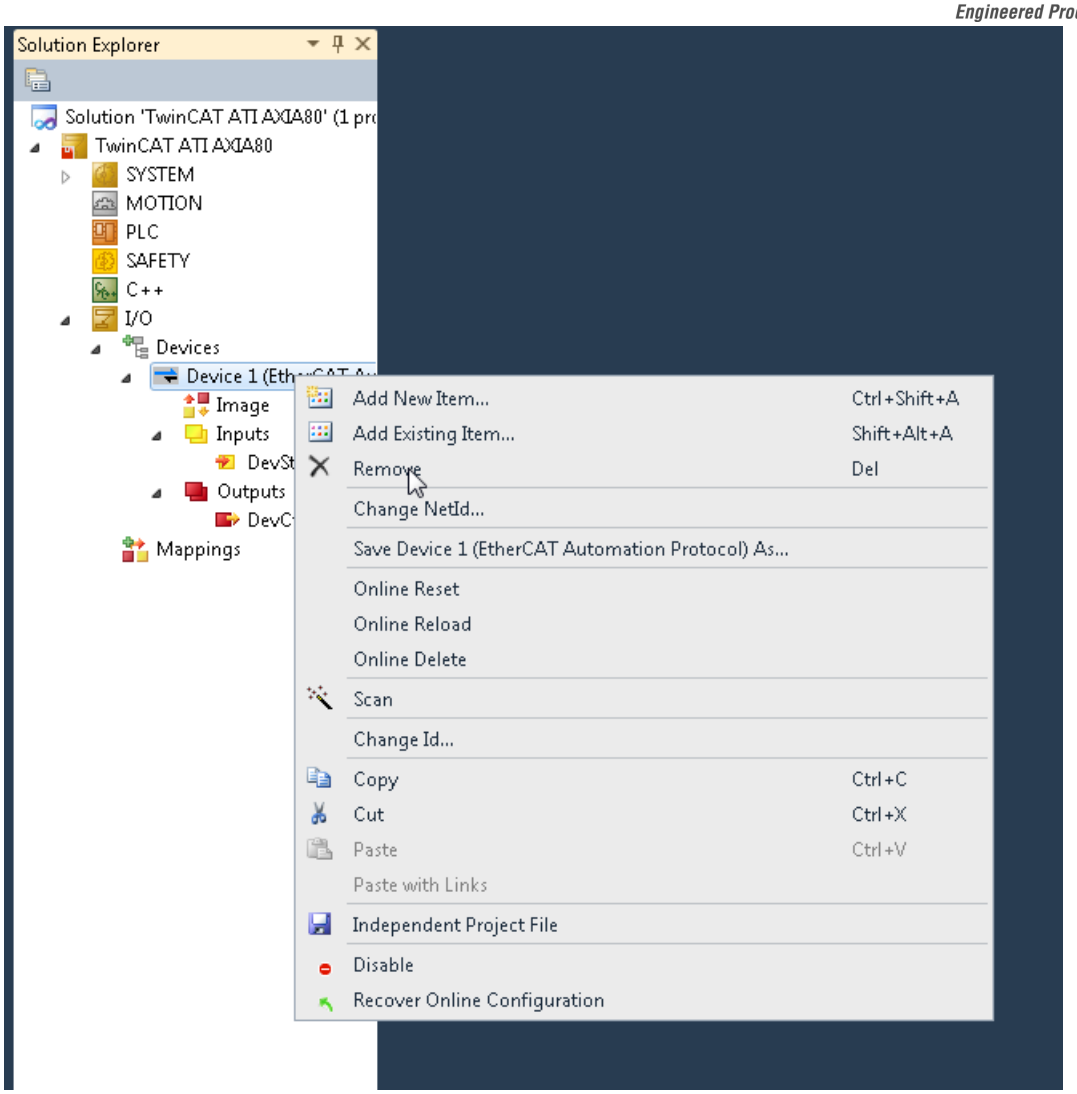
Click the following (Tooltip says restart twincat (config mode))



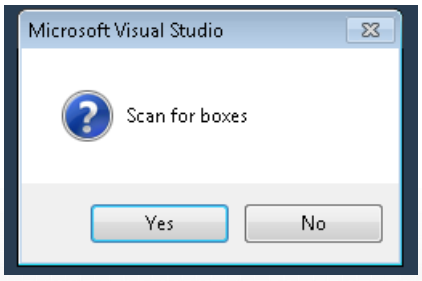
Select the EtherCAT device(sensor must be powered up and connected to correctly configure the device.)



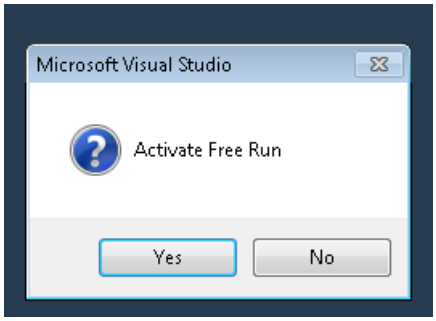
If Device was added incorrectly, you need to remove it, it cannot be refreshed. If you wish to switch between a normal ECAT sensor and an Axia80 ECAT sensor, you must remove and rescan with new sensor attached. (ESI file matching sensor needs to be in the folder).



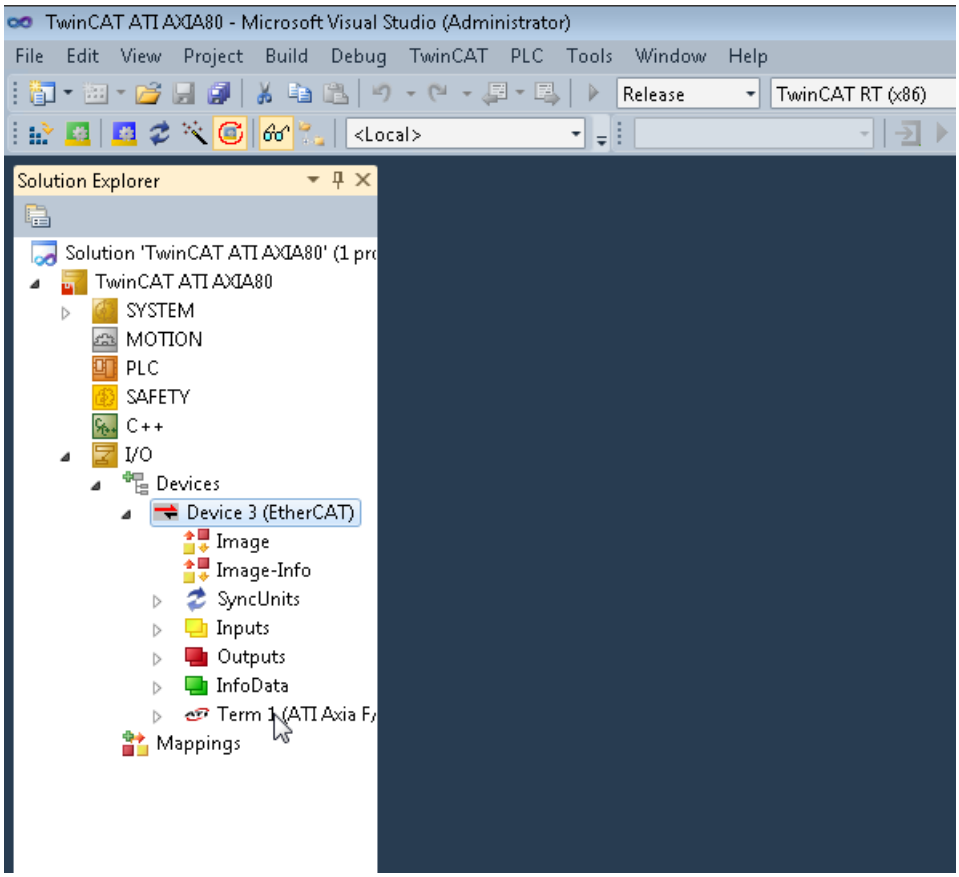
Scan for Boxes(Yes)

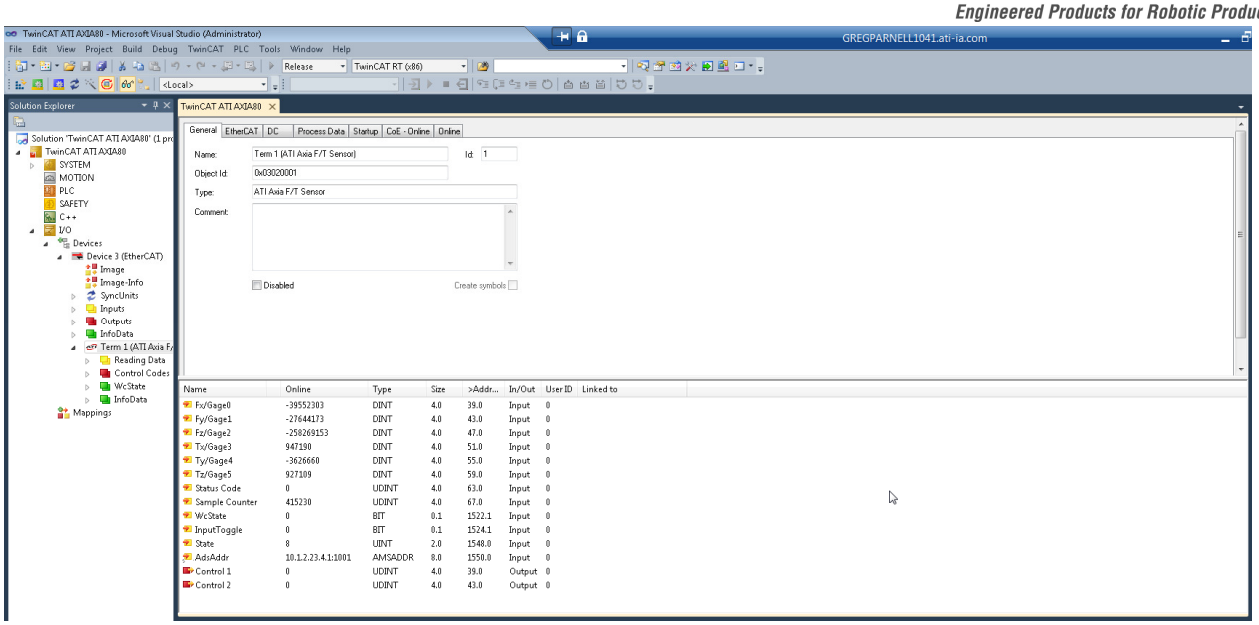


Activate Free Run (YES)



Select the ATI Sensor to see the data(double click)





To change control code use Online Write… (note this changes the code that is sent out every ms, so a bias will permanently zero the sensor until the bit is lifted) So you bias by sending a bias, then waiting, then sending the original control code.

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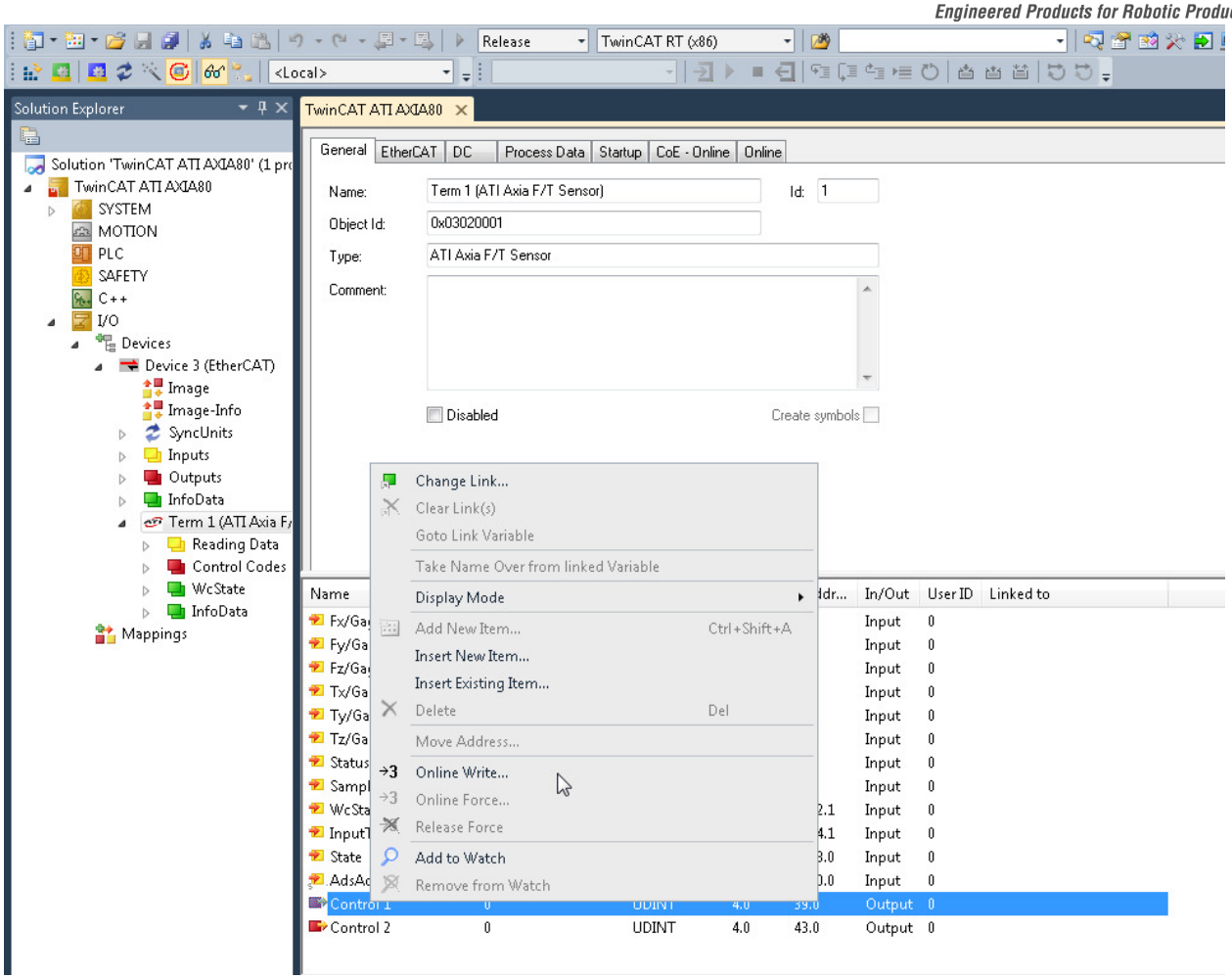

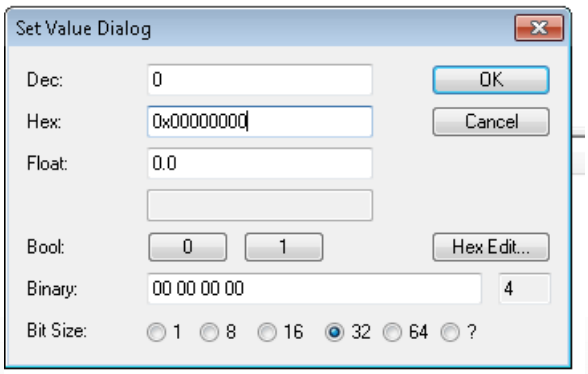

