NanoUSB2
Evaluation Unit

Revision History:

Version	*Date*	*Modifications*	*Author*
1.00	26/11/14	Document Creation	Fátima Baptista
1.0.1	18/12/14	Updated Document	Fátima Baptista
1.0.2	20/08/15	Updated Document	Fátima Baptista
1.0.3	01/09/15	Updated Document	Fátima Baptista
1.0.7	01/09/15	Updated Document	Fátima Baptista
1.0.6	27/10/16	Updated NanEye FlexPCB connector mechanical drawing	Fátima Baptista
1.0.7	14/12/16	Updated section 2	Fátima Baptista

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1 Overview

NanEye is a tiny camera module which consists of a CMOS image sensor with a footprint size of 1mm x 1mm and, optionally, an adapted miniature optics. The device is mounted on a flat ribbon cable measuring up to 2m in length. Other cable lengths, up to 3m are possible upon request.

The Evaluation set consists of the NanEye base station which receives the NanEye sensors LVDS bit serial data stream and translates it to a USBII protocol that will interface over a standard USBII connection to a PC.

The supplied viewer software controls the NanEye camera, and displays the video images.

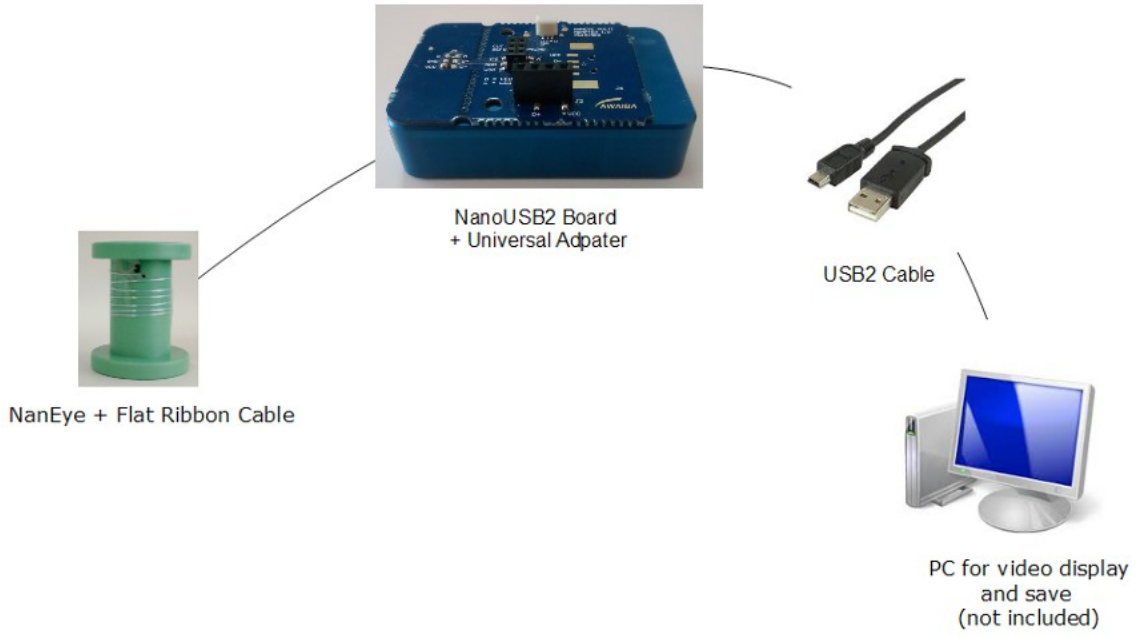

Figure 1: NanEye evaluation set overview block diagram

2 NanoUSB2 Evaluation Board

NanoUSB2 base station is a miniaturized FPGA – USB2.2 control board that is able to deserialize and communicate with AWAIBA NanEye sensor, and transfer the data via USB2 to a host PC. The base station is powered over the USB 5V supply and creates a regulated power supply for the sensor. Finally, the base station handles the upstream configuration data for the configuration of the sensor registers, such as the exposure time, offset and gain.

