

MultiTool v2.0.13e – June 2016

MultiTool v2.0.13e - Android Data Logging for TuneBoy flashed ECU

Updated – JUNE 5th, 2016 – GooglePlay Version 13

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Introduction

Whilst MultiToolTB provides basic service rest functions as well as ODO winding for standard Multistrada 1200's, it's main benefit is that it is designed to run in conjunction with the TuneBoy firmware for Multistrada 1200, Panagale and Diavel, the Ducati Data Logger reads and records the engine data, and allows conversion into a format acceptable for playback in the TuneBoyTrim program.

For ANDROID, it is necessary to connect to the bike's diagnostic port using a BlueTooth ELM327 device instead of the OT-2. In general these will have a standard OBDII connector and will use the DDA to OBDII adapter supplied with the Tune Boy kit.

Why BlueTooth

Android does not allow you to (natively) create an AdHoc WiFi connection. Don't ask me why ...

Unfortunately the OT2 provides only AdHoc connections... Again, don't ask me why

So how do we get around this impasse ? BlueTooth obviously !!

It's cheap to implement, and Android is very happy working with BlueTooth.

Blue Tooth OBDII diagnostic dongles are available frickin' everywhere, ranging in price from about \$10AU upwards.

In theory the more expensive ones *may* work better, however all development work for this project has been with 'cheap' knock-offs from China sourced off EBAY.

These must be ELM327 devices (V1.4 or later)

My personally view is bigger is better, as bigger *may* have a bigger antennae



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More recently, some WiFi ELM's have become available that do support Infrastructure connections.

CAUTION: WiFi dongle must support infrastructure connections, because Android cannot make use of AdHoc only WiFi dongles.

Eg: The **AutoDoctor007** works great !



CAUTION: leaving the dongle attached to the bike will eventually drain the battery unless the bike is ridden or charged regularly.

What's it do ?

The main reason for this app was to provide an easy way for Android users to log data from the bike, similar to using, and compatible with TuneBoyTrim, but without the hassle of lugging a laptop around.

In addition some simple RESET's can also be performed as well as ODO winding (forward only). These do not require a TuneBoy flashed ECU.

What's it record ?

	Data	TuneBoy Trim	MultiTool
<p>Ultimately, TuneBoyTrim is the tool to use if you want to record ALL of the performance data.</p> <p>The MultiTool records a subset.</p> <p>However the MultiTool also records information w.r.t. the CC function, as well as GPS position data.</p>	RPM		
	Throttle Position %		
	Air Fuel ratio		
	Speed		
	Fuel Trims		
	Ign Trims		
	Air temp		
	Engine temp		
	ECU flags		
	CC set speed		
	CC RES speed		
	Gear		
	Last nudge button pushed		
	Kill pressure		
	Blip pressure		
	Manifold Air Pressure		
	Throttle Position Trim		
	Total Fuel Value		
	Ign Advance		
	GPS satellites		
GPS Longitude			

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	GPS Latitude		
	GPS SPEED		
	RPM break points		

Additional Notes :

- The log file recorded by MultiTool must to be converted into a TuneBoyTrim compatible .RAW file.
- GPS positioning data is recorded as a KML file which can be uploaded to Google Maps.
- There is a limit to the File Size of the .LOG file. This is adjustable between 0.1MB and 50.0MB in the Config Options screen. The reason is to allow the ability to limit file size to a size that can be emailed by your provider. It's up to you

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What DOESN'T it do ?

Many things

In a nutshell, amongst other things, it doesn't :

- Allow you to change Trim File settings
- Load or save Trim Files
- Flash Tune Files
- Read Trouble Codes from the ECU
- Enable/Disable Heated Grips
- Act as an ELM terminal
- Read your bikes VIN

Main Requirements

This then brings us to the requirements for this Application.

- Android, plain and simple ! (note: root kitted phones and other OS's may not work correctly)
- Android 2.2 or later with BlueTooth supported.
- A Tuneboy flashed ECU (with Cruise, Tune or Cruise and Tune Key)
- A BlueTooth or WiFi OBDII diagnostic adapter (ELM327 or STN1110) ELM ver1.4a or genuine 2.0 or 2.1 (beware the chinese knockoffs)
- It's preferable if you can power the phone from your bike if you plan on using it for extended logging periods. (see Known issues for advice on screen settings).

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The Screens Explained

Start Screen Main buttons

The start Screen gives you several options :

Connect to BT Paired : connects to a BlueTooth device you have previously paired with. (Long click invokes 'search for new devices')

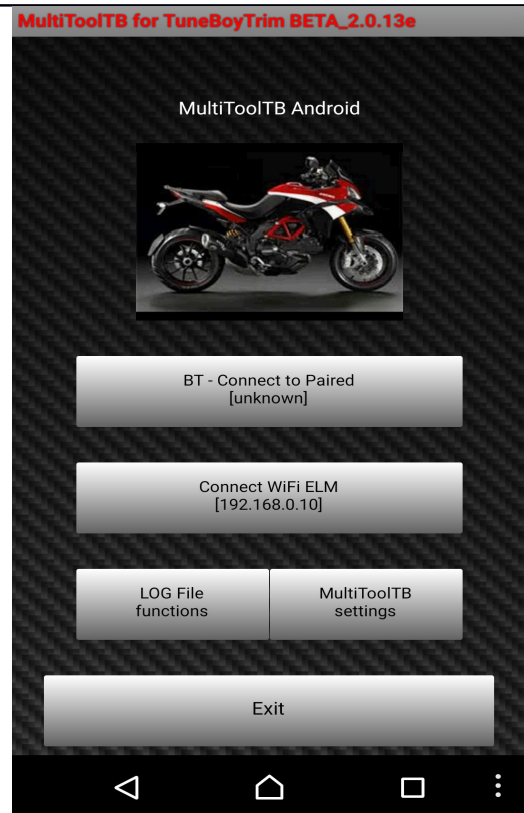
Search for new BT devices : listens for broadcasting devices nearby and presents a list of devices to choose from. (Asks you to pair if you haven't done so already)

Connect to WiFi ELM : connects to a WiFi ELM device.

WiFi Settings : allows some customization of WiFi settings.

Log File functions : Allows you to choose a log file, trace file, or even debug file and email to yourself, (or someone else even)... as well as convert data into TuneBoy compatible .RAW files.

MultiToolTB Settings : personal and system settings etc.



Additional Notes :

Although the BlueTooth ELM327 powers up when plugged into the bike, and you can 'pair' and connect to it with your phone, the application won't actually 'connect' unless the bike is powered on. (Key On).

- WiFi users need to note that the WiFi ELM must support 'Infrastructure' mode connections (Not just AdHoc).
- WiFi users must make the phone connect to the Wifi device when it has powered up.
- **CAUTION** Leaving the BT or WiFi dongle attached to the bike will drain your battery regardless of manufacturer's sleep modes.

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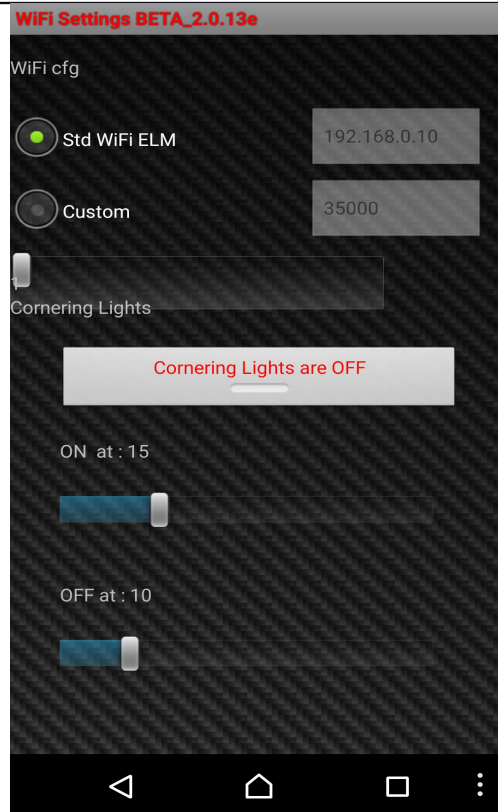
WiFi Settings

Two default WiFi devices are provided, (although they are actually the same in terms of address and port).

Plus one 'custom' setting, if you have a weird WiFi device that uses a different IP and or port. (*See your devices instructions w.r.t. IP address and TCP port*)

I have had good results with the AutoDoctor007 with the one exception that it goes to sleep if you're not using it, and needs a power reset to wake it up.

Don't forget, you need to connect your phone to the devices WiFi network.



Additional Notes :

The AutoDoctor has one annoying habit.

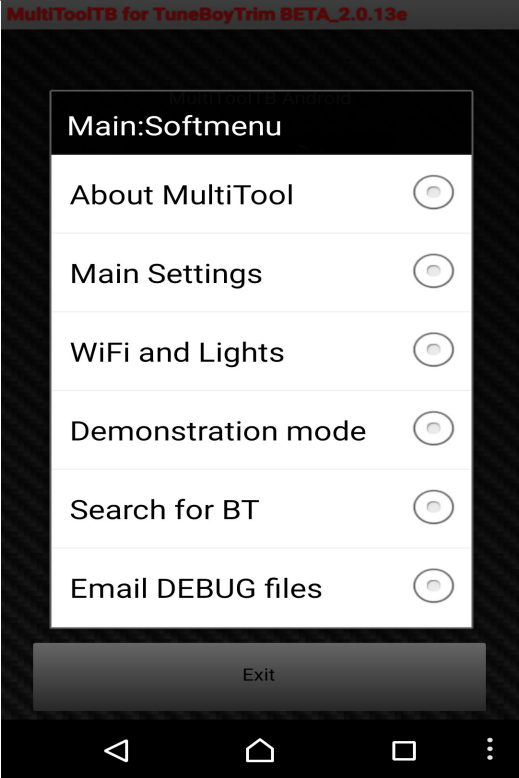
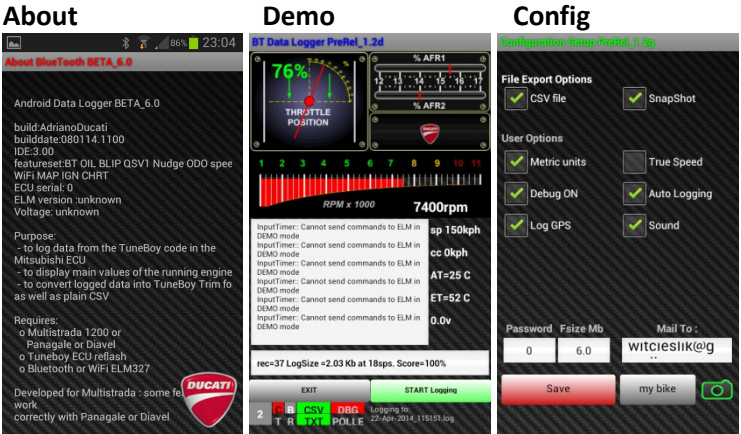
If you don't actively use it for a period of time, it goes into PowerSaving mode, which :

- drops your WiFi link to the bike
- requires a power reset to wake up.

I've also found that even in sleep mode, after being connected to the bike for 3-4 days straight without running the bike, I had lost enough charge that I couldn't start the bike ... Doh !