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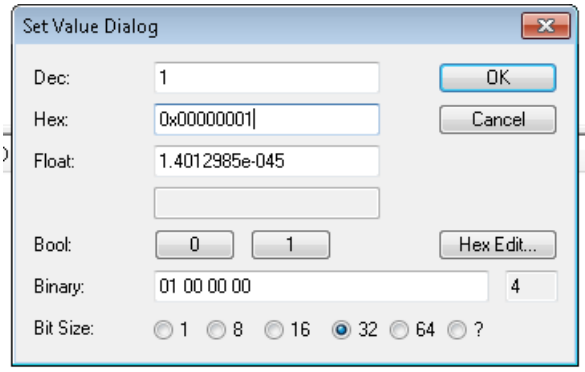
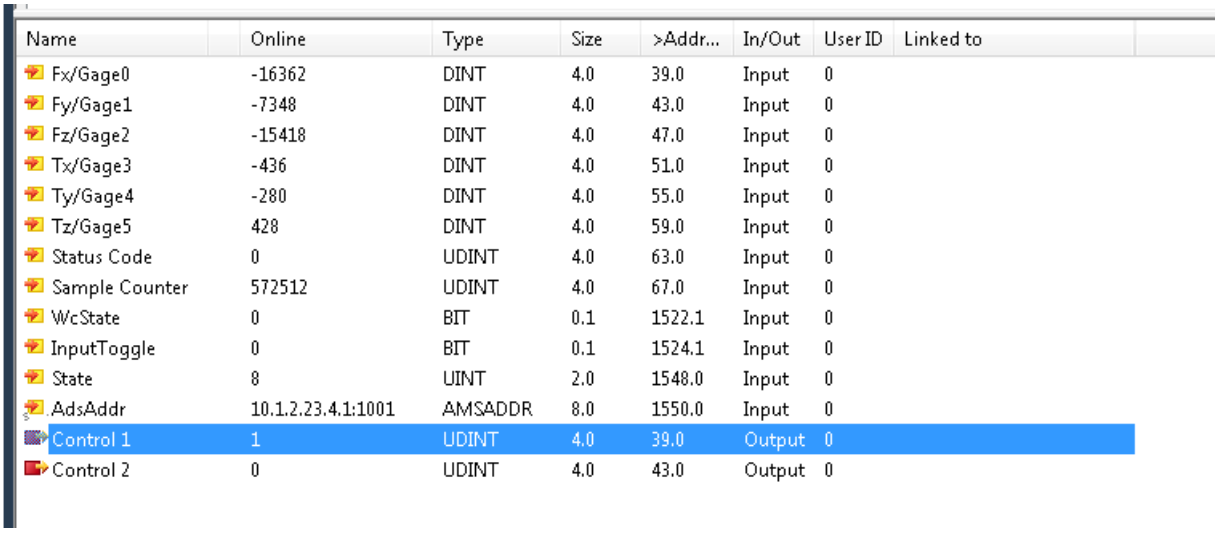
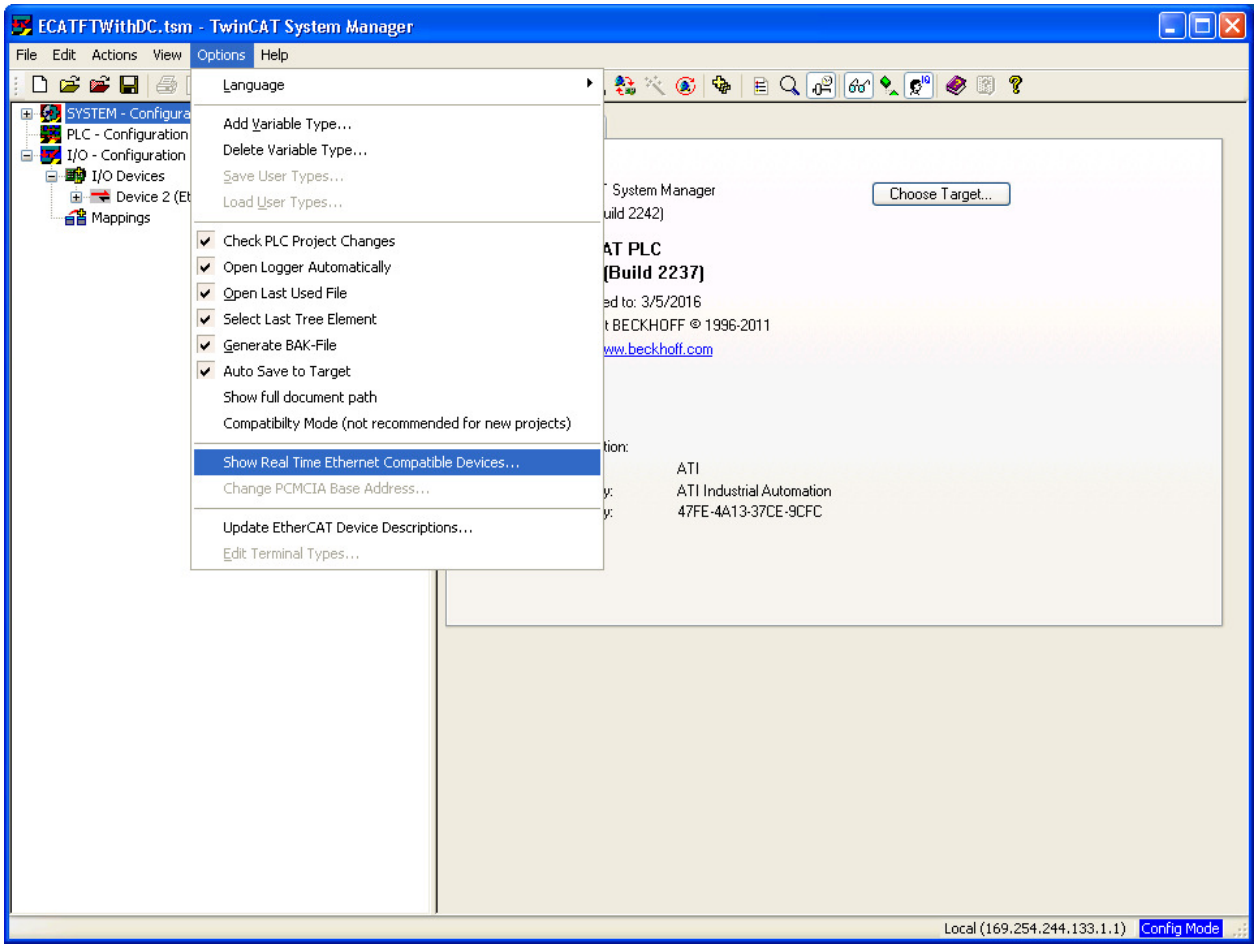




