

NGX ARM USB JTAG



Features:

- USB 2.0 Full Speed device (12 Mbits/sec) interface
- Can be used to debug and program all ARM processors supported by OpenOCD
- Provides a standard 2X10 pin JTAG interface
- Adds a virtual RS232 serial port to your computer or laptop
- No external power supply required – it runs off of the USB power from the host computer
- Complete schematic provided
- Supported by open source debugger OpenOCD and commercial tools like Crossworks

The ‘NGX ARM USB JTAG’ is a compact USB to JTAG in-circuit debugger and programmer designed for ARM cores. It connects via USB to the host PC. The ‘NGX ARM USB JTAG’ provides a standard 20-pin JTAG interface as well as a standard RS232 port.

It is based on FTDI's popular FT2232 Dual USB UART/FIFO integrated circuit. The FT2232 has two devices integrated on it:

- Channel A: USB to JTAG interface
- Channel B: USB to SERIAL UART

JTAG Interface

It provides a standard ARM-compatible 20-pin JTAG interface. The JTAG interface enables access to the on-chip debug module which is integrated into the ARM CPU. The debug module enables a programmer to debug the software on an embedded target system.

Serial UART

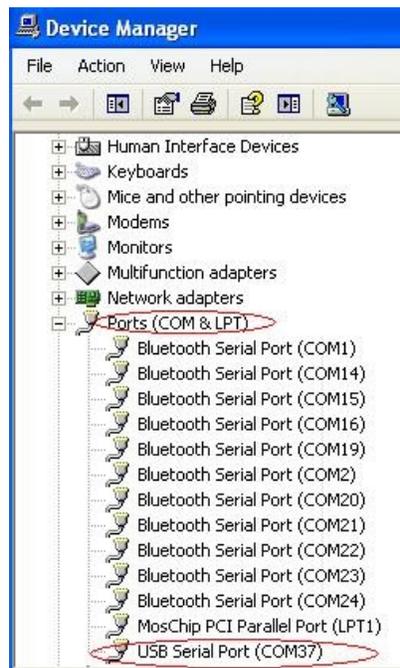
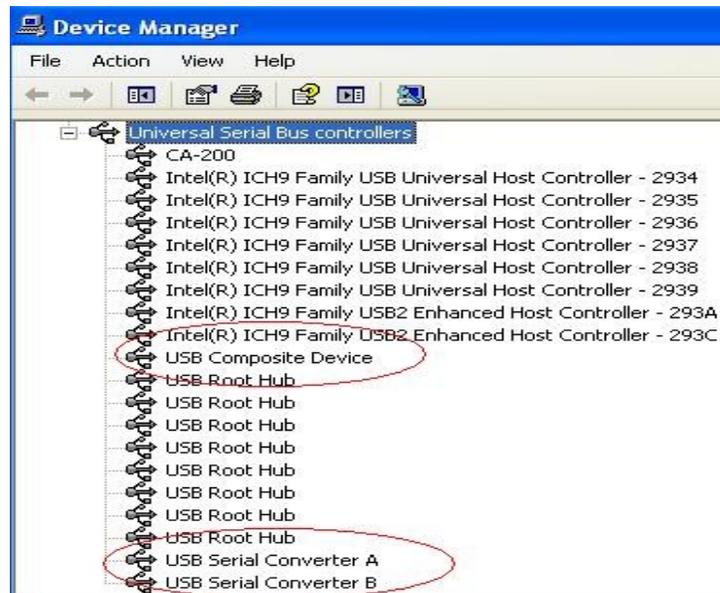
'NGX ARM USB JTAG' serial port provides you with an independent functional "USB to RS-232" serial device. For Linux, the RS232 driver for the FT2232 is part of the main kernel tree and is provided in most standard Linux distributions. In Windows, you have to load the Windows driver for the FT2232. Once the driver is loaded, Windows will assign a virtual COM port to the serial port. It operates just like a standard COM port. You can use it on laptops or PC's that do not have a 9-pin legacy serial connector.

How to use the 'NGX ARM USB JTAG' with Crossworks?