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Settings Options

<p>The MultiToolTB Settings page.</p> <p>About : Help and About.</p> <p>Main Settings : Customization</p> <p>WiFi and Lights : WiFi Settings (and experimental Cornering Lights settings)</p> <p>Demonstration Mode: Demonstration display (animation only, using bogus made up values. Drag finger across display to open TP).</p> <p>Search for BT : Presents a list of active BT devices for connecting/pairing.</p> <p>Email DEBUG files : emails the last 5 DEBUG files as one ZIP export.</p>	
<p>ABOUT offers some info about your device, the Application and your session stats.</p> <p>*Click the Ducati logo to email session stats</p> <p>** LongClick the Ducati Logo for Web Help.</p>	
<p>DEMO shows the Logging screen in action (without your bike, so you can show others what it looks like)</p>	
<p>Main Settings allows setting of some program defaults</p>	<p>Tap to email Stats* or Hold to access Web Help**</p>

Additional Notes :

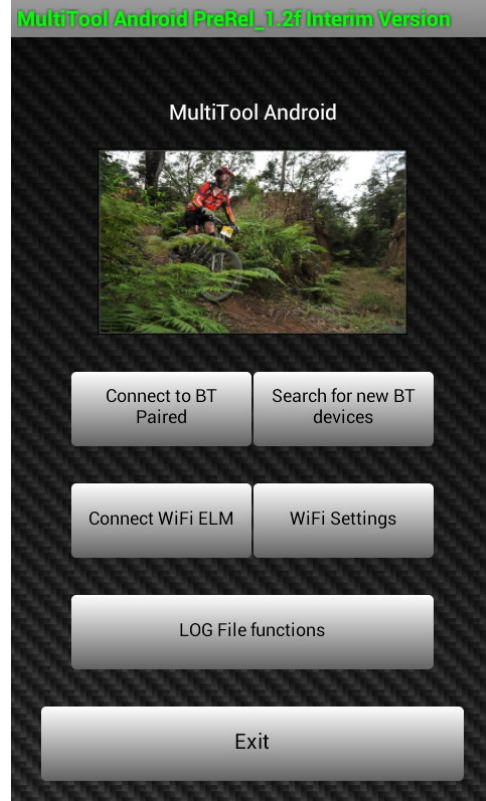
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The 'bike' button

Allows you to change the image on the Start Screen from a choice of 'canned' images.

Choosing the 'My Bike' image will make the camera icon go green.

If you press the camera icon, you will be able to take your own photo, and this image will be displayed on the start up page.



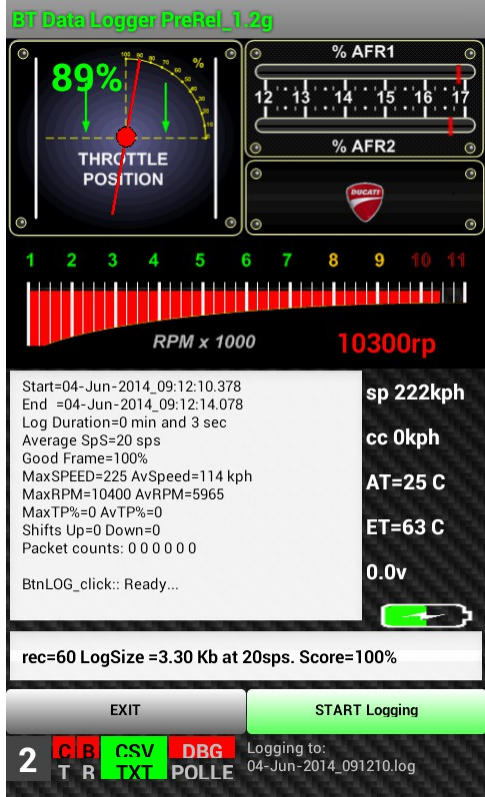
Additional Notes :

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Main Logging Screen

Once your Bluetooth or WiFi connection is made, the App will automatically open the Main Logging Screen which allows you to START and STOP the logging, as well as displays some 'live' information while logging. (Logging will start automatically if you have selected that feature in 'Config')

Eg: Throttle Position and RPM, AirFuel Ratio, Engine Temp, and the status of several key 'switches' on the bike... (BRAKE and CLUTCH, Like PreFlight).

<p>TP% Gauge : Indicates how far open the throttle bodies are open in % (not the twist grip)</p> <p>AFR gauges: Air Fuel ratio pointer(s)</p> <ul style="list-style-type: none">• AFR1 doubles as QS sensor• AFR2 doubles as Nudge Button Sensor <p>RPM gauge : RPM</p> <p>Message Window : Shows important messages as required (error Warnings etc)</p> <p>sp: Speed</p> <p>cc: CC set speed</p> <p>AT : Air Temp</p> <p>ET : Engine Temp</p> <p>ELM voltage:</p> <p>Phone Battery State: (as Icon)</p> <p>Status Line : shows size of log file and samples per seconds</p> <p>EXIT button : exit this screen</p> <p>LOG button : start and stop the data logging</p> <p>Gear : gear (Yellow indicates ABS light is on)</p> <p>Clutch indicator : RED = clutch pulled</p> <p>Brake Indicator : RED = Brakes ON</p> <p>Tx/Rx LEDs : indicates Tx/Rx Data</p> <p>Optional Output Files:</p> <p>Log File Name : The .TXT file in use.</p>	
---	---

Additional Notes :



- LOG files are stored in your phones "Android/data/com.BTWIFI.logger/files" directory
- By default a .TXT (trace) file is created.
- By default a .CSV file is created. It is required for Charts.
- Optionally, a _DEBUG.TXT file may be created
- SnapShot function creates a, ...SS.csv file

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- If GPS is enabled then a simple **KML** file is also generated.
- **While LOGGING is stopped**, your phones MENU button will bring up several additional **NON-Logging options**
- Changing between START logging and STOP logging requires a few seconds as the App switches between the two modes. (yes.. it takes time !)

Main Logging Screen (continued)

A few words about things that you thought were obvious but possibly aren't...

<p>THROTTLE POSITION</p> <p>This is a linear scale showing the opening of the butterflies from 0% to 100%.</p> <p>You might be surprised to see that for much day to day riding, your TP% is actually quite low.</p>	
<p>AFR</p> <p>These two gauges show your Air Fuel ratio if using the O2 sensors.</p> <p>If you are NOT using the O2 sensors then these can show the inputs from the NUDGE buttons and the QuickShifter.</p> <p>The Nudge gage should show a reading of 17 for no buttons held.</p> <p>Nudge up should show a reading of about 15</p> <p>Nudge down should show about 12</p> <p>The QuickShifter gage should sit in about the middle.</p>	

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<p>Shifting UP will make the needle drop down.</p> <p>Shifting DOWN will make the needle jump UP.</p>	
<p>SCREEN BRIGHTNESS</p> <p>To make it easier on the eye at night, and to preserve power, you can change the screen brightness through 5 levels by swiping the 'speed, temperature, volts display' in a downwards motion.</p>	

Additional Notes :

from v1.2K a new feature was added to allow a crude live view of the relationship between APS and TPS, in the form a 'live' bar chart that over lays the main logging screen.

- Activating the chart is done by press of the TPS graphic on the top left hand side of the screen.
- Hiding the chart is by touching either on the bar charts

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Configuration Screen

This allows the persistent configuration of various ‘personal’ features for the App.

Configurable features include :

- additional output file(s)
- email name
- password
- Automatic Logging enabled

Enable CSV file creation (*req'd for charts*)

SnapShot Allows live view without logging and optional save of last minute of data (also enables CSV when ticked)

Now has Auto Trigger function which allows SnapShot to be taken when specific conditions arrive or even by pushing the bikes Start Button.

Metric units (Imperial if not ticked)

True Speed (display 100% speed instead of 108%)

Enable Debugging file (for me)

Auto logging Start logging as soon as connected.

Password (to Match the password *YOU* set in FlashMistubishi)

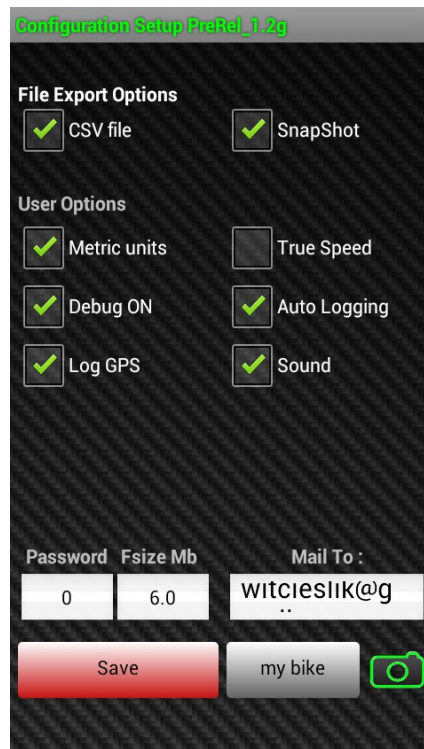
MailTo is passed to your mail app as the recipient.

Fsize Log File Max Size in MB (0.1 – 50.0)

Save Button to save any changes.

(green=no changes, red=changes to be saved)

Choose your Start Screen bike color.. or make your own !



Additional Notes :

MultiTool now ‘discovers’ what bike you have and sets several factors accordingly. You should see the bike discovered as a brief ‘toaster message’ just after the main logging screen starts up.

The known models to date are : Multi 2010-12, Multi2013-14, Panigale, Diavel, Diavel DualSPark.

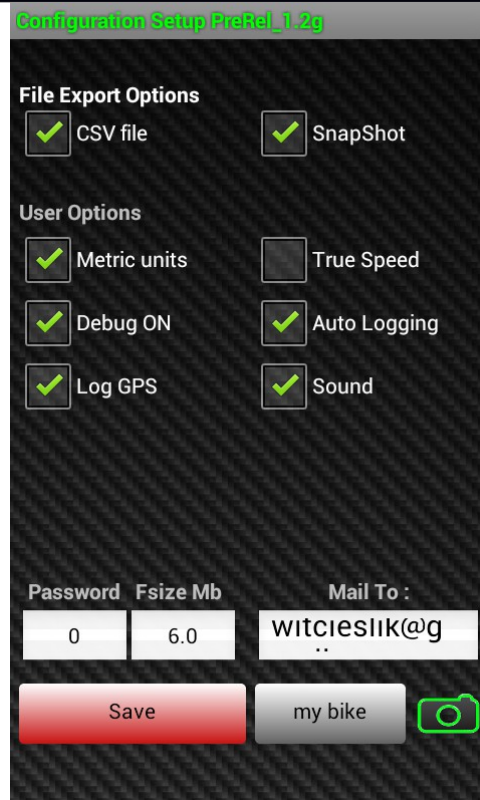
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My Bike (Photo)

You can now take a photo of YOUR bike for the start up screen.

After selecting 'my bike', the camera icon will go green.

Pressing this will open the Camera control.



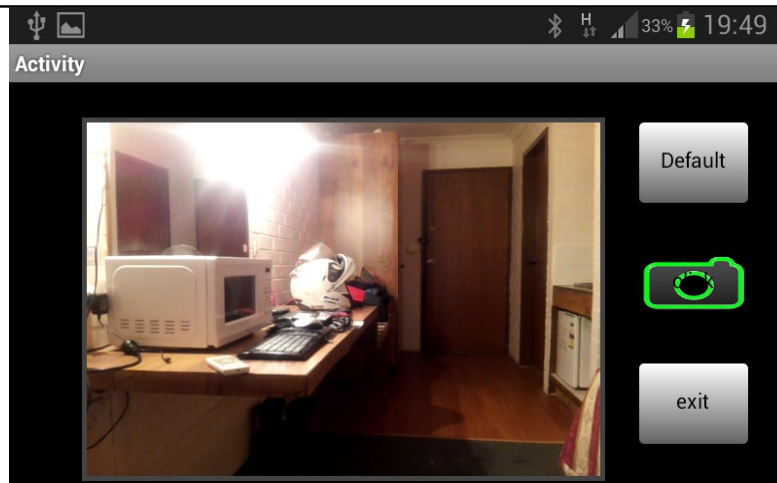
(Yes.. I was working away from home when I wrote this...)

Landscape orientation is recommended.

The camera icon takes a photo and loads it into the right place.

Default: simply sets the program to use the 'no bike' image

Exit : what it says



Additional Notes:

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Snapshot Feature

If snapshot is enabled in your config settings, then the MultiTool will display live data but not log anything. This allows you to :

- Ride whilst displaying live data and not fill your phone memory with huge log files
- Record the last 1 minute (approx.) of data at a button push, into a CSV file, suitable for charting.

While in SnapShot mode, the top of the Log Window displays the blue SnapShot button.

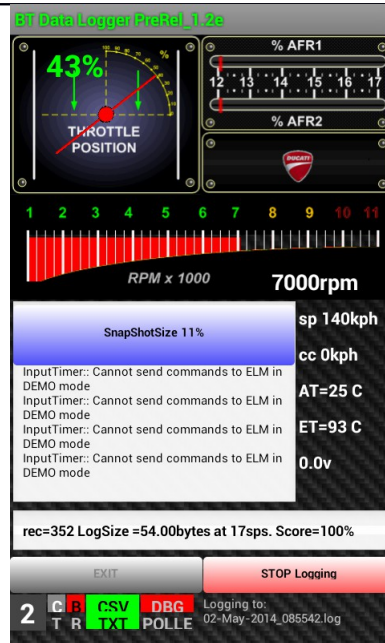
The text in the button indicates how much of the SnapShot buffer is full.

A full buffer (100%) represents approx 1 minutes worth of data.

Turning Snapshot ON in your config settings will also enable CSV.

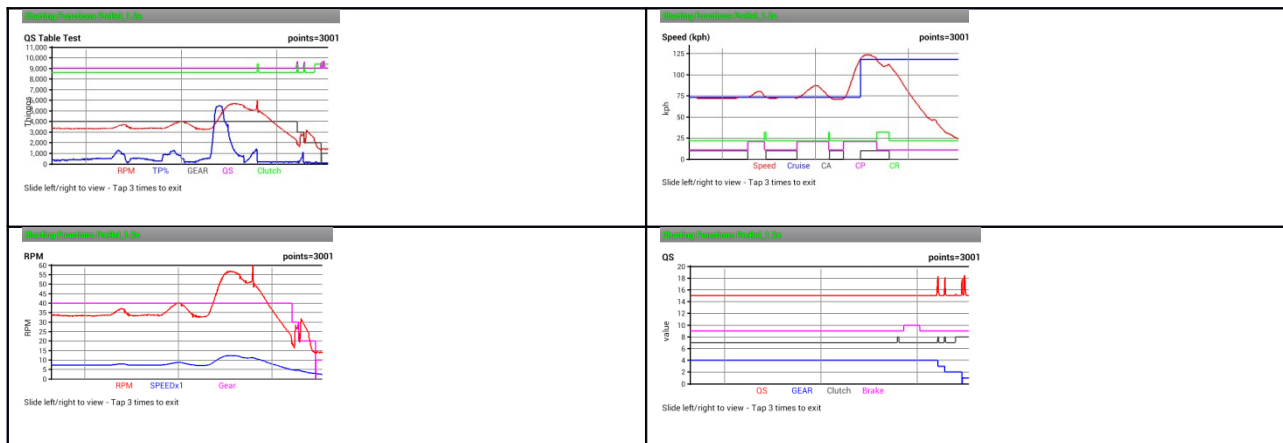
Conversely, if you disable CSV then SnapShot will also get disabled.

Snapshot mode with no triggers has a BLUE button.



Additional Notes :

Sample charts from SnapShot data



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SnapShot Trigger Feature

In practice I found trying to hit the snapshot button a PIA.

The obvious answer was to add triggers for specific conditions, and let the SnapShot happen automatically.

Whenever you enable the SnapShot feature you will be shown the SnapShot Triggers page where you can 'check' on which conditions will trigger a snapshot.

Just one example is perhaps 'checking' on StartButton. This means you can trigger a snapshot by pushing the bikes start button.

SnapShot Trigger page allows you to select one or more specific conditions that will trigger a snapshot.

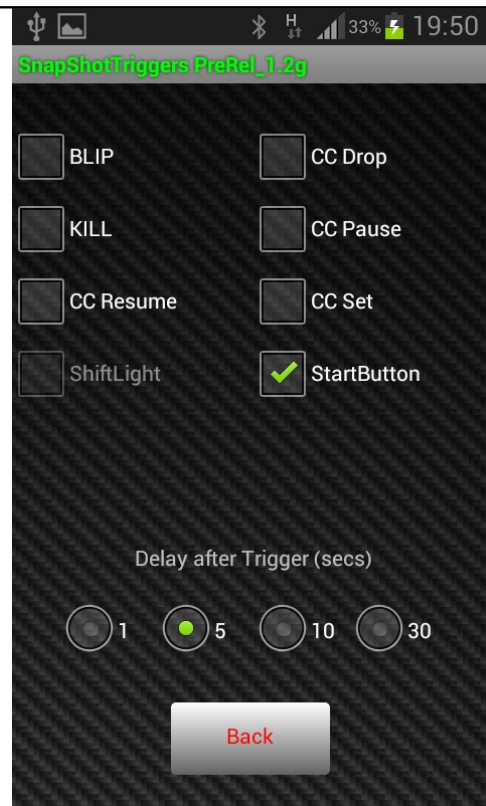
You can also select the delay after the event before the SnapShot takes place.

Note:

The Snapshot button on the Main Screen will be green instead of blue if one or more triggers are set.

The text of the SnapShot Button will be red during the period between the SnapShot being Triggered and the timer actually taking the SnapShot.

The Back button on the triggers page will have red text if one or more triggers is set.



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LOG file Functions

From the Start screen you can navigate directly to the LOG File Functions, which now includes a charting function. (No need to connect to the bike!)

Within the LOG File Functions you can :

- convert the TXT file to a RAW file for import into TuneBoyTrim
- Email files to yourself (or someone else)
- DELETE old files
- access the 'Charting functions
- view GPS tracks in Google Maps

Scroll to find the file you are after and touch the required filename to initiate the allowed actions for that file type.

Converting TXT to RAW can take a very long time if the file is large.

Filter the list by file extension

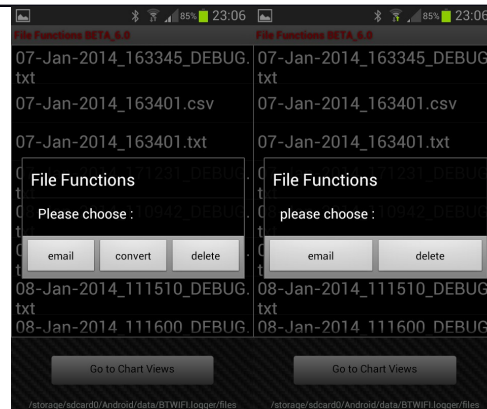
Go to the **Chart Views** with the button.

Your phone's 'Menu' button will open a **'Delete All'** Dialogue.



- **Convert, Email or Delete** your stored .TXT files
- **Email or Delete** your converted RAW or Debug files.

Note: **RAW** files contain only a *subset* of the data logged by the TuneBoy Trim program. (see table below)



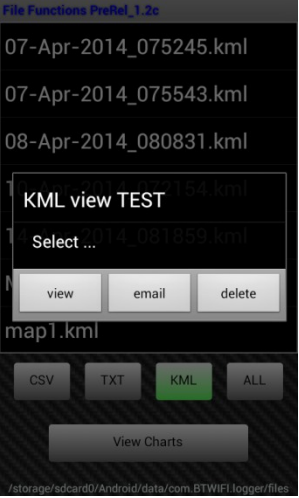
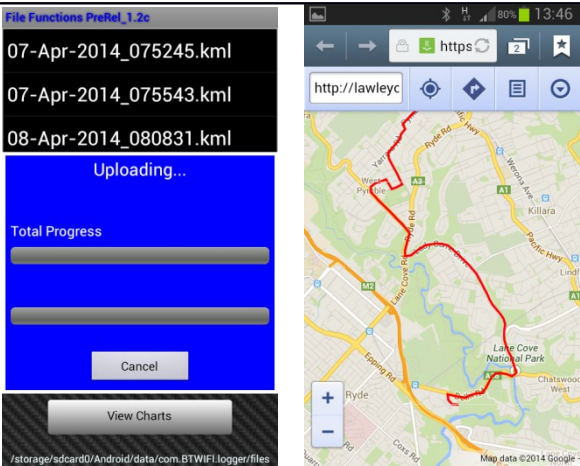
Additional Notes :

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- Use the phones MENU button to access the DELETE_ALL function
- If DEBUG is enabled then a detailed 'DEBUG' file is created.
- One DEBUG file is created per App Start and All sessions are debugged logged in it.
- Conversely, the data log .TXT file, the .CSV file and the .KML file are unique to each logging run.

KML file viewer

MultiTool tracks your position with GPS (if enabled) and records a KML file.

<p>MultiTool logs your GPS position data in the CSV file, and creates a standalone KML file as well.</p> <ul style="list-style-type: none">• GPS must be enabled• CSV must be enabled for CSV GPS logging <p>View, Email or Delete your stored .KML files</p>	 <p>The screenshot shows the 'File Functions PreRel_1.2c' menu with a list of KML files: '07-Apr-2014_075245.kml', '07-Apr-2014_075543.kml', and '08-Apr-2014_080831.kml'. A dialog box titled 'KML view TEST' is open, showing a 'Select ...' dropdown and three buttons: 'view', 'email', and 'delete'. Below the dialog are buttons for 'CSV', 'TXT', 'KML' (highlighted in green), and 'ALL', along with a 'View Charts' button.</p>
<p>Viewing the KML requires an Internet connection.</p> <p>Your KML file is uploaded and then MultiTool opens a browser to view your route in Google Maps</p> <p>(Upload only takes a few seconds)</p>	 <p>The left screenshot shows the 'Uploading...' progress bar with 'Total Progress' and a 'Cancel' button. The right screenshot shows a browser window with the URL 'http://lawleyc' and a Google Maps view of a red route in the Ryde area, near 'Low Cove National Park'.</p>

Additional Notes :

- Requires GPS enabled
- Requires Internet access.

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Chart Views

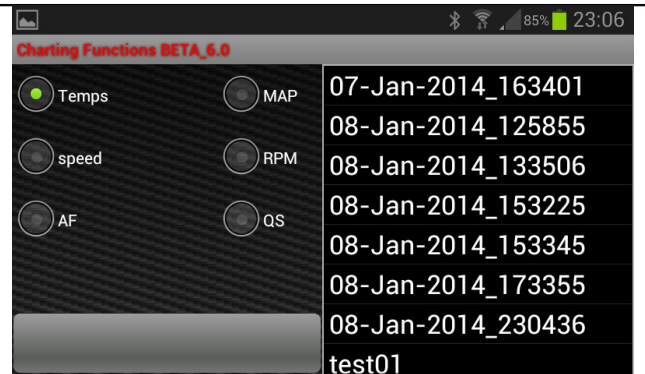
Rudimentary charting is now available.

This view lists your stored CSV files and allows selection of several pre-defined chart types

- Select the chart type
- Select the file to chart (and wait)

Note: As charting uses the **CSV** file. You must have CSV file recording enabled.

