RVX FPGA Setup Manual

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1 Overview

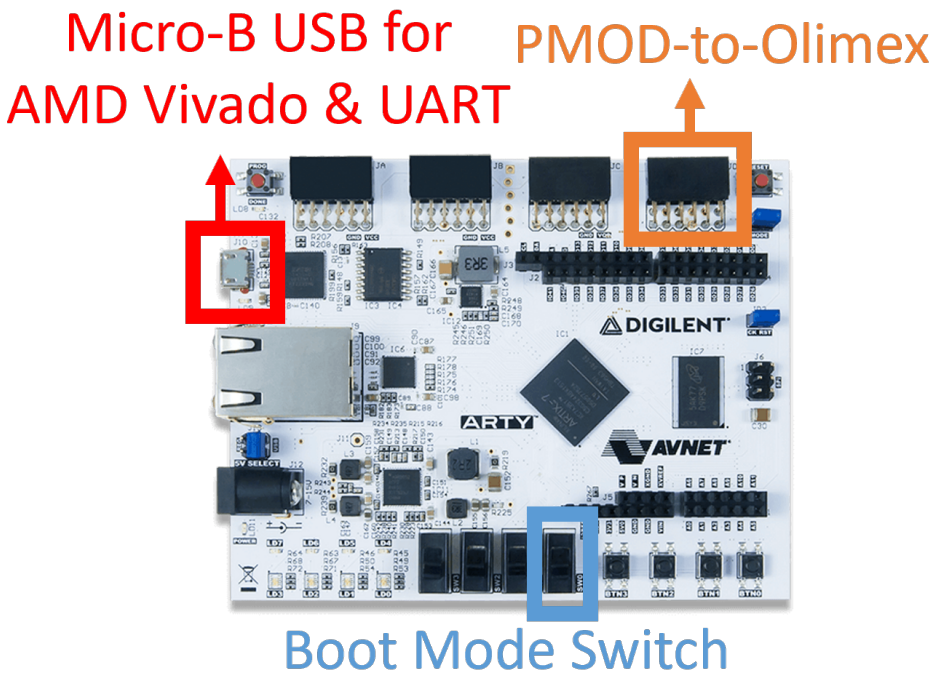
- This manual provides information about the supported FPGA boards and explains how to connect them to your computer for use with RVX.
- FPGA prototypes generated by RVX require additional module to connect to your computer, which varies by board.
- The additional module is either Olimex ARM-USB-TINY-H (OLIMEX-JTAG) or RVX Expansion Bridge (RVX-EB).
- RVX-EB is not an off-the-shelf product and is available by custom order only.

2 Arty A7-100T + OLIMEX-JTAG

2.1 Information

- This board is referred to as `arty-100t` in the RVX
- `https://digilent.com/shop/arty-a7-100t-artix-7-fpga-development-board/`
- `https://www.olimex.com/Products/ARM/JTAG/ARM-USB-TINY-H/`
- Vivado freely supports this board.
- Vivado 2022.1 or later is required.
- Installation of `Olimex Driver` and `Telnet` is required (See Miscellaneous section).

2.2 Connection to your computer



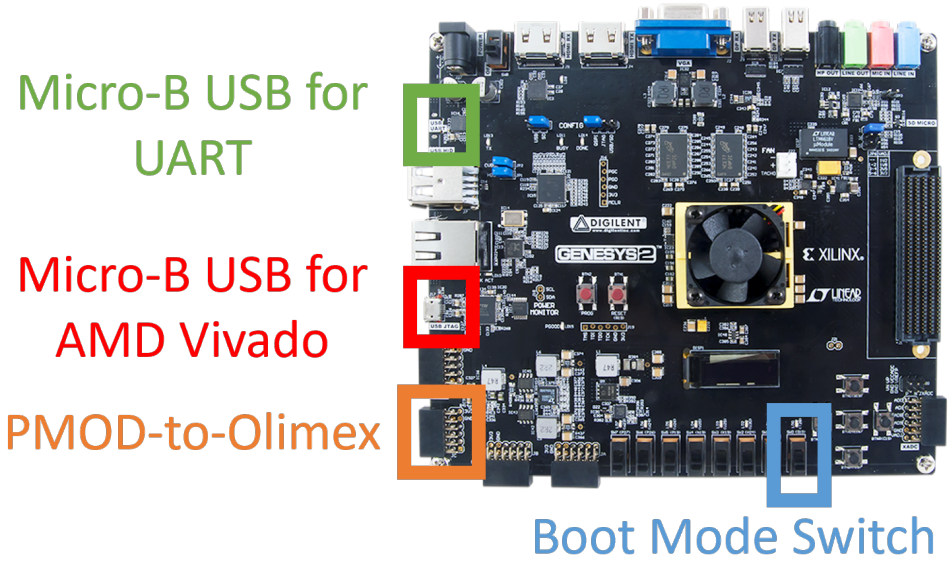
- Micro-B USB port should be connected to your computer for FPGA programming and UART communication.
- PMOD port should be connected to your computer for RVX JTAG communication via the Olimex module (See Miscellaneous section).
- Make sure all the sliding switches are set to the down position.