Name	Online	Type	Size	>Addr...	In/Out	User ID	Linked to
Fx/Gage0	-16362	DINT	4.0	39.0	Input	0	
Fy/Gage1	-7348	DINT	4.0	43.0	Input	0	
Fz/Gage2	-15418	DINT	4.0	47.0	Input	0	
Tx/Gage3	-436	DINT	4.0	51.0	Input	0	
Ty/Gage4	-280	DINT	4.0	55.0	Input	0	
Tz/Gage5	428	DINT	4.0	59.0	Input	0	
Status Code	0	UDINT	4.0	63.0	Input	0	
Sample Counter	572512	UDINT	4.0	67.0	Input	0	
WcState	0	BIT	0.1	1522.1	Input	0	
InputToggle	0	BIT	0.1	1524.1	Input	0	
State	8	UINT	2.0	1548.0	Input	0	
AdsAddr	10.1.2.23.4.1:1001	AMSADDR	8.0	1550.0	Input	0	
Control 1	1	UDINT	4.0	39.0	Output	0	
Control 2	0	UDINT	4.0	43.0	Output	0	

2. When starting TwinCAT for the first time, you must install the EtherCAT driver on the network card you will use with TwinCAT:


ECATFTWithDC.tsm - TwinCAT System Manager
File Edit Actions View Options Help
Language
Add Variable Type...
Delete Variable Type...
Save User Types...
Load User Types...
Check PLC Project Changes
Open Logger Automatically
Open Last Used File
Select Last Tree Element
Generate BAK-File
Auto Save to Target
Show full document path
Compatibilty Mode (not recommended for new projects)
Show Real Time Ethernet Compatible Devices...
Change PCMCIA Base Address...
Update EtherCAT Device Descriptions...
Edit Terminal Types...
SYSTEM - Configura
PLC - Configuration
I/O - Configuration
I/O Devices
Device 2 (Et
Mappings
System Manager
uild 2242)
Choose Target...
AT PLC
(Build 2237)
ed to: 3/5/2016
t BECKHOFF © 1996-2011
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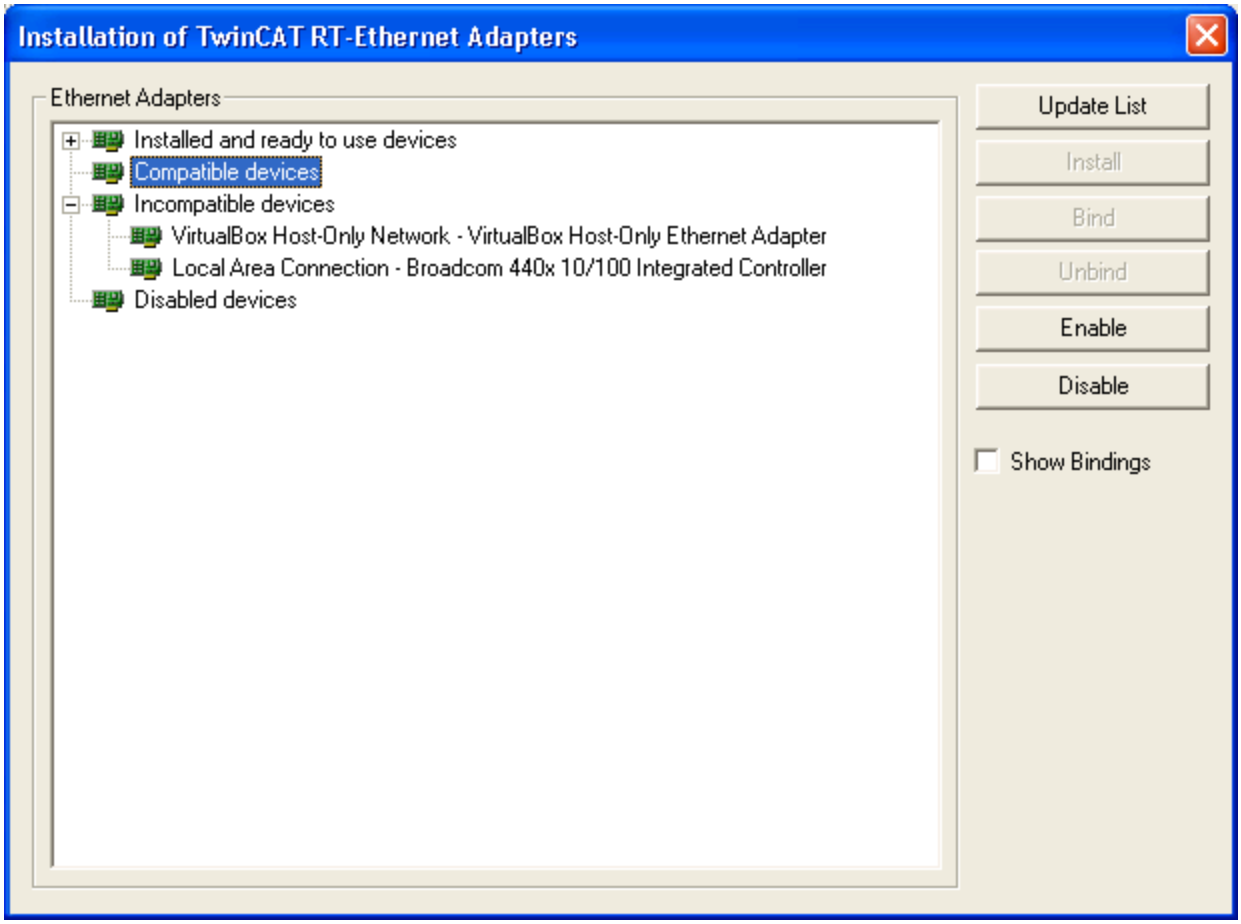
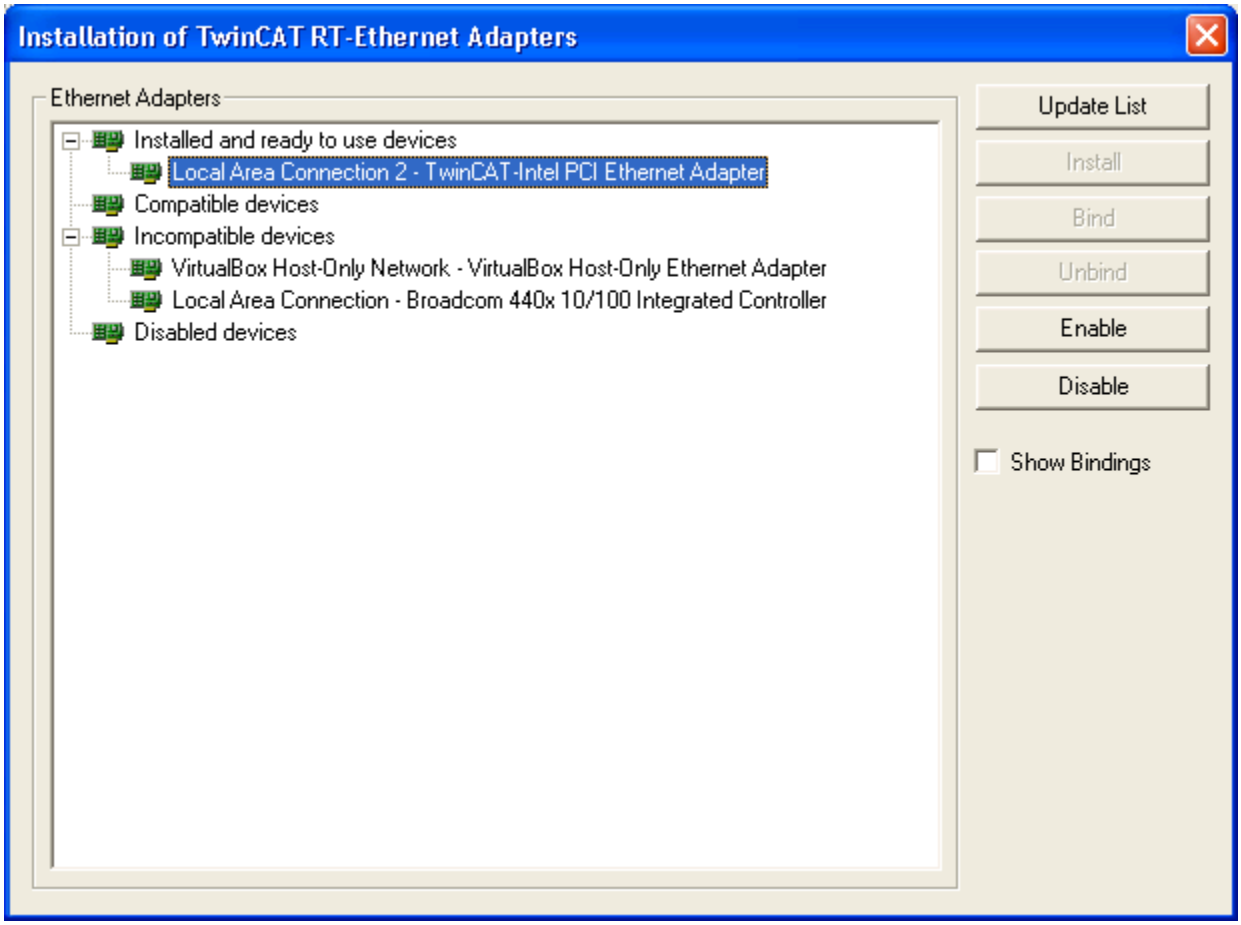
ion:
ATI
ATI Industrial Automation
47FE-4A13-37CE-9CFC
Local (169.254.244.133.1.1)
Config Mode