See Appendix:Charts for more information

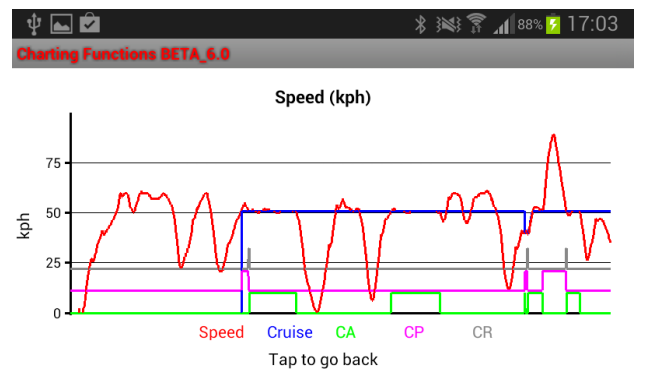


Eg:

The speed chart shows :

- Bike SPEED
- Cruise ACTIVE
- Cruise SET SPEED
- Cruise PAUSED
- Cruise RESUMING

So you can see what CC functions were being performed



Additional Notes :

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Email your LOG files

In addition to being able to connect the phone to a PC and drag the Log files to your Computer in the normal fashion, the app now supports emailing files using your choice of email client.

To Email a log file, simply scroll through the list until you find the file you want to send, then touch and hold that entry .

Your phone will start up your Email application with the file already attached.

If you have an Email name set in 'Config' then this too is populated into the 'To' field.

You just have to push whatever your 'send' button is.

You can edit any of the fields before sending, as well as add/delete text.

If you have multiple options for sending Email, then the first time you do this, Android will ask you to select one and confirm if this is the one you want to use. (Only happens the first time).



Additional Notes :

The usual way of transferring files to your PC from your phone is by USB, and dragging and dropping the files in Windows Explorer. Being able to Email files is simply another way of moving files either to your own PC or even for sending them in for support purposes.

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NON-Logging options

While LOGGING is STOPPED you can access the NON-Logging features via the 'setting' button on the Logging screen.

<p>Non-Logging Features</p> <p>TuneBoy Tools : (requires TuneBoy maps)</p> <ul style="list-style-type: none">• CC and Nudge Button settings.• QS settings• LC settings• Corner Lights Settings (Experimental) <p>Ducati Tools : (Does not require TuneBoy maps)</p> <p>Service Resets : Reset Functions (Service Resets, PIN reset, and several 'test' commands)</p> <p>Wind ODO: Winds your ODO forward at approx 500kph.</p> <p>Stop ODO : Stops the winder early if you need to!</p> <p>*WARNINGS*</p> <ul style="list-style-type: none">• The ODO can only wind forward.• If you go past your target, you cannot go back.• Your ODO, stops at 99,999. It does NOT wrap back to 0, and you cannot wind back.	Need logging screen shot
<p>Non TuneBoy ECU's will <u>only</u> see the 'Ducati Tools' option.</p>	

Additional Notes :

In general these are commands that are sent to the bike.

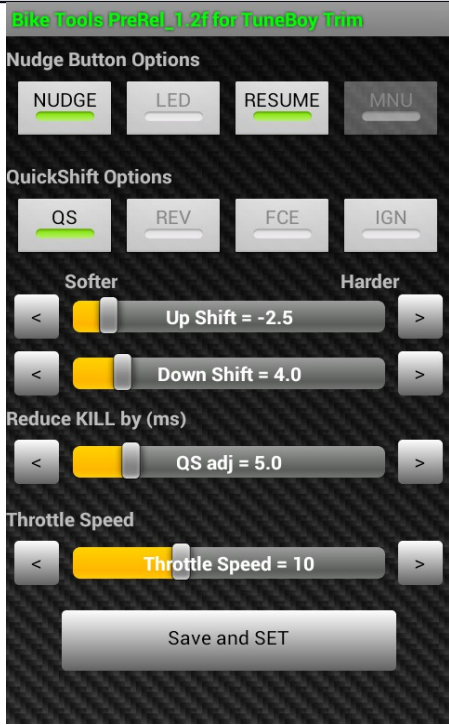

WARNING : Not all commands are applicable to all bikes, and not all have been fully tested.

This page needs updating !!

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TuneBoy Tools

TuneBoy features for configuring CC Nudge Buttons and QS controls.

<p>You can Enable/disable CC and QS features as well as tune QS settings.</p> <p>NUDGE: Nudge buttons enable/disable LED/O2: ON=O2 heaters ON OFF=LED for CC RESUME: Resume button enable/disable MNU: Use MENU buttons for CC (<i>Panagale only</i>)</p> <p>QS: QS enable/disable REV: Reverse shift setting FCE: Fuel Cut Eliminate : enabled/disabled IGN: Ignition soft cut</p> <p>UPSHIFT: QS Upshift pressure setting DOWNSHIFT: QS downshift pressure setting KILL Adjust: QS KILL tuning (make kill time shorter)</p> <p>Throttle Speed: the butterfly speed (not used)</p> <p>Save and SET: saves the values to the bikes memory as well as your phone.</p>	
<p>Changing any option will highlight the 'Save and Exit' button in red. Reminding you that you made a change(s), and should send it to the bike.</p> <p>To exit without sending the change, use your phone's back button.</p>	

Additional Notes :

These settings are read from the bike when the App connects and starts communicating with the bike, and again, when you access this page.

These commands should work on ALL bikes and ALL models

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TB Tools (Values Explained)

The **TuneBoy Tools** page, is my equivalent to the 'TuneBoyTrim Tools → Config Options'

NUDGE: Nudge buttons enable/disable
(Disabled means the O2 sensor is available to actually read O2 is desired)

LED/O2: ON=O2 heaters ON
OFF=LED for CC
(Must be ON [ie show as 'O2'] for usage with O2 sensors)

RESUME: Resume button enable/disable
MNU: Use MENU buttons for CC (*Panagale only*)
(The Panagle can use the bikes up/down buttons for nudge)

QS: QS enable/disable
Disable to stop the QS from triggering when using the O2 sensors)

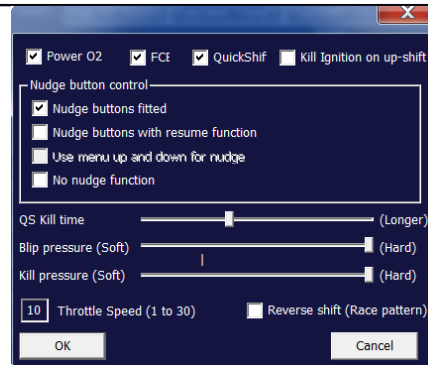
REV: Reverse shift setting
(reverses the direction of the voltage detect for GP stype shift setups)

FCE: Fuel Cut Eliminate : enabled/disabled
(if enabled then fuel is NOT cut at 0% throttle)

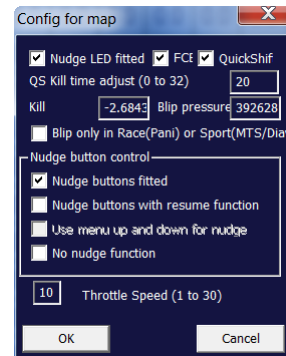
IGN: Ignition soft cut
(If enabled causes a slight retard in IGN immediately after KILL to soften the initial re-firing)

UPSHIFT: QS Upshift pressure setting
DOWNSHIFT: QS downshift pressure setting
KILL Adjust: QS KILL tuning
(This figure is subtracted from the default KILL time to shorten the KILL time if desired).

(Throttle Speed: the butterfly speed
Represents the speed at which throttle changes are made under CC)

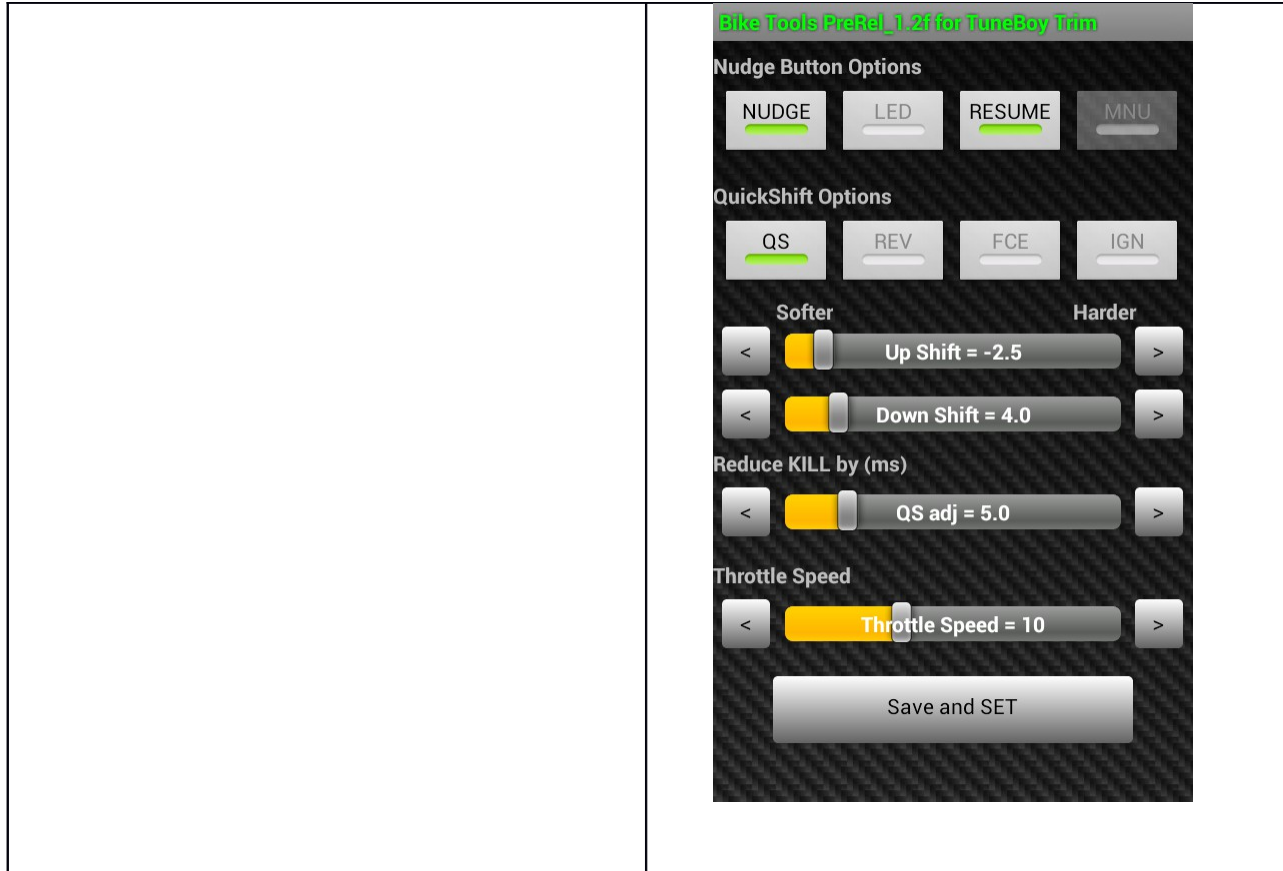


V4 →



V3 →

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Ducati Tools

The 'Ducati Tools' option presents as a dialog box with three options.

Resets :

Service ad system reset commands and tests

Wind ODO :

Wind the ODO forward at approx 500kph until specified target is reached.

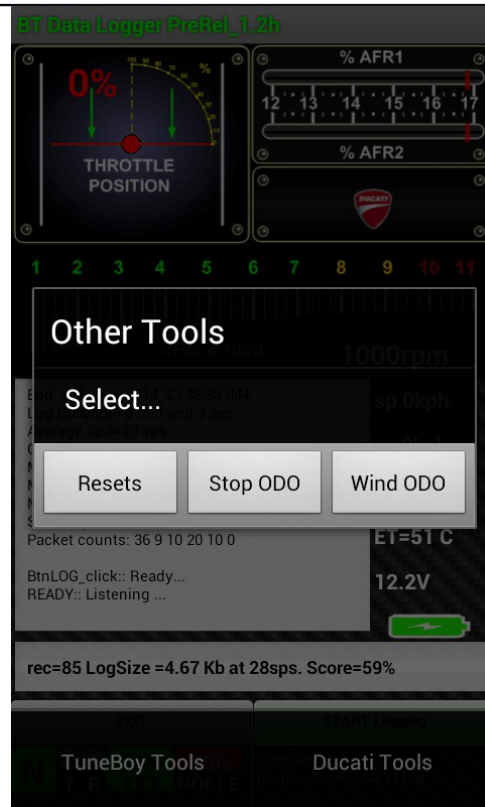
Stop ODO :

Stops the winder at your command.

Note:

Simply canceling back from this screen will also stop the ODO winder if it is running.

These options do not require a TuneBoy flashed ECU.



Additional Notes :

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RESETS

Simply select the reset you want, and hit Reset it!

Some of these command are bike model/year specific, and most are NOT TESTED fully.

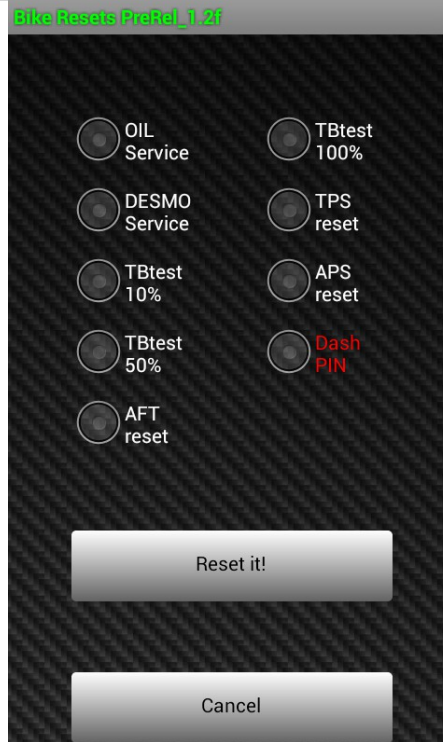
OIL resets both OIL and Desmo on pre 2013 Multi's

2013 and later Multi's use specific commands for each.

Dash PIN works on my 2010-12 test bed.
This sets the dash back to NO PIN so you can enter a new one. (not tried on the bike yet)

TPS, APS, and AFT also need to be confirmed.

The TB test's simply open the Throttle Bodies to that % amount for a few seconds.
For the obvious reasons, MultiTool will not allow you to do this if the engine is running.



Additional Notes :

Service Resets

It is NOT possible to reset your service interval warning before it has appeared.

ie: You can only reset it once you have reached a service interval, and the warning has actually been displayed.

General

Some of the other RESET commands are bike/model specific. I own only a single 2010 Multi.

	OIL	DESMO	TB10%	TB50%	TB100%	PIN	TPS	APS
Multi 2010	OK	OK use OIL for 2010	OK	OK	OK	TBD	not tested	not tested
Multi 2013	OK	OK	not tested	not tested	not tested	not tested	not tested	not tested
Panigale	not tested	not tested	not tested	not tested	not tested	not tested	not tested	not tested
Diavel	not tested	not tested	not tested	not tested	not tested	not tested	not tested	not tested

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ODO winder function

A common complaint on early Multi's is the DASH being replaced, and the service intervals now being out of step. This function allows you to wind your ODO forward

Selecting this option will ask if you really want to do this .. Even if you say YES, you can still back out and do nothing.

The feature will next ask you to enter your **TARGET** mileage and **GO**.

Pressing **GO** will take you back to the Main Logging screen, and the status of the ODO winding is reported on the Status Line.

Winding stops when the **target Odo** is reached (usually). And can be stopped manually if required. (Even just exiting the App will stop the winder)

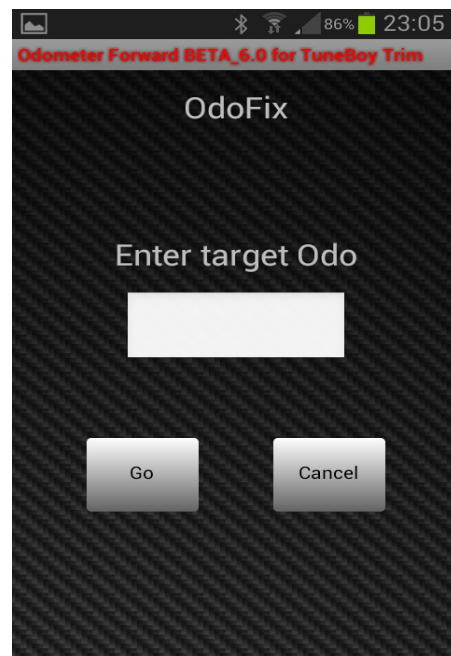
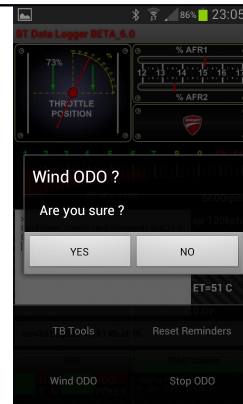
IMPORTANT!!

Winding the ODO needs to have the bikes **BBS** computer disconnected.

See Appendix: **Disconnect BBS**

NOTE: 500kph sounds fast, but if you have 10,000km to catch up... this will take 20 hours! (Do it in manageable chunks over a few evenings).

Note: The TARGET Odo value is not dependant on your settings w.r.t. Miles or Km's. It just the value displayed on the dash regardless of the units. Ie: you don't have to convert anything.



Additional Notes :

See below for comments on how to disconnect the BBS.

WARNING : The ODO can only be wound forward. You CANNOT wind it back. (Use caution. Be alert)

WARNING : You cannot wind past 99,999.

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Additional File System comments

All files are stored in your phones “./**Android/data/com.BTWIFI.logger/files**” directory

- TuneBoy Trim file stored as [datetime.raw]
- Trace files are stored as [datetime].txt
- CSV files are stored as [datetime].csv
- Debugging option creates [datetime]_DEBUG.txt
- GPS option logs cords into CSV file, and KML

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Known Issues

Open Issues	Importance	Possible fix
PASSWORD at start-up occasional grumpy		Workaround is to just restart
Resolved Issues		
Takes a while to discover the BT devices which makes starting up kinda slow...	Resolved	Resolved by adding the ability to connect to a previously paired device
Logging pauses if screen goes to sleep or turned off Fixed in App with 'Keep alive' Power the phone from the bike for long logging sessions...	Resolved	Although Keep Alive will attempt to keep your screen Open, it helps if you can adjust your screen timeout to the maximum (eg, 10 mins for the GalaxySII)
Possible need more SpS	Resolved	New pump mode gets 40+ sps on my Galaxy SII
Speed divisor is different on 2013 multi	resolved	App now detects which bike and model (Family)
Exception errors due to missing data		Wrappers seems to have cleaned this up for now ...
Issue with data "over run"		Mostly solved by dumping data. Occasional crashed now where data length is not as expected
Read RPM break point from Trim tables		Completed - working
APK published as BETA v1 (1.2)	Mar 5, 2014	Initial pre-release
APK published as BETA v2 (1.2)	Apr 5, 2014	Fixed MAP index value misread
APK published as BETA v3 (1.2b)	Apr 8 2014	Added KML file upload to GoogleMaps
APK published as BETA v4 (1.2c)	Apr 14 2014	Enhancements to above
APK published as BETA v5 (1.2d)	Apr 23 2014	Fix Resets Commands not being sent
APK published as BETA v6 (1.2e)	May 21 2014	Many changes ...
APK published as BETA v7 (1.2f)	May 21 2014	Many changes ...
APK published as BETA v8 (1.2g)	11 June 2014	Fix 'About screen' error Fix delete all Fix QS read Add SnapShots Add My Bike photo
APK published as BETA v9 (1.2h)	20 June 2014	Disable Adaptive Timing and Set long time out to fix ReadQS. Modify TOOLS page to align with

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		Wayne's format. Fixed double '+ve' error in ReadQS . Fixed errors in ODOwinder if using MILES. Fixed Camera button not enabled if opening with MyBike.
APK published as BETA v13 (v2.0.13e)	05/06/16	Background recording CSV file fixes (Exp) cornering lights email a zip file (last 5 DEBUG logs)

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Installation

- Simply Download the App from Google's Play Store.
- Connecting the hardware to the bike is simply done by using the adapter cable that came with your OT-2 to connect the BlueTooth ODBII module to the bikes 4-pin diagnostic connector

Installing the APK file on your Android

Get it from the Google Play store:

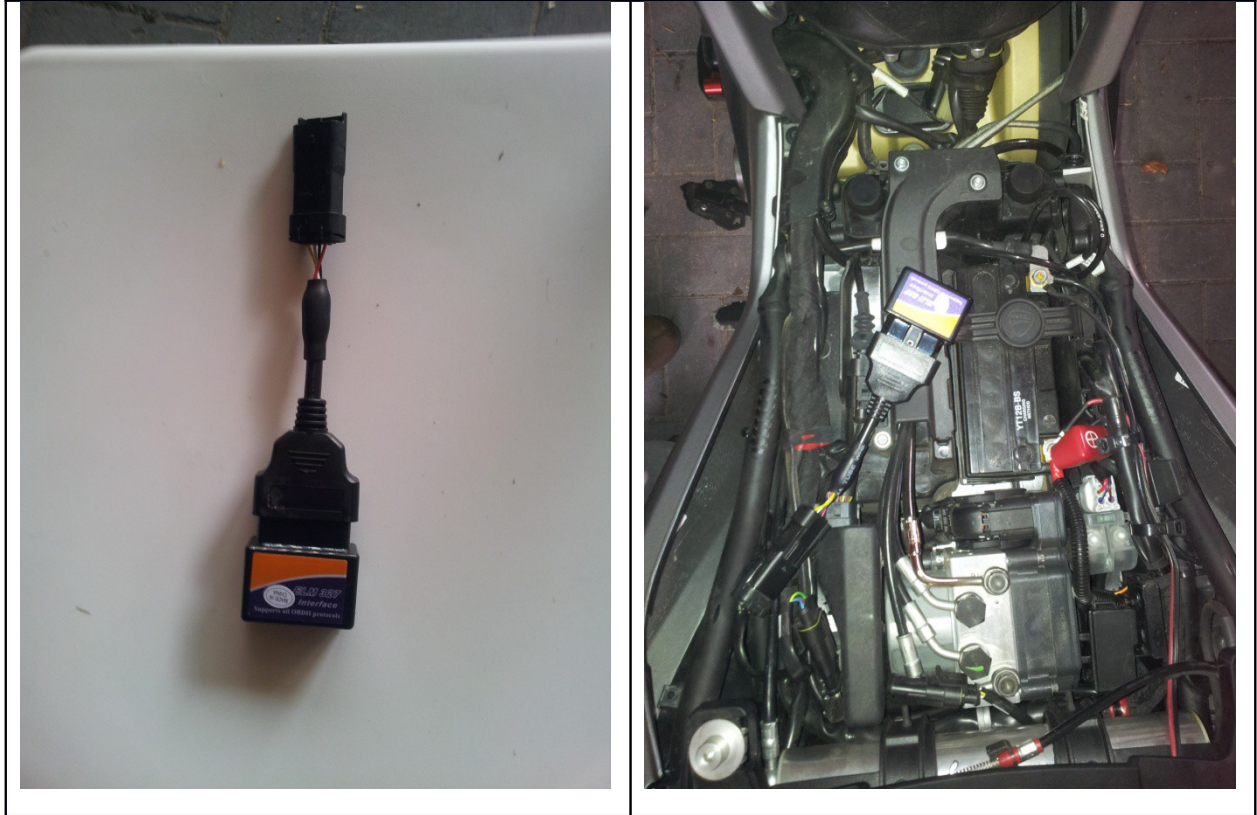
<https://play.google.com/store/apps/details?id=com.BTWIFI.logger>

[\[Click to Link\]](#)

Connecting the hardware

Take the 4-pin to OBDii adapter cable originally supplied with the OT-2 and connect it to the bikes diagnostic port. Now plug your BlueTooth or WiFi ELM327 into the ODBII port.

It should power up straight away, and you can 'pair' and connect to it with your phone.



(Photos Courtesy Paul Doty: many thanks)

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Make your own Adapter Cable

- TuneBoy users can use the same adapter cable that came with your TuneBoy hardware.
- **NOTE:** Non TuneBoy users will have to *make their own* adapter cable.

An adapter cable will be needed to go between the Diagnostic plug and your ELM327.

A suggested cct is provided.

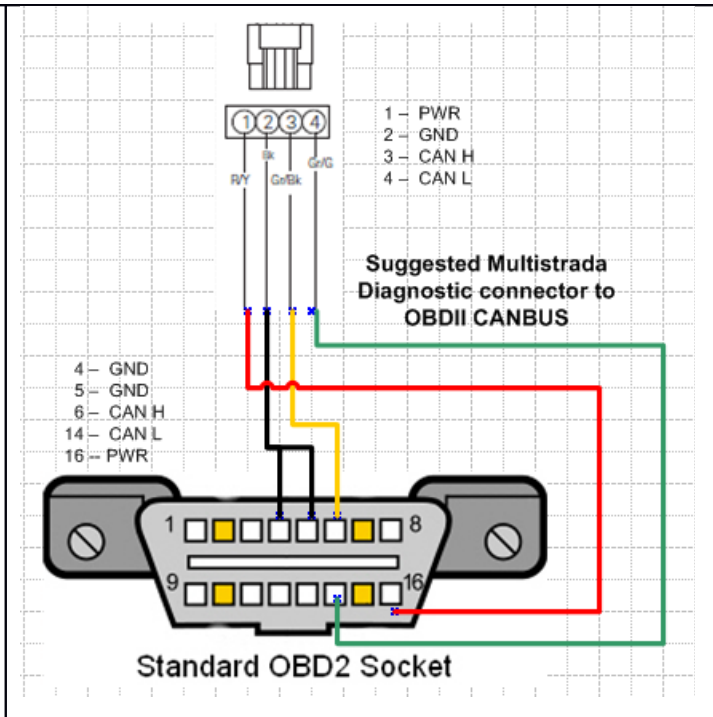
The 4-ping plug required is a :
4w Sicma Miniseal Male Black 1.5mm
By DELPHI

Any standard OBD2 socket can be used.

Warning: Pin1 (PWR) is always live on the bike.

Warning: Be very careful of the pin out.

Test it carefully with a multi meter before connection.



Warning: You are making this cable of your own free will.

Warning: the PWR pin is always live (+12v), even if the bike is off.

Warning: the color codes in the diagram are simply to allow for easier reading and may have **NO RESEMBLANCE to the colors of the wires in the cable you have purchased.**

4w Sicma Miniseal Male Black 1.5mm
By DELPHI



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Reporting Errors

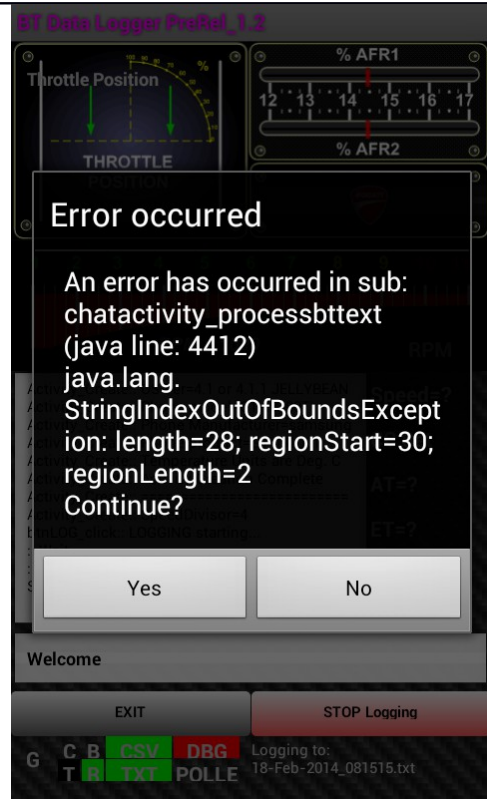
At present there are still a number of BUGs to resolve.

The two common ones are :

- Sometimes the App will complain that the 'password' doesn't match. [just exit and start again]
- Sometimes the App crashes with an exception message. There are many reasons for these and a screen shot of it, can help me identify where it's happening, so I can try to trap it in a later release.

If you're wanting to report problems to me, please include the **stats file** and a screenshot with your description of the issue.

Try enabling DEBUG mode, reproduce the error and send me the DEBUG file as well as the .TXT trace file.



Additional Notes :

If possible, press YES a few times to try and get the troublesome, error causing 'sub of a bitch, to report into the debug file a few times for me...

Acknowledgments

It has been terrific to have such a meaty project to get involved with as my first dabble with Android development, Bluetooth data, WiFi connections, Canbus operation and of course ... just f**king with my Multi in general.

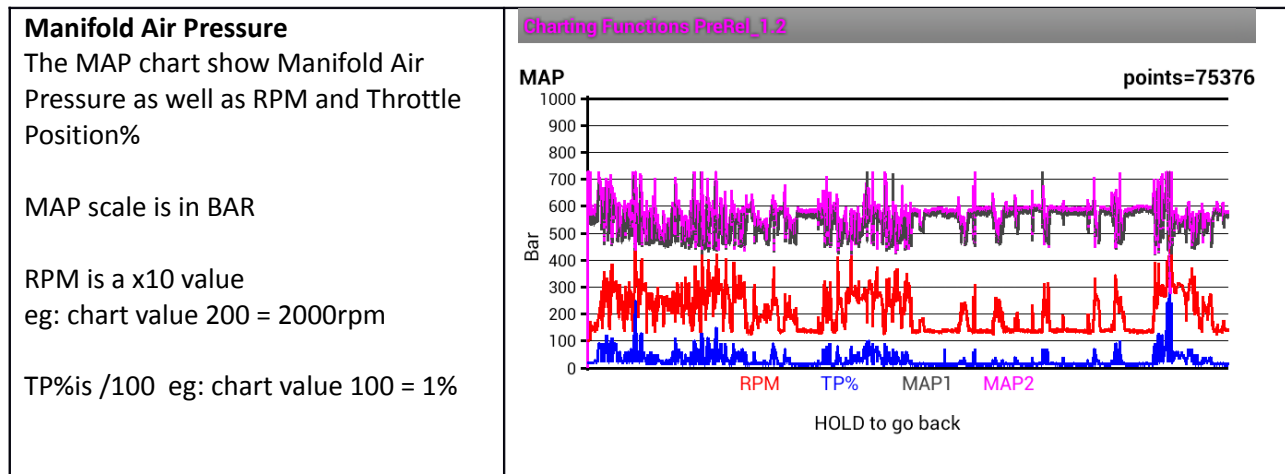
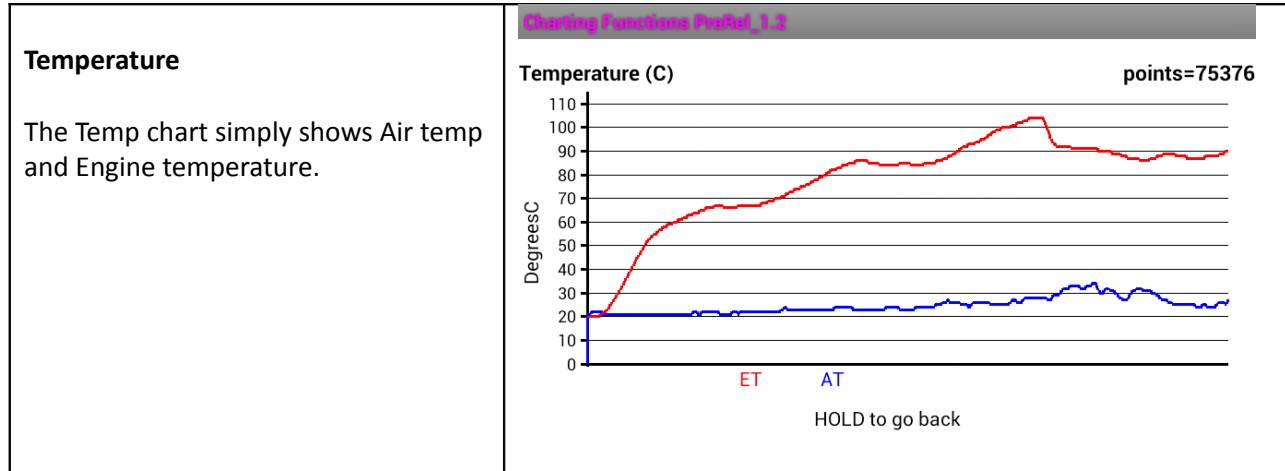
This App would not have been possible without the patience, support and guidance of Wayne from TuneBoy.com.au, in providing the data, and much advice and education on using the ELM 327 and Canbus operation.

Also the B4A user community at large for help with various aspects of Android Development.

Appendices

Appendix: Charts

The Charting functions are primitive, but do allow you to check various readings while still out and about on the bike, ie: without having to download your CSV file and graph it in Excel.



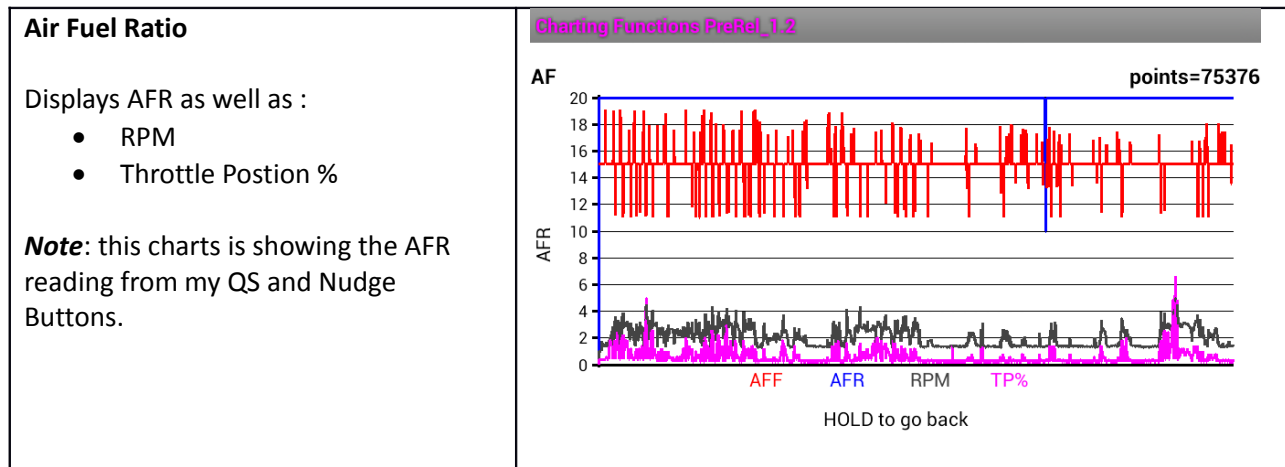
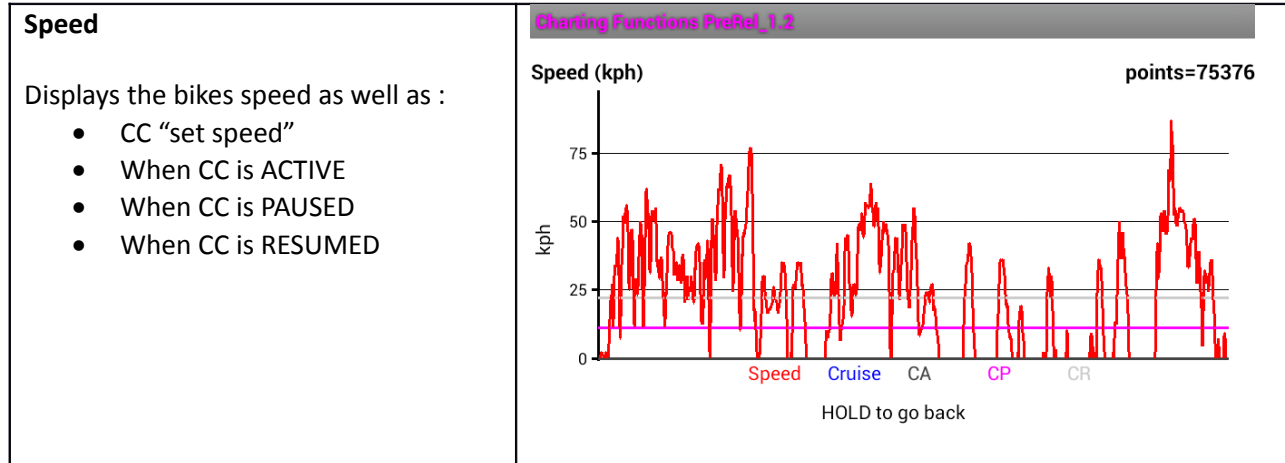
Additional Notes :