Before you can use the 'NGX ARM USB JTAG', you need to install the FTDI USB drivers. Here are steps to install the drivers. Download the drivers file from <http://www.ftdichip.com/Drivers/CDM/CDM20600.exe> and run the downloaded exe

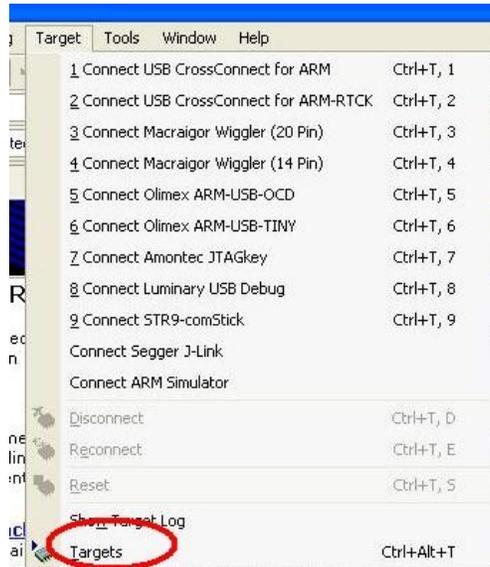
Note: The latest driver, when this document was created is version 2.06.00. The above link might not work when a new driver version is released and updated on the FTDI website

When you connect the 'NGX ARM USB JTAG' you should find a USB device listed under windows device manager

