Texas Instruments

AM437x Industrial Development Kit for Industrial Automation Quick Start Guide

The Industrial Automation Quick Start Guide for the AM437x Industrial Development Kit (IDK) is comprised of the following steps:

Hardware setup

- Connect the cable between the compatible Ethernet controller on the PC and the port on the IDK. A list of compatible NICs can be found here: **http://infosys.beckhoff.com/english.php?content=content/1033/tcsystemmanager/reference/ethercat/html/ethercat_supnetworkcontroller.htm**. Note that this is a mandatory hardware requirement.
- Connect 24V to the board.
- Power up the EVM (after the software setup).

Software setup

- Install TwinCAT (Evaluation version is available for free download from **http://www.beckhoff.co.in/english.asp?download/tc3-download-xae.htm**). Select PLC mode for installation and check the I/O drivers box.
- Copy sdk\examples\ethercat\esi\TiEtherCATLib.xml to <Drive>:\TwinCAT\Io\EtherCAT folder.
- Start TwinCAT XAE (VS 2010) from start menu.
- Create new TwinCAT XAE project: File > New > Project > TwinCAT Project.
- Go to TwinCAT > Show Real-Time Ethernet-compatible devices and install the RT Ethernet adapter connected to the IDK.

11 Right-click Box n > RxPDO > 32Bit Output. Select Online Write.

12 Enter the value in hexadecimal format, where each bit in the LSB represents an output.

13 Changing the LED value will set/clear the appropriate LED.

Get started

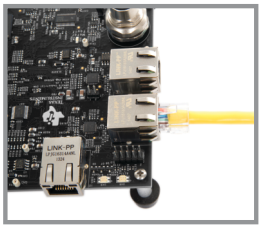
Please visit **www.ti.com/am437xidk**. Here you will find instructions to begin programming the AM437x Industrial Development Kit, detailed information and resources.

- Connect CAT5 Ethernet cable from TwinCAT PC to ECAT IN/Port0 (J3) of IDK. If you have multiple IDKs in chain, please connect from ECAT OUT/Port1 (J4) to Port0 of the next IDK. For the last IDK in the chain, Port1 is left open.
- Go to <Project name> > I/O > Devices – right click and select Scan. You will see a list of Ethernet adapters on your system, with a tick next to the adapter connected to the IDK. Choose OK. Device n (EtherCAT) will be added to I/O devices.
- Choose “Yes” in response for “Scan for boxes”.
- Box n (TIESC-001) will be detected automatically.
- Choose “Yes” in response for “Activate Free Run”.
- The next dialog asks for confirmation to Activate Free Run – select Yes. This will put TI ESC into OP mode.
- Now the user can control digital out LEDs using TwinCAT. Select Box n (TIESC-001) > RxPDO > 32Bit Output. The LEDs are controlled by the least significant byte on the 32-bit output. Open Online tab (double-click 32Bit Output), and click the Write button to control the LEDs.

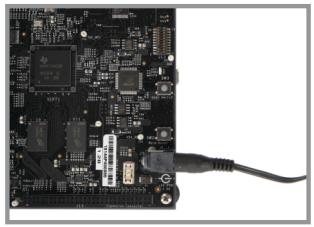
Additional information is available at **www.ti.com/sitara_twincat**.

Setup for EtherCAT operation

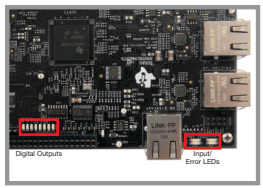
Quick start instructions are provided below. For detailed instructions and troubleshooting, please refer to **www.ti.com/sitara_twincat**.



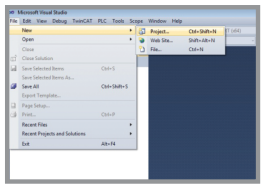
1 Connect the network cable between EtherCAT ports and the PC with TwinCAT installation.

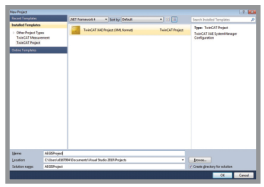


2 Power IDK board with 24-V power supply.
Please note that there is no power supply included in this kit. In order to power the AM437x IDK, it is recommended to use a power supply with output voltage of +24VDC, positive center pin, and output current max 1.67 Amp, as well as the applicable regional product regulatory/safety certification requirements applicable to your region.
An example of a power supply that you may purchase from your own electronics supplier is: CUI/V-Infinity part number EMSA240167-P5P-SZ, model EMSA240167.

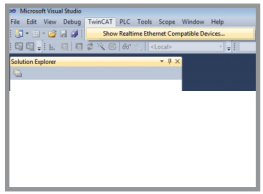


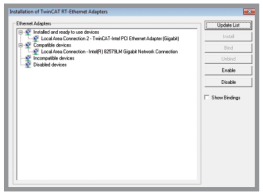
3 Observe the LEDs for a pattern to confirm EtherCAT application has started.

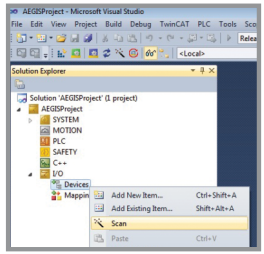




4 Start TwinCat XAE (VS 2010) from the start menu. Create new TwinCAT XAE Project (XML format).



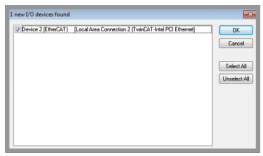




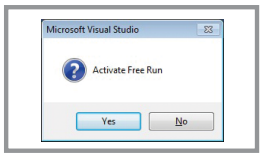
5 For the first time, you need to define which Ethernet port will be used as the EtherCAT port. Go to TwinCAT > Show Realtime Ethernet-Compatible Devices.

6 Select the Ethernet adapter from the list of compatible devices, and press Install. This will install a Beckhoff EtherCAT driver. Once installed, the Ethernet port will show up in “Installed and ready to use devices”.

7 Go to I/O > Devices. Right-click and select Scan. Press OK in the next dialog to start scanning for EtherCAT devices.



8 Once an EtherCAT-compatible device has been detected on this Ethernet port, the above dialog is displayed. Note that there is a tick mark next to the adapter to which the IDK is connected. Press OK and confirm to start “Scan for boxes”.



9 The TI device will be listed “Box n (TIESC-001)”. Press Yes to activate Free Run.

10 Expand the box to see Process Data Inputs (PDI) and Outputs (PDO).

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