Specifications	
PC Interface Protocol	USB2
Programmable Unit	FPGA – Xilinx Spartan 3E
Power Supply	Via USB 5V
NanoUSB2.2 Housing Dimensions	58mm x 37mm x 14mm
Mechanical Dimensions of the Board	52mm x 30.4mm
Sensors	1 x NanEye 2D
LED Supply	12bit DAC, 50mA max @ 16V max Config. via USB with 12bit register
LED (optional)	4 LED's with 2 PCB dimensions

Table 1: NanoUSB2 Specifications

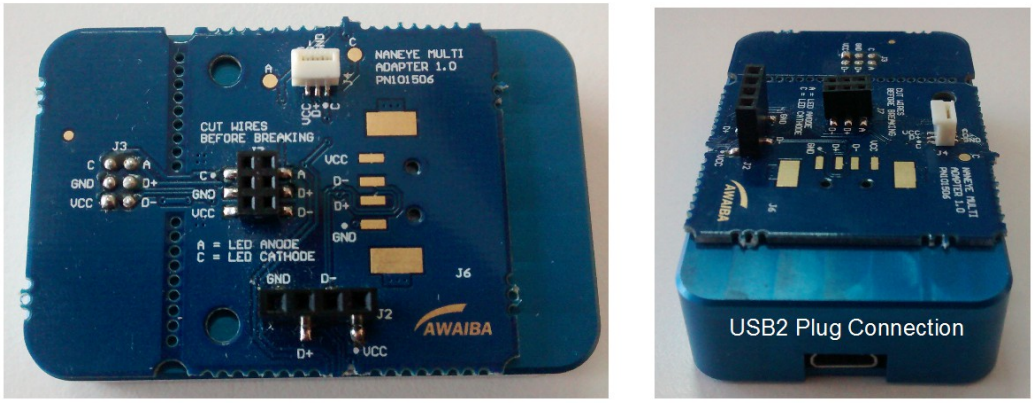

Figure 2: NanoUSB 2.2 board

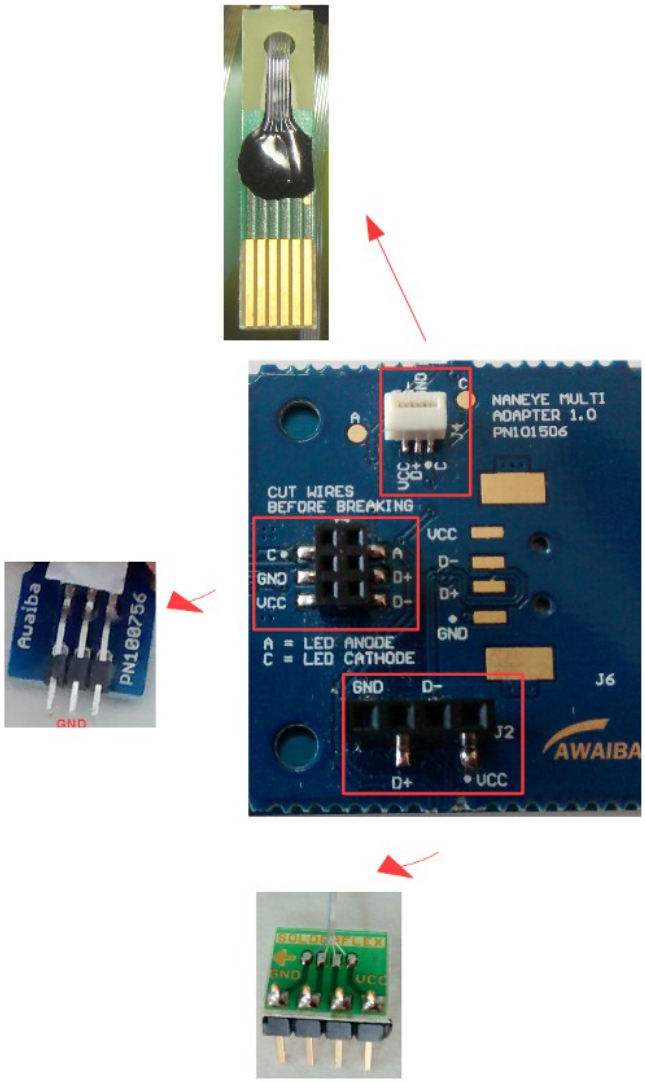

Figure 3: Universal Adapter to use with NanoUSB2 board

Note: *Take as reference the GND defined as blue wire and the instructions in the universal adapter.*

J4 – Flex PCB connector. Standard connector.

J7 – Match the GND.

J2 – Follow the instructions in the PCB.

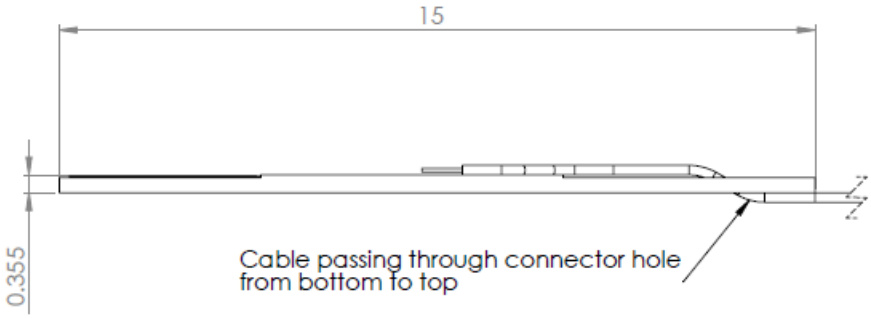

Figure 4: NanEye Flex standard connector. If not otherwise noted all tolerances are +/- 0.1mm.

