



# RaceChrono

## TouchScreen GPS Lap Timer Manual

1. <u>Introduction</u>	3
2. <u>What's in the Box</u>	4
3. <u>Initial set up</u>	5
4. <u>Using the Touchscreen</u>	5
5. <u>Touchscreen Lap Timer and External GPS Receiver mounting</u>	5
6. <u>Battery Power or Direct Power</u>	7
7. <u>GPS Setup</u>	8
7.1 <i>Setting up for Internal GPS (RaceChrono Basic)</i>	8
7.2 <i>Setting up for External GPS (RaceChrono Pro)</i>	9
8. <u>Start Menu</u>	9
8.1 <i>Settings</i>	10
8.2 <i>General settings</i>	10
8.3 <i>GPS receiver settings</i>	10
8.4 <i>OBD-II reader settings</i>	11
8.5 <i>High/Low speed settings</i>	12
8.6 <i>Device Settings</i>	12
9. <u>Lap timing with RaceChrono (create new session)</u>	13
10. <u>Live Timer</u>	14

---

11. <u>Online Track Library</u>	15
12. <u>Creating a New Track</u>	16
12.1 <i>Adding traps while driving</i>	16
12.2 <i>Adding traps after driving</i>	16
13. <u>Viewing lap times</u>	17
13.1 <i>Sectors Mode</i>	18
13.2 <i>Splits Mode</i>	18
13.3 <i>Trap Speeds Mode</i>	19
13.4 <i>High/Low Speeds Mode</i>	19
13.5 <i>Information Mode</i>	20
13.6 <i>Changing Comparison Lap</i>	20
13.7 <i>Marking and Hiding Laps</i>	20
13.8 <i>Viewing Graphs</i>	20
14. <u>Performance Tests - Run Times</u>	21
14.1 <i>View run times and speeds</i>	21
15. <u>Browse Traps</u>	21
16. <u>Travelled Route</u>	22
17. <u>Exporting</u>	22
17.1 <i>Export Types</i>	23
18. <u>Importing</u>	23
19. <u>Transferring Data &amp; Viewing on PC</u>	23
20. <u>Updates</u>	24
21. <u>Troubleshooting</u>	24
22. <u>GPS Switch Position – 10Hz</u>	25
23. <u>Contact Details</u>	26

## 1. Introduction

The RaceChrono TouchScreen GPS Lap Timer is the latest in GPS timing technology intended for measuring lap times and analysing laps, as well as logging many different performance tests and critical engine functions.

The software application that the RaceChrono TouchScreen unit uses was originally developed as a free S60 mobile phone application by a Finnish company named RaceChrono. The aim of RaceChrono was to give immediate feedback of laps and to provide a way to analyze laps without transferring any data to a computer. The software was particularly aimed towards recording lap times in motor sports, but it had also a lot of users in down hill skiing, bicycling and even horse racing.

With Lap timing feature you can test and improve your track driving skills. RaceChrono supports both circuit and special stage type tracks. Of course using this feature is not limited only to track driving; you can for example time your commute to work.

RaceChrono offers its users a huge online track library containing the start, finish and split lines for many different race tracks. There is currently over 200 tracks in 40 countries in the library, all of which are downloadable within the application.

The RaceChrono TouchScreen GPS Lap Timer uses global positioning system and lap time error margin is typically 0.10-0.05 seconds depending on satellite positioning accuracy and the position of the GPS receiver being used. The best accuracy is gained using the external Bluetooth GPS receiver provided with the Pro Kit, but the internal GPS receivers in the TouchScreen unit is supported as well.

RaceChrono also has a performance testing feature which you can use to time your car's or bike's performance on, for example, a quarter mile track, and view the speeds at the finish line.

Please visit our web pages at [www.racechrono.com](http://www.racechrono.com) for latest news, installation files, manuals and support forum!

## 2. What's in the Box

If you have purchased the RaceChrono Basic System you will find included...

- 1 X RaceChrono 3.5" GPS Touchscreen Lap Timer
- 1 X Power supply (wall charger – used to charge the TouchScreen and the GPS receiver)
- 1 X Power supply (12v car charger)
- 1 X USB cable
- 1 X Car windscreen mounting kit
- 4 X 3M Dual lock mounting tape
- 1 X Quick Start Guide

If you have purchased the RaceChrono Pro System you will also find included...

- 1 X Qstarz High Speed Bluetooth GPS Receiver
- 1 X Power supply (car charger)
- 1 X Li-ion battery
- 1 X USB cable
- 1 X Qstarz Quick Guide & Warranty Card



### 3. Initial set up

Before use please make sure that the RaceChrono Touchscreen Lap Timer has been fully charged. Normal charge time is approximately three hours.

While charging a red LED light will be showing, the red light will go out when the unit is charged.

The RaceChrono Touchscreen GPS Lap Timer can be charged either via the wall charger, car charger or USB cable. Battery operation time is approximately 2hrs continuous use and it is recommended that this unit be turned off between lap timing sessions. Battery life can be extended when the unit is in "locked" mode during lap timing (screen turned off but unit still functions).

If you have the RaceChrono Pro System you will also need to fully charge the Qstarz GPS receiver. Instructions for inserting the battery and charging can be found in the Qstarz Quick Guide. Battery operation time is approximately 25hrs in 5Hz mode. This unit may be left on all day when lap timing.

### 4. Using the Touchscreen

Your new RaceChrono Touchscreen GPS Lap Timer is a precision instrument and contains sensitive electronic hardware. To interact with functions on the screen you can use either your finger (for best results use your fingernail) or the scribe provided (inserted into the bottom left corner of the unit).

*Note: The RaceChrono Touchscreen uses a 'One Click' system...*

*Touch once to open an item. (equivalent to 'double click' on PC)*

*Touch and hold to select an item without opening (equivalent to 'single click' on PC)*

*Touch, hold and drag to scroll up and down, left and right.*

Every care should be taken not to drop or damage the unit. You should also be careful when mounting the unit to a motorcycle/kart using the 3M Dual Lock tape provided – try not to push on the screen when mounting the unit. Physical damage to the unit will void your warranty.

Also be careful not to mount the unit in a position where it will get too hot. Running the unit in areas that are above 40 degrees Celsius is not advisable and will void your warranty.

Note: The RaceChrono Touchscreen Lap Timer is not water proof. For use in wet conditions we advise mounting the unit in a dry area on your motorcycle/kart or carrying the unit in your pocket. Water damage to the unit will void your warranty.

### 5. TouchScreen Lap Timer and External GPS receiver mounting

Mounting the RaceChrono 3.5" GPS Touchscreen Lap Timer

**Car** - Your RaceChrono GPS Lap Timer can be easily mounted to the windscreen of your car using the Car Windscreen Mounting Kit supplied (see pic 1).

**Motorcycle/Kart** - RaceChrono GPS Lap Timers come with several strips of 3M Dual Lock mounting tape. This is the best and most reliable reclosable fastening system available and can be used to mount the lap timer in a variety of different positions on a motorcycle including on the tank, triple clamp, steering damper, steering wheel or to a custom made mount such as the one in Pic 2. When using the 3M Dual Lock Tape, be sure to clean any mounting surfaces thoroughly with a paint safe

solvent such as Brake Clean or Prepsol and thoroughly test for good adhesion once the unit has been mounted.