3. Look in the list of “Compatible Devices” for the NIC you will use to connect to the EtherCAT F/T. If you do not have a Compatible Device, you may still be able to install the driver on one of the “Incompatible Devices,” but you will not be able to make TwinCAT go into real-time mode, and you may also have difficulty entering Free Run mode. Select the device you wish to install the driver on and click “Install” (note: this screenshot doesn’t show any available compatible devices because the system it was taken on already has the driver installed):

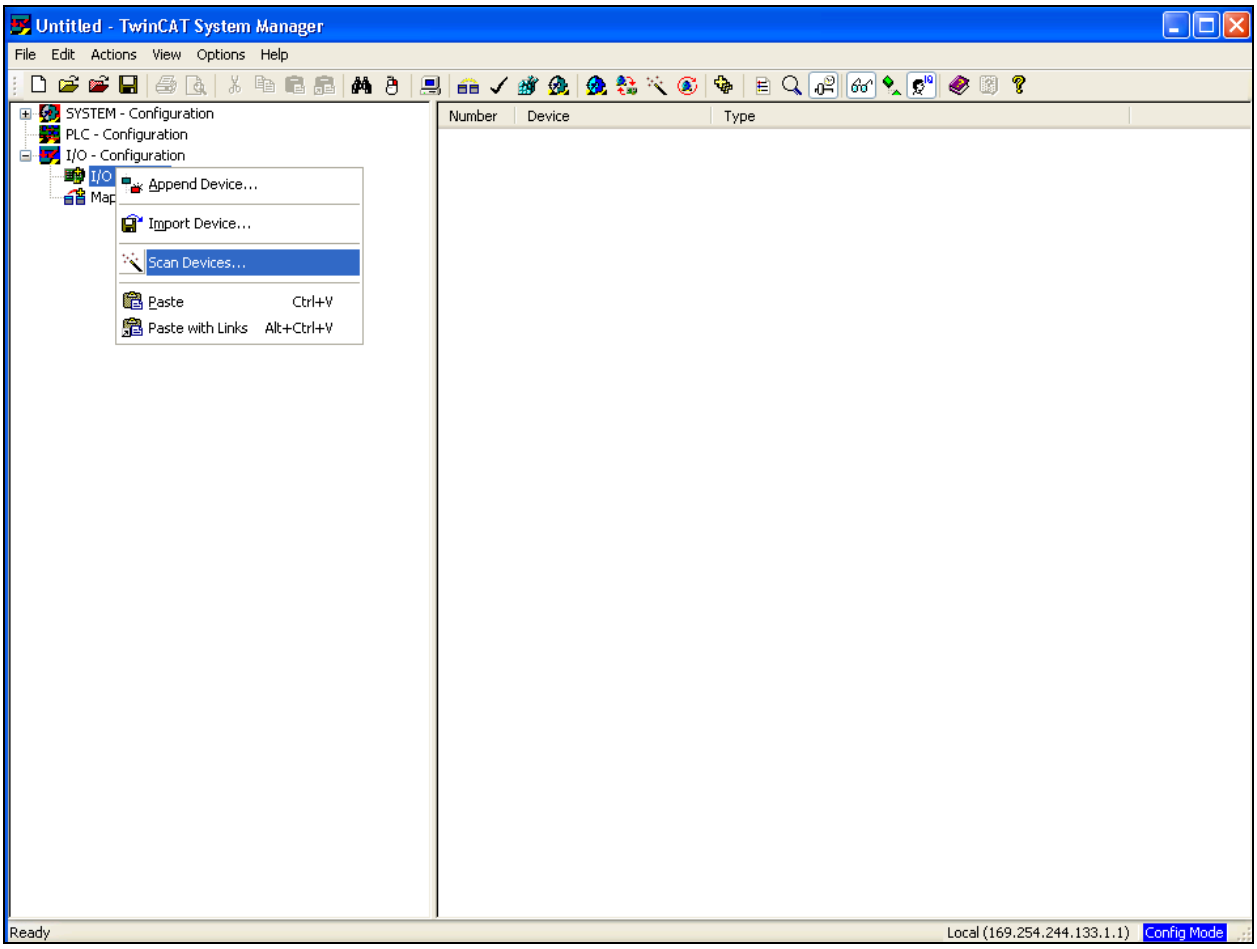


4. After installing the driver, TwinCAT will show the device as “Installed and ready to use.”



5. Connect the EtherCAT F/T sensor to the NIC you have installed the driver on, and apply power to the sensor.

6. Right click “I/O Devices” and select “Scan Devices”



7. Click OK on this notification:

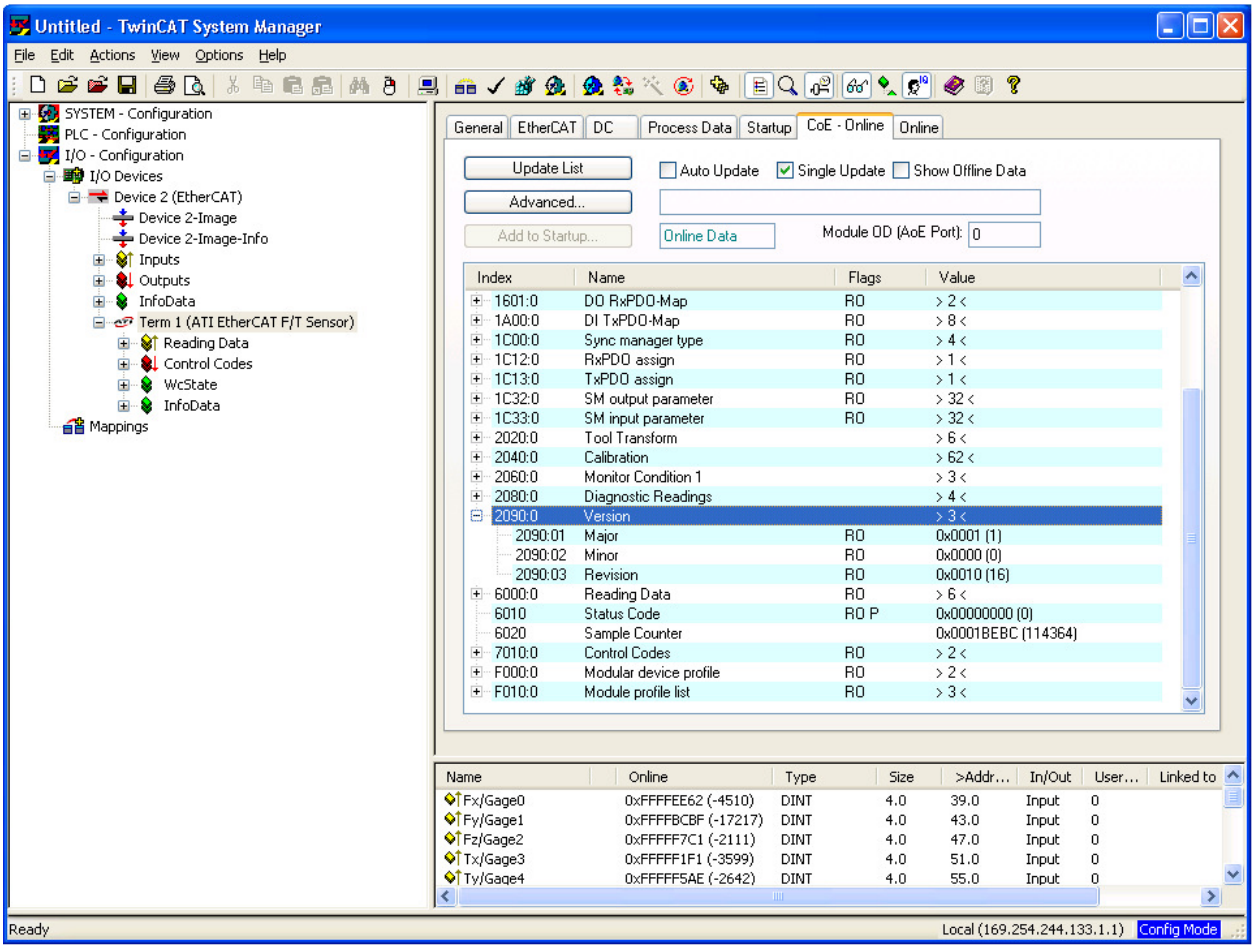
8. If the EtherCAT F/T is found, the adapter will be shown as an “EtherCAT” device. Click OK.

- Note: If the adapter is not labeled “EtherCAT,” for example if the adapter is labeled as “RT-Ethernet,” the sensor may not be communicating or powered up, and you will not be able to communicate until you fix this issue.

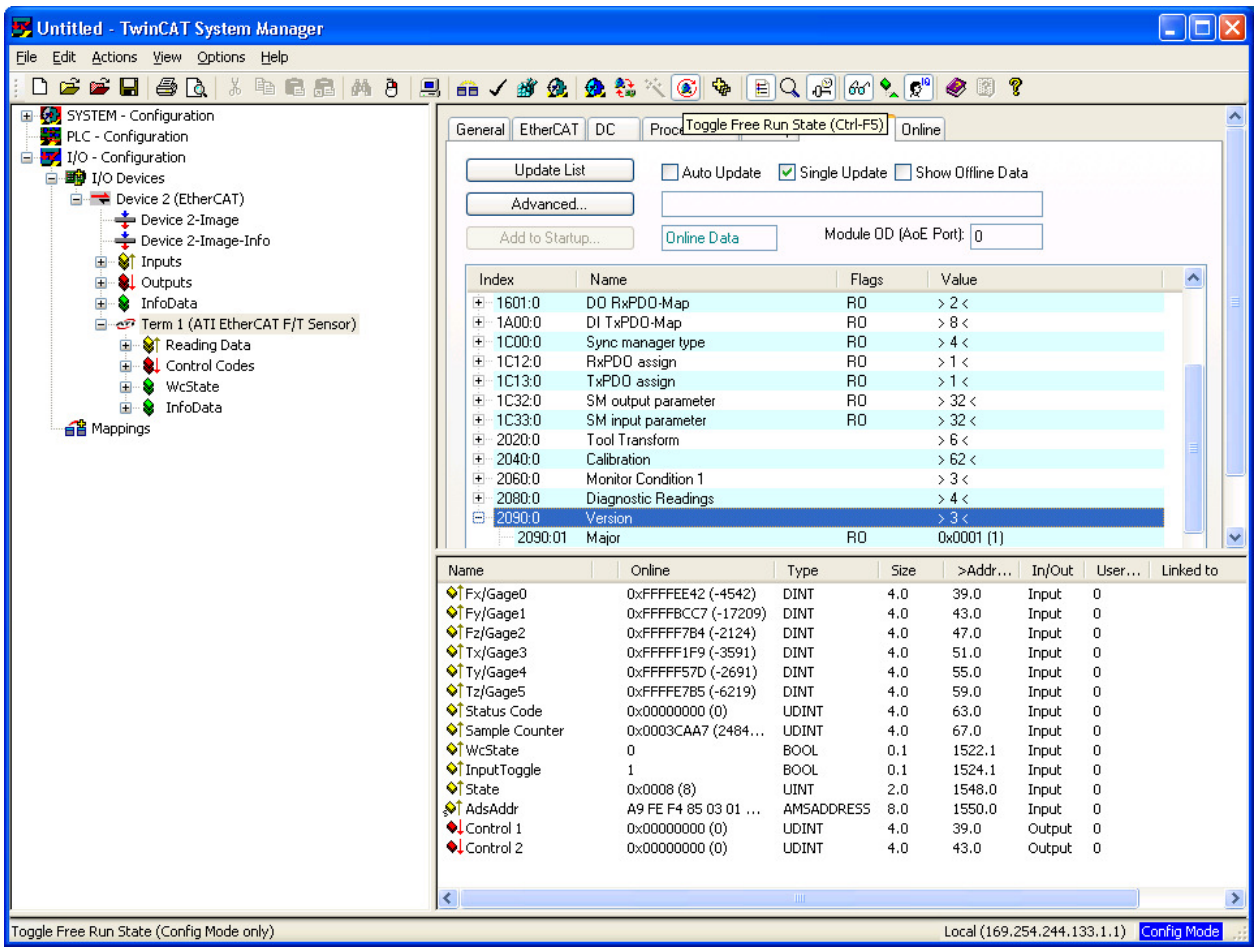
9. Click “Yes” when asked to scan for boxes. “Boxes” is the term for EtherCAT modules such as the EtherCAT F/T Sensor.

