PowerTune User Manual V1.0

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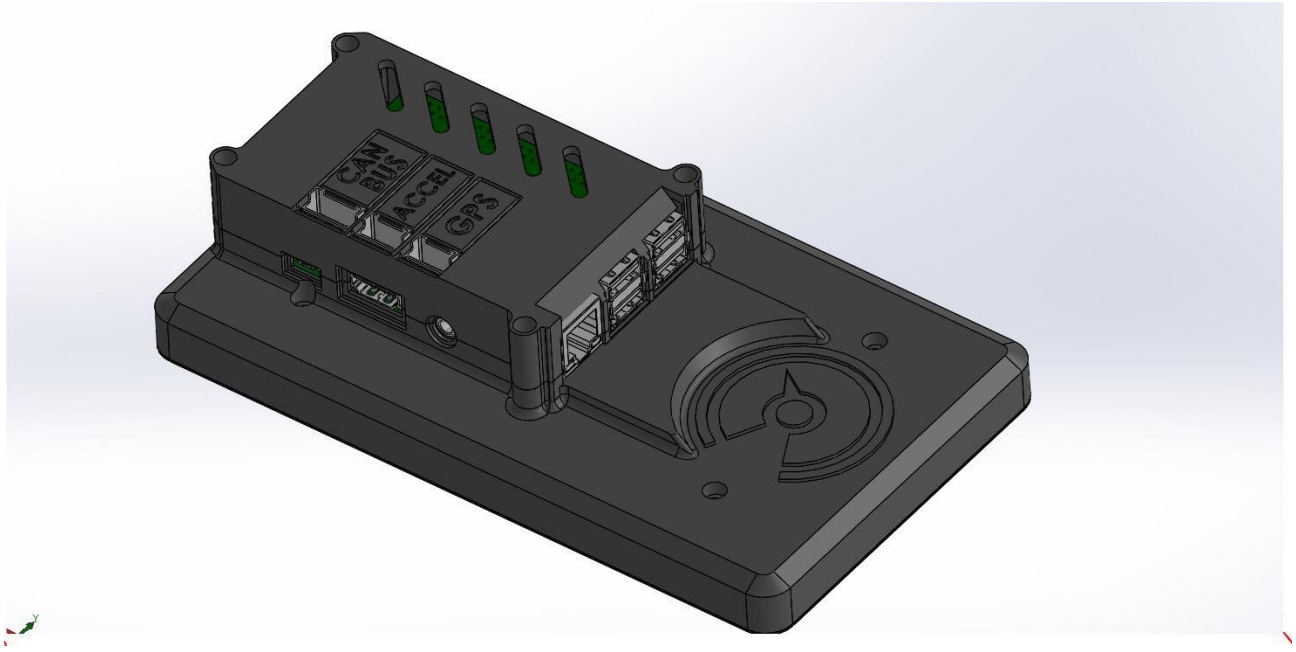
Installation in Vehicle

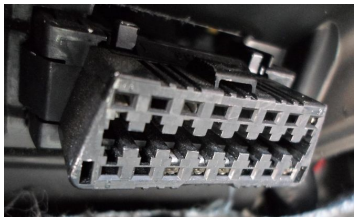
Connect the Power Supply to Ground and a Switched 12V source (ignition)

Data Cable

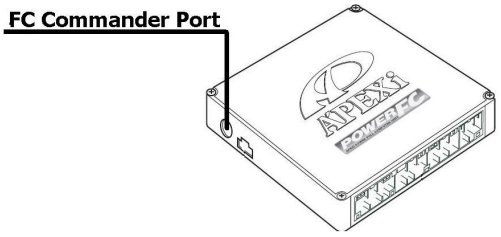
Depending on your ECU, connect your ECU Cable to your PowerTune Dash.
For Apexi /,*OBD2/* ,Nissan Consult / insert the ECU cable into one of the USB ports on the side of the Dash, for CAN ECU's insert the CAN cable into the CANBUS port of the Dash



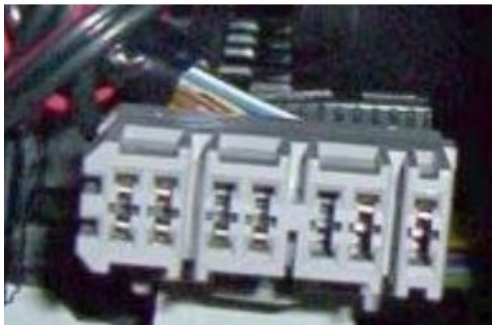
Connecting the data cable to the ECU
The OBD port is located on the drivers side of the Vehicle in the Footwell area
(consult your vehicle manual for exact location)



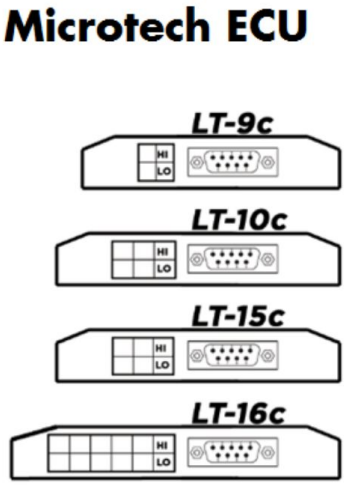
For Apexi the communication port is the circle port on the Side of the ECU



Nissan Consult Port is located in the footwell area near the drivers fuse box

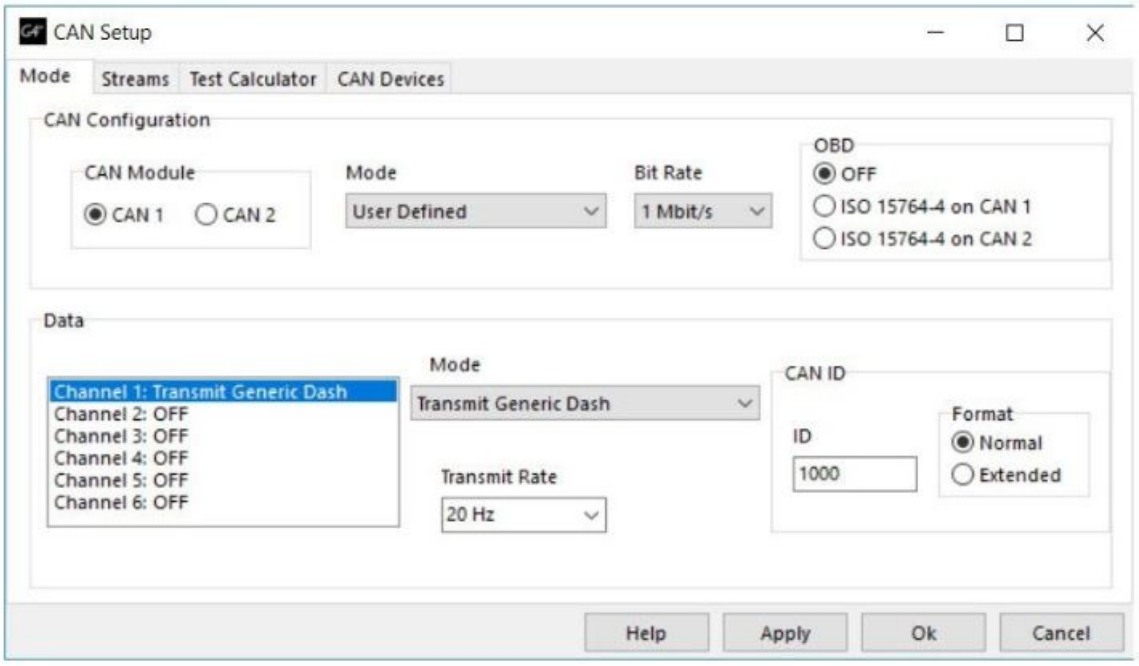


For CAN based ECU's (Link/Vipec/Haltech and most other modern ECU's) consult the User Manual of your ECU to locate the CANBUS port (some examples Below)



ECU Configuration

LINK / VIPEC



Haltech

Haltech automatically outputs at 1mbit over CAN and does not require configuration in almost all cases. In some circumstances CAN output may need to be enabled at 1mbit in the Haltech windows software.

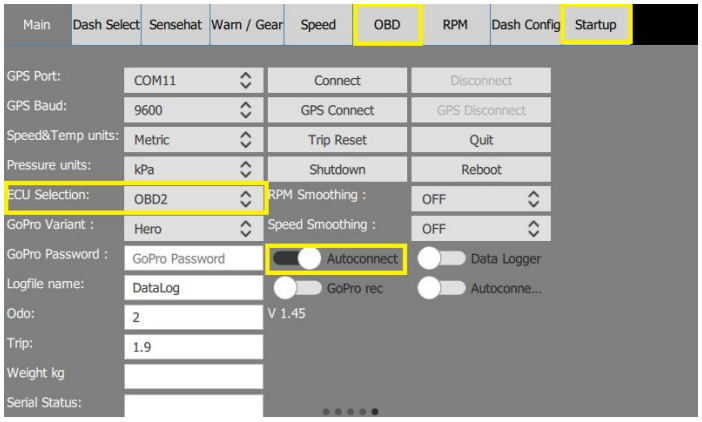
Adaptronic

Microtech

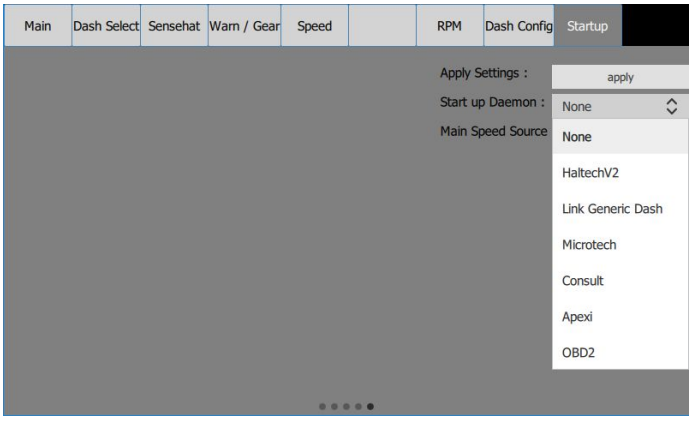
PowerTune ECU SETUP

ECU setup

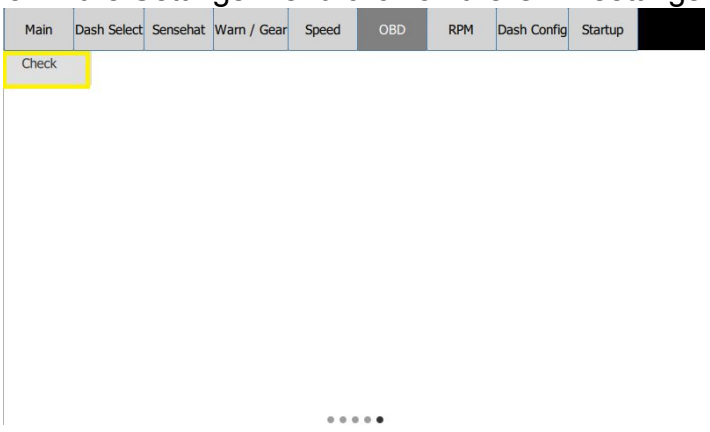
- ***OBD2***
  1. In the Settings screen ECU select choose “OBD2”
  2. Switch the Autoconnect button to the right into the on position



  3. In the Startup settings TAB select OBD
  4. Click apply and the Dash will reboot



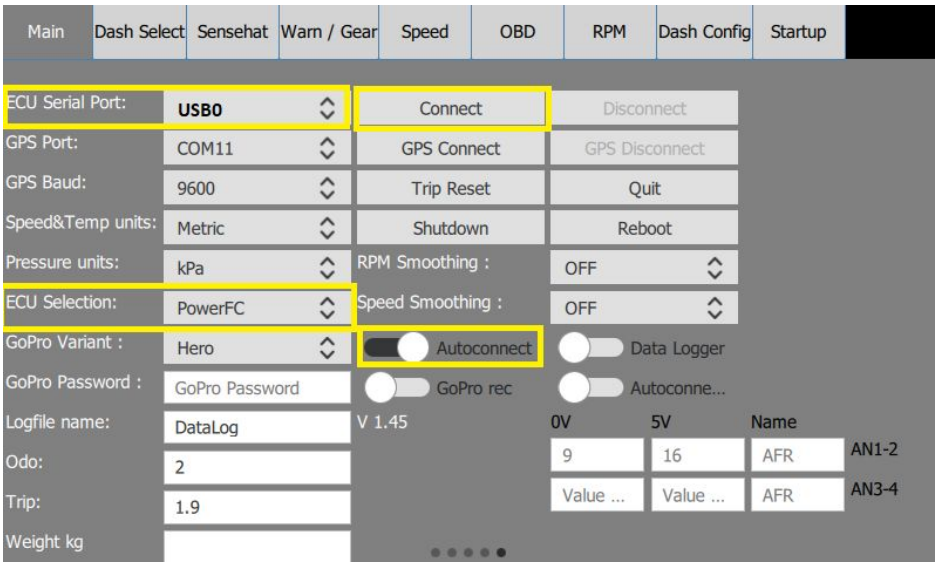
  5. In the Settings menu click on the OBD settings Tab



  6. Click Check
  7. Select the values you want to poll from the ECU
  (the more you choose the slower the update rate)
  8. Click Apply (The Dash will reboot and your ECU communication is finished)

Apexi Power FC

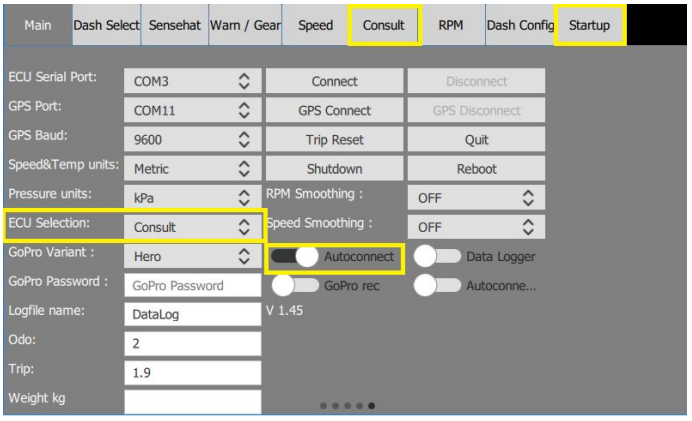
1. In the Settings screen ECU select choose “Power FC”

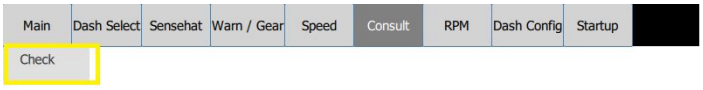


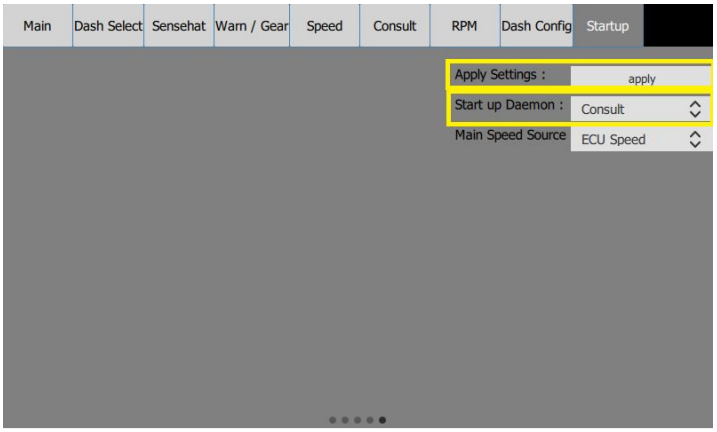
2. Switch the “Autoconnect” button to the right into the on position
3. Select the ECU COM Port from the dropdown “/dev/ttyUSB0”
4. Click Connect

Nissan Consult

1. In the Settings screen ECU select choose “Consult”
2. Switch the “Autoconnect” button to the right into the on position
3. In the Startup settings TAB select Consult
4. Click apply and the Dash will reboot
5. In the Settings menu click on the Consult settings Tab
6. Click Check
7. Select the values you want to poll from the ECU
   (Choose only the ones you need)
8. Click Apply (The Dash will reboot and your ECU communication is finished)

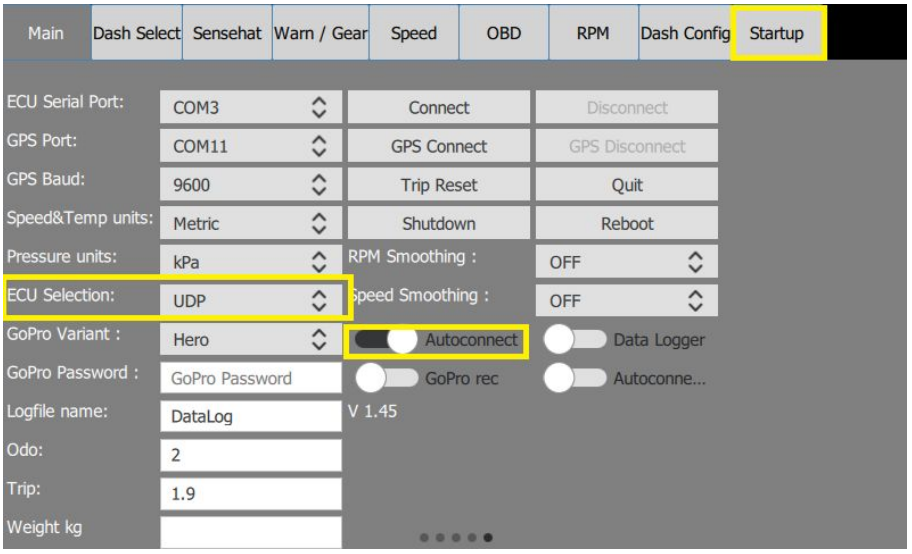






CAN based ECU's (all other supported ECU's such as Link, Haltech)

1. In the Settings screen ECU select choose "UDP"
2. Switch the Autoconnect button to the right into the on position
3. In the Startup settings TAB select your ECU Protocol (Haltech or Link)
4. Click apply (The Dash will reboot and your ECU communication is finished)