To date we have not had this tape fail (when mounted correctly) but if you feel like adding an extra measure of security a cable tie can be placed around the unit to hold it in place. RaceChrono will not be held responsible for poorly mounted units that fall off during racing conditions.

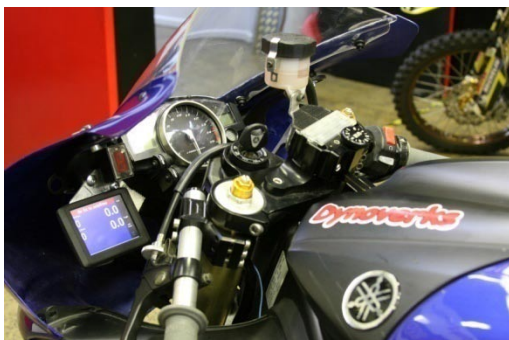


Pic 1. Car Mount.



Pic 2. Custom made Bike Mount.

If you do not have the RaceChrono Pro System (no external GPS receiver) then your RaceChrono Touchscreen GPS Lap Timer will be using the internal GPS to gather lap timing data and must be mounted with clear view to the sky for best GPS reception. Although mounting under objects that are plastic will not really interfere with GPS signals it is not advisable to mount the unit under metal objects. If you have your timer mounted in a position where it may have an obstructed view and you are not receiving good signal then move the unit to a better position (see pics 3 & 4).



Pic 3. Low mount is ok for use with RaceChrono Pro.



Pic 4. High mount is better for GPS Signal reception and for use with RaceChrono Basic (no external GPS).

For discrete use, wet conditions or off road racing, the RaceChrono GPS Lap Timer can be kept in a pocket or pouch, away from harm's way.

### Mounting Qstarz High Speed Bluetooth GPS receiver (Pro System Only)

**Car** - The Qstarz GPS receiver must be mounted face up with an unobstructed view to the sky for best GPS reception, far forward on the dash or on the roof of the car are two good locations.

**Motorcycle/Kart** - The Qstarz GPS receiver must be mounted face up with an unobstructed view to the sky for best GPS reception. The ducktail of the motorcycle is a good place for this (see pic 5). For discrete mounting, this unit can be attached face up under surfaces such as fibreglass or plastic but not under metal. Under the fibreglass panel that runs along the edge of the bike's windscreen (see pic 6), or on top of the bike's instrument panel, or even inside the hump in your race suit are all good places for discrete mounting.



Pic 5. External GPS Ducktail mount.



Pic 6. External GPS Discrete Mount.

*Note: After installing the battery to your Qstarz High Speed GPS Receiver, please run a strip of clear cellophane tape around the unit before attaching the 3M Dual Lock Tape. This will stop the body accidentally detaching from the battery cover if exposed to high winds.*

The Qstarz GPS Receiver comes packed with two strips of 3M Dual Lock mounting tape that are ideal for mounting in these positions. You must first remove the rubber non-slip pad on the battery cover of the High Speed Receiver before applying the 3M Dual Lock Tape.

Keep in mind that GPS receivers work best on clear days with unobstructed views to the sky. If you find you are having problems getting a good signal try to move your RaceChrono GPS Lap Timer (Basic System) or Qstarz GPS Receiver (Pro System) to a better position on your vehicle.

## 6. Battery or Direct Power

The RaceChrono Touchscreen Lap Timer has an internal battery that will last for approximately 2 hours of continuous use, more if the screen lock/saver is used. The unit also comes with a car charger that can be plugged into a cigarette lighter in a car or wired directly to the 12v system on a bike/kart.

There are four power options that will suit different people's needs.

1. Battery Power only – You can easily run your RaceChrono Touchscreen Lap Timer on battery power only but you will need to turn it off when not in use/between track sessions. Doing this will give you approximately 2 hours of use time which will last you for the whole day as long as you turn the unit off between sessions. It's also a good idea to bring the wall charger with you just in case. Good for motorcycles/karts.
2. Battery Power with Wall Charger – Take the charger with you and plug the RaceChrono Touchscreen Lap Timer in for charging after every session. This quite easy to do if you are already running tyre warmers etc and allows you to simply leave the unit on for the whole day. Good for motorcycles/karts.
3. Power with Car Charger – If you are taking your car to the track simply plug the RaceChrono Touchscreen Lap Timer into the cigarette charger while using or between track sessions. Good for street cars/track days
4. Permanent Power – If you own a purpose built track/race car or motorcycle/kart and want the unit to be under permanent charge you can achieve this by purchasing a female cigarette charger socket from your local electronics store and wiring this into the 12v supply on your car/bike/kart, then plug the RaceChrono Touchscreen Lap Timer car charger into it. The unit will then be under permanent charge whilst in use and can be left on. Good for cars/motorcycle/bikes.

## 7. GPS Setup

### 7.1 Setting up for Internal GPS use (Basic System)

#### Drawbacks of the RaceChrono Basic System

The RaceChrono Basic System consists of the 3.5" GPS Touchscreen Lap Timer and accessories only, (no high speed external GPS) and uses the internal GPS in the Touchscreen to acquire GPS lap timing data. Although the lap timing accuracy with the internal GPS can be relatively good, the RaceChrono Pro system is recommended for very accurate timing, frequent track day use and motorcycles/karts.

The RaceChrono Basic Lap Timing System will record reasonably accurate lap times but it does have some drawbacks that we have listed below.

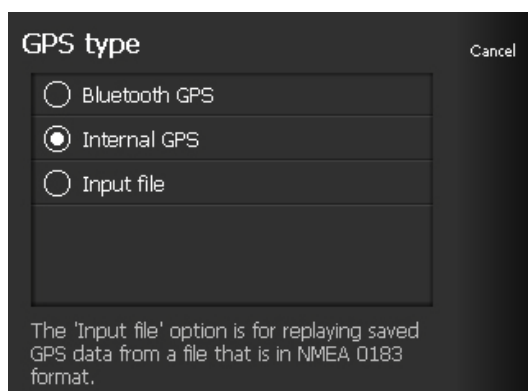
- The Touchscreen's internal GPS has a slower satellite acquisition time. If inside a building or under cover area, this unit needs around 90 seconds outside to acquire satellites before lap timing can commence.
- The Touchscreen's internal GPS works at only 1Hz. This means that the amount of incoming data from the GPS is 5 times less than using the Qstarz High Speed Receiver included in the Pro System, resulting in lower resolution of recorded data such as Speed Graphs and Travelled Route.
- Using the Touchscreen's internal GPS means that the Touchscreen must be mounted with a clear view to the sky. This can sometimes be difficult, whereas the Qstarz High Speed Receiver is much smaller and easier to mount in difficult positions.

We recommend the RaceChrono Pro System be used for all motorcycle/kart lap timing and serious car lap timing. Qstarz receivers can be purchased separately from [www.racechrono.com](http://www.racechrono.com) (Europe) or [www.racechrono.com.au](http://www.racechrono.com.au) (Australasia).