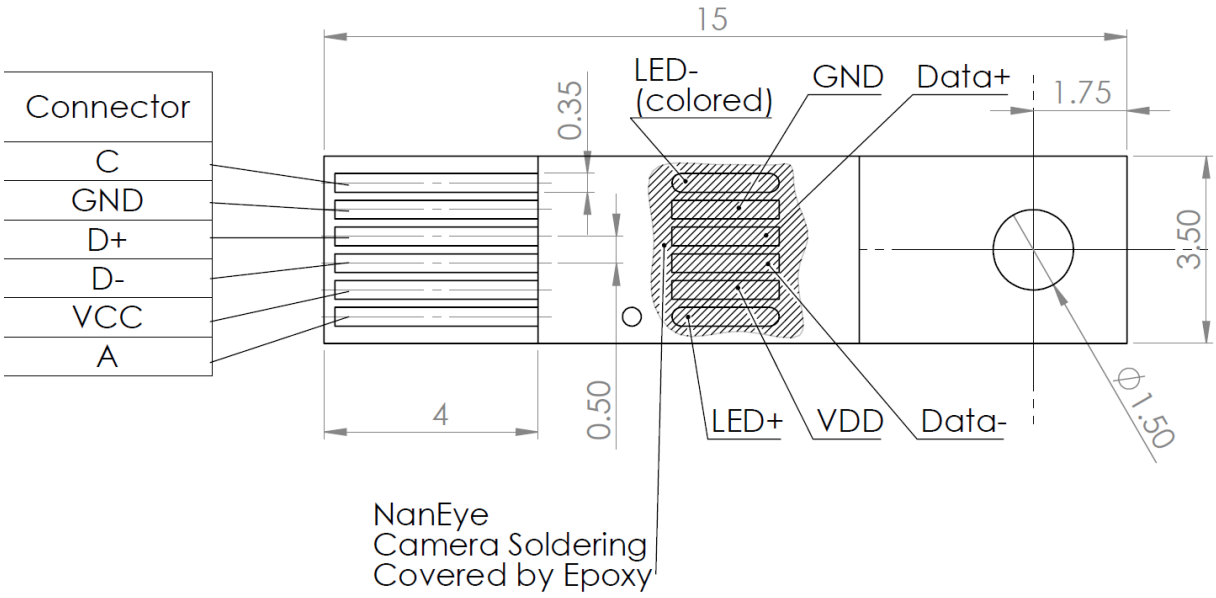

Figure 5: NanEye Flex PCB connector. If not otherwise noted all tolerances are +/- 0.1mm.

3 Evaluation Software

The Evaluation system comes with the USB evaluation unit that receives data from the FPGA-Module with one Nan Eye and the windows software to run the camera on a PC in real-time. Image display and storage is provided. It has the following features:

- Possibility to adjust white balance automatically
- Possibility to save directly to compressed .avi streams of either the processed or the raw data
- Possibility to save snapshots in PNG and in PGM (saving the 10 bit raw data)
- Possibility to acquire black and white gain masks
- Dynamic Gain and Offset switching
- Load in runtime a new configuration and change the sensor/board to receive images
- Possibility to control the LED intensity

This software also contains some Image processing algorithms:

- Colour Reconstruction
- Gamma Correction (only for colour version)
- Pixel linear correction
