

## Tachometer Plus operating instructions and handbook

Thank you very much for purchasing the R3 Racing Tachometer Plus. We hope you enjoy using this product and that it will provide you with many years of karting data. Please take a few moments to read through these instructions as we think it will enable you to get the best from your Tachometer Plus.

The Tachometer Plus measures 4 things. Engine revs, Kart speed, Temperature, and Lap times using its internal crystal controlled clock.

### **Features**

Measures and records engine Revs, Temperature and Lap times

Simple to operate

Contains a 100 lap log

Speed measurement in mph and kph

Sleep mode automatically implemented

Robust plastic case.

Water resistant.

Large 16 digit display

Years and years of battery life

Temperature sensor

Magnetic Strip sensor

2 or 4 stroke operation

Infra red sensor option

We reserve the right to change specification without notice.

### **Getting started** (wakey wakey)

When you first get your Tachometer Plus it will be 'asleep'. The Tachometer Plus can be woken up in one of two ways. Either by pressing one of the 2 keys, or alternatively it will wake automatically if it receives an ignition signal. Once awake it will keep awake for as long as there is an ignition signal or a key has been pressed. If neither of these two things occurs for 2 minutes or more then the Tachometer Plus will automatically go to 'sleep' again.

### **Display**

The display consists of 16 characters. There are 8 basic display modes. When the Tachometer Plus first 'wakes up' it goes to mode 4. See the diagram. The diagram shows what you will see by scrolling through.

### **Keyboard**

The keyboard contains 2 keys. One marked with an upward arrow and labelled 'set'. The other marked with a downward arrow and labelled 'mode'. Normally the keys are pressed individually to scroll 'up' and 'down' the menu.

To reset parameters and to use as a 'shift key' then 2 keys have to be pressed in a particular sequence as follows. To enter the 'programme mode' press and hold down the 'set' key. Press and release the 'mode' key. Now release the 'set' key. You will now be in the 'programme mode'. To use as a 'shift move' key do exactly as just described for a shift move down and for a shift move up reverse the keys. Press and hold down the 'mode' key. Press and release the 'set' key. Now release the 'mode' key. This will only have an effect when you are looking

is.

### **Lap log**

When you get to the lap log you will only see laps 1 and 2 if no laps have been completed and these of course will both be 00.00. When more laps have been completed then you will be able to see them all. If you connect up the magnetic strip sensor and use the small test magnet supplied to 'create' laps then you will see the result for yourself. See mode 7 and 8 below. New laps cannot be initiated within 5 seconds of each other and the display 'freezes' for 8 seconds after each completed lap.

### **Mode 1 Engine Run Timer and Magnetic Strip setting**

Mode 1 displays the Engine Run Timer clock and the magnetic strip setting. The Engine Run Timer displays the total time that the engine has been run since it was last reset. It increments only while the engine is running. The Magnetic Strip setting sets the magnetic strips per lap. To reset the Engine Run Timer or to change the number of Strips enter the 'programming mode'. The Engine Run Timer will flash. To reset press the 'set' key and to skip press the 'mode' key. Next the number of Strips will flash. To set a different number press the 'set' key, and to skip and leave the 'programme mode' press the 'mode' key again. Normal operation is now resumed and the keys return to their scroll operation.

### **Mode 2 Peaks Revs and Peak Temperature records**

This display is a record of the peak engine Revs and Temperature since they were last reset. To reset the engine Revs or the Temperature enter the 'programming mode'. The engine Revs will flash. To reset the engine Revs press the 'set' key and to skip press the 'mode' key. Next the Temperature will flash. To reset the Temperature press the 'set' key, and to skip and leave the 'programme mode' press the 'mode' key again. Normal operation is now resumed and the keys return to their scroll operation.

### **Mode 3 Revs, Temperature and Lap time difference**

This display shows engine Revs, Temperature, and the difference between the last 2 completed laps (if any). There are no programmable settings in this mode.

### **Mode 4 Revs or Speed, Temperature and Lap time**

This display shows engine Revs or Kart speed, and Temperature and Lap time. The lap time display shows the lap time except for the first 5 seconds of a following lap when the display freezes to show the last lap time for 5 seconds. The Kart Speed can be shown in either MPH or KPH. To change the engine Revs to show Kart speed enter the 'programming mode'. The engine Revs will flash. To change to MPH press the 'set' key once and to change to KPH press the 'set' key again. To return to engine Revs press the 'set' key yet again. To skip press the 'mode' key. You will notice that the right hand side of the display shows 'mode > lap'. And having pressed the 'mode' key the > is flashing. Pressing the 'set' key has no effect. However pressing the 'mode' key will return you to normal operation. This is used to set the Tachometer Plus so that you can use any magnetic strip as the strip for recording your lap times. To use simply set up the Tachometer Plus so that the > is flashing. On your warm-up lap press the 'mode' key at any time prior to the strip you want to use as your reference strip (e.g. between strips 2 and 3 if you want to use strip 3). The Tachometer Plus will then ignore the other strips and use only that strip for your lap times. You must do this for every outing or race otherwise it will use the first strip you encounter after leaving the dummy grid.

### **Mode 5 Speed and engine type setting**

This displays various details relating to the Kart which enables the Tachometer Plus to calculate Speed and accurately record engine Revs. Starting from the left-hand side we have: The circumference of the rear wheel 'w' (distance around the tyre) in millimetres. The number of teeth on the rear axle

two stroke and 4 for four stroke. All these values can be changed. To change a value enter the 'programming mode'. First the most left-hand digit will flash. To change press the 'set' key. When you have the correct number then move on to the next digit by pressing the 'mode' key. If you wish to skip a digit simply press the 'mode' key again and move on to the next digit and so on. After leaving the 2 or 4 stroke option by pressing the 'mode' key you will be back into normal operation and no digits will flash. The first three of these details are required so that your Tachometer Plus can calculate the Kart Speed accurately. If you do not use the Speed option you must still set the 2 or 4 stroke option or the Revs will not be correct.

#### **Mode 6 Best lap and Clear lap log**

This mode always displays your best lap recorded in the lap log. This provides an easy to use reference to the days best result. The first number is the lap number in the log and the second number is the actual lap time in seconds to the nearest 100<sup>th</sup> second. To clear the lap log and set all the records to zero enter the 'programming mode'. The display now shