*Firmware and software instructions*

*Computing unit preparation*

1. Install windows drivers for TTL-USB device by following the instructions in the Readme file. “PL2303\_64bit\_Installer.exe” executable file with the drivers is provided. Alternatively, it can be found online1.
2. If you are using Windows version older than 10, follow the instructions2 to install Smoothieboard drivers.
3. Download3 and install the latest Arduino IDE.
4. Download4 and install Python 3.
5. Download5 and install Pylon 6 Camera Software Suite. For operating systems other than Windows use Basler software search engine6.
6. Download Arduino libraries7 and save in the Arduino library folder.
7. Suggested Python editor: Spyder – The Scientific Python Development Environment. Follow online installation guide8 to install Spyder on the computing PC.

*Arduino firmware initialisation*

1. Open Arduino firmware sketch called “MEW digital platform 1.0”.
2. Make sure Arduino Due board and correct port are selected.
3. Upload the sketch.

*Smoothieboard firmware initialisation*

For more detailed information on how to configure Smoothieboard refer to the “Configuration file” section9 of the online documentation.

1. Upload “config” file to the SD card used with a Smoothieboard.
2. Reset Smoothieboard to implement the changes.

*Python user interface initialisation*

Python UI was developed by modifying an existing code10. Before running the main function “MEW digital platform UI.py”, open the function in Sypder (or other text editor) and make sure that the correct “COM” port is selected by replacing “X” with the number corresponding to the port Arduino Due is connected to.

1 <http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41>

2 <http://smoothieware.org/windows-drivers>

3 <https://www.arduino.cc/en/software>

4 <https://www.python.org/downloads/>

5 <https://www.baslerweb.com/en/sales-support/downloads/software-downloads/pylon-6-1-1-windows/>

6 <https://www.baslerweb.com/en/sales-support/downloads/software-downloads/>

7 Link to my Githup repo

8 <https://docs.spyder-ide.org/current/installation.html>

9 <http://smoothieware.org/configuring-smoothie>

10 <https://gist.github.com/andySigler/80c60d3f7e4ba4a950200cccc6400ca1>