- Adjust colour saturation
- Adjust brightness

An **API** interface to the data stream is available for easy integration in existing display systems and evaluation of image processing algorithms.

3.1 How to Install Awaiba Viewer

Please take a look in Awaiba Viewer Quick Start file.

3.2 How to Start Awaiba Viewer

After installing the Awaiba Viewer Software and with the board connected to a PC, you can start the Viewer with the following options, for instance.

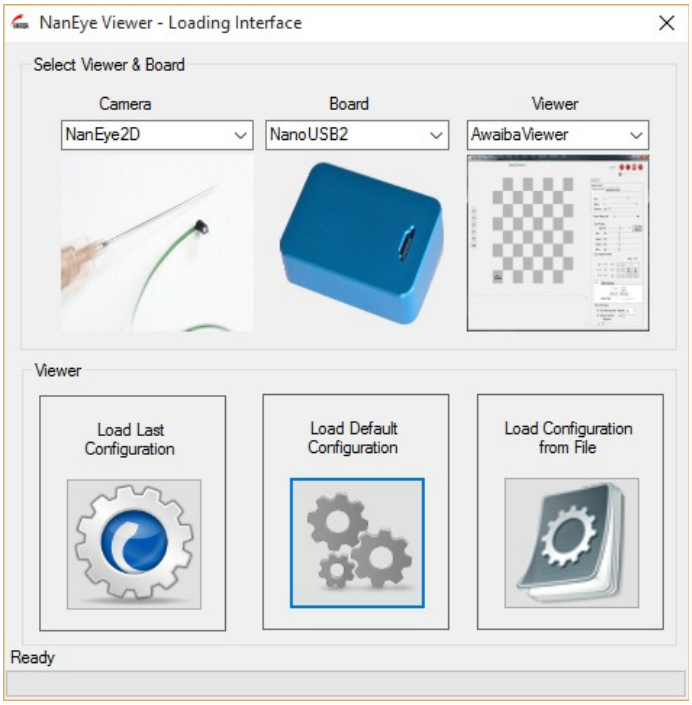

Figure 6: Start the Viewer

3.3 How to Use Awaiba Viewer

Please take a look in NanEye - Awaiba Viewer file.

3.4 How to Debug NanoUSB2

Afterwards installing Awaiba Viewer please take a look into C:\Program Files (x86)\Awaiba\Awaiba Viewer v2.16.2.3\application\debug where is the NanEye – Debug Manual.

For additional information or assistance please contact our technical support through **support@awaiba.com**.

End of Document

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