***Multi-channel Acquisition* Installation and Software Instruction Manual**

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# Installation Guide

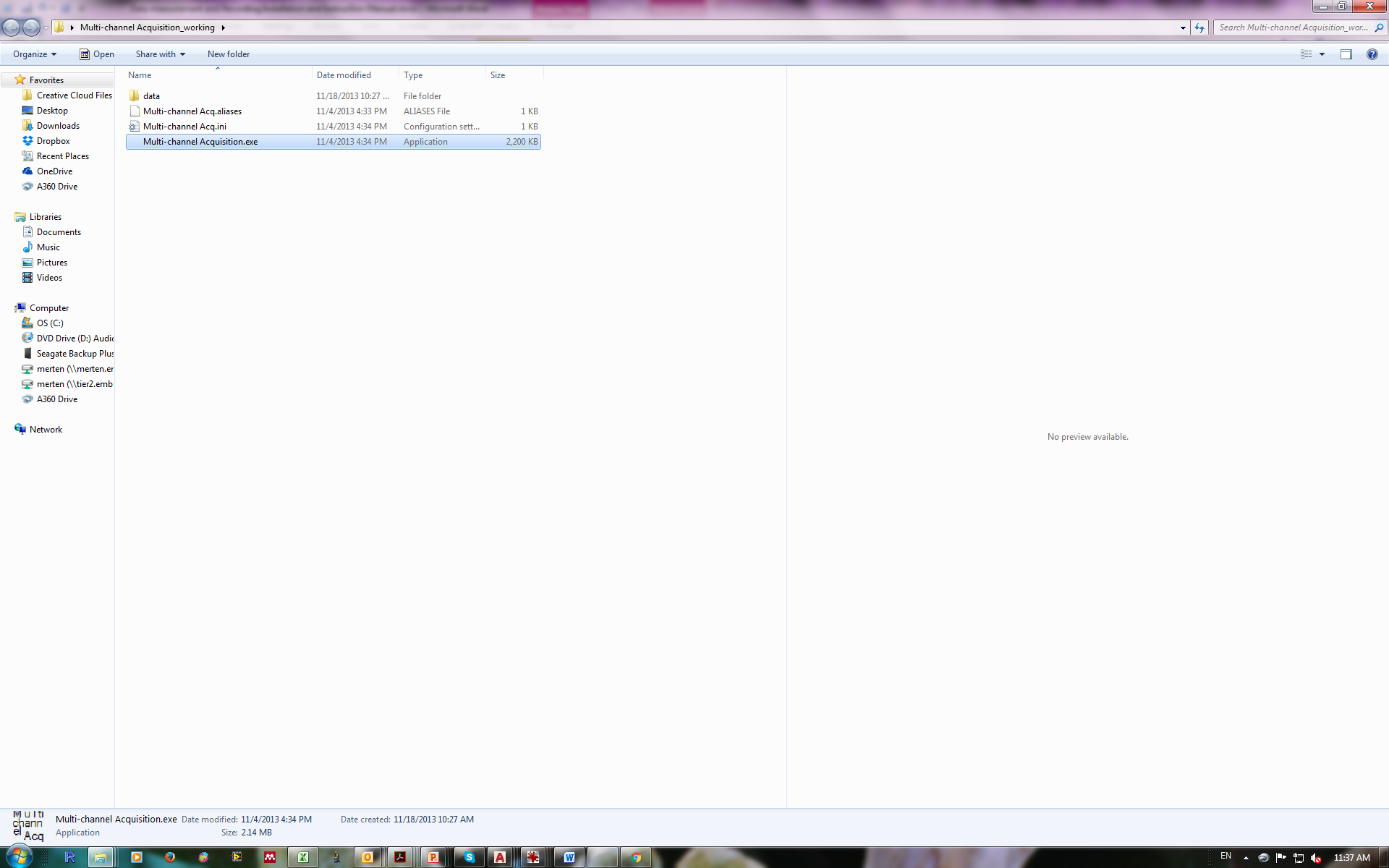
\*\*NOTE: You DO NOT need to have LabVIEW installed to run the executable, however if LabVIEW is not installed you will need to install LabVIEW Run-Time Engine 2013. An .exe is included in the *Multi-channel Acquisition.zip* to install LabVIEW Run-Time Engine 2013.

## To Download Files

* Download *Multi-channel Acquisition.zip* and extract to the desired location.

## To Launch the *Multi-channel Acquisition* Executable

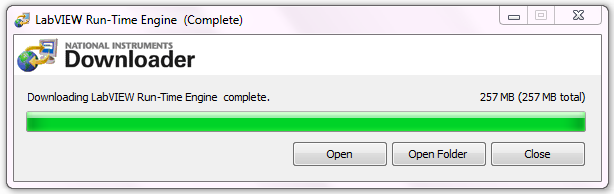
1. In *Multi-channel Acquisition* directory navigate to the *Executables* folder.
2. Double-click the *Multi-channel Acquisition.exe* application file to launch the program.



1. Once opened the program will begin running immediately. To correctly configure the software please refer to [Running the *Multi-channel Acquisition* Executable](#_Running_the_ElectricRailSorting).

## To Install LabVIEW Run-Time Engine 2013

1. Download the run-time engine from National instruments website (https://www.ni.com/en-ca/support/downloads/software-products/download.labview-runtime.html#359538)Double click *LVRTE2013std\_downloader* executable. The LabVIEW Runtime Engine 2013 Downloader appears and begins downloading.



1. When the pop-up dialog box appears click ok and you will be prompted to unzip the files to your desired location. Use *Browse* to choose the desired location and leave the *When done unzipping open: .|setup.exe* box checked.

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1. Click okayto the dialog box confirming files have been successfully unzipped and if necessary allow the *National Instruments Installer* to make changes to your computer. This will launch the NI LabVIEW Run-Time Engine 2013 Installer.



1. Follow the instructions to install LabVIEW Run-Time Engine 2013.

## To Connect FPGA and Equipment

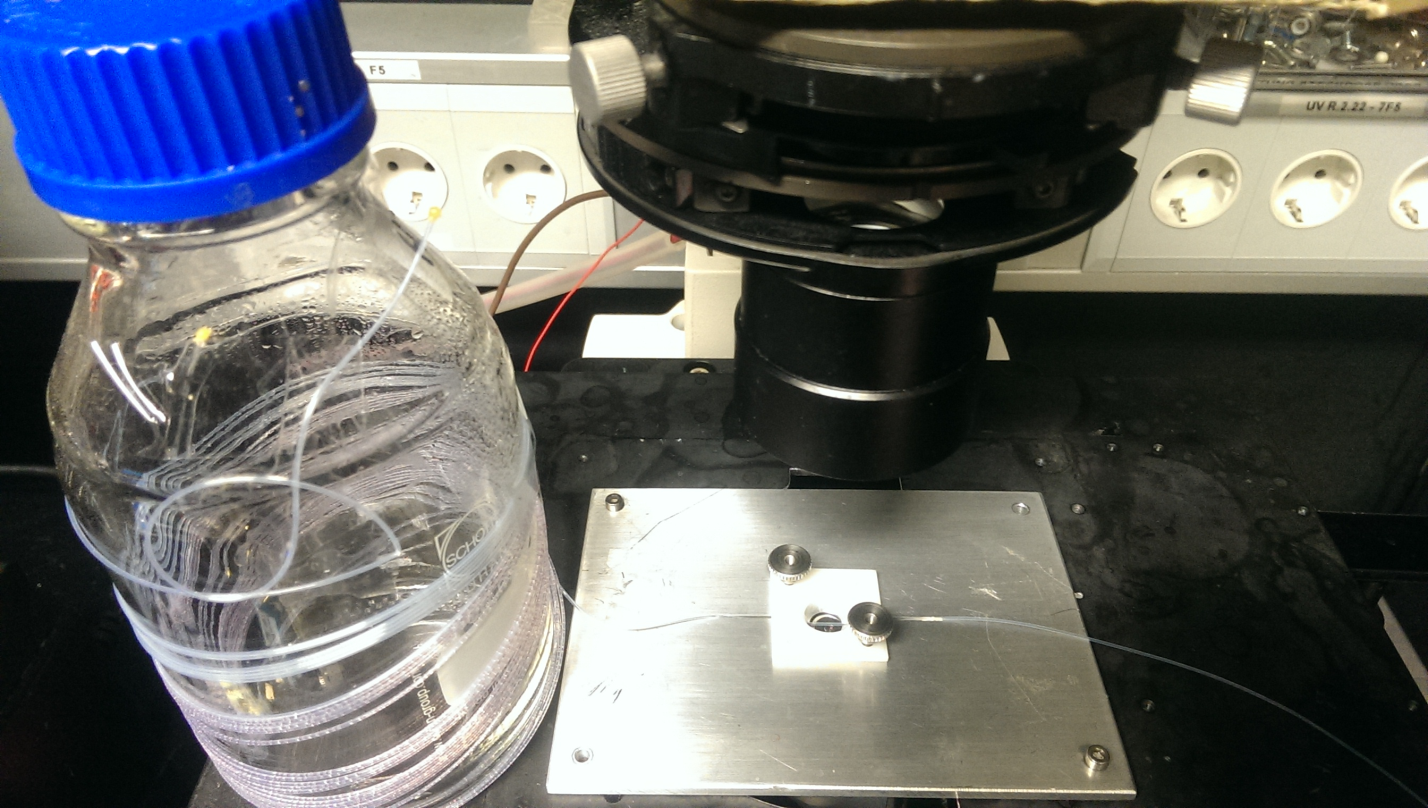
The *Multi-channel Acquisition* executable requires the following wiring:

- PMT detecting the first light colour should be connected to an analog input pin and its ground equivalent. Analog Input 0 (AI0) is used as the default although this can be any analog input pin if the correct option is chosen in the user interface of the software.

- The same is true for the PMT detecting the second and third light colour. Analog Input 1 (AI1), Analog Input 2 (AI2) and their ground equivalents are selected by default.

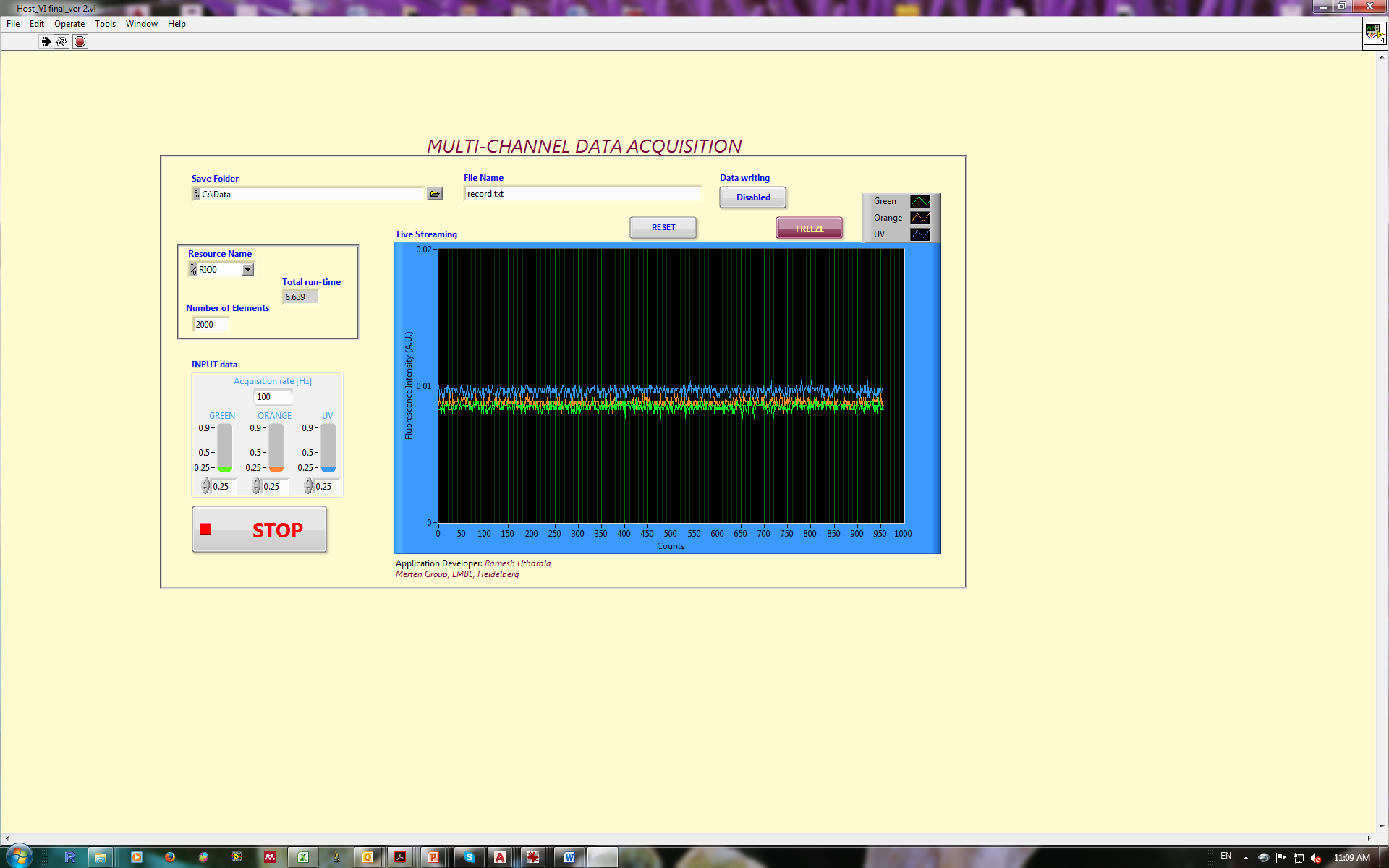
# Experimental Setup and use of Software

1. Connect the one end of the tubing to the syringe containing 5 mL of FC-40 and other end of tubing out put the waste.
2. In-house build stage is used to mount the tubing just above the 40X objective
3. Adjust the focus using the knobs on the microscope
4. Align the laser with the centre of the tubing so that the signal intensity is maximum

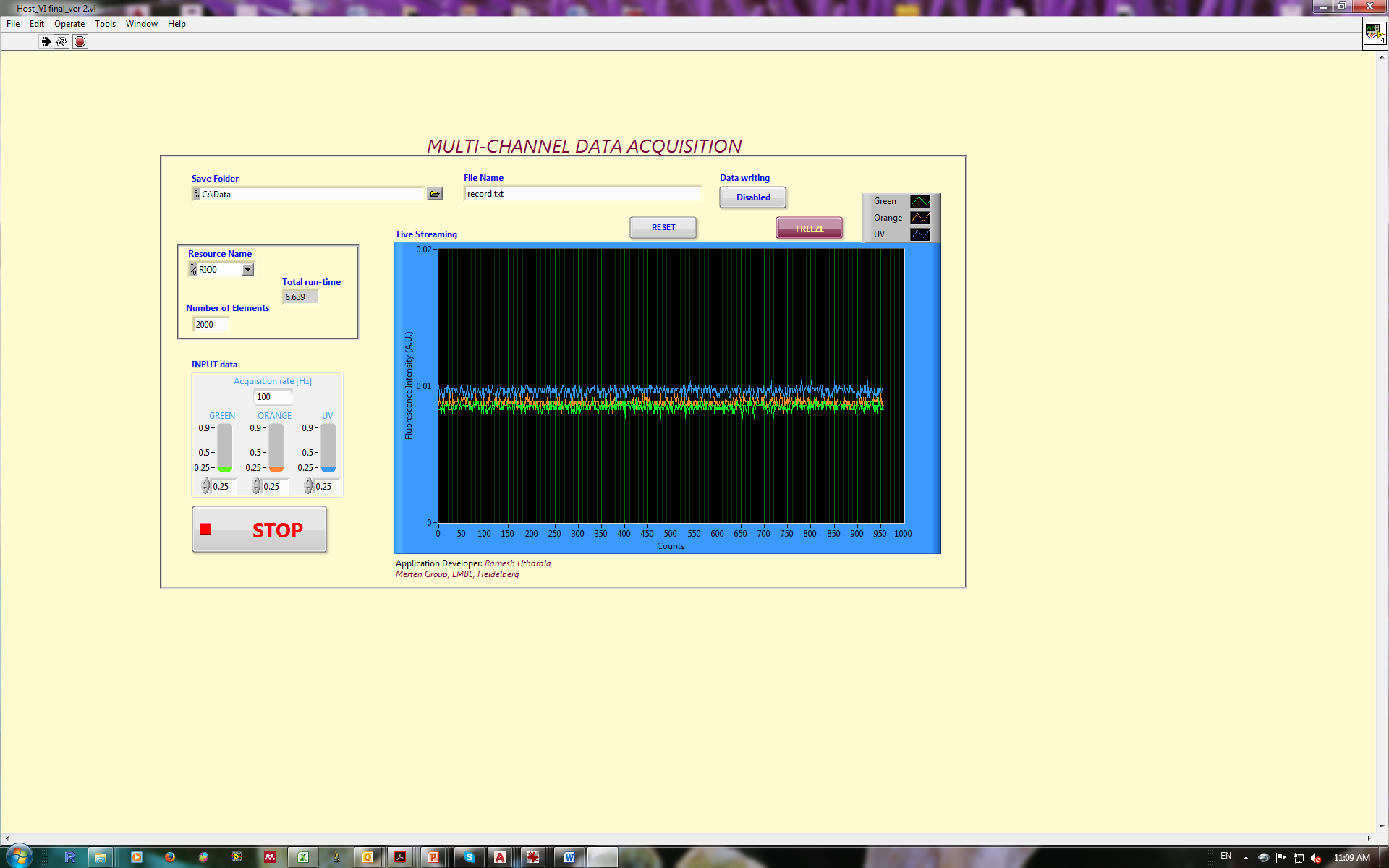


## Running the *Multi-channel Acquisition* Executable

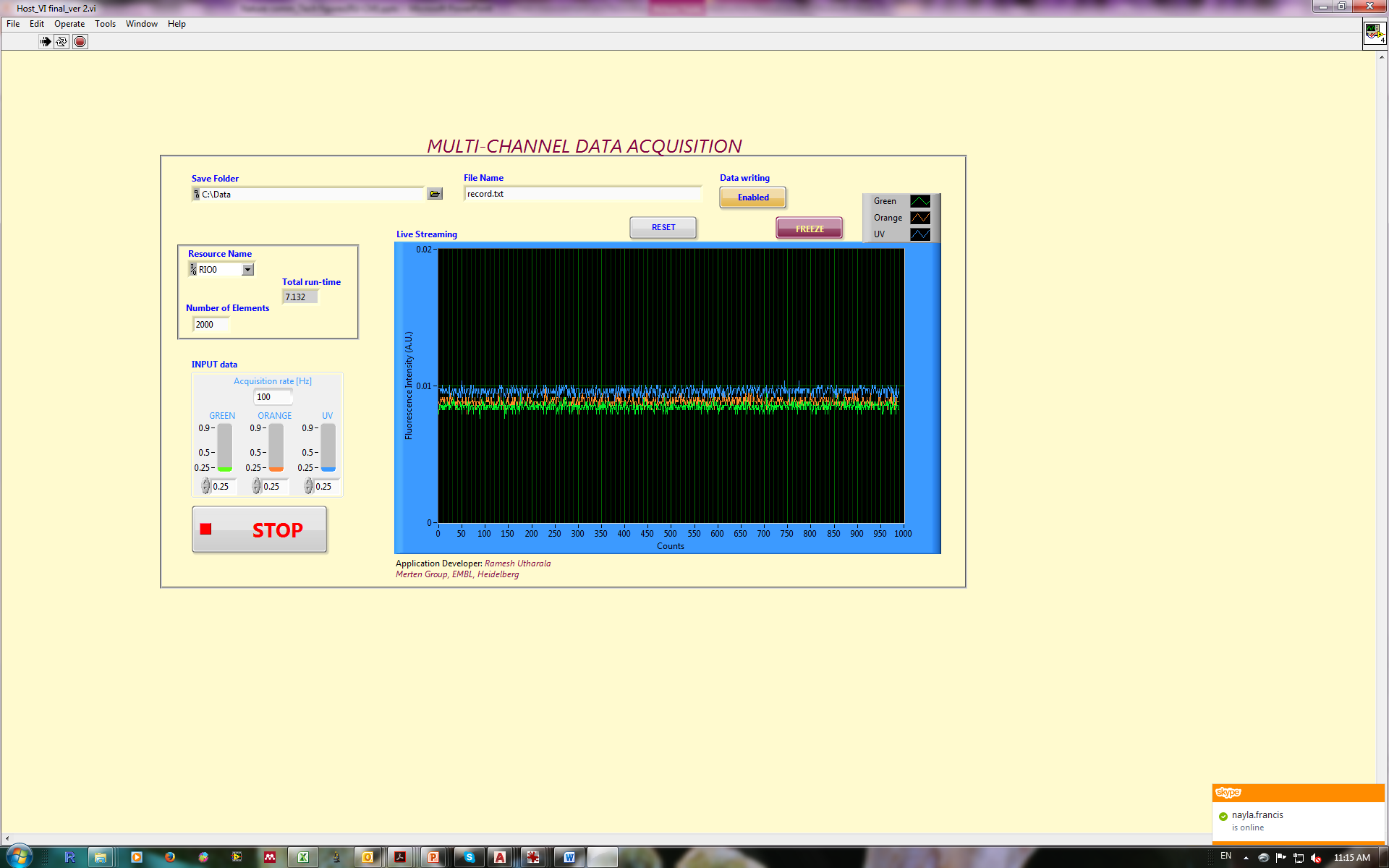
1. Select the FPGA resource name (in our case RIO0) and define number elements that can be passed to host from FPGA for every iteration. Total run-time is defined as the total amount of time taken for the entire recording.



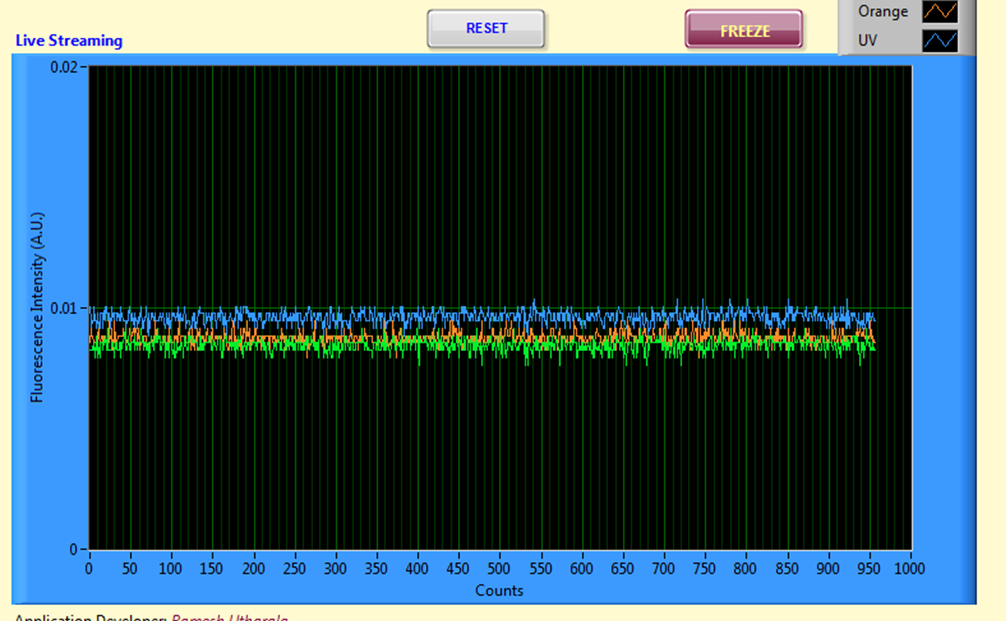
2. Set the acquisition rate and the gain values for three different PMTs.



3. Saving the signal in the specific folder with defined filename can be done by defining a file path and enabling the data writing.



4. Then press run button to see Live Data signal and additional functions such as ‘freeze’, which shows the current plot and ‘reset’ removes all data in the plot can be used to monitor real data.



4. Finally press the STOP button once the measurement is finished.