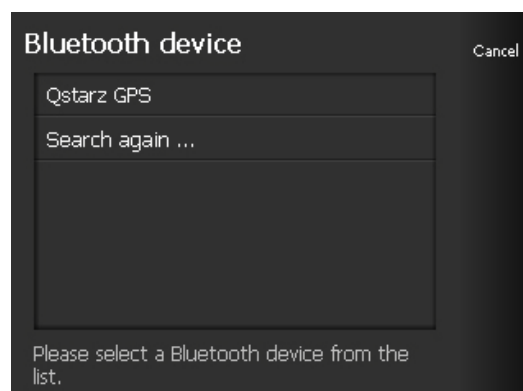
#### Setting up the Internal GPS

If you have the RaceChrono Basic System, the first time you turn your unit on you will need to make sure it is set for use with the INTERNAL GPS. You will only need to do this once.

1. **Make sure the Touchscreen unit is fully charged.**
2. **Turn the unit on and let it power up (hold the power button down for 3 seconds).**
3. **Select - SETTINGS - GPS RECEIVER - GPS TYPE**
4. **Make sure INTERNAL GPS is selected then exit back out to the start menu (see pic 7).**



Pic 7. Internal GPS select.



Pic 8. Qstarz External Bluetooth GPS select.

Your RaceChrono Touchscreen Lap Timer is now ready for Lap Timing with the Internal GPS (see Lap timing with RaceChrono on page 13)



*Note: This is how you can select which GPS is to be used, Internal or External. Handy to remember if you decide to change to a High Speed External GPS at a later time. Qstarz High Speed Bluetooth GPS Receivers can be purchased from [www.racechrono.com](http://www.racechrono.com) (Europe) or [www.racechrono.com.au](http://www.racechrono.com.au) (Australasia).*

## 7.2 Setting up for External GPS use (Pro System)

The RaceChrono Pro System comes packaged with a Qstarz High Speed Bluetooth GPS Receiver. This receiver works at five times the speed of the Touchscreen's internal GPS, allowing for more accurate lap timing (+/- .05 secs under good conditions) and easier mounting for discrete lap timing and optimum GPS signal strength.

Setting up for External GPS

- 1. Make sure the Touchscreen unit and the High Speed External GPS Receiver are both fully charged.**
- 2. Turn the unit on and let it power up (hold the power button down for 3 seconds).**
- 3. Turn the High Speed External GPS Receiver on by pushing the sliding switch to 5Hz\* (if using the Qstarz 818XT 10Hz receiver – please read Qstarz 10Hz switch position note on page 25)**
- 3. Select - SETTINGS - GPS RECEIVER - GPS TYPE.**
- 4. Select – BLUETOOTH GPS – BLUETOOTH DEVICE – the unit will now search for available Bluetooth Devices \***
- 5. When the unit finds 'Qstarz GPS' select it and exit back out to the start menu (see pic 8).**

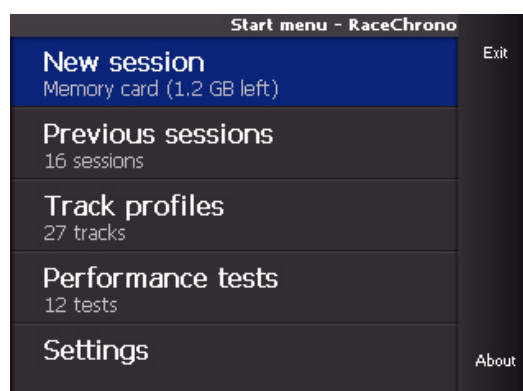
*\* When searching for available Bluetooth Devices it is highly recommended that this be done at home or away from other Bluetooth GPS Devices to avoid possible pairing with incorrect device.*

Your RaceChrono Touchscreen Lap Timer is now paired with your External GPS and is ready for Lap Timing (see page 13)

## 8. Start Menu

From the Start menu, the user can navigate:

- New sessions
- Previous sessions
- Track profiles
- Performance test
- Settings



In Main Menu you can also see

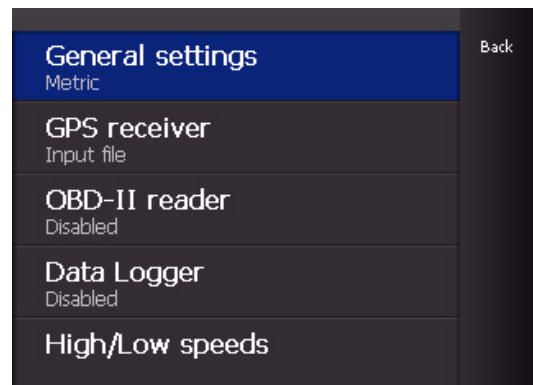
- storage space left (Kb)
- total of:
  - Sessions

- Track profiles
- Performance tests
- About - shows version number and other software information.

## 8.1 Settings

The settings are divided in four separate groups:

- General settings
- GPS receiver settings
- OBD-II reader settings
- Data Logger
- High/low speeds settings.
- Device Settings



## 8.2 General Settings

### Timer decimals

The times are displayed with accuracy of 1/10<sup>th</sup> of a second by default. Change this setting to 1/100<sup>th</sup> if you are using an expensive high-end professional GPS (10-100 Hz).

### Units

The units can be changed between Metric and English units with this setting. Default is Metric.

### Start-up warning

The start-up warning can be switched on/off with this setting

## 8.3 GPS receiver settings

The GPS receiver settings tell RaceChrono how the position data is to be collected.

### GPS type

Here you can choose between internal GPS, External Bluetooth GPS receiver or Input file. Refer to **GPS Setup** on page 7 for GPS setup.

#### GPS device

Select the Bluetooth GPS device.

#### GPS serial port

Select the serial port (COM port) for your GPS device.

### GPS baudrate

Don't change this setting unless you really need to. You can override the default setting for Bluetooth serial GPS baud rate. With internal GPS type this setting has no effect.

### Input file

This option is used for replaying sessions and testing purposes. Once a session file is selected from the folder racechron0\sessions you can replay this file by simply opening a new session and pressing START. The session file you previously selected will now re-play in this session.

## 8.4 OBD-II reader settings

The OBD-II reader settings tell RaceChrono if it should connect to an OBD-II reader, and what channels it should request from the reader.

### OBD-II type

You can enable the OBD-II reader by changing this setting to ELM or compatible.

### Bluetooth device

You can connect to the OBD-II reader with this setting.

### OBD-II baudrate

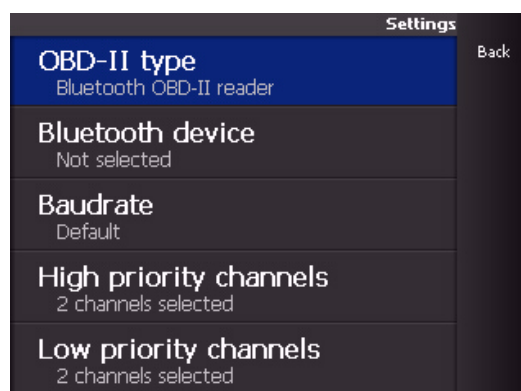
Don't change this setting unless you really need to. You can override the default setting for OBD-II reader baud rate.

### High priority channels

Select the OBD-II channels that are monitored most frequently. OBD-II generally allows 2 - 4 channel requests per second, so update rate for each channel gets slower the more channels have been selected. It not recommended having more than 3 channels selected as high priority channels.

### Low priority channels

Select the OBD-II channels that are monitored less frequently, generally each high priority channel is monitored 10 times more often than low priority channels. It makes sense to have all "slow moving" channels (like temperatures) as low priority channels. But for channels like RPM it is not much use, as the polling frequency will be very low.



## 8.5 High/low speeds settings

The High/low speeds settings tell RaceChrono how to draw the High/low speeds display mode in lap times view.

### High/Low speed threshold

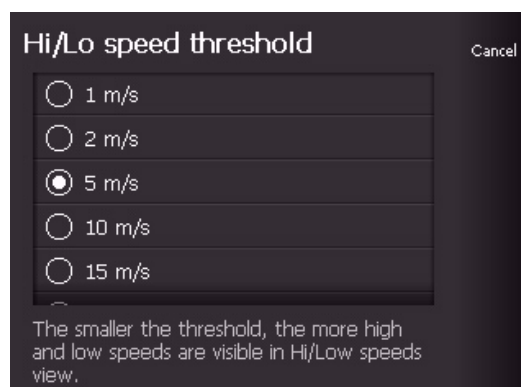
Depending on the track and the vehicle you may need to change this setting. Generally lower value will show more marked highs and lows in High/Low speed mode and higher value will show less of them.

### Acceleration limit

The amount of positive longitudinal G-force, where the route in High/low speeds mode is drawn with the brightest green color.

### Braking limit

The amount of negative longitudinal G-force, where the route in High/low speeds mode is drawn with the brightest red color.



## 8.6 Device Settings

Device Settings can be found by scrolling up in the Setting Screen. Clicking **Device Settings** will open the unit into the Standard Interface software mode. From here you can read many formats stored on the memory card such as Images, Text, Music or Video by selecting the respective icon.\* file formats listed below

Audio - WMA9, MP3, WAV. Video – AVI, ASF, MOV, MPG. Photo – JPG, PNG, TIFF

If you click Settings you will then have access to the other device settings listed below

**Volume** – Change volume

**Language** – This setting will only change the language for device settings, not RaceChrono

**Backlight** – Change backlight strength

**Power** – View battery power levels

**Time** – Change date and time

**System** – Test internal GPS – Perform Factory reset – Calibrate TouchScreen

**NavPath** – Change the navigation path for startup software (Do not change)

**FM** – Used to adjust FM output frequency so that music can be played through car radio

**Bluetooth** – These settings can be used to allow pairing to mobile phone so you can dial and talk via the unit. We recommend not using this function as the TouchScreen is designed to work with the RaceChrono Software only.

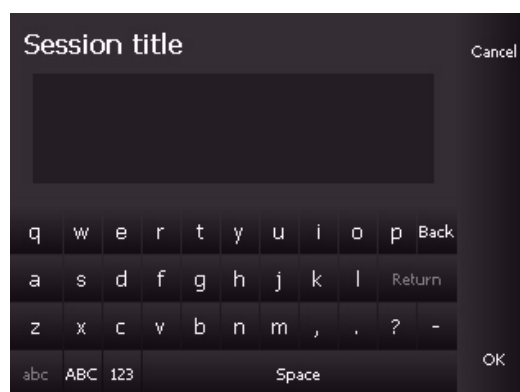
**Note:** Pressing the X or close button whilst in Device Settings Mode **will** confirm your selection. Pressing the arrow back button **will not** confirm your selection. To return to RaceChrono simply back all the way out using the X button and select GPS or restart the system.

## 9. Lap Timing with RaceChrono (create new session)

To start a new session, open **New session** from the **Start Menu**. When starting a session, please be careful with the remaining storage space. One hour session requires approximately 10 megabytes of space, when using a 5 Hz GPS receiver and also saving the NMEA data. Available space on selected storage can be viewed in the **Start Menu**.

### Session title

Enter a descriptive name for the new session. This name can be used to identify this session in the future.



### Session type

Choose Lap timing, Performance Test or Data logging session. The data logging session just saves the route, and does no timing or measuring.

### Track / Performance test

If **Lap timing** is selected then you must select a **Track**. If you don't see the track you need, you must either download the track from the [www.racechrono.com](http://www.racechrono.com) website (see **Online Track Library** on page 15) or you can select **Create new** to create an empty track (this is done when creating a new track - see **Creating a New Track** on page 16)

If **Performance testing** session is selected then select the **Performance test** you wish to do. If you cannot find one you need, you can always create a new one from the Performance tests menu.

### Driver

Here you can enter the driver's name if more than one driver is using the vehicle.

### Session notes

Here you can enter some initial **Session notes**. This may contain any information that is useful for you when analyzing the session later. For example track conditions and used tires are always useful information to have in the notes.

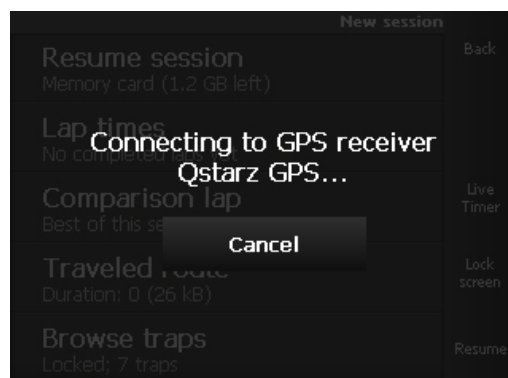
### Save NMEA data (scroll up)

Lastly, you can choose if you want to save NMEA data or not. You can save a lot of storage space if you choose not to Save NMEA data, but this data is particularly useful when you are having some

problems with the software and the RaceChrono team needs to find out the reason. So it is still recommended to keep this setting enabled.

### Start

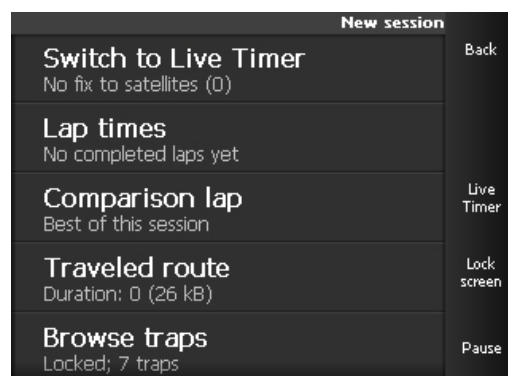
After configuring your new session, just press *Start*. Now RaceChrono will try to connect to your GPS receiver. If you are using RaceChrono for the first time, you may be asked whether to use internal or Bluetooth GPS receiver, and if you selected Bluetooth, also which device to connect to. After connection has been made, your session is then running and you can begin your laps!



## 10. Live Timer

Once the session has been started, and is running you can **Switch to Live timer**. The live timer used to watch lap times and performance test results in real-time. Before starting your laps, wait until the status text on top says your GPS receiver has been locked to some satellites.

**Note:** *If you do not want to watch the results in real-time, it is useful to lock the screen to save battery power by not illuminating the screen unnecessarily. To lock the screen press LOCK SCREEN and the screen will shutdown after a few seconds. To turn the screen back on simply touch the screen once then slide the lock bar to the left. This can be done with a glove on and is handy for discrete use.*



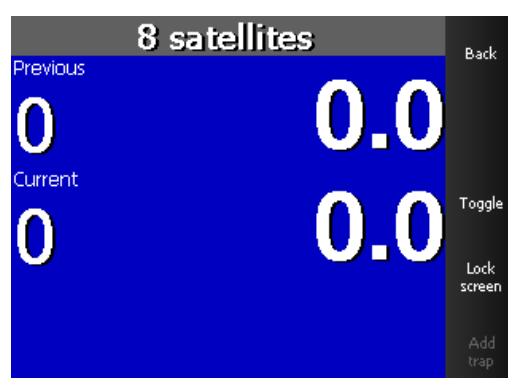
Tap **Toggle** to switch between the Simple, Classic or Gauge modes.

Function	Touchscreen
Toggle to another Live timer mode	Tap the <b>Toggle</b> text
Add a new trap (in a lap timing session)	Tap the <b>Add trap</b> text
Back to Session view	Tap the <b>Back</b> text

### Simple mode

The Live Timer will open in simple mode as default. In simple mode you will see your current and best time. You can switch between **Best Lap** and **Previous Lap** by tapping **Best** or **Previous**.

### Classic mode



The classic mode shows the current lap (or test) time, the travelled route and a selectable gauge. The gauge is in the bottom left corner, and the default is the satellite gauge which displays detailed status of the satellites. The satellites in view are drawn as coloured balloons and the locked satellites have a white border. If a satellite is **green** the reception is good and when the balloons are fading to **red** the reception is getting worse. Gauge mode shows the gauge bigger, but no travelled route.

Function	Touchscreen
Zoom the traveled route	Tap the + and – icons
Switch to another gauge	Tap the gauge

### Gauge mode

Gauge mode shows big selectable gauge and current lap (or test) time. To change to a different gauge simply tap the Gauge

Gauges available are:

#### Satellite Reception

#### GPS Time

#### Coordinate Position

#### Bearing

#### GPS Speed

#### Altitude



## 11. Online Track Library

It is possible to create your own tracks in RaceChrono, but remember to check our online track library first, if you find the track you wish to test at you can simply download instead of creating! We're constantly updating our track library with the submissions we get from our users. You can download new tracks by going to <http://www.racechrono.com/tracks/?lang=en> and downloading the track you wish to use to your desktop. Then you will need to transfer the track to the racechrono\tracks folder on the memory card in your TouchScreen Lap Timer and, if you are using RaceChrono on PC, to the racechrono/tracks folder in My Documents on your computer.

*\* Your RaceChrono Touchscreen GPS Lap Timer does have the capability to mount directly to your PC/Lap Top via the supplied USB Cable for data transfer, although we do not recommend this as a regular data transfer method as the RaceChrono software on the unit will not remain stable when connected directly to a PC/Lap Top via the USB Cable. We recommend the use of a Micro SD card reader to transfer all data from the Touchscreen unit to PC/Lap Top.*

*Note: after installing RaceChrono on your PC you will need to copy all the tracks you want to view either from this TRACKS folder or from [www.racechrono.com/tracks/?lang=en](http://www.racechrono.com/tracks/?lang=en) to the My Documents\RaceChrono\Tracks folder on your PC.*

*CAUTION: Do not delete the PROGRAM FILES folder on the memory card. Deleting this folder will result in the Touchscreen Lap Timer not functioning. If you do delete this folder you will need to contact us to have the software reloaded.*

*Note: the RaceChrono Touchscreen Lap Timer will function only in **Device Settings** mode with the memory card removed.*

## 12. Creating a New Track

The RaceChrono team is constantly updating the ready made tracks library all the time. If we do not have your favourite track, you can easily create it by yourself. The track can be created either while driving the first lap, or more safely after driving. This chapter describes both ways to create your own track. Basically this means creating an empty track, then adding the start and finish lines to it, as well as the split lines during or after the session. The start, finish and split lines are commonly referred to as traps.

To create a new track, you first need to start a **New Session** and select **Session Type – Lap Timing**, then select **Track - Create New** (scroll up) to create an empty track. When starting a new session with an empty track you should now see **Start line not defined** warning on top of the Live Timer screen. The warning tells that your track is incomplete, and you need to add a start line (as well as a finish line, or a combination of both). You'll also need to add some sector lines to your track. This is covered by the next chapter. After adding these you are ready to start timing your laps!

Traps (start finish lines and sectors) can be unlocked/locked from **Browse traps ➔ Options ➔ Unlock traps / Lock traps**. Locking the traps is very useful after you have finished your track, and do not want to do any more changes to it.

Please submit your own tracks to RaceChrono online track library by sending them to [aol@racecrhono.com](mailto:aol@racecrhono.com)

### 12.1 Adding traps while driving

The first method of adding traps to the empty tracks is adding them on your first lap. You should drive slowly if adding them while driving yourself. Please note driving slowly or stopping on the track is dangerous, if there are others on the track. Please use the second method if in doubt.

Start driving with low speed and press **Add trap** to open a pop-up menu. When you are close to the wanted position, for example the start/finish line, select the trap type. Don't worry, if you are too busy to select the correct type, it can be changed later.

After you have successfully inserted a trap line to the new track, you see blue crossing through your route. Trap line is placed in a straight angle to your current bearing, and is 50 meters wide.

Information such as name, type, bearing and width of the trap can be modified later from **Track Profiles** by selecting the correct track, then turning the **lock traps** off and opening **Traps** and changing their properties.



## 12.2 Adding traps after driving

Sometimes it is not feasible or safe to add traps while driving. If this is the case do not hesitate to take advantage of the possibility to add traps in the pits after driving a few laps.

Simply pause out of the current “Create Track” session and open **Browse traps** to add and modify traps after driving. Then you can add traps by pressing **Add new**. Use the +/- buttons to zoom in and out ◀ and ▶ to position the trap along the travelled line trap (holding down on ◀ and ▶ will make the trap move faster). First select the location of the trap by moving the trap with the ◀ and ▶. Second press **OK** and select the trap type you want. Then, repeat this process for the rest of the traps. After you have added the traps you can use the ◀ and ▶ to select different traps where you will see more options to move, rotate, widen, rename or delete that trap. Complete this process until all start/finish and sectors are added, positioned, named etc. After this is complete you will be able to save the track and view your lap times for this session by simply pressing back.

It is also a good idea at this point to lock the traps. Simply press **More – Lock Traps**. This locks the traps and prevents accidental changing of trap properties. To modify a trap from this point you will need to **Unlock Traps** in the same screen.

If you back out to the Start Menu you will see **Track Profiles**. Here you can open all created tracks and change some details about the traps such as trap width, name etc.

If you wish to reposition a trap you will need to go into one of your previous lap timing sessions for that track and click **Browse Traps**. From here will be able to move, rotate, widen, rename or delete traps for that track.

## 13. Viewing lap times

To view and analyze your driven laps, open Lap times from the **Sessions** view. From this view, various aspects of the recorded laps can be viewed and analyzed.

If you click **Lap Times** an optimal lap is displayed at the top and is composed of best sectors of the current session. The theoretical optimal lap is treated like any other lap, so it can be viewed in graph, used as comparison and it can be exported to some of the export formats.

The **Lap times** display can be switched between **Sectors, Splits, Trap speeds, High/Low speeds** and **Information** modes. The different display and result modes are described in detail in the chapters below.

Also the results mode can be switched between Absolute or Difference. The difference mode will show the results as the difference from the selected comparison lap. You can switch this by clicking **More ➔ Difference Mode/Absolute Mode**.

### Function

Switch results mode

### Touchscreen

Select from **Lap Times** menu **More ➔ Difference Mode/Absolute Mode**

Switch display mode

Mark lap invalid / valid (in matrix only)

Open details for the focused lap (in matrix only)

Focus another row or column (in matrix only)

Open graph for the focused lap (in details only)

Zoom the map (in details only)

Select the next item (in details only)

Select from **Lap Times** menu **Display mode**

Select from **Lap Times** menu **More** ➔ **Mark invalid/valid**

Select from **Lap Times** menu **Open details** or click selected lap

Drag the view by sliding your finger on the screen, and tap shortly on a box to focus it.

Select from **Lap Times** menu **Open Details** ➔ **Open graph**

Tap the + and - icons

Tap the ◀ and ▶ icons

### 13.1 Sectors mode

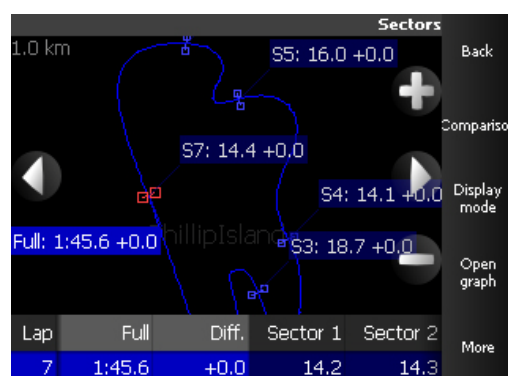
In Sectors mode you can view sector times for each lap. A sector is the part of the track between two traps.

The Full column shows your full lap time. The Diff column shows the difference to the comparison lap, and the rest of the columns show the sector times.

The sectors times that are faster than the same sector in the comparison lap are **green** and slower sectors are **red**. The comparison lap is **blue**.

You view details for a selected lap by clicking **Open details**. This will show you the lap in a map where the route is coloured by same criteria as in the sector matrix.

Sectors					Back
Lap	Full	Diff.	Sector 1	Sector 2	
Opt.	1:44.8	-0.8	14.2	14.2	
1	1:46.5	+1.0	14.6	14.4	Comparison
2	1:46.2	+0.7	14.4	14.5	
3	1:46.0	+0.4	14.6	*	Display mode
4	1:49.8	+4.2	14.2	14.6	
5	1:45.7	+0.1	14.2	14.2	Open details
6	1:46.3	+0.7	14.2	14.3	
7	1:45.6	+0.0	14.2	14.3	More



### 13.2 Splits mode

In Splits mode you can view split times for each lap. A split time is the time it took from the start to that split line.

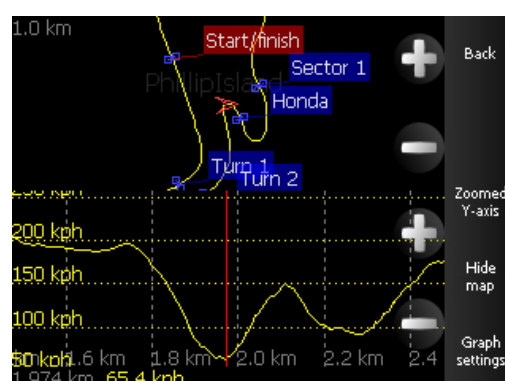
The **Full** column shows your full lap time. The **Diff** column shows the difference to the comparison lap, and the rest of the columns show the split times. Split times that are faster than in the comparison lap are **green**, and slower splits are **red**. The comparison lap is **blue**.

You view details for a selected lap by clicking **Open details**. This will show you the lap in a map where the colour of the route indicates locked satellite count on that position. Green indicates good reception (8 or more satellites), yellow is fair (6 - 7 satellites), orange is bad (4 - 5 satellites) and red is no reception (0 - 3 satellites).

### 13.3 Trap speeds mode

In Trap speeds mode you can view trap speeds for each lap. A trap speed is the current speed (GPS) when a trap line was crossed. Trap line is a start, finish or split line. The **Full** column shows your full lap time. The **Diff** column shows the difference to the comparison lap and the rest of the columns show trap speeds.

Trap speeds					
Lap	Full	Speed 0	Speed 1	Speed 2	Back
Opt.	1:44.6	239	165	202	Comparison
1	1:46.5	238	172	203	
2	1:46.2	238	166	199	Display mode
3	1:46.0	240	159	*	
4	1:49.8	240	162	205	Open details
5	1:45.7	238	174	202	
6	1:46.3	239	165	204	More
7	1:45.6	240	166	203	
8	2:18.9	238	171	198	

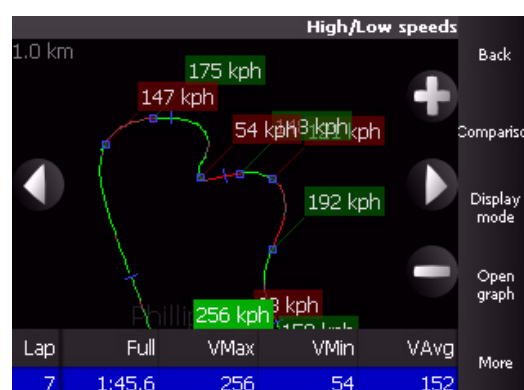


You view details for a selected lap by clicking **Open details**. This will show you the lap in a map where the route colour indicates the speed on that position. Colours between red-yellow indicates 0 - 100 km/h, yellow-green indicates 100 - 200 km/h and green-cyan indicates 200 - 300 km/h.

### 13.4 High/low speeds mode

In High/low speeds mode you can view the maximum, minimum, average, straight and corner speeds for each lap. The matrix displays the lap time, maximum speed, minimum speed and average speed for each lap. Faster speeds than in the comparison lap are **green**, and slower speeds are **red**. A comparison lap is **blue**.

You view details for a selected lap by clicking **Open details**. The details will show you the straight and corner speeds on the map. A straight speed is a high point on your speed curve, and a corner speed is a low point. Depending on the track and the vehicle it may be needed to change the High/low threshold speed defined in **Start Menu** ➔ **Settings**. Generally lower



value will show more marked highs and lows and higher value will show less of them.

The colour of the route in details view indicates the longitudinal acceleration; **Green** means acceleration, **Red** means braking, **Grey** means no change in the speed. The route colour is brightest green at acceleration limit (and over it), and bright red at braking limit (and over it). As well as the High/low threshold setting, these limits can be changed in **Start Menu** ➔ **Settings**.

### 13.5 Information mode

In Information mode you can view lap time, lap length (in km or miles depending on your settings), start time, start date, and a note for each lap. You view details for a selected lap by selecting **Open details**.

### 13.6 Changing comparison lap

A comparison lap can be changed by selecting **Comparison**. The session best is used as default comparison lap. You can select between comparing to the best lap and the selected lap (highlighted), or possibly a lap from another session.