Charts width now scales (to a point), to be wider than the screen, to alleviate 'crowding' of the data.

- Drag the chart left / right with your finger.

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- Tap the chart 3 times to go back
- The three vertical lines on the chart are simply ‘rulers’ to help line events up on the screen when examining your data



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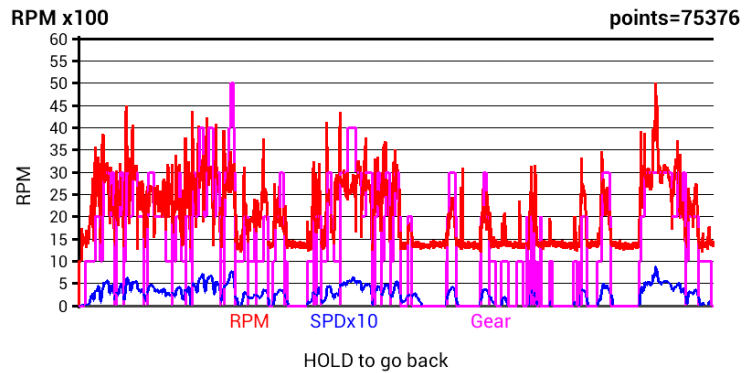
RPM

Displays RPM as well as :

- Speed (x10)
- Gear (x10)

Note: Gear = 0 means Neutral

Charting Functions PreRel_1.2



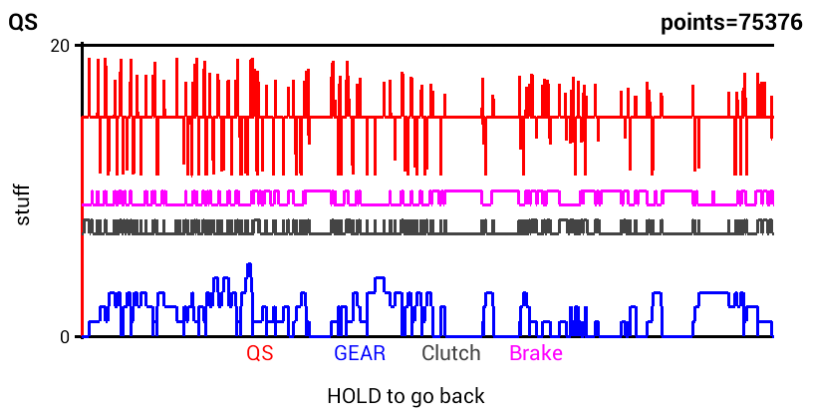
Quick Shifter

Displays Strain Guage results (as measured by the O2 sensor) as well as :

Gear
Clutch activation
Brake activation

If the QS is being used you would expect to see QS pulses up or down, and Gears stepping up or down, but no corresponding Clutch activation.

Charting Functions PreRel_1.2



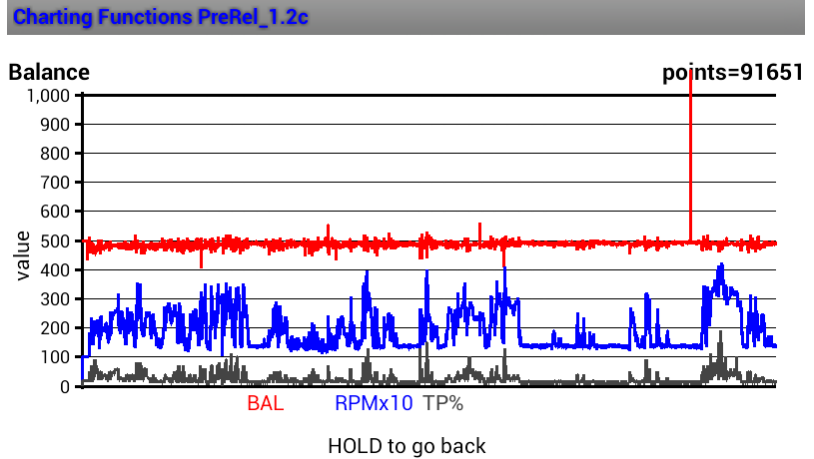
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Throttle Body Balance

Slightly improved now...

BAL maps the difference between Cyl1 and Cyl2 MAP.

In theory, you would expect this to work out to be roughly a straight line.

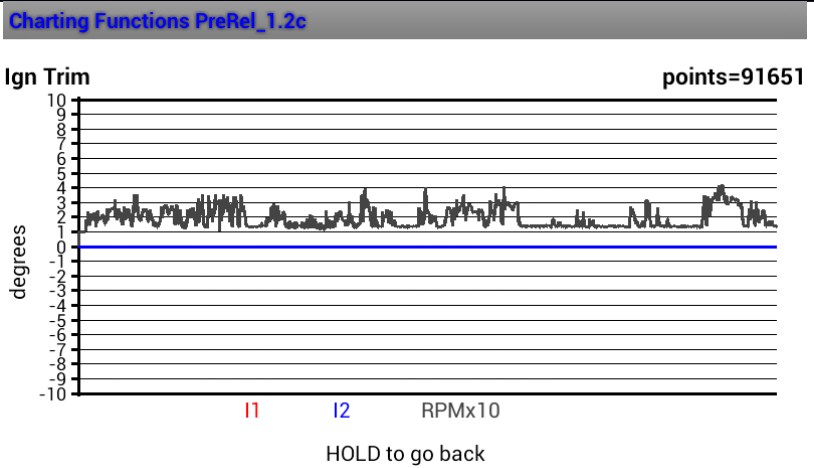


Ignition Timing

Also still working on it


Maps **Ignition Advance** and **Retard** 'trim' values, along with RMP as a reference

As you see, I have no trim adjustments form bike.



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Appendix: About

<p>Help and About If you have stopped logging, you can back out to the 'About' screen and see a short summary of that logging run.</p> <p>Email Clicking the Emblem in the lower right hand corner will open these in your email application ready for emailing.</p> <p>Help A long click will open a browser session to the on-line help at : http://www.madcoz.com/MultiTool/help</p>	 <p>The screenshot shows the 'About' screen of the MultiTool app. It displays various technical details including build date (270214.0801), IDE version (3.00), featureset (BT OIL DESMO TB's Nudge, QSV3 KILL, BLIP TIME, ODO WiFi MAP CHRT PIN ID), ECU serial (2010836223), ELM version (ELM327 v1.5), and voltage (28.3V). It also lists device information like Android version (16), OS (4.1 or 4.1.1 JELLYBEAN), phone model (GT-I9100T), and manufacturer (samsung). A 'Main Purpose' section lists logging from the Mitsubishi ECU, displaying main values, and converting data into TuneBoy Trim format. A 'Requires' section lists supported models (Multistrada 1200 or Panagale or Diavel) and ECU reflashes. A Ducati logo is visible in the bottom right corner.</p>
<p>Emailed Statistics Contains information about your Android Device, as well as some of the Max and Average values from your run.</p> <p>It looks something like this ...</p> <p>(Don't be too worried if the ELM voltage is reported as something weird.. I think some ELM's are a bit flakey with this).</p>	<p>Sent at: 27-Feb-2014 App Stream: AdrianoDucati Build Date: 270214.0801 Bike Family: MULTI2010-12 SpeedVar: 4 MapFormat: 1 Expects TBver: 3.12 ECU Serial=2010836223 ELM Version=ELM327 v1.5 Elm Voltage=28.3V Android=16 OS=4.1 or 4.1.1 JELLYBEAN Phone=GT-I9100T Manufacture=samsung Product=GT-I9100T Start=27-Feb-2014_08:38:48.995 End =27-Feb-2014_09:08:35.606 Log Duration=29 min and 46 sec Average SpS=42 sps MaxSPEED=87Av Speed=22 kph Max RPM=5000Av RPM =2036 Max TP=33Av TP =2 Shifts Up=93Down=85 Packet counts: 31377 8903 8548 17670 8877 0</p>

Additional Notes :

- Touch the Ducati Icon to open the eMail function.
- Hold the Ducati Icon to open a browser to the On-Line help at <http://www.madcoz.com/MultiTool/help>

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Appendix: BBS Disconnection

To make use of the ODO winding feature, you must first **disconnect the BBS**.

To disconnect the BBS, simply unplug the connector my, overexposed, finger is on. (see photo)

This connector has a 'push' tab on it's face, facing the center of the bike.

To release it, reach under the plastic duct and push the tab, with a finger, outwards to the LHS of the bike, while wiggling the connector itself, forward, and off.

ie: push tab in direction of arrow in photo...

Do not try and start your bike with the BBS disconnected !!!



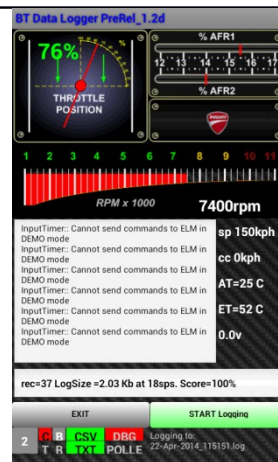
Appendix:Try This !

Try This !

- Ignition **ON** and MultiTool connected
- Engine **RUNNING**
- Bike in **NEUTRAL**
- Logger **STOPPED**

Now swipe the gauges left to right. !

Note: If you've just changed to 'STOP Logging', it will take 2-3- seconds before the App is ready to send commands to the bike like this.



Additional Notes :

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If this function does not work for your bike, the 1st likely culprit to look into are your BLIP H and BLIP L tables in TuneBoyTrim. (They are probably all '0'). They need to have sensible values !

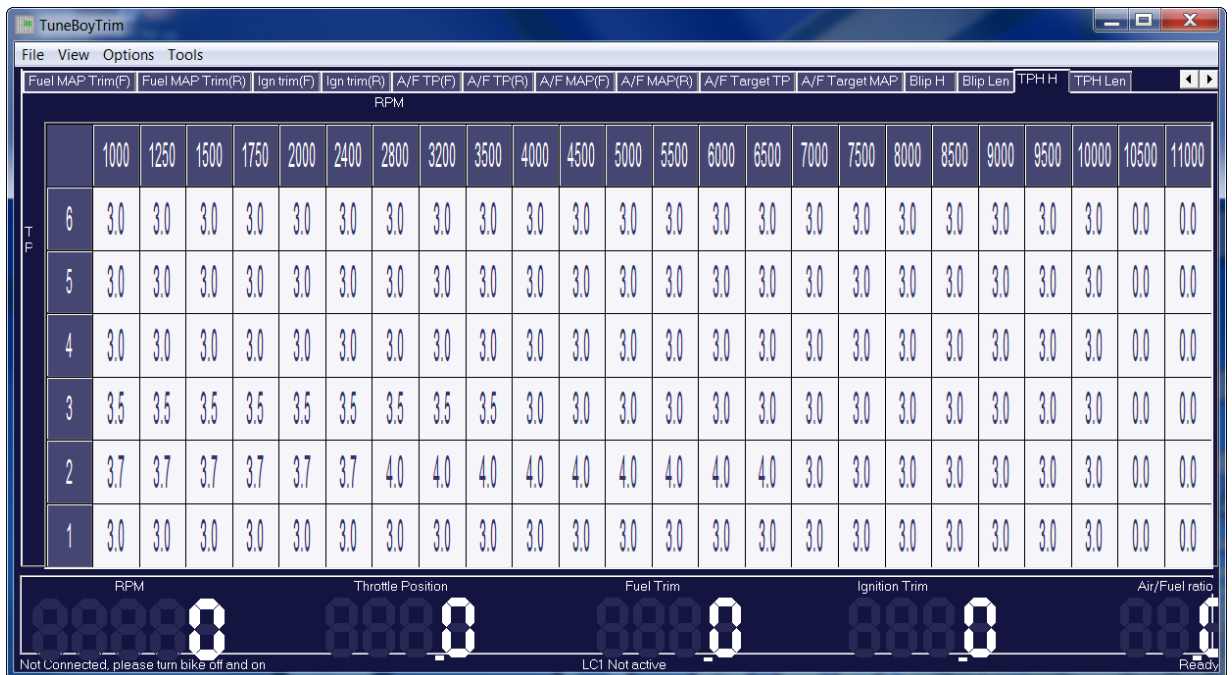
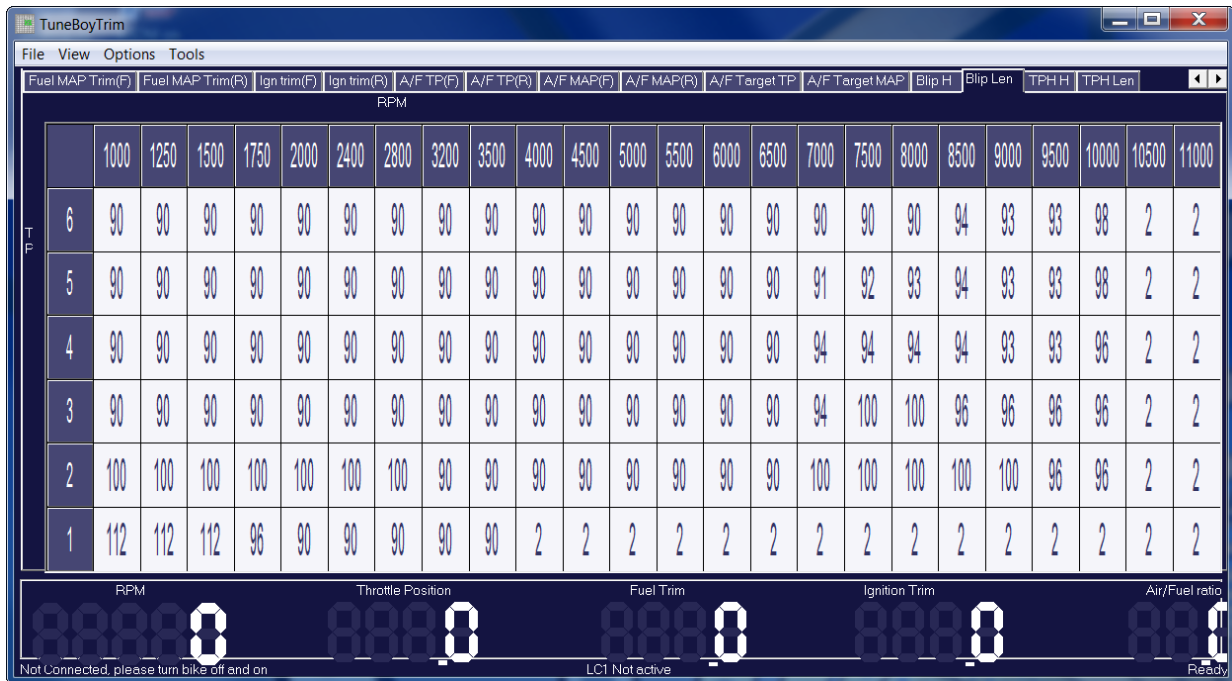
Here are mine :

	1000	1250	1500	1750	2000	2400	2800	3200	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500	11000
TP 6	10.0	10.0	9.0	7.7	7.5	7.0	7.0	7.3	7.5	8.1	8.5	9.9	11.5	13.5	15.8	17.8	19.6	20.6	21.1	21.6	22.1	22.6	0.0	0.1
TP 5	10.0	10.0	9.0	7.7	7.5	7.0	7.0	7.3	7.5	8.1	8.5	9.9	11.5	13.5	15.8	17.8	19.6	20.6	21.1	21.6	22.1	22.6	0.0	0.0
TP 4	10.0	10.0	9.0	7.7	7.5	7.0	7.0	7.3	7.5	8.1	8.5	9.9	11.5	13.5	15.8	17.8	19.6	20.6	21.1	21.6	22.1	22.6	0.0	0.0
TP 3	10.0	10.0	9.0	7.7	7.5	7.0	7.0	7.3	7.5	8.1	8.5	9.9	11.5	13.5	15.8	17.8	19.6	20.6	21.1	21.6	22.1	22.6	0.0	0.0
TP 2	10.0	10.0	9.0	7.7	7.5	8.0	8.0	8.1	8.3	8.9	9.0	9.9	11.5	13.5	15.8	17.8	19.6	20.6	21.1	21.6	22.1	22.6	0.0	0.0
TP 1	20.0	20.0	20.0	11.5	10.0	8.0	7.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RPM: 00000000
 Throttle Position: 00000000
 Fuel Trim: 00000000
 Ignition Trim: 00000000
 Air/Fuel ratio: 00000000

Not Connected, please turn bike off and on
 LC1 Not active
 Ready

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The screenshot shows the TuneBoyTrim software interface. At the top, there is a menu bar with 'File', 'View', 'Options', and 'Tools'. Below the menu bar is a toolbar with various parameters: Fuel MAP Trim(F), Fuel MAP Trim(R), Ign trim(F), Ign trim(R), A/F TP(F), A/F TP(R), A/F MAP(F), A/F MAP(R), A/F Target TP, A/F Target MAP, Blip H, Blip Len, TPH H, and TPH Len. The main area is a table with RPM on the x-axis and Gear (1-6) on the y-axis. The table contains numerical values for each cell. At the bottom, there are five digital gauges: RPM, Throttle Position, Fuel Trim, Ignition Trim, and Air/Fuel ratio. The status bar at the very bottom shows 'Not Connected, please turn bike off and on', 'LC1 Not active', and 'Ready'.

	1000	1250	1500	1750	2000	2400	2800	3200	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500	11000	
6	100	100	100	120	120	120	120	120	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2
5	100	100	100	120	120	120	120	120	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2
4	100	100	100	120	120	120	120	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2
3	100	100	100	120	120	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2

RPM: 00000
 Throttle Position: 0000
 Fuel Trim: 0000
 Ignition Trim: 0000
 Air/Fuel ratio: 0000

Not Connected, please turn bike off and on | LC1 Not active | Ready

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Appendix:Version History

My Version	Google PlayStore Version	Comment
1.2	1	- 1 st Beta release – published via Google Play Store
1.2(a)	2	<ul style="list-style-type: none"> - minor fixes for some commands - Added GPS location recording and KML file generation - CSV creation is now ON by default (if you install the app from scratch) NB: updates do NOT alter your configuration settings - Added a DELETE ALL function to Log Files screen (use phones Menu button to access)
1.2b	3	- 08APR2014 - fixed index error in Manifold Air Pressure value and added Altitude to KML
1.2c	4	<ul style="list-style-type: none"> - add KML viewer by browser - add filter for file list in Log File Functions - blip swipe is now a swipe (not just a poke) - more debug around send blip
1.2d	5	<ul style="list-style-type: none"> - minor fixes for some commands - URGENT fix to 'Resets' function - Log File size now configurable 0.1Mb to 50.0Mb (Config Screen) - added framework for reading RPM break points from current TRM in bike. (still testing) - more debug messaging - more consistent phone/App/user Stats
1.2e	6 SKIPPED	-
1.2f	7 published May2014) It has been reported and confirmed that the 'About screen will cause an error if accessed before MultiTool has had a chance to read anything from the bike.	<ul style="list-style-type: none"> - Added RPM breakpoint table read from bike - Added SnapShot Function - Augmented sliders in Tools with up/down buttons - Added Sliding charts (wider charts) - Added 'ruler' sights added to charts for lining up event data - Added 'pos' or index value added to chart - Added Start and finish time added to chart - IGN toggle button added to QS settings in Config Options - MNU toggle button added to CC settings in Config Options - Added New Family DiavelDS added for Diavel DualSpark - Screen Brightness control added - Fixed incorrect SPEED reading (TrueSpeed Flag was inverted) - Fixed FileSize box not saving value - Added OS recognition for SDK 19 (KitKat) - Fixed cosmetics on 'About' screen - More 'robust' code around GetQS settings - Enabled APS and TPS resets - Added AFT reset
1.2g	11 th June	<ul style="list-style-type: none"> - Fixed broken 'About' - Added new bike shots for start screen - Added 'my bike' feature for start screen

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		<ul style="list-style-type: none"> - Cosmetic changes 'Tools' - Added phone battery warning - Fix Delete ALL - Fix ReadQS - Added SnapShot feature - Added SnapShot Auto triggers
1.2h	Est 20 th June	<ul style="list-style-type: none"> - Disable Adaptive Timing. Set long time out to fix ReadQS - Modify TOOLS page to align with Wayne's format - Fixed double '+ve' error in ReadQS - Fixed errors in ODOwinder if using MILES - Fixed Camera button not enabled if opening with MyBike.

Android Devices Tested with :

The following Android devices are undergoing testing.

Phone	CPU	speed	API		Android	
Samsung Galaxy S2 (GT-I9100)	Dual core, ARM Cortex-A9	1200 MHz	15	ICS	4.0.3	Wit
Samsung Galaxy S2 (GT-I9100T)			16	JELLYBEAN	4.1.2	
Sony Tablet S	Dual core NVIDIA Tegra	1000 MHz	14	ICS	4.0.1	Wit
IDEOS u8150	Single core Qualcomm Snapdragon S1 MSM7225	528 MHz	8	FROYO	2.2	wit
Samsung Galaxy S (GT-I9000)						
Samsung Galaxy Pocket (GT-S5300)						
Google Nexus 7 (flo)						
HTC HTC EVO 4G LTE (jewel)					Cynaogen 11 KK 4.4. (build unknown)	Pairing works fine, it's the attempt to connect that fails
Samsung Galaxy S4 (jflte)						
Samsung Galaxy S3 (m0)						
Samsung Galaxy Note 10.1 (p4notelte)						
Samsung Galaxy Note 10.1 (p4notewifiww)						

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MultiToolTB does not help when you are 1600km from home and snap a pannier off !!!