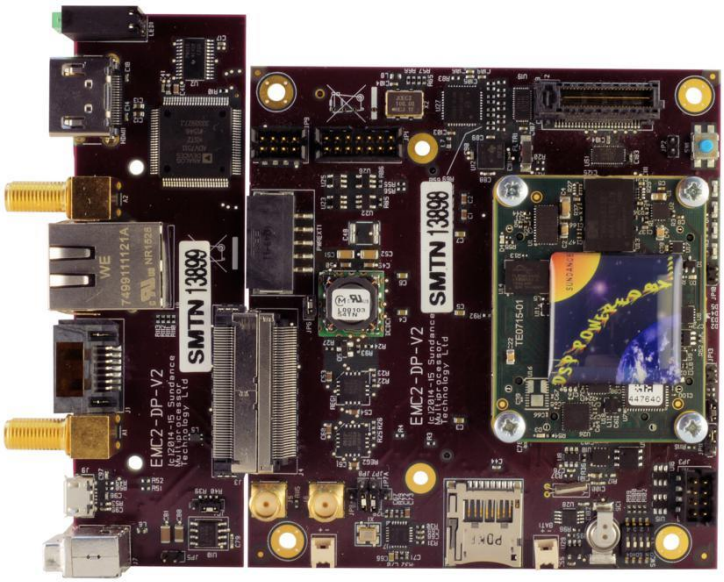
JTAG communication with ZYNQ 7000 based target



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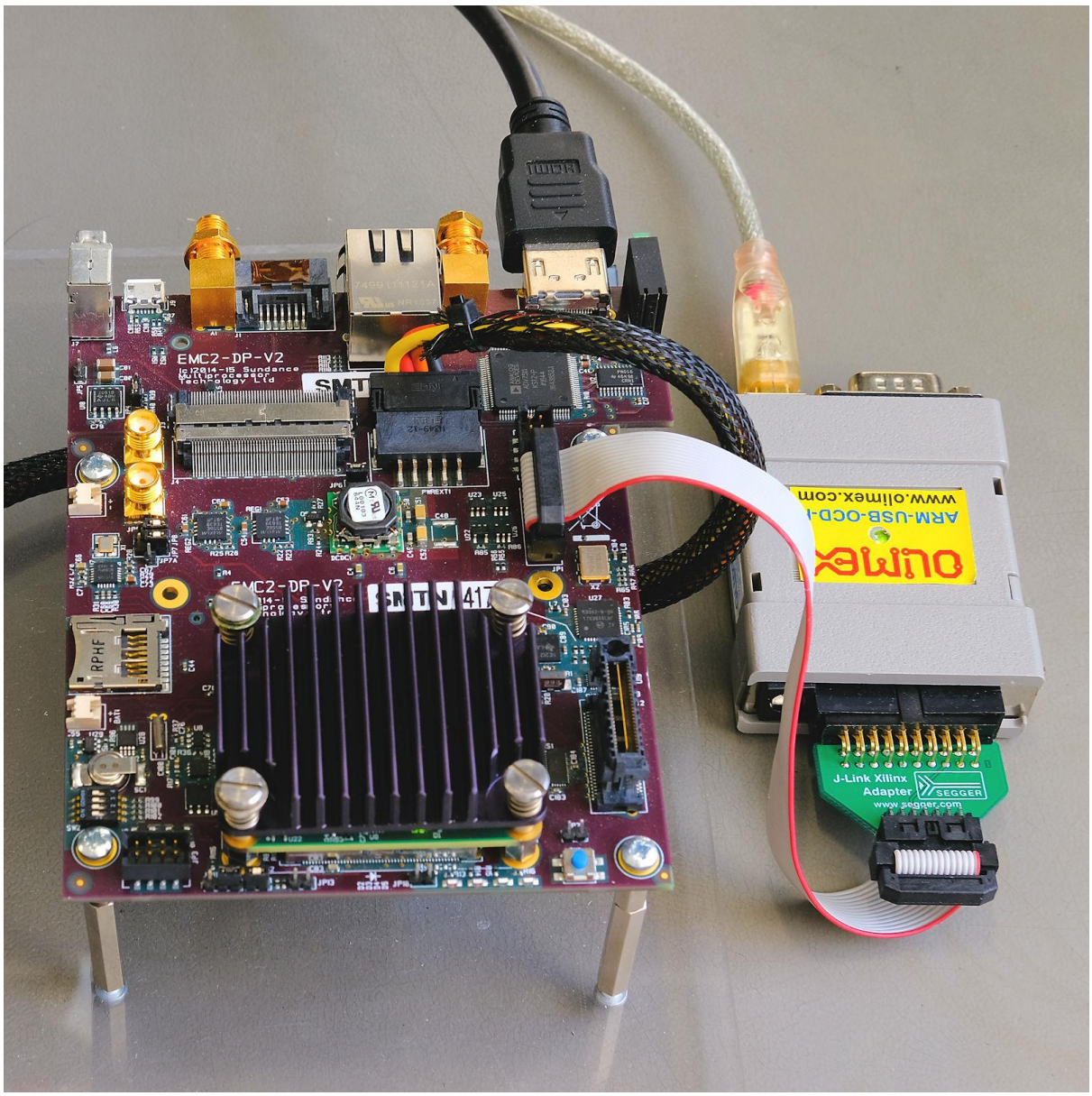
1. OPENOCD ARM JTAG DEBUGGER

1.1 Required hardware

- EMC²-DP,
- Trenz SoM module based on Zynq 7000 FPGA
- Olimex OpenOCD ARM JTAG debugger ARM-USB-OCD-H
- J-Link Xilinx adapter
- USB A to B cable
- AXT power supply



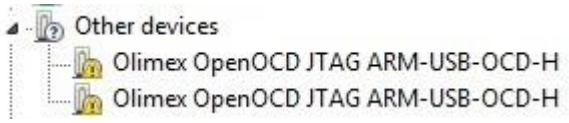
1.2 Windows PC setup.

a. Reboot the PC to “Disable driver signature enforcement”

- Go to “Settings” from the Start menu.
- Select “Update & Security”.
- From the menu on the left select “Recovery”.
- On the right you will see “Advanced start-up”. Click the “Restart now” button. Your PC will ask you to “Please wait”.
- In the next menu, select “Troubleshoot”, then select “Advanced options”.
- Select “Start-up Settings”.
- This next page tells you the options you will have when you press the “Restart” button. Press the “Restart” button.
- Now your PC will restart.
- You will be presented with a menu. As we want to Disable driver signature enforcement, we need option 7. Press the function key “F7”.
- Windows will now boot.

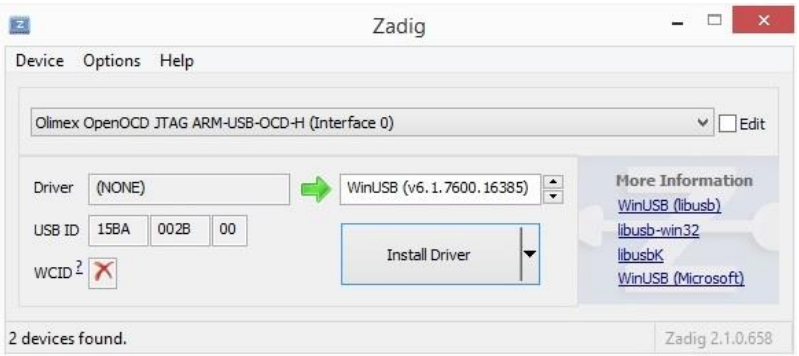
b. Installing drivers.

When ARM-USB-OCD-H debugger is connected to your PC using USB cable in “Device manager” you see following:



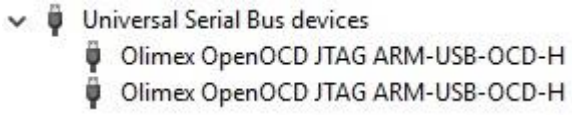
Easiest way to install driver is to use program Zadig which can be found here:

https://zadig.akeo.ie/downloads/zadig-2.3.exe



Install WinUSB driver for each interface.

If installation is successful in “Device manager” you should see:



c. Olimex Software

- Olimex debugger ARM-USB-OCD-H software for Windows can be found here:

https://www.olimex.com/Products/ARM/JTAG/_resources/OpenOCD-OLIMEX-WINDOWS.zip

Extract the zip file and go to Readme.txt file

At line 49 there is example to establish simple connection using different hardware option.

"openocd.exe -f ./interface/ftdi/olimex-arm-usb-ocd-h.cfg -f ./target/stm32f1x.cfg"

In our case target configuration file is:

…openocd-0.9.0-rc1\scripts\target\zynq_7000.cfg

And debugger configuration file:

…openocd-0.9.0-rc1\scripts\interface\ftdi\olimex-arm-usb-ocd-h.cfg

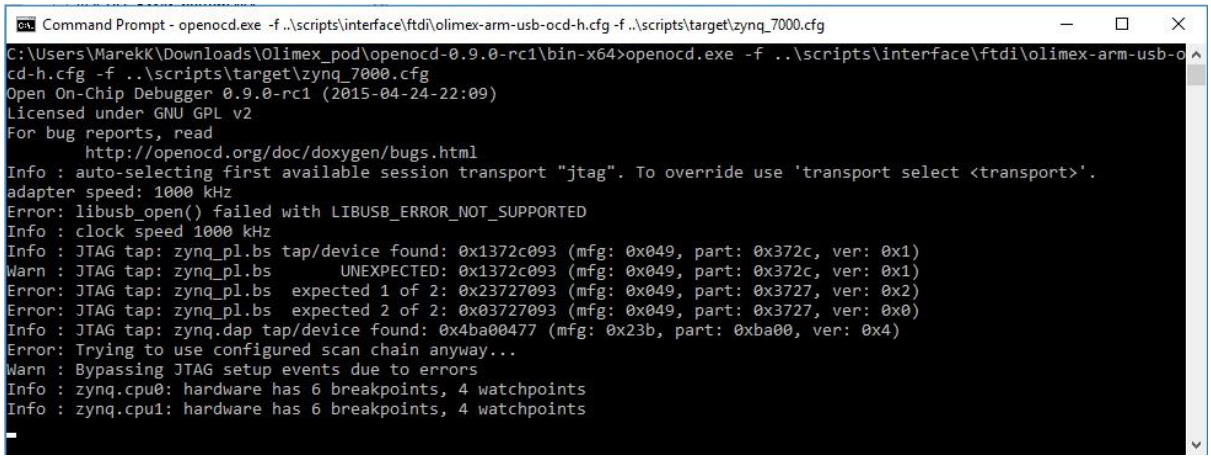
so our command will look like this:

"openocd.exe -f ..\scripts\interface\ftdi\olimex-arm-usb-ocd-h.cfg -f ..\scripts\target\zynq_7000.cfg"

Make sure that EMC²-DP is switched ON and J-Link adapter is connecting JP1 on EMC²-DP with Olimex debugger.

1.3. Run OpenOCD server.

Open in Command Prompt folder "bin" or "bin-x64" if you are using 64 bit OS. Easiest way to do it is while holding "Shift" button right click on the folder and pick option "Open Command window here", then paste above command and press "enter", after few seconds you should see:



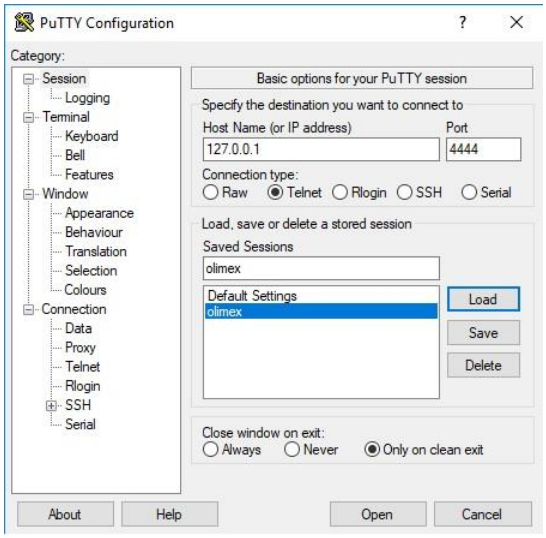
1.4. Communicating with the target.

Finally, you can open PuTTY and configure it as follow:

Connection type: *Telnet*

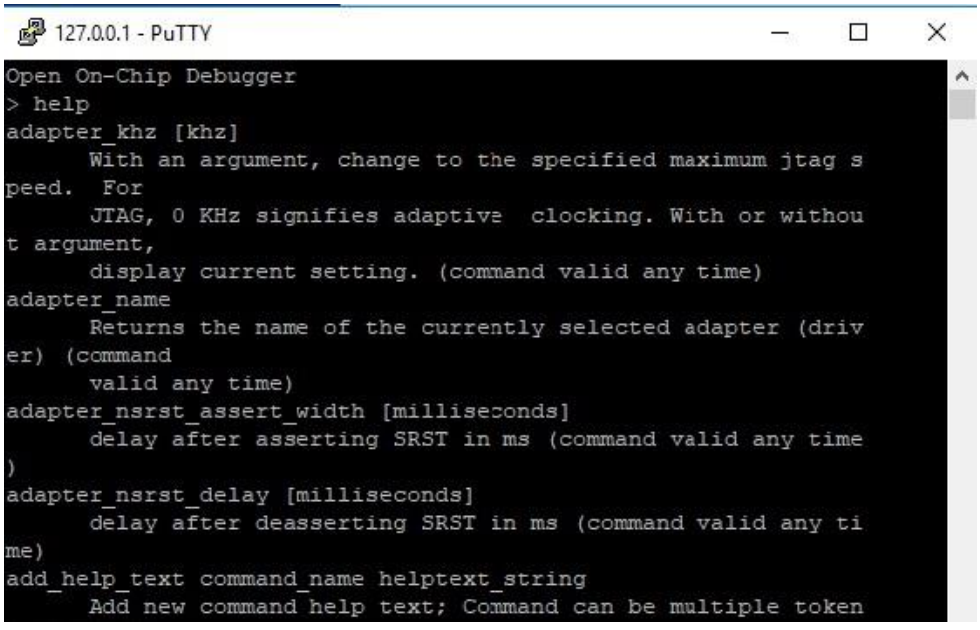
Host Name (or IP address): *127.0.0.1*

Port: *4444*



And press Open to be connected with the target.

Type “ help” to find more possible commands.



More information is available here:

https://www.olimex.com/Products/ARM/JTAG/_resources/Manual_TELNET.pdf

http://openocd.org/

2. Xilinx USB JTAG pod.

2.1 Required hardware

- EMC²-DP,

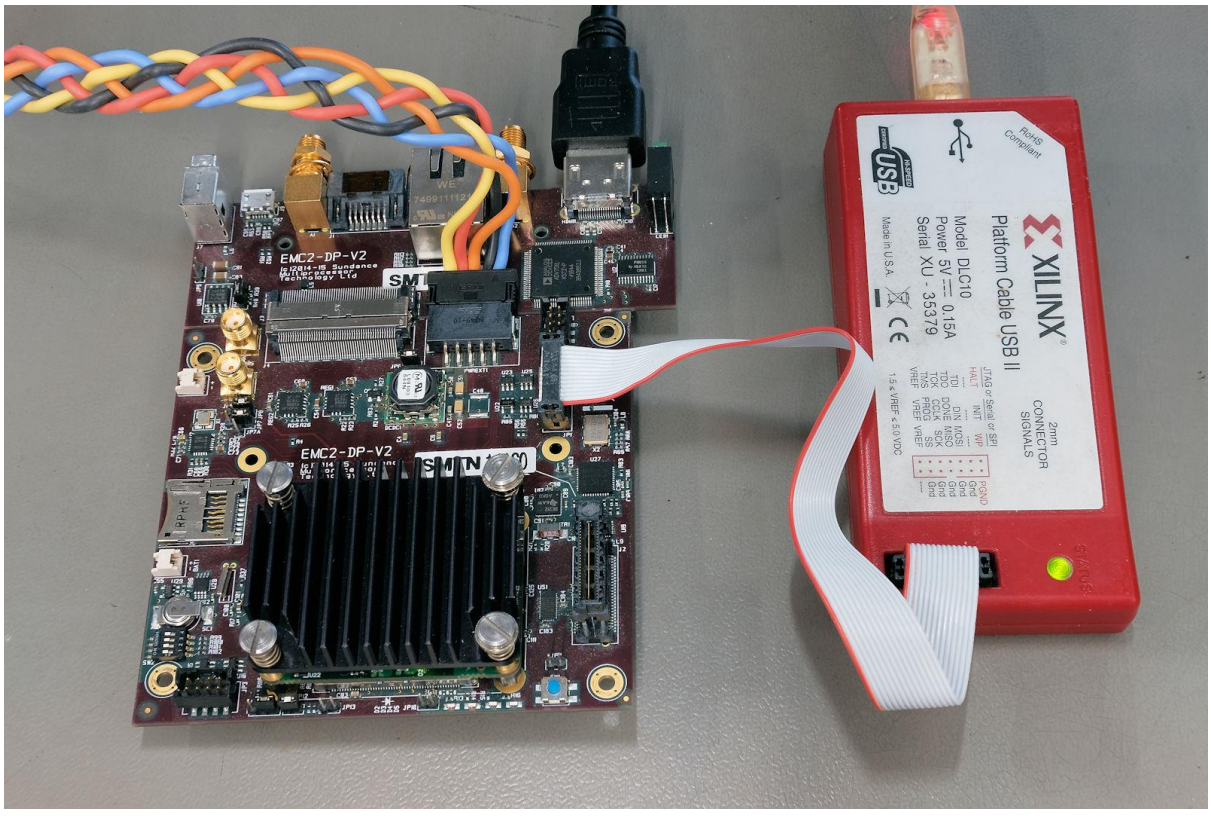
- Trenz SoM module based on Zynq 7000 FPGA

- Xilinx Platform Cable USB II

- Windows PC with Vivado software installed

- USB A to B cable

- AXT power supply



2.2 PC setup.

When you will connect Xilinx Platform Cable USB II with your PC using USB cable your PC should find and install drivers for it automatically. You can check when it's done in "Device manager"

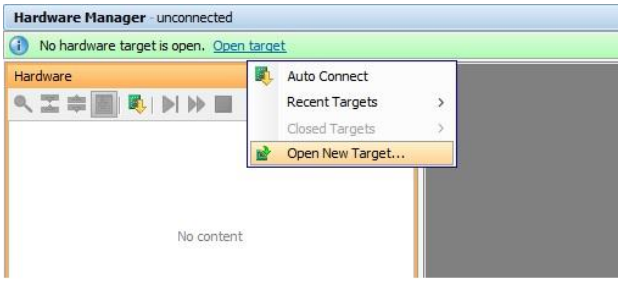
2.3 Vivado software.

Connect JP1 on EMC²-DP with Xilinx pod using grey ribbon cable. Turn the power ON for EMC²-DP and make sure that LED on the pod does change colour from orange to green.

It indicates correct JTAG voltage on EMC²-DP.

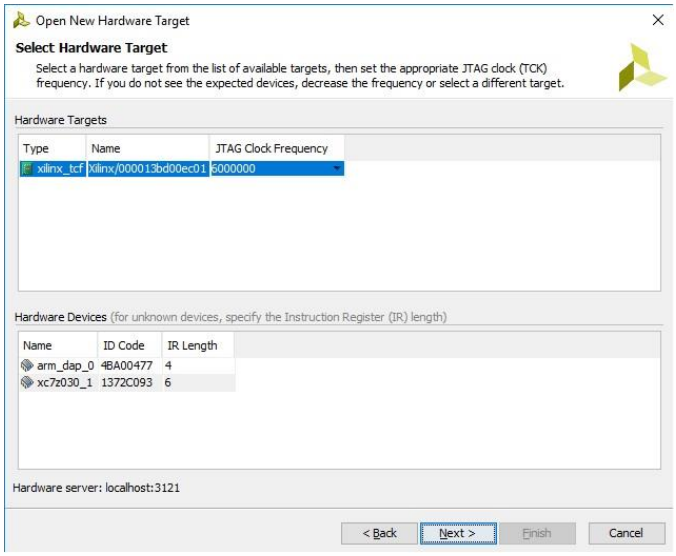
Open Vivado software and pick " Open Hardware Manager"

Choose "Open target" than "Open New Target…"

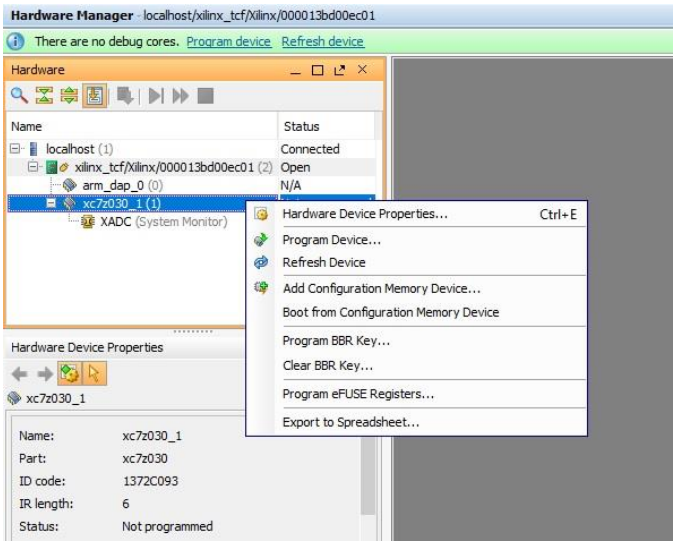


Than “Next”, twice

At this stage in “Hardware Devices” window you should have list of devices recognized on JTAG chain. Pick whichever device you want to program and click “Next” and then “Finish”.



Now you ready to go.



More information about EMC²-DP can found here:

http://support.tulipp.eu/viewtopic.php?f=5&t=2

http://www.sundance.com/