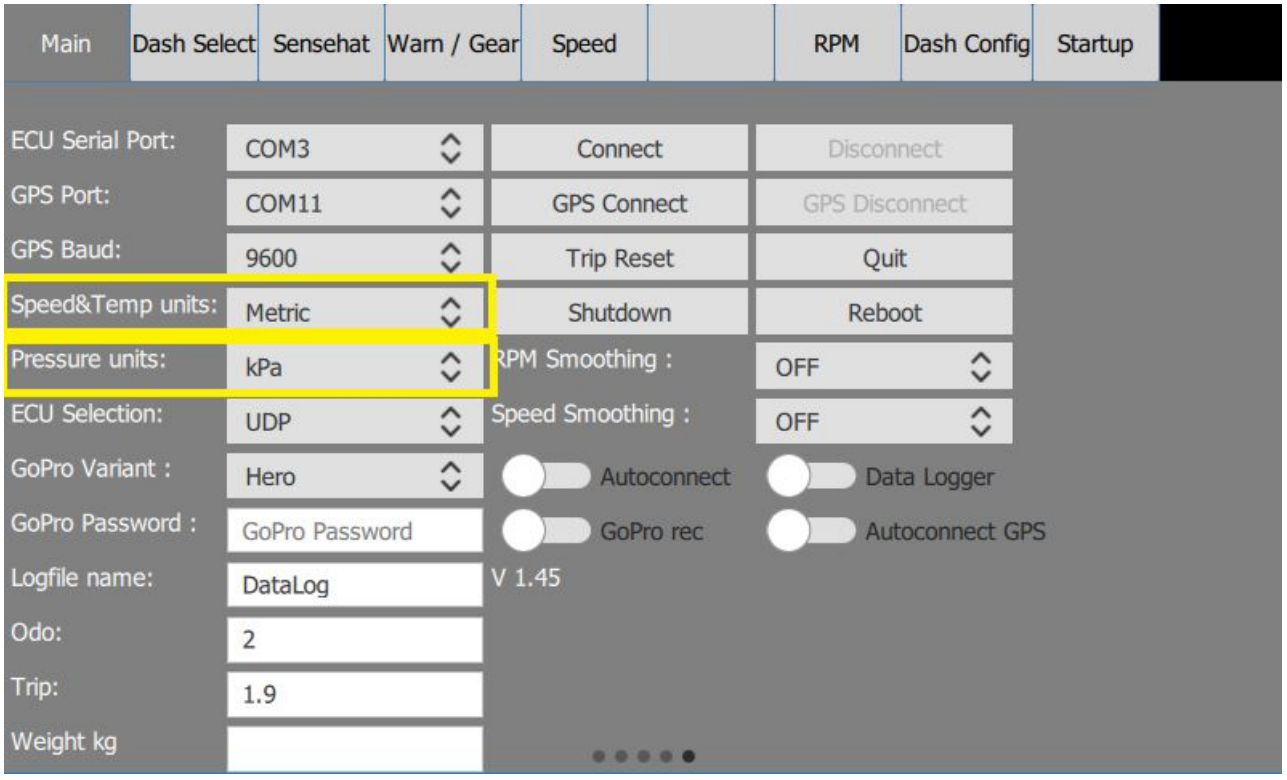


Unit selection

There are 2 unit selection drop down menus in the Settings Menu (to access settings, scroll across to the right)

Speed and Temperature
-Imperial (Speed will be shown in MPH and Temperatures in Fahrenheit)
-Metric (Speed will be shown in KMH and Temperatures in Celsius)

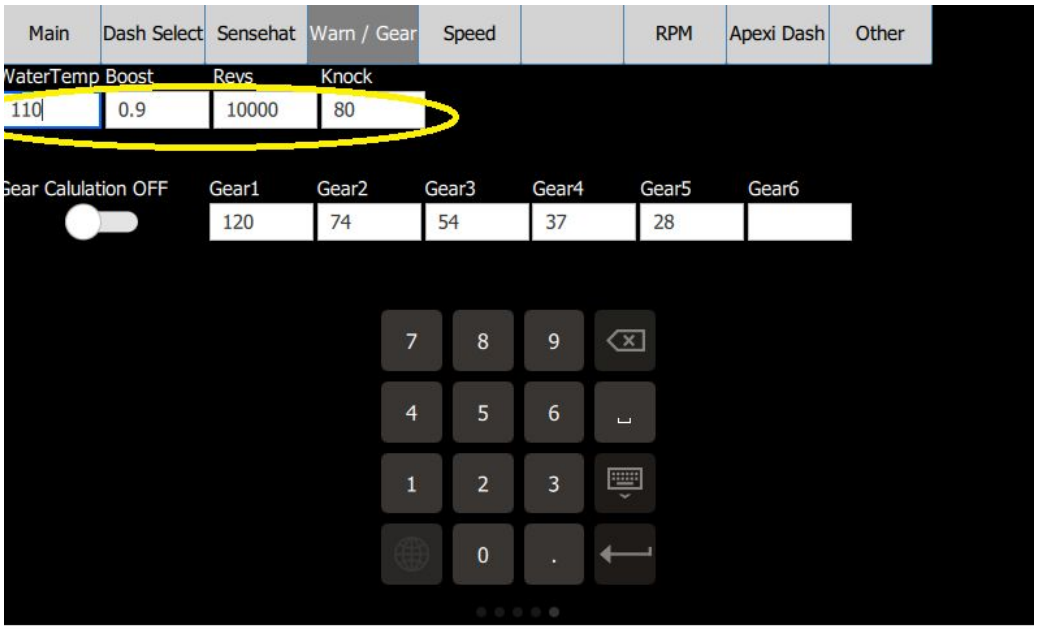
Pressure Units
-kpa (Displays all pressure units in kpa)
-PSI (Displays all pressure units in PSI)



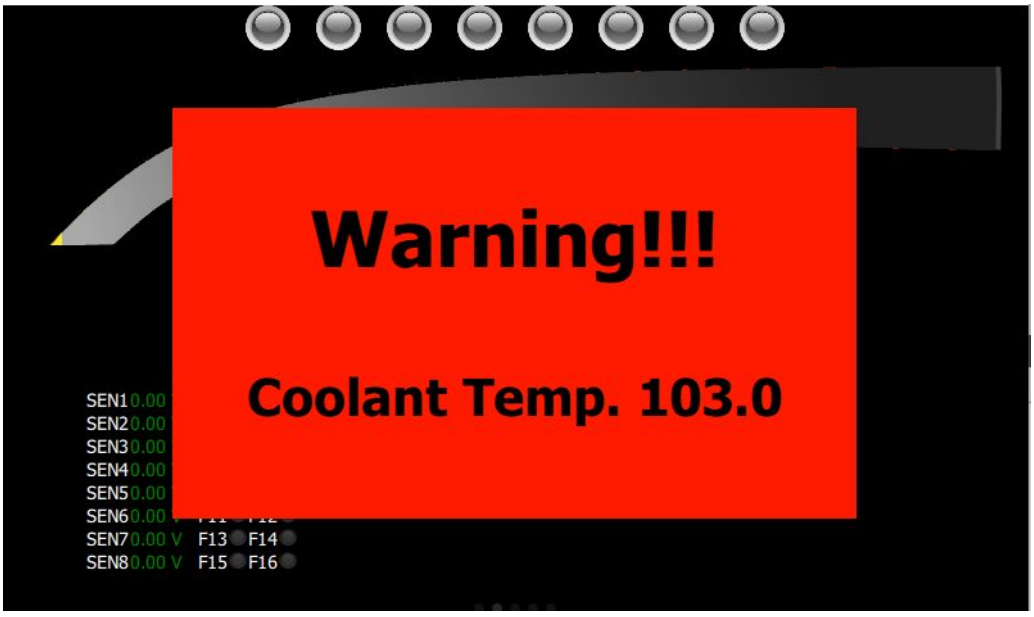
Master Warning settings

In The Settings screen click the Warn/Gear Tab

Enter the Values that you want the Warning to trigger.
If you don’t wish to have warnings, just set the values to a higher value than possible
Easter Egg :
The Revs warning Triggers a Danger To Manifold Warning like the one in a certain movie ☺



Warning Example

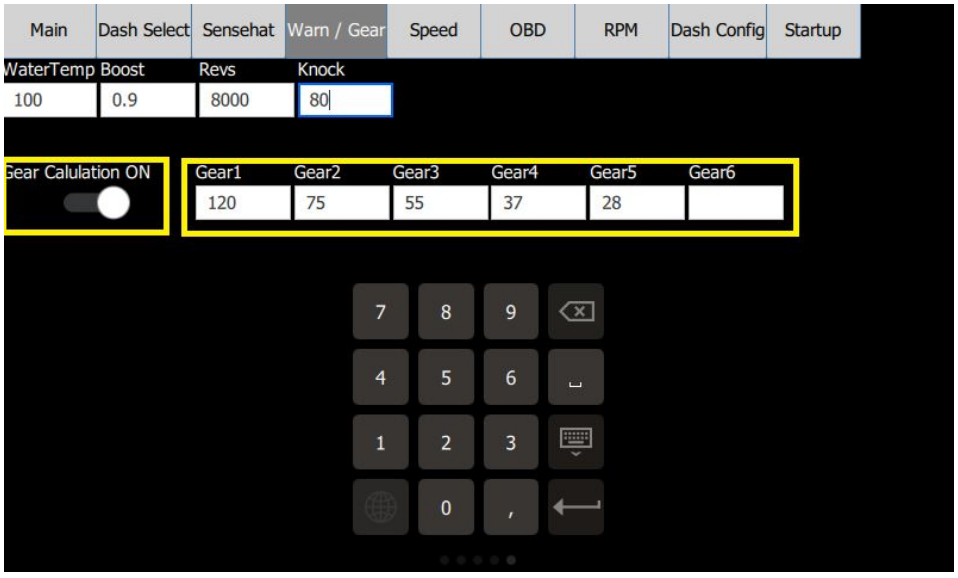


Setting up the Gear Calculation Feature :

If your ECU does not send the current gear you can switch on the gear calculation feature. (Leave the switch off if your ECU sends this information)
In the Settings screen click on the “Warn/Gear” Tab
To make the Gear calculator work you need to set up the values per gear .
RPM divided by Speed gives a fixed number for each gear .
Drive your car and record the speed at a specific rpm for each gear (you can choose different rpms per gear, just record the speed you are driving, the current rpm and note which gear you are in) . You can round the result to the next full number

Example :

gear	rpm	speed @ rpm	formula	gear value to be entered in
1st	3000	25	3000rpm / 25 *Km*h	120
2nd	3000	40	3000rpm / 40 *Km*h	75
3rd	3000	55	3000rpm / 55 *Km*h	55
4th	3000	82	3000rpm / 82 *Km*h	37
5th	3000	108	3000rpm / 108 *Km*h	28



Useful non PowerTune related fact :

Now that you know the value for each gear you can now also calculate each gears top speed, or speed in a specific gear at a specific RPM

Lets say your car is a Mazda RX7 and your redline is 8100 RPM
Just take the rpm and divide it by the calculated gear value

1st Gear = 8100rpm / *120* = *67 Km*h
2nd Gear = 8100rpm / 75 = 108 *Km*h
3rd Gear = 8100rpm / 55 = 147 *Km*h
4th Gear = 8100rpm / 37 = 219 *Km*h
5th Gear = 8100rpm / 28 = 289 *Km*h

Speed correction

In some vehicles, both the original analogue cluster and PowerTune will show incorrect speed readings for a variety of reasons beyond just an old car, such as in situations where different size wheels and tyres have been put onto a vehicle. Firstly, have a friend measure your highway speed using a third party device (smartphone GPS app) and compare this with your speedo reading.

In the Speed Correction TAB enter your correction factor in percent, 100 is default and will display the value as sent by the ECU to the display.

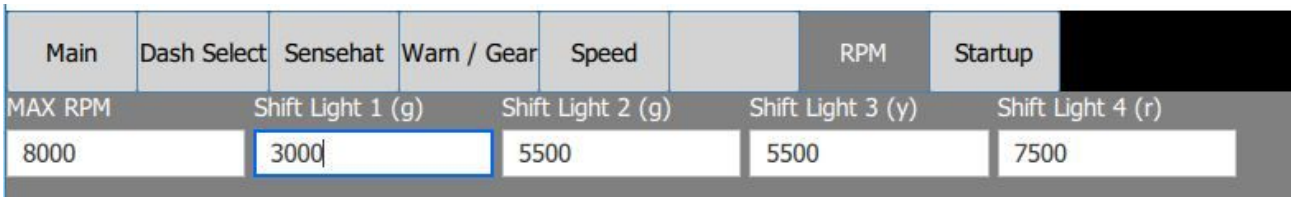
Example:

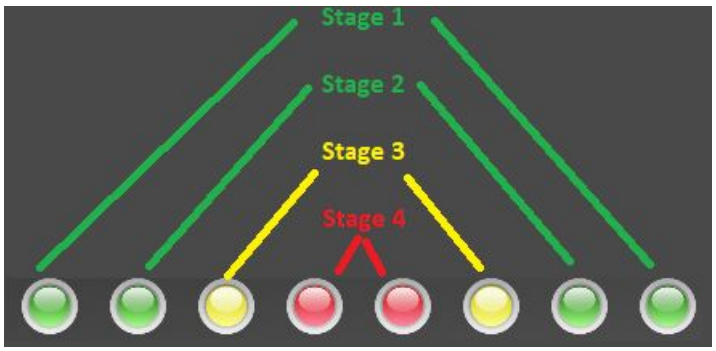
Your friend tells you the smartphone says you are driving at 100 KM/H per hour but your speedo shows 90 KM/h, which is 10% too little. You then enter 110 in the speed correction and this will show 10% more speed than what is read from the ECU

RPM and Shiftlight Settings

Click on the RPM Settings TAB

1. Enter the max Value Your RPM Gauges should display (this does not affect ECU settings, nor does any other PowerTune feature)
2. The shift Lights on the Dashboards have 4 Stages
   Enter the RPM value that triggers each Stage





Dashboard display configuration

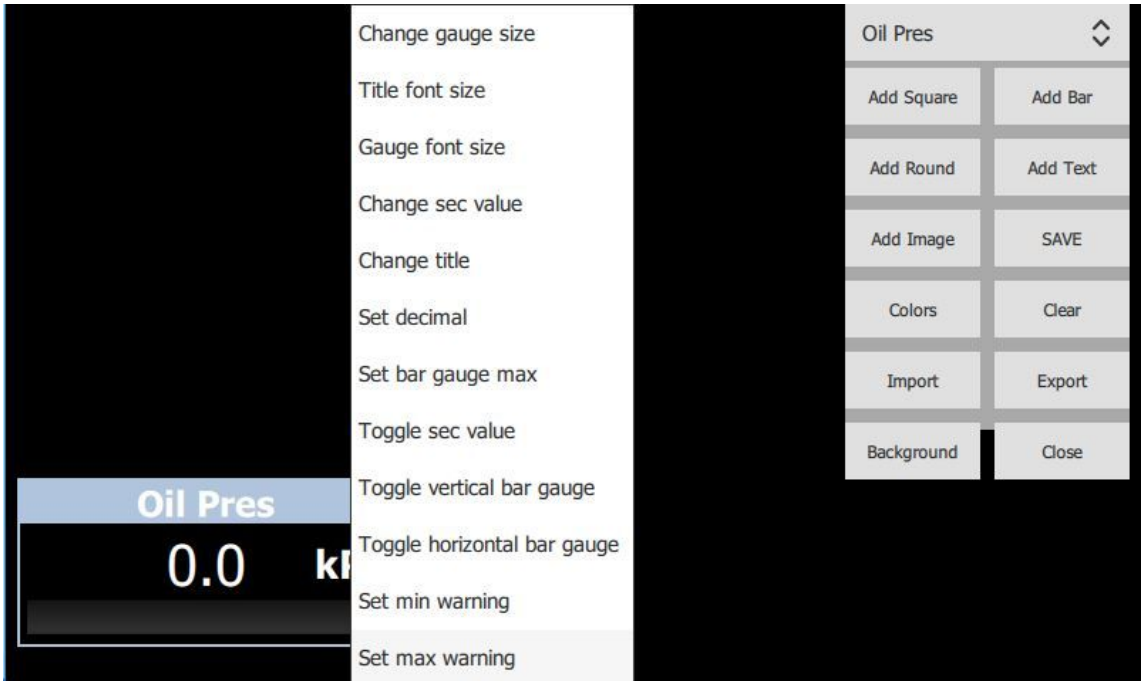
You can select 4 Different active dashboard screens from the dropdown boxes in the “dash select” tab of settings.

Select which RPM bar style you would like for each userdash (you can also choose none)

Some dashboards in PowerTune are configurable, such as UserDash. In order to begin building a dash, in the dash select screen, add UserDash1 one of the four active displays. Scroll across to this display, which will be an empty black page. Start building your dash by double tapping the black page

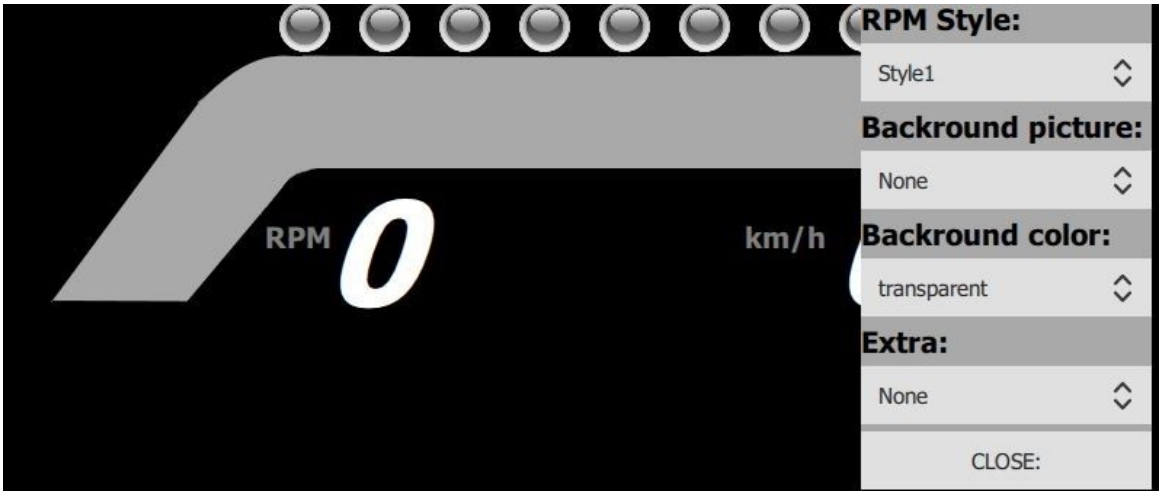
From the dropdown box in the top right corner, select the desired sensor and then start by clicking ‘add square’ to add a square style gauge. Once the gauge has been added, you can double-tap on the gauge to modify the look, style, warnings and limits as well as the labels.

Double-tap on the gauge, this will allow you to move the gauge by dragging it across the screen and will also bring up the settings menu for the gauge, allowing you to change a variety of values. For example, if we wanted the gauge to flash red if the Oil Pressure drops below a certain level, we would select “set min warning” and enter the lowest acceptable number before the gauge starts flashing red to warn you. To remove the gauge, scroll down in the options list and select “remove gauge”

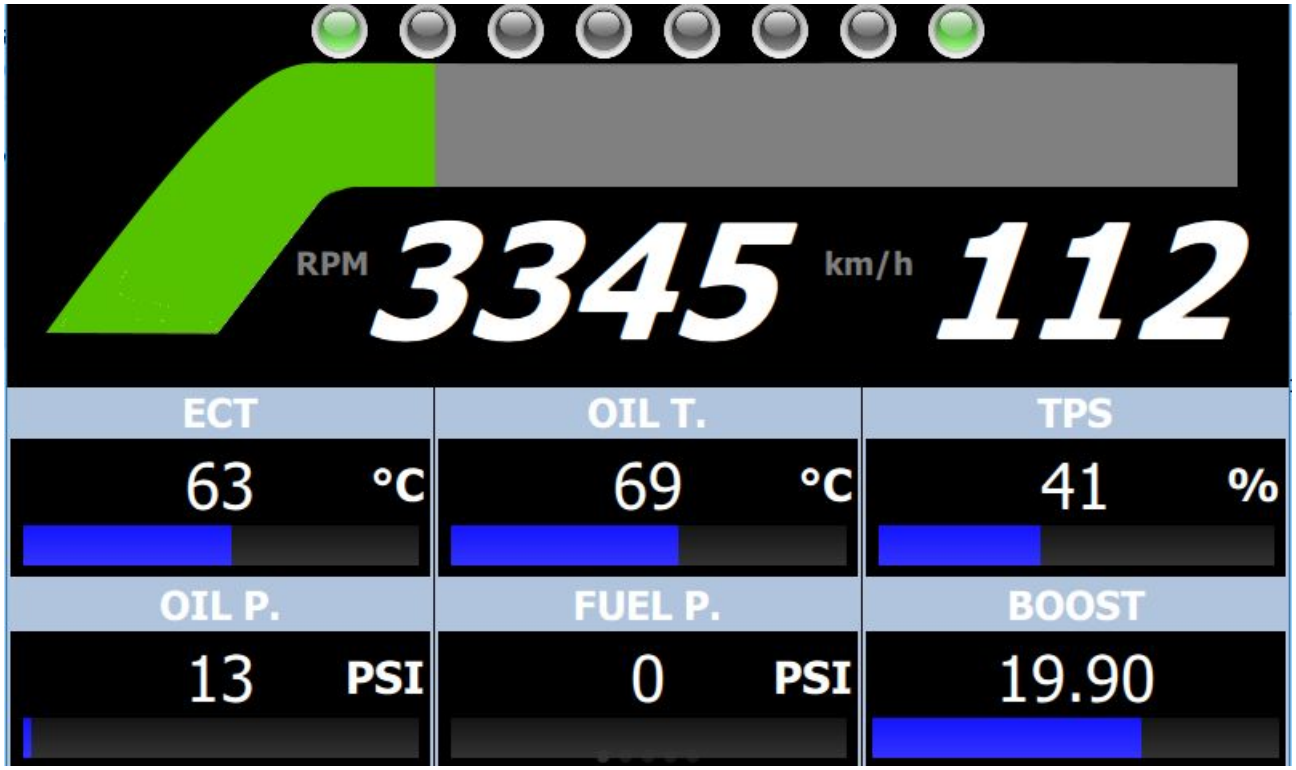


From the same menu where you added the square gauge, note the other buttons available. The “save” button will save your changes for the next reboot. The “background” button will allow you to add your RPM/speed bar style, background pictures and colours. To add background images, put the files (PNG FILES ONLY) in the folder /home/pi/Logo If you want the background image to perfectly cover the entire display, the resolution for the image must be 800x480 pixels

Set the RPM style in the top right corner to your preferred taste. Power-FC users have the option to add sensor states using the “extra” menu.



Example dash:



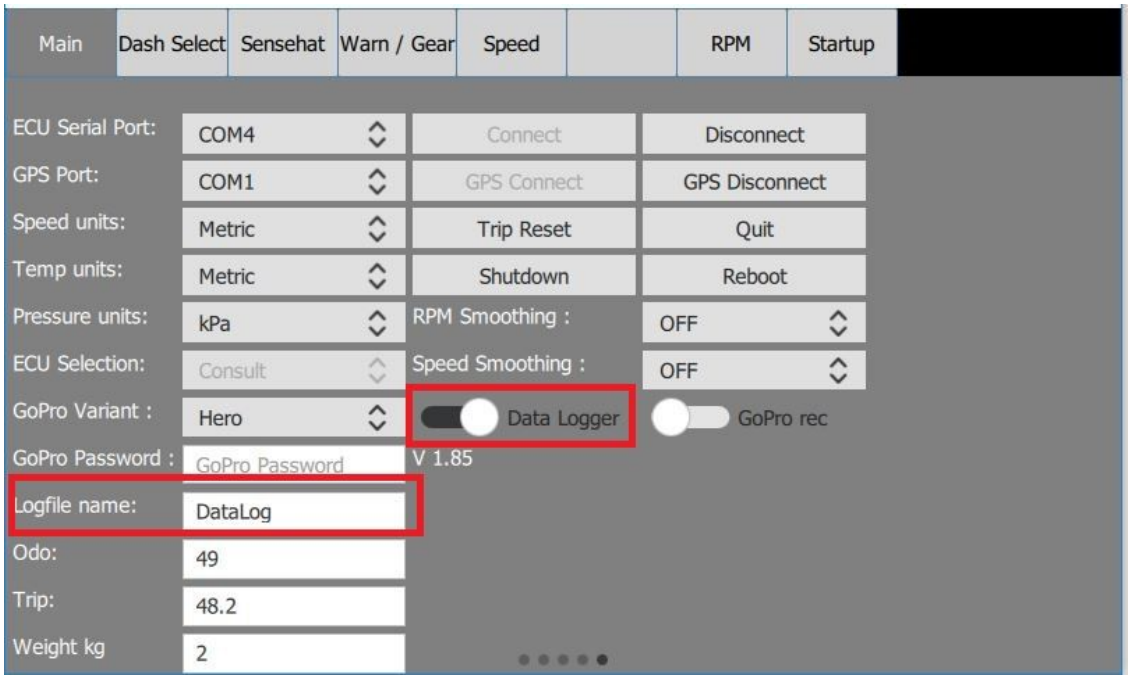
GPS/Lap timer setup

The GPS and Laptimer dashes can be enabled from the dash select tab in the settings menu. PowerTune automatically calculates lap times based on the start/finish line of the particular track you are using via the GPS module coordinates. It does not require any manual input from the user, other than resetting the fastest lap time when required and selecting the current track from the dropdown boxes along the top right corner of the laptimer dash. Our testing has shown lap times are accurate to within 1/10th of a second. The GPS dash screen (shown as Dash3 below) will only display map data if the display is connected to a WiFi network - typically this dash screen is not required to be active.

Datalogging

To start datalogging, enable the datalog switch in the settings menu. PowerTune will export the data to a CSV spreadsheet stored on the SD card of the unit. **Each time you toggle the datalog switch, the current datalog will be overwritten.** If you want to datalog multiple runs, ensure you change the logfile name each time, example run1, run2 ect