10. You can activate Free Run now wait until later.

11. The EtherCAT F/T Sensor should show up in the list of boxes. You can click on it and select the "CoE – Online" tab to explore the dictionary objects. Several dictionary objects are standard EtherCAT objects and are not covered in the ATI manual. All ATI-specific objects, such as the firmware version object 0x2090, are covered in the ATI manual.

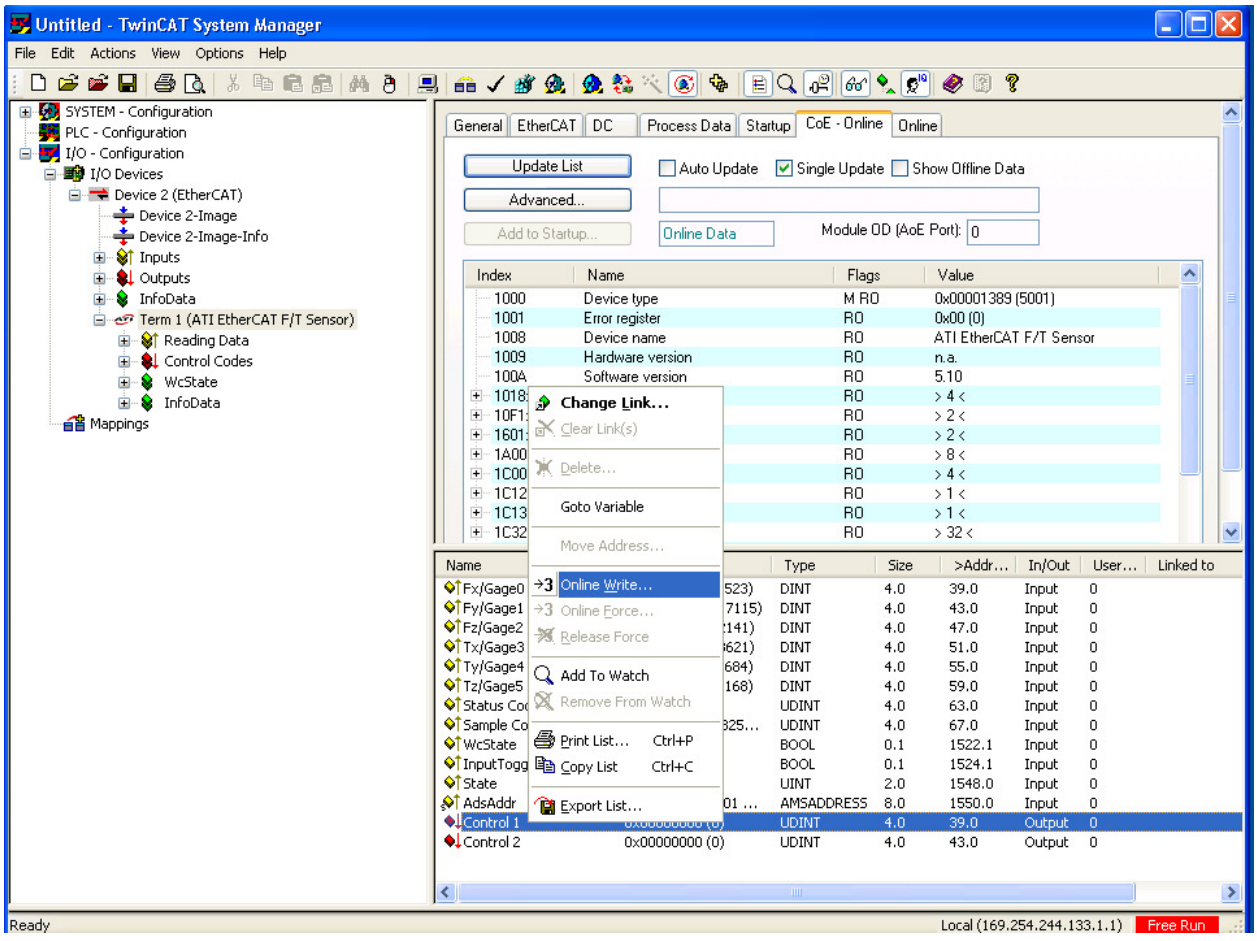


12. To enter free run mode, click the Free Run icon in the toolbar at the top of the window. When in free-run mode, you can expand the data view and see the F/T count values changing.

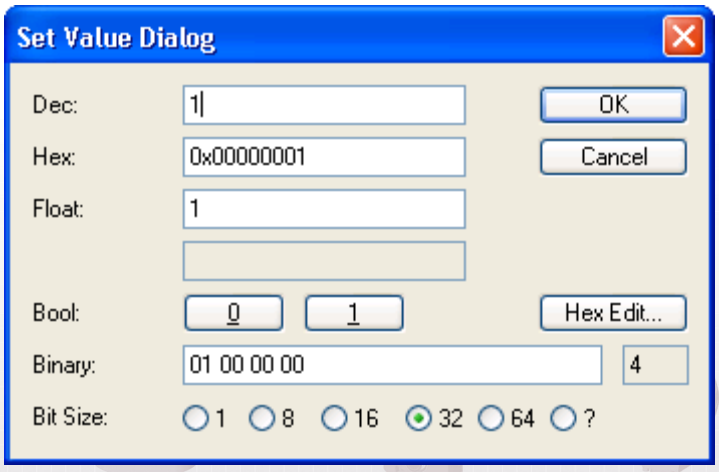


- Note: Free Run mode is not “Real Time,” it is simply continuously querying the data at regular intervals based on the PC clock. Configuring TwinCAT for Real Time mode is not covered in this document. If you have questions about configuring TwinCAT for real time mode, consult Beckhoff for technical support and licensing details.

13. To perform actions such as biasing the sensor in Free Run mode, right click the appropriate control code and select “Online Write.” See the ATI manual for description of the functions of the control codes.



14. For example, to bias the sensor, set bit 0 of Control 1.



Note: As long as that bit is set, the sensor will continually bias itself and the readings will stay close to zero: