



NuLAB Controller Guide

Hardware setup

The Raspberry Pi (RPi) computer in the controller is powered by a USB to USB micro cable commonly used to charge cell phones. Power the controller by inserting the micro USB end of the power cable into the socket adjacent to the HDMI port. Be careful to observe the correct orientation of the cable and socket. The RPi requires a minimum of 1,500 mA at 5 V; be sure the power supply used meets these requirements. Some cell phone chargers meet these power demands, but many do not and inadequate or failing power supplies often result in crashes at boot-up or poor performance.

Connect the pluggable USB to serial converter into any available USB port on the RPi or the provided USB expander. Plug in the provided wifi adapter to another available USB ports or a LAN cable if internet is desired. The Rii wireless keyboard USB dongle must also be plugged into an available USB port.

Note: The USB dongle of a Rii is matched to the keyboard and must also be replaced when replacing a Rii.

There is no power switch for the RPi. As soon a power is supplied to the micro USB socket the RPi will boot. The desktop should appear in less than one minute after power up.

Running the NuLAB interface

Click the terminal icon in the upper left of the screen. At the prompt type the `cd ComScriptPi`

```
pi@reaspberrypi: ~$ cd ComScriptPi
```

Then type `mono ComScript.Mono.exe NuLAB_Manual_nr` to launch the ComScript NuLAB interface.

```
pi@reaspberrypi:~ ComScriptPi $ mono ComScript.Mono.exe NuLAB_Manual_nr
```

The NuLAB Manual Controls and NuLAB Output windows will open. Position the windows so they can both be viewed simultaneously. Basic commands and macros are run from the Manual Controls window and system messages and data are displayed in the Output window.

To close the interface, type Ctrl-c in the terminal window with scrolling output and close the terminal.



Data viewing and retrieval

To view data from the analysis macros, click on the file browser icon in the upper left of the screen. Navigate to `/home/pi/ComScriptPi/profiles/NuLAB_Manual_nr` and the data is organized in separate files for each channel (e.g. Nitrate_Data-M.txt). To collect data from the RPi, insert a USB drive into any available USB port. A window should open automatically asking if you want to open the drive in File Manager - click yes. You can now copy and paste the data file from the RPi to the USB drive with simple copy (Ctrl-c) and paste (Ctrl-v) commands. It is very important to eject the USB drive before removing it from the RPi by clicking the eject icon in upper right of the screen next to the time display.

Useful RPi commands

- To set the date and time on the Real Time Clock (if unit supplied with a RTC)

```
pi@reasperrypi: ~$ date DateAndTimeString
```

where *DateAndTimeString* = MMDDhhmmyyyy.ss

MM = two digit month

DD = two digit day or the month

hh = two digit hour (note: 1pm = 13)

yyyy = four digit year

.ss = two digit seconds

- To display current date and time

```
pi@reasperrypi: ~$ date
```

- To display network information

```
pi@reasperrypi: ~$ ifconfig
```

- Use the up and down arrow keys to scroll through commands already typed into the terminal.