### 13.7 Marking and hiding laps

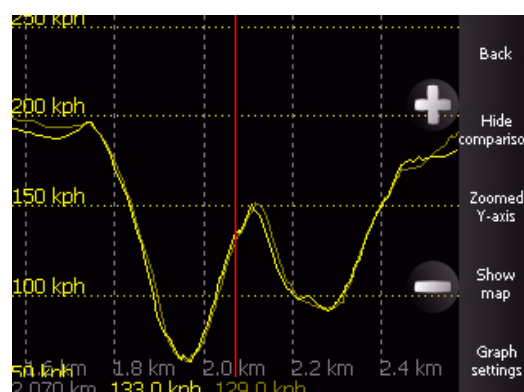
Laps with bad GPS data or entry/exit laps can be removed from the list by selecting **More** ➔ **Mark invalid**. The invalid laps are not calculated to the optimal lap. Also it is useful to mark warm-up and cooling laps invalid, since the marked laps can be hidden from the list. To unmark previously marked lap just select **More** ➔ **Mark valid**. To hide the invalid laps just select **More** ➔ **Hide invalid**. To show them again, just select **More** ➔ **Show invalid**.

### 13.8 Viewing graphs

In the Graph view a lap can be analyzed in more detail.

The graphs for the selected lap will be shown in brighter colours and for comparison laps in darker colours.

You can modify the graph settings by selecting **Graph settings**. For example altitude and OBD-II data can be viewed as well.



#### Function

Zoom the X-axis of the graph

Zoom the Y-axis of the graph

Move in the graph

#### Touchscreen

Tap the + and – icons on the graph

Tap the **Zoomed Y-axis** text

Drag the graph to left or right

Hide and show the comparison graphs

From the Graph menu select **Hide** or **Show comparison**

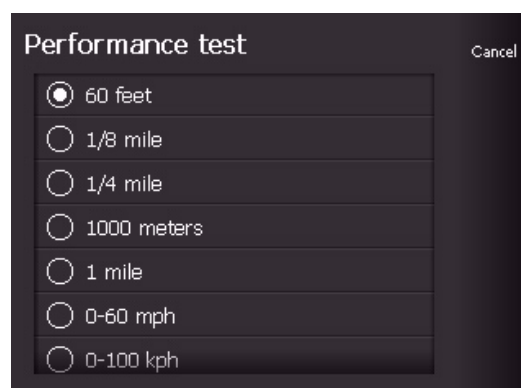
## 14. Performance tests - Run times

With the Performance Testing feature, you can test your vehicle's acceleration. You can select from various different tests, for example 0-100 km/h acceleration test and a quarter mile test. Remember not to try these tests on the public roads!

Pre-defined performance tests:

60 feet, 1/4 mile, 1/8 mile, 1000 meters, 1 mile, 0-60 mph, 0-100 kph, 0-200 kph, 80-120 kph, 0-100 mph, 60-160 kph and 100-200 kph.

You can also create your own performance tests by selecting **Performance Tests** ➔ **Create new**



### 14.1 View run times and speeds

Select **Previous sessions** ➔ **Your session** ➔ **Run times** to view all results for performance tests. You will be able to browse through results for the main test that you have selected. Open a run and you can also see all sub tests results for the run, for example 60 feet for a run 0-100 km/h.

To take a more detailed look, open the run and select **View graph** to view graph of the run.

You can configure the graph by selecting **Graph settings**. The graph can be browsed left and right by dragging your finger or the scribe across the screen, and the x-axis can be zoomed with up and down keys.

## 15. Browse traps

In **Previous sessions** ➔ **"Select session"** ➔ **Browse traps** you can browse the traps you have for your lap timing session. You can add new traps, and also move, rotate and delete old ones.

To add a new trap select **Browse tracks** ➔ **Add new**. First select the location of the trap by moving the trap to wanted location. Second press **OK** and select the trap type you want.

You can now adjust the position or rotation of the trap by either selecting **Move** or **More** ➔ **Rotate**.

*Note: click the left and right arrows to rotate a trap.*

Function	TouchScreen
Zoom the map	Tap the + and – icons
Select the trap (when browsing traps)	Tap the ◀ and ▶ icons

Select new trap location (when adding new trap)	Tap the ◀ and ▶ icons
Select new trap location quickly (when adding new trap)	Hold down the ◀ and ▶ icons
Rotate a trap when in rotate mode	Tap the ◀ and ▶ icons

## 16. Traveled route

In **Travelled route** you can view the logged plots.

To export your travelled route select **Export**. Please check Export chapter for details.

To view the next 15 minutes of the travelled route in graph select **Next 15 mins**.

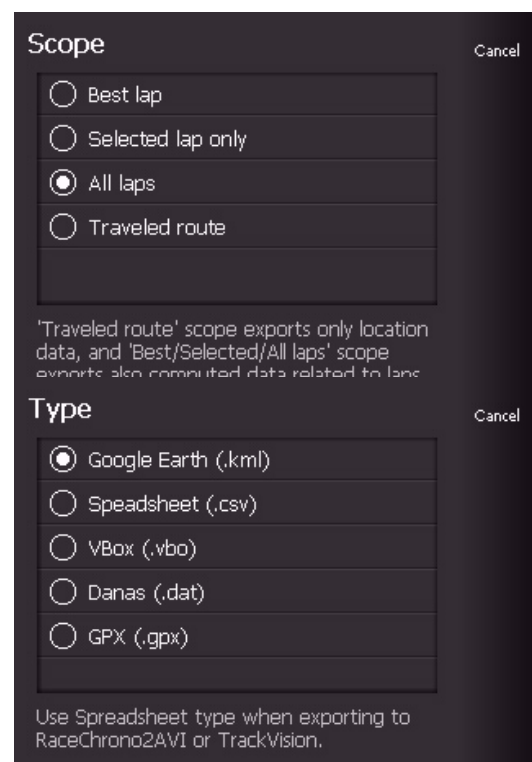
Function	TouchScreen
Zoom the map	Tap the + and – icons
Select previous or next plot	Tap the ◀ and ▶ icons
Select previous or next plot quickly	Hold down the ◀ and ▶ icons

## 17. Exporting

The exporting functionality allows you to export your laps and travelled route to various different formats. To export your travelled route open **Travelled route** ▶ **Export Route** and to export laps select **More** ▶ **Export**. This will display few exporter settings, which you need to set before starting the export.

### Scope of the export

All laps	Export all of the finished laps
Best lap	Export only the best lap of the session
Selected lap	Export the selected lap (selected prior opening the exporter)
Travelled route	Export the whole travelled route. Only this export scope can be used for <i>Performance Testing</i> or <i>Data Logging</i> session.



### Type of your export

See the full explanation of all possible export types in the chapter below.

#### Start

Then just press Start and the exporting begins. If there is nothing to export an error is displayed (for example if exporting laps and you have none completed).

After successful export, the exported file can be found on the memory card in the RaceChrono\Exports\ folder.

## 17.1 Export types

### Google Earth (.kml)

KML files can be opened in Google Earth or Google Maps. Notice that the Google Earth satellite images are not always correctly aligned to the actual GPS-coordinates, so you might see slight offset between your travelled route and the road.

