Instruments That Advance The Art

Pixie-Net Quick Start Guide

Introduction

Thank you for using our products. This document contains the most important information to get started with the Pixie-Net system. Please read the entire document and keep it nearby as you go through the installation of hardware and software and the initial setup of the detector system. Please also read at least the first 3 chapters of the Pixie-Net User Manual provided with the software distribution

System Requirements (Section 1.3 of the User Manual)

- Windows PC (for initial setup). See manual for Linux options.
- Local network connection

Setup (Sections 2.1/2.2 of the User Manual)

1. Download and extract/install Silicon Labs CP210x USB-to-UART driver from https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers See microzed.org/sites/default/files/documentations/CP210x_Setup_Guide_1_2.pdf for details.
2. Download and install Tera Term (or other suitable terminal program) from http://ttssh2.osdn.jp/
3. Connect
   - DC power plug from the AC adapter to the "12VDC" power input on the Pixie-Net
   - USB cable between Pixie-Net ("UART") and PC (any USB port)
   - CAT 5 network cable from Pixie-Net to local network
4. From the Silicon Labs installation, run CP210xVCPInstaller_x64.exe to create a COM port and find the new COM port's number in device manager
5. Open Tera Term.
   - Connect via the serial port showing the COM number above
   - Select Setup > Serial port. Defaults are ok, except baud rate must be 115200.
   - type <enter> in the terminal prompt
   - Login with default credentials **root/xia17pxn**
6. Once logged on via the Linux terminal, the following steps must be performed:
   - Change to working directory: cd /var/www
   - Apply parameters from file settings.ini to FPGA: ./progfippi
     (For units 1320 and up, this is executed automatically at Linux startup)
   - Automatically set a few basic parameters: ./findsettings
     This should be performed with the detector connected, with the correct polarity and termination setting specified in the settings file.
   - Find IP address: ifconfig (if no IP address is assigned, contact your network admin)
7. On the PC, open a web browser and type the Pixie-Net's IP address into the search/address field.
8. On the PC open Windows Explorer and type \\<IP address>\PNvarwww in the address field. Login with default credentials **root/xia17pxn**

Getting Started (Section 3 of the User Manual)

Adjusting Settings

The FPGA settings and processing parameters must be adjusted (once) to match the detector characteristics. This includes analog settings such as gain and offset, and pulse processing parameters such as decay time and trigger threshold.

All settings are stored in the file settings.ini. The default settings file is configured for the Pixie Net internal pulser. Examples of other settings files are on the SD card. An easy way to test operation is therefore to connect the "PULSE" output to one of the analog inputs. For a description of the parameters, please see the Pixie-Net User Manual. To modify a parameter, edit the .ini file and then execute `./progfippi` to apply the changes to the FPGA. Editing can be accomplished with a built-in Linux editor through the terminal (for example VI) or by opening the file in a Windows editor through the SMB file sharing.

To verify that analog settings are correct (signal in range, pulses start with rising edge, no clipping), open/refresh the Pixie-Net ADC page in the web browser, or execute `./gettraces` and view the resulting file ADC.csv. You can also execute `./runstats` to read the output parameters in the resulting file RS.csv. The current input count rate, out of range fraction, temperatures, and FPGA system time will update even when no run is in progress. The function `./findsettings` can assist in finding parameters such as DC offset.

Data Acquisition

1. In the terminal, type `./startdaq` or `./acquire` to start a run with current settings. The screen will print updates of runtime etc. An alternative is to execute the equivalent functions from the web operations webpage.
2. In the browser, navigate to the MCA page ("view spectra") or the Run Statistics page ("view run statistics") under DAQ Monitoring. Refresh these pages with the browser button to see updates during the data acquisition
3. < wait for run to finish >
4. When the data acquisition finishes in the terminal, the final MCA, the run statistics, and the list mode data files have been created.
5. In the browser, the data files can be viewed or downloaded (under "DAQ Results")
6. In the terminal, the data files can be copied to local USB drive or network drive
7. In a Windows Explorer window pointing to \\...\PNvarwww, the data files can be copied or opened with Windows tools and programs.

Important Notes

- Remember to change the default password for root SSH or serial login (root/xia17pxn) using `passwd`.
- Remember to change the default password for root SMB (root/xia17pxn) using `sudo smbpasswd -a root`.
- Remember to change the default password for web operations (webops/xia17pxn) using `vi webopspasswords`
- Remember to make a backup copy of the Pixie-Net SD card. This must be a byte-by-byte copy using a program like Win32DiskImager.

Further Information

Downloads: https://github.com/xia-whennig/PN-Releases

Support: https://xia.com/support/pixie-net/ or support@xia.com