3 Genesys2 + OLIMEX-JTAG

3.1 Information

- This board is referred to as `genesys2` in the RVX
- `https://digilent.com/reference/programmable-logic/genesys-2/`
- `https://www.olimex.com/Products/ARM/JTAG/ARM-USB-TINY-H/`
- A valid license for Vivado is required.
- A one-year temporary Vivado license is included with the board purchase.
- Vivado 2022.1 or later is required.
- Installation of `Olimex Driver` and `Telnet` is required (See Miscellaneous section).

3.2 Connection to your computer



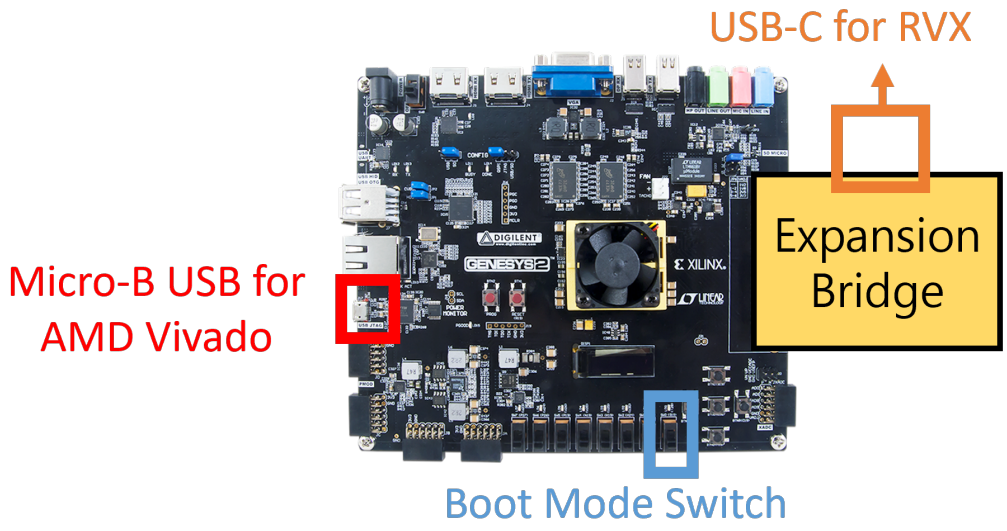
- Micro-B USB port should be connected to your computer for FPGA programming.
- Another Micro-B USB port should be connected to your computer for UART communication.
- PMOD port should be connected to your computer for RVX JTAG communication via the Olimex module (See Miscellaneous section).
- Make sure all the sliding switches are set to the down position.

4 Genesys2 + RVX-EB

4.1 Information

- This expanded board is referred to as `genesys2-eb` in the RVX
- https://digilent.com/reference/programmable-logic/genesys-2/
- A valid license for Vivado is required.
- A one-year temporary Vivado license is included with the board purchase.
- Vivado 2022.1 or later is required.
- Installation of `RVX-EB` Driver and `Telnet` is required (See Miscellaneous section).

4.2 Connection to your computer



- Micro-B USB port should be connected to your computer for FPGA programming.
- USB-C port should be connected to your computer for RVX functionality.
- Make sure all the sliding switches are set to the down position.

5 AMD FPGA Board + RVX-EB

5.1 Information

- Only AMD boards with an FMC connector are supported.
- An FPGA registration process is required (imp_class_info).
- The Vivado license depends on the FPGA chip you are using.
- Installation of RVX-EB Driver and Telnet is required (See Miscellaneous section).

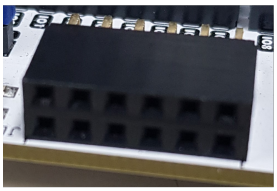
5.2 FMC Signal Mapping for a Pimmap of FPGA

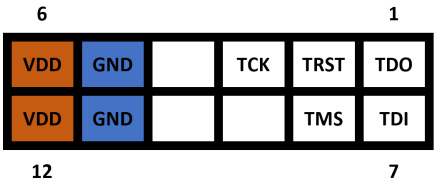
Signal	FMC Pin
pjtag_rtdo	LA_30P
pjtag_rtrstnn	LA_24N
pjtag_rtck	LA_30N
pjtag_rtdi	LA_28P
pjtag_rtms	LA_28N
printf_tx	LA_32N
printf_rx	LA_32P
PMOD1_1	LA11_N
PMOD1_2	LA11_P
PMOD1_3	LA07_N
PMOD1_4	LA07_P
PMOD1_7	LA04_N
PMOD1_8	LA04_P
PMOD1_9	LA02_N
PMOD1_10	LA02_P
PMOD2_1	LA25_N
PMOD2_2	LA25_P
PMOD2_3	LA22_N
PMOD2_4	LA22_P
PMOD2_7	LA20_N
PMOD2_8	LA20_P
PMOD2_9	LA16_N
PMOD2_10	LA16_P

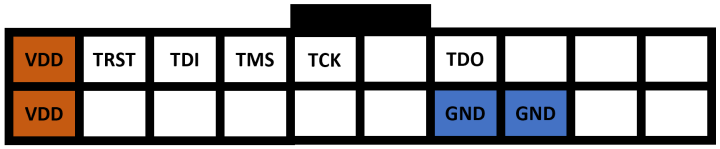
6 Miscellaneous

6.1 PMOD-to-Olimex Signal Mapping

Connect the five labeled signals using wires according to the mapping below.







6.2 Olimex Driver

6.2.1 Instruction @ Windows

```
inst) Connect the OLIMEX-JTAG cable to your computer.
inst) Run the zadig program
> Run ‘zadig-2.5.exe’ from the ${RVX_MINI_HOME}\windows_binary directory.
> Or, Download it from ‘https://zadig.akeo.ie’ and run it.
inst) In the zadig program,
> Select [Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 0)].
> Click [Install Driver].
> Select [Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 1)].
> Click [Install Driver].
```

6.2.2 Instruction @ Linux

No additional installation is required.

6.3 RVX-EB Driver

6.3.1 Instruction @ Windows

```
inst) Connect the RVX-EB cable to your computer.
inst) Run the zadig program
> Run ‘zadig-2.5.exe’ from the ${RVX_MINI_HOME}\windows_binary directory.
> Or, Download it from ‘https://zadig.akeo.ie’ and run it.
inst) In the zadig program,
> Click [Options] in the menu bar.
> Click [List All Devices] by enable it.
> Select [Quad RS232-HS (Interface 0)].
> Select [WinUSB (XXXXXX)].
> Click [Install Driver] or [Replace Driver].
```

6.3.2 Instruction @ Linux

No additional installation is required.

6.4 Telnet

6.4.1 Instruction @ Windows

```
inst) Open [Control Panel]
> e.g., type ‘control’ into the Windows Search bar.
inst) Click [Programs]
inst) Click [Turn Windows features on or off]
inst) Enable [Telnet Client]
inst) Confirm
```

6.4.2 Instruction @ Linux

No additional installation is required.

6.5 FTDI Drivers for Telnet

If you use only Telnet on Windows without installing Vivado,
you need to install the FTDI driver.

6.5.1 Instruction @ Windows

Install the VCP drivers from `https://ftdichip.com/drivers`.

6.5.2 Instruction @ Linux

No additional installation is required.

7 Navigate

- RVX Homepage
- NPX Homepage