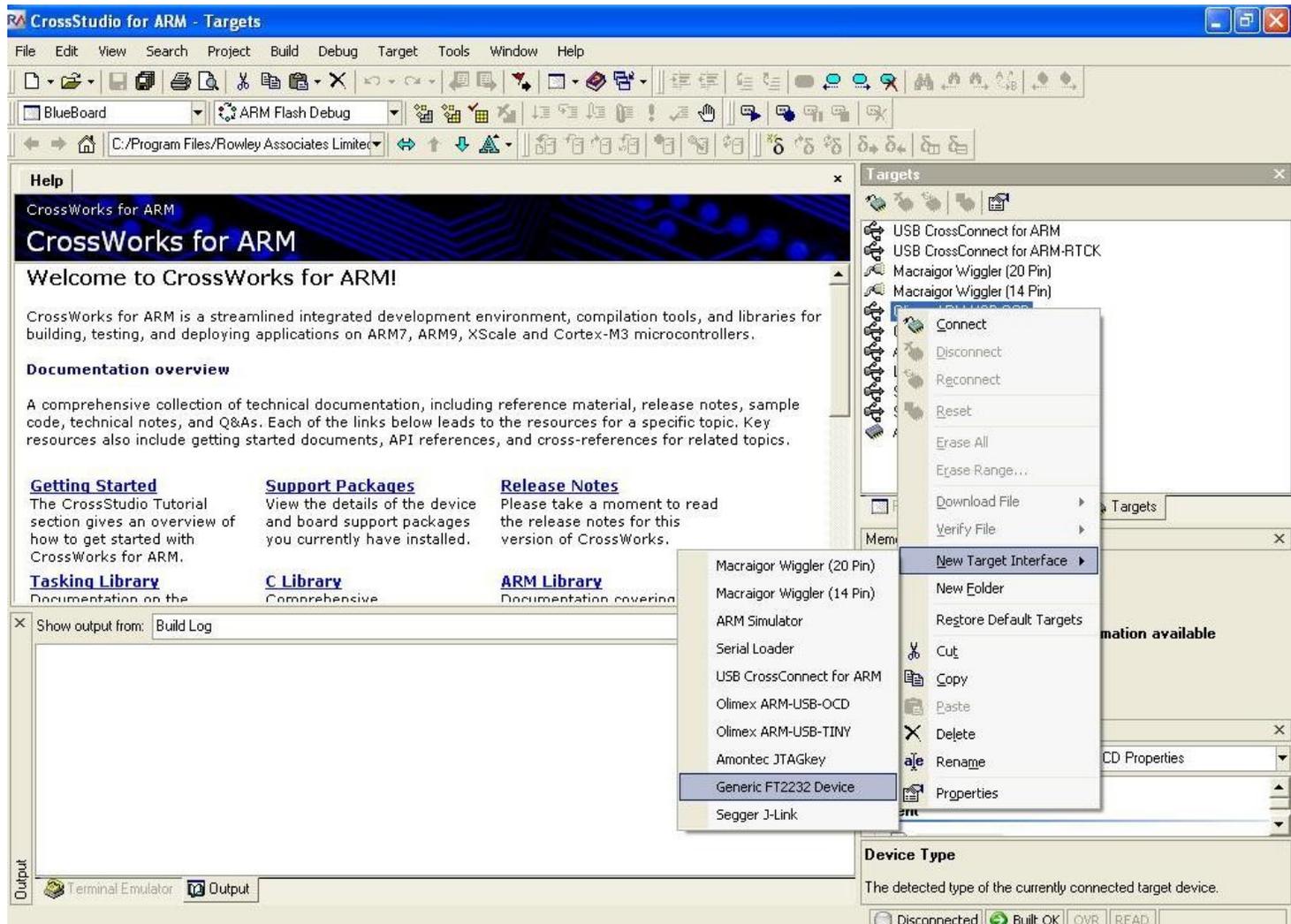


Once the drivers are installed; integrating with the Rowley CrossWorks IDE is pretty simple. Here are the steps:

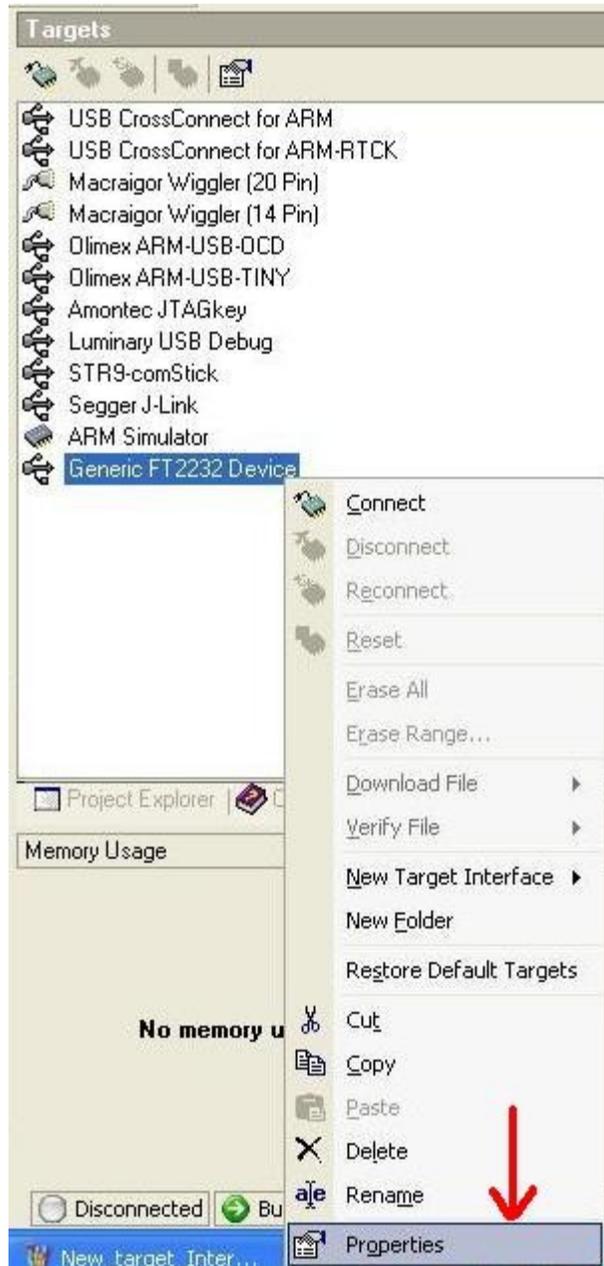
Step1: Open any 'Crossworks' workspace and go to 'Target' tab and select 'Targets' option (last options)



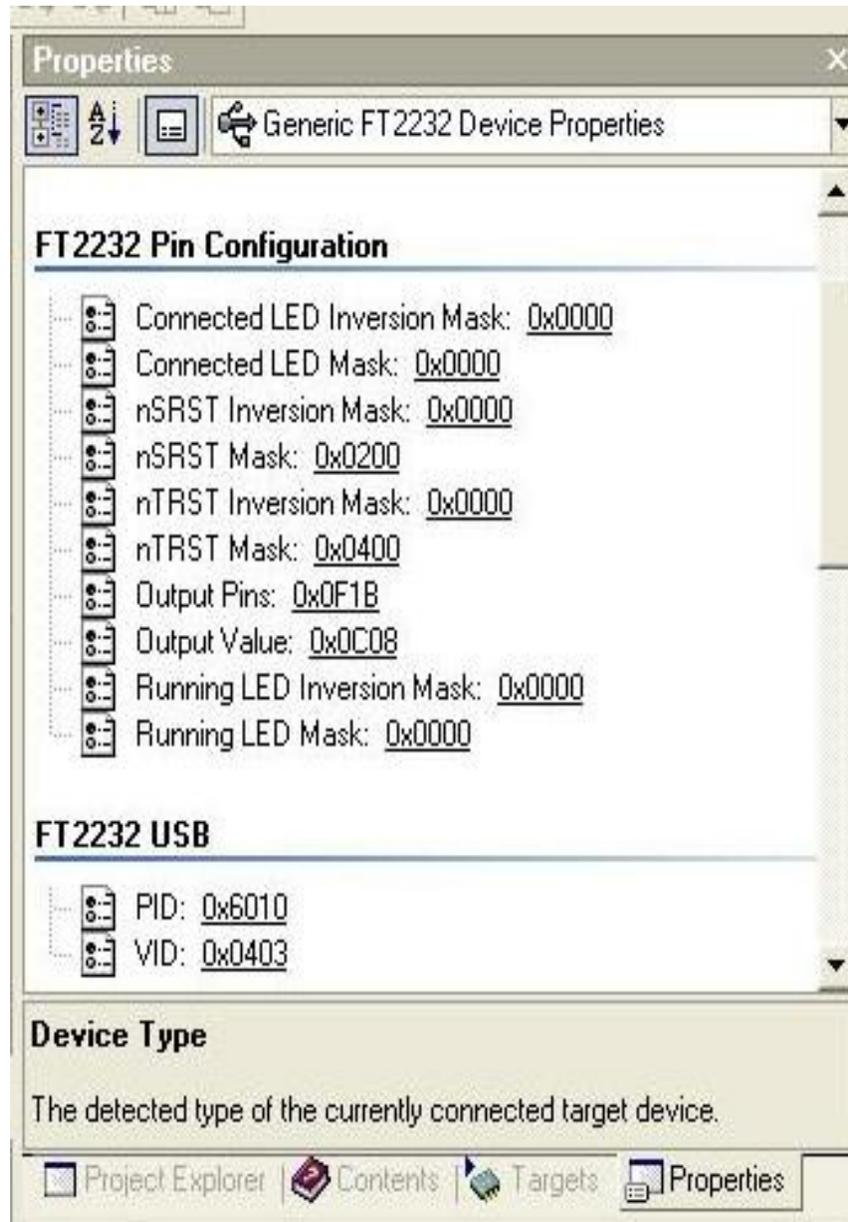
Step2: Next, in the right pane; select targets and 'Right click then go to → New Target Interface → Generic FT2232 Device



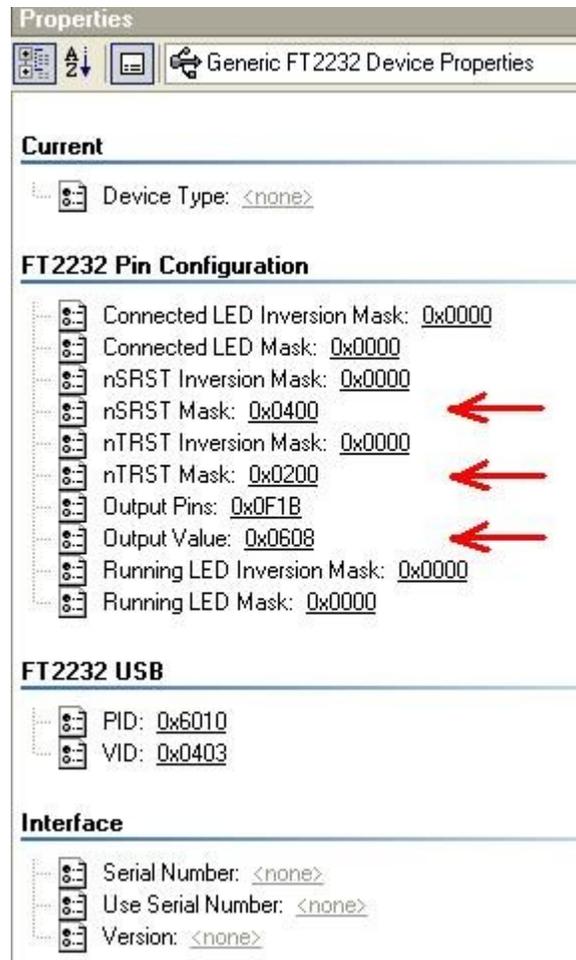
Step3: In the 'Target Window', Right click on 'Generic FT2232 Device' and select 'Properties' from the drop down list



Step 4: Go to properties window. The Window looks similar to the image given below



Step 5: Change nSRST Mask to 0x0400, nTRST Mask to 0x0200, Output Value to 0x0608 and clock divider to a value greater or equal to 6 as shown below



Properties
Generic FT2232 Device Properties

Current

Device Type: <none>

FT2232 Pin Configuration

- Connected LED Inversion Mask: 0x0000
- Connected LED Mask: 0x0000
- nSRST Inversion Mask: 0x0000
- nSRST Mask: 0x0400
- nTRST Inversion Mask: 0x0000
- nTRST Mask: 0x0200
- Output Pins: 0x0F1B
- Output Value: 0x0608
- Running LED Inversion Mask: 0x0000
- Running LED Mask: 0x0000

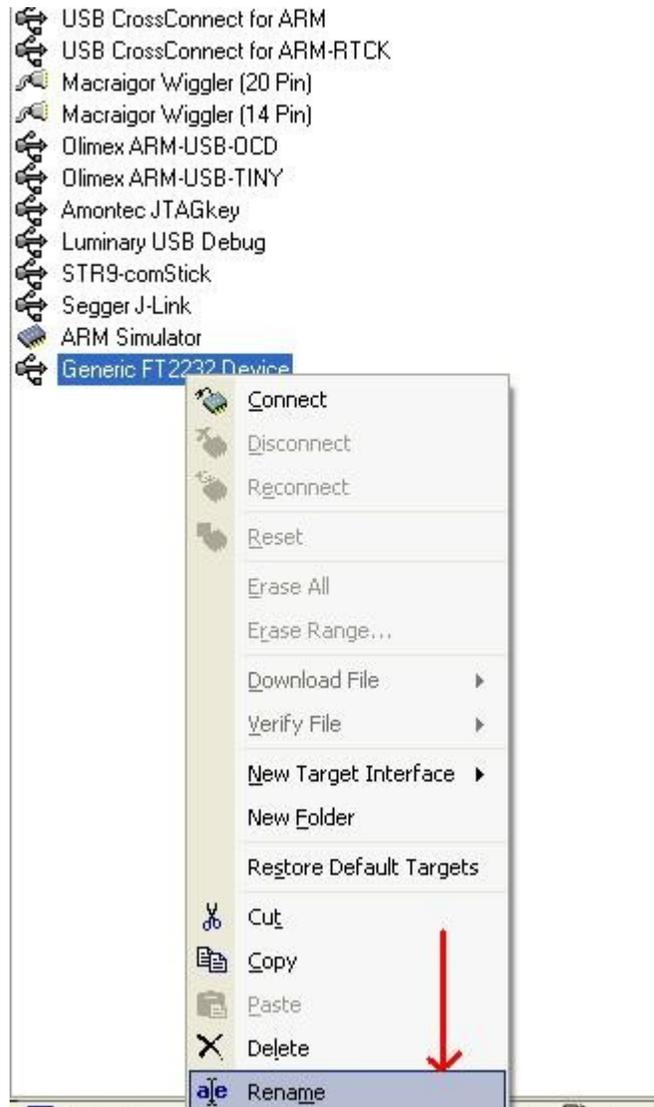
FT2232 USB

- PID: 0x6010
- VID: 0x0403

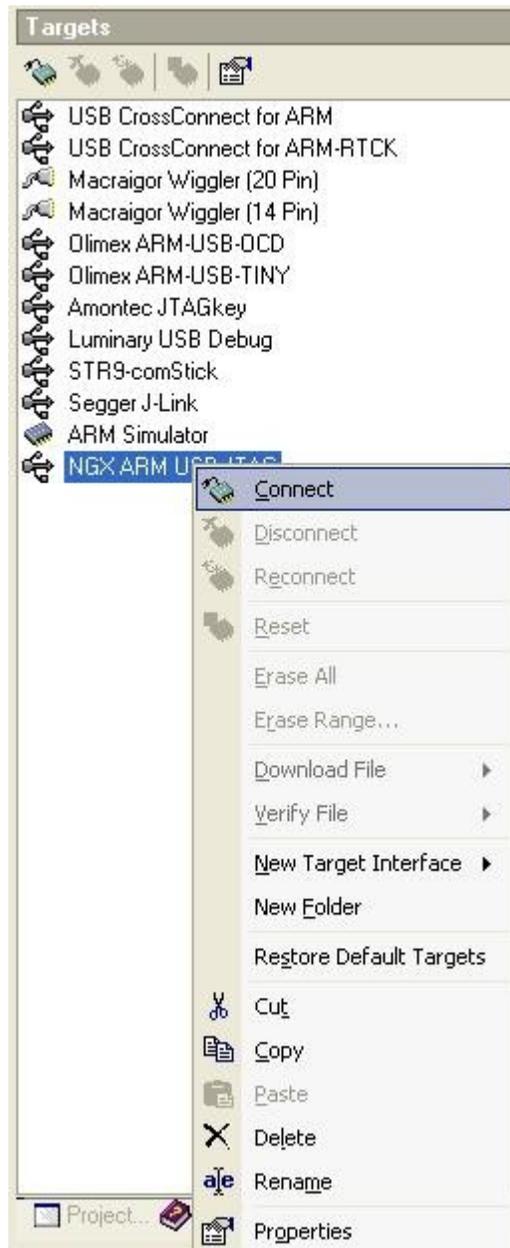
Interface

- Serial Number: <none>
- Use Serial Number: <none>
- Version: <none>

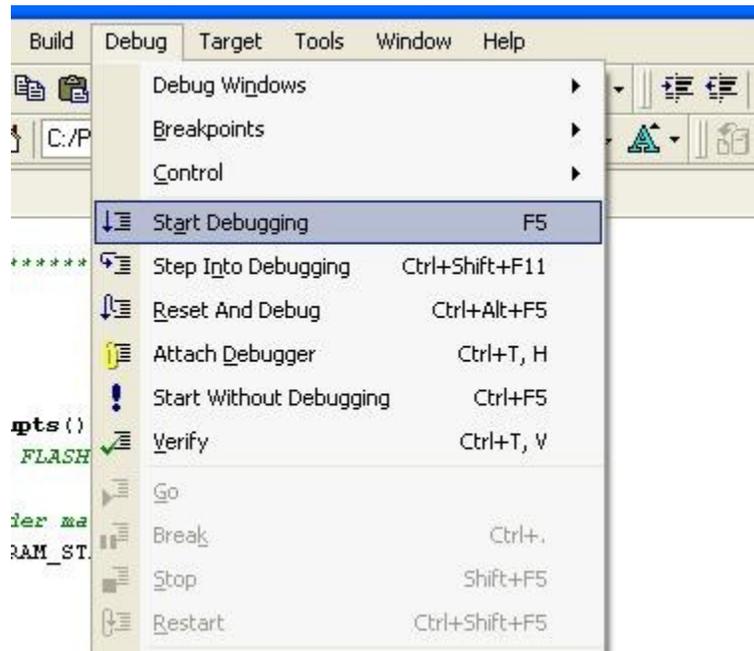
Step 6: We are now all set to use the NGX USB ARM JTAG. Right click on the ‘Generic FT2232 Device’ and click on ‘Rename’ and rename it to ‘NGX USB ARM JTAG’



