Quick start guide for Raspberry Pi based field monitor

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1 Introduction

This document is intended to give you a very quick set up of the field sensor system. It assumes that you don't really need to know any of the complicated details, and only want to change a few of the parameters. If you are interested in a more in-depth explanation, take a look at *field_monitor/documentation/documentation.pdf*.

The Raspberry Pi image provided will run without any modfications. So, this document only explains how to modify parameters on the logger and controller.

1.1 What you need

There are a couple of things that you need to upload code to the logger and controller:

- The Arduino IDE - get it at `https://www.arduino.cc/en/Main/Software`
- The software - since you're looking at this guide, I'll assume that you have everything already
- An FTDI cable to upload code. This has a USB port on one end, and a six pin header on the other. The six wires should be green, yellow, orange, red, brown and black, in that order. It must have 5V power and 3.3V logic. If you're not sure, grab a multimeter. Plug in the cable and test the voltage between the red wire and the black wire - it should be around 5V. Now test the voltage between the yellow wire and ground. It should be around 3.3V

2 Installing the libraries

The field monitor makes use of some external libraries. These can be found in *field_monitor/arduino_libraries*. There are four of them, and they need to go in the right place, or your code won't work. For windows, you should have a directory called *My Documents/Arduino/libraries*. Place all of the folders inside *field_monitor/arduino_libraries* into this directory. For Linux, they need to go in */sketchbook/libraries*.

You need to restart the Arduino IDE for it to find the libraries.

3 Plugging in a Moteino

Before plugging in the controller or logger Moteino, make sure you turn off the other power sources! If you forget, you'll probably be OK, but this is good practice.

Since we are using an FTDI cable, it's not as simple as just plugging in a USB socket, because it's possible to plug it in the wrong way around. It's a

good idea to plug the cable into the Moteino first, then double check that it's the right way around before plugging the cable into the computer.

It's pretty straightforward:

- Pick up the cable and the Moteino
- Have a look at the 6-pin header on the Moteino. You can see that at one end, a pin is labelled **GND**, and at the other, a pin is labelled **DTR**
- Line up the FTDI header so that the black wire is lined up with **GND**, and the green wire is lined up with **DTR**
- Plug it in

4 Setting up the IDE

You need to select the right board to upload to. The Moteino is very similar to the Arduino Uno, so we can use that:

- Open Arduino IDE
- Go to Tools - Board
- Select "Arduino Uno"

You also need to select the right port:

- Open Arduino IDE
- Go to Tools - Port
- Select the port that your Moteino is on. If you're not sure, unplug the Moteino, and see which one disappears

5 Setting up the controller

So, the controller is plugged in, the libraries are in the right place, and the IDE is set up. You are ready to modify some code! The first thing to do is to open the script that runs on the controller, and check that it works:

- Go to File - Open
- Find the file called *controller.ino*, and open it. It's in *field_monitor/controller*
- A new window will open, with some code in it
- To test if everything is working, click the big tick icon just under the "File" menu option
- A loading bar will appear in the bottom left hand corner

- After a few seconds, the loading bar will disappear. You will see a message that says *Done compiling.*

Hopefully, compiling worked. If the bar at the bottom goes orange, there is something wrong. Check that your libraries are in the right place (did you remember to restart the IDE after adding them?). You will also get some messages in the console - if there is something more complicated wrong, you can try and sort it out by looking at these messages.