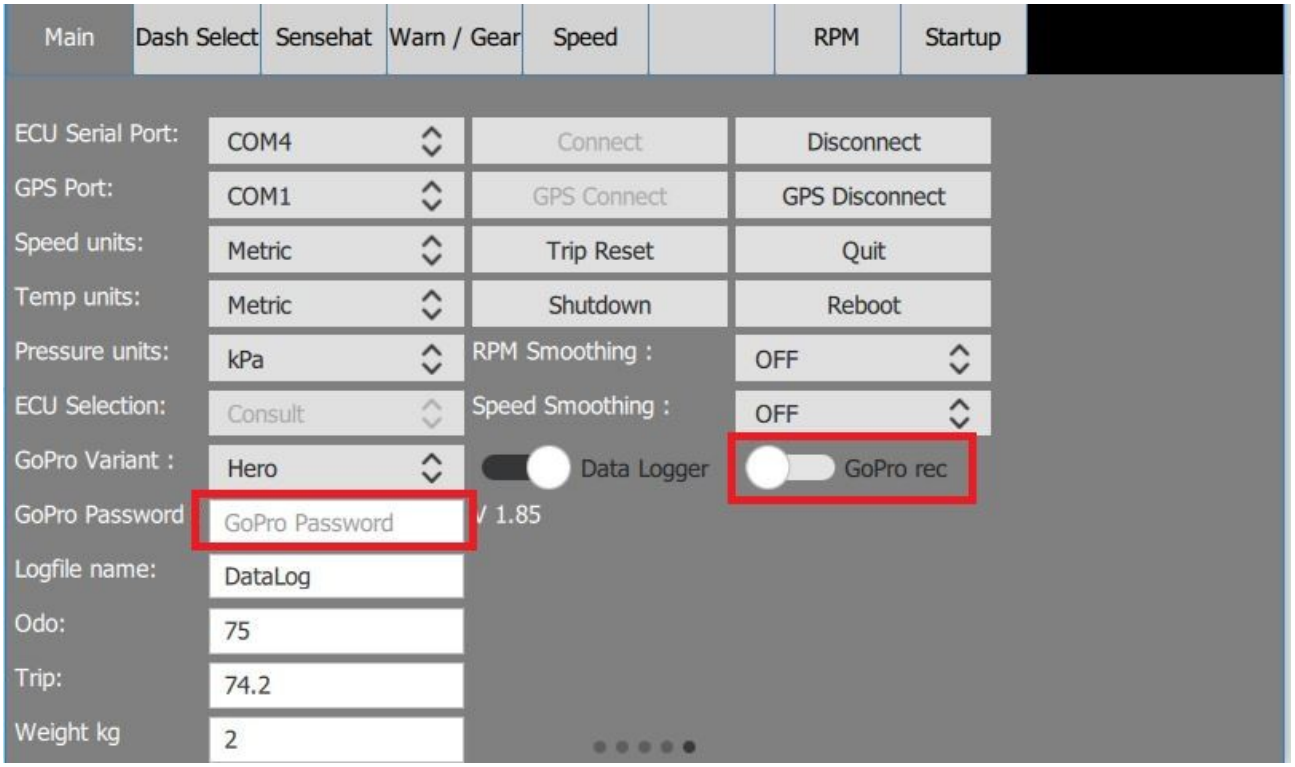
The datalog files can be found in the directory /opt/PowerTune when connecting to your display from a computer (more details below, refer to WINSCP).
(opt is a root folder, is it not within the home folder)
Note: Datalogs will be deleted when PowerTune is updated.



GOPRO setup

PowerTune can integrate with GoPro cameras so you can trigger the GoPro recording from your PowerTune dash; and with datalogging enabled it will also log the moment the recording is started so you can overlay your ECU data onto video footage, just like a real racing car driver! First, quit PowerTune from the settings menu, and connect the display to your GoPro's WiFi network (see WiFi setup in this manual for detailed steps). Once you have connected the WiFi, restart the display back into PowerTune by typing sudo reboot now (and then press enter)

Re-enter the GoPro password into the password box and when you are ready toggle the "GoPro rec" button. This will tell your GoPro to start recording, and if datalogging is enabled, this exact moment in time will be captured in the datalogs.



WIFI Setup

Quit PowerTune from the settings menu and connect a keyboard to the display.
At the login prompt login as
user: pi
password: raspberry
Open the advanced settings by typing: sudo raspi-config (then press enter)
Select “network options” and enter your WiFi credentials to connect (you will not be notified if connection is successful)
Once you have completed the setup, select finish in the bottom right corner (using the arrow keys + enter) and then type sudo reboot now

Software update

Quit PowerTune from the settings menu and connect a keyboard to the display.
At the login prompt login as
user: pi
password: raspberry
type: ./updatePowerTune.sh

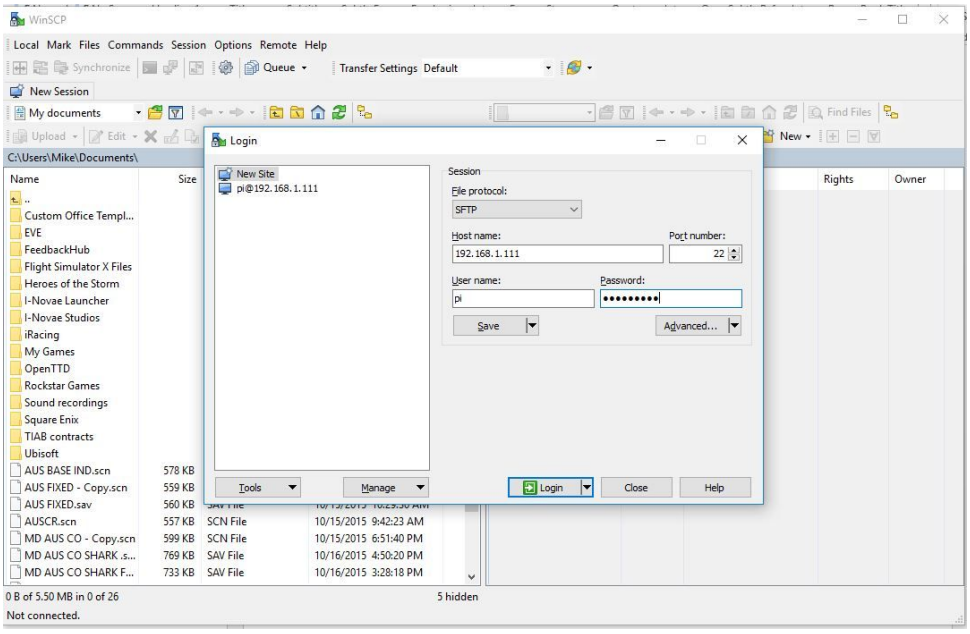
Accessing PowerTune from Laptop via WIFI

Install ‘WINSCP’ for Windows from: https://winscp.net/eng/download.php

Connect your display to your WiFi network (or via LAN cable) and obtain the IP address for the display. You can obtain the IP address two ways, either by quitting powertune, logging

in with ‘pi’ and ‘raspberry’ for the username and password and then typing ‘ifconfig’ . Alternatively you can login to your home router/modem and check the DHCP list for the IP address of the display. It will be something similar to 192.168.0.2 / 192.168.X.XXX

Enter your IP address into the host name field, username as ‘pi’ and password as ‘raspberry’ and select Login. Leave the port as whatever is selected by default.



PowerTune