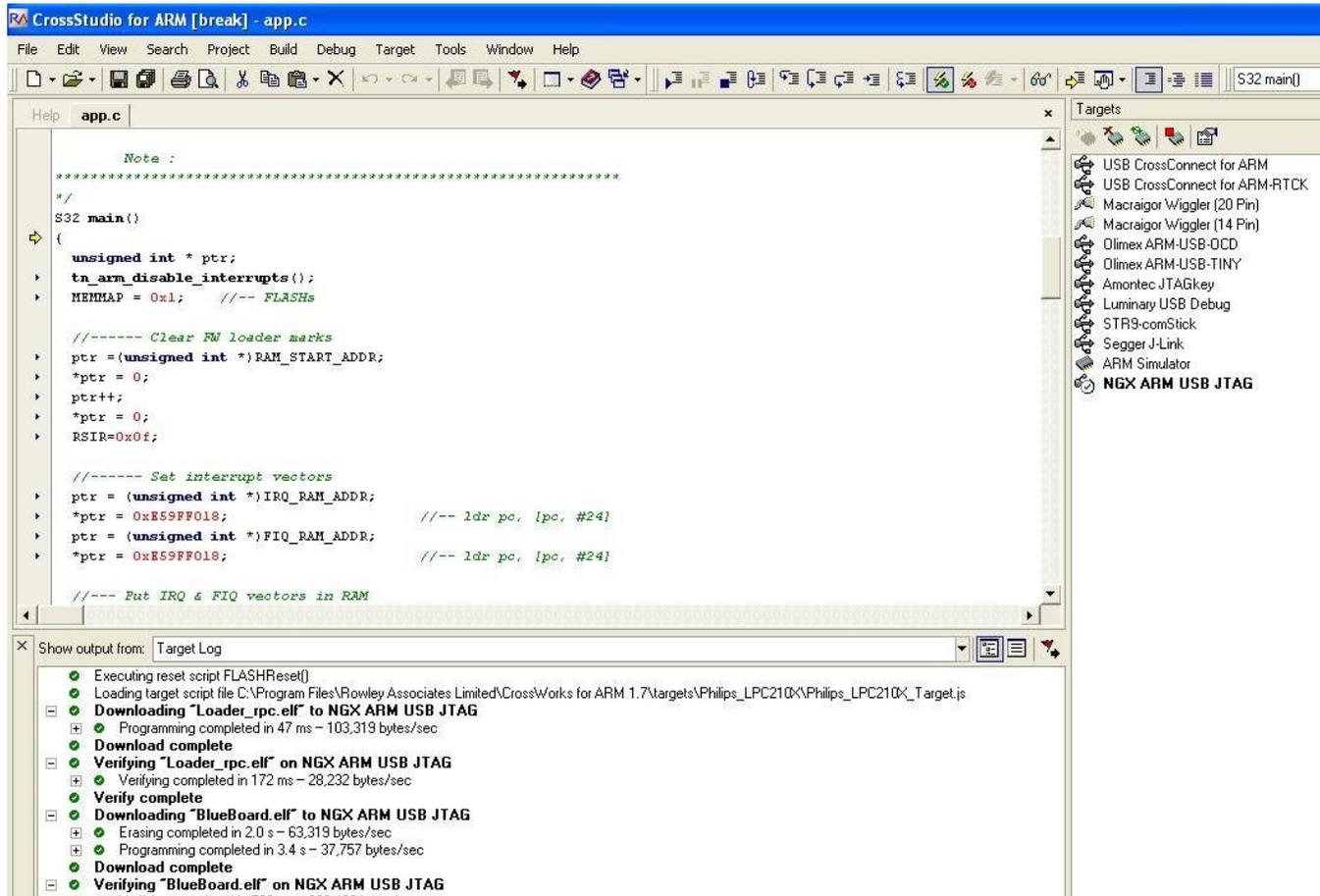
Step 7: Connect the USB JTAG to the ARM board using the 20 pin ribbon cable provided, right click on the 'NGX USB ARM JTAG' and click on 'Connect'



Step 8: Once connected go the 'Debug' option and select 'Start Debugging' option or alternatively press F5 to flash the code using NGX USB ARM JTAG.



Step 9: After flashing the code you can set breakpoints and step into the code as shown below



For using with OpenOCD for debugging please refer to the below links:

http://www.siwawi.arubi.uni-kl.de/avr_projects/arm_projects/openocd_intro/index.html -by Martin Thomas

<http://www.yagarto.de/> - by Michael Fischer

Schematics:

The schematics for the NGX ARM USB JTAG can be found at http://blueboard-lpc214x.googlecode.com/files/ARM_USB_JTAG.pdf

Troubleshooting:

1. CrossWorks reports “**No devices with USB PID/VID of 0x0403/0x6010 attached**”
 - ⇒ CrossWorks is unable to find the NGX ARM USB JTAG, please check that module is connected and powered through USB and also ensure the FTDI drivers are installed. This can be confirmed by looking at the device manager

2. “**Cannot Identify Target. Check JTAG connections and that the target is powered**”
 - ⇒ This is reported when the target board is not RESET or the 20-pin ribbon cable is not connected. Connect the 20-pin JTAG cable between the JTAG and the ARM board, reset the ARM board and now try connecting again.