### Spreadsheet (.csv)

CSV files can be opened in video software like RaceChrono2AVI and TrackVision (use the standard separators for these). You can also open CSV files in Microsoft Excel, but you need to select correct separator type depending on your Windows localization settings. Usually the standard separators will work, except for countries like Finland.

### VBox (.vbo)

VBO files can be opened in for example PerformanceBox Performance Tools software. Notice that the Start/Finish line is not exported by RaceChrono, so you need to set it separately in Performance Tools.

### Danas (.dat)

DAT files can be opened in I2M Danas software. Notice that the Start/Finish line is not exported by RaceChrono, so you need to set it separately in Danas.

### GPX (.gpx)

GPX files can be opened by various software, like SportsTracks for example.

## 18. Importing

RaceChrono supports importing track and session files from other data logging systems.

### Importing sessions files

Open **Previous sessions** ➔ **Import new** to import session files from PerformanceBox, DriftBox, Vbox and G2xtreme formats.

Multiple files can be selected for import. This is useful especially for PerformanceBox which generate a new session file every time it is disconnected from its power source. Note that the importing order is determined by the file names, not the order which you select the files in.

## 19. Transferring Data & Viewing on PC

The RaceChrono Touchscreen GPS Lap Timer uses a 2 gigabyte Micro SD memory card to store all lap timing and track information in a simple folder structure.

*Note: In order to view lap times on your PC you will first need to download and install the RaceChrono PC version from [www.racechrono.com/download/](http://www.racechrono.com/download/).*

To transfer lap timing data from the Touchscreen unit to your PC or vice versa you will need to purchase a Memory Card Reader capable of reading a Micro SD Card \*

Remove the Micro SD Card from your Touchscreen unit and insert it into your card reader then insert your card reader into your PC. You should now be able to navigate to the folders on the memory card. On the card you will find a simple folder structure that looks like this

#### **RaceChrono\Exports**

**\Sessions**

**\Tracks**

#### **EXPORTS FOLDER**

This is where you will find all of your lap times/sessions that you have exported to different formats such as Google Earth or Spreadsheet.

#### **SESSIONS FOLDER**

This is where RaceChrono stores all of your lap timing data. Use this folder to copy your Sessions data to the RaceChrono\Sessions folder on your PC **found at My Documents\RaceChrono\Sessions** (only after RaceChrono PC has been installed and run). The Sessions folder on the memory card is also where you would place another rider's lap timing (sessions) data if you wanted to run a comparison on the Touchscreen unit, although it is better viewed on the PC. RaceChrono for PC can be downloaded from [www.racechrono.com/downloads](http://www.racechrono.com/downloads)

## **20. Updates**

From time to time RaceChrono will post updated versions of the software found on the RaceChrono Touchscreen Lap timer. To update the software, first you will need to check what version your unit is currently running. You can do this by pressing the ABOUT button at the start screen and noting the version you have. Next, you will need to check to see if the latest software version available at [www.racechrono.com/download](http://www.racechrono.com/download) is newer than yours. If it is not then you are already up to date. If it is newer then you can download it and copy it to the folder: Program Files\RaceChrono on the memory card in your Touchscreen unit. When asked if you want to copy over existing files click yes. Your RaceChrono Touchscreen Lap Timer will now be up to date.

## **21. Troubleshooting**

#### **My RaceChrono Touchscreen Lap Timer will not turn on.**

- *Make sure the unit has been charged.*
- *Make sure the memory card is inserted correctly.*
- *Make sure you have not accidentally deleted the PROGRAM FILES folder from the memory card.*

#### **My RaceChrono Touchscreen Lap Timer will not find my Qstarz High Speed Bluetooth GPS Receiver.**

*Make sure the Qstarz GPS Receiver is fully charged and switched to 5Hz before searching (1Hz for 818 XT receiver - see Qstarz 10Hz switch position note on page 25)*



- *Make sure both units are within 3 metres of each other before searching.*
- *Turn both units off then back on and try again.*

#### **I have set up my RaceChrono Touchscreen Lap Timer but it does not record any lap times.**

- *Make sure you have the correct track selected.*
- *Make sure you have given the unit or external receiver enough time to acquire new satellites before entering track.*
- *Make sure you can see a fix to at least 4 satellites on the timer screen before entering track.*
- *When using an external GPS receiver, after you have set up the unit for lap timing make sure you don't walk away from the external GPS with Touchscreen unit in hand. This will break the Bluetooth connection and no lap times will be recorded.*

#### **RaceChrono is fixing to only a few or no satellites.**

- *If you are NOT using an External GPS make sure you have placed the Touchscreen unit in position that has clear view to the sky and not obstructed by metal objects. Try a few different positions to see where you get best reception.*
- *If you are using an External GPS make sure you have placed it in a position that has clear view to the sky and not obstructed by metal objects. Try a few different positions to see where you get best reception.*
- *If you are setting up in an undercover area such as race pits, make sure you go outside and wait until you can see the unit has fixed to at least four satellites.*
- *If you are at the track for the first time or are using RaceChrono at a different track from the one you were at last time, please turn the unit on and sit it outside for 5 mins so that the GPS can acquire satellites for the new area. If you are using a High Speed External GPS Receiver please do the same with that.*
- *GPS signal strengths can vary from place to place and are subject to weather conditions. Poor weather can result in poor GPS signal. On days of poor weather try to place your Touchscreen Lap Timer or GPS receiver in the best position possible for good GPS reception.*

#### **My Travelled Route/GPS Speed Graph looks very messy.**

- *If you are using the RaceChrono Basic System then the resulting data will be low resolution and look a bit messy. This is because the internal GPS in the unit is only 1Hz and delivers less information to the software, resulting in low resolution graphs, travelled routes etc.*
- *If you are using an External GPS you may not have it mounted in a position where it is getting good GPS signal which is resulting in poor data flow. Please try to move your External GPS to a better position and keep an eye on the fix to satellites.*

#### **Some laps have been recorded but some have been missed**

- *This is most likely a result of poor GPS signal. Try to move your GPS receiver to a better position.*

## **22. Qstarz 10Hz switch position**

The latest version of the RaceChrono Pro System comes with the new Qstarz 818XT GPS receiver. This receiver has a three position switch (Off - 1Hz - 10Hz). We have performed an internal

modification to the receiver that changes the 1Hz switch position to 5Hz. So essentially the 1Hz switch position = 5Hz.

The reason for this is that although 10Hz position is useful and recommended for performance tests such as 1/4 mile or 0 - 100km, it does not support DGPS which provides better quality GPS signal and thus better accuracy for lap timing.

If you are using the new Qstarz 818XT GPS, we recommend the 1Hz switch position (5Hz) for lap timing and the 10Hz switch position for performance tests.

### **23. Contact Details**

If you are having any problems with your unit or you would like to provide us with some feedback, please feel free to contact us via the details below.

Europe:

**[www.racehono.com](http://www.racehono.com)**

**email [sales@racechrono.com](mailto:sales@racechrono.com)**

Australasia:

**[www.racechrono.com.au](http://www.racechrono.com.au)**

**email [sales@roostindustries.com](mailto:sales@roostindustries.com)**

+61 03 9876 0069

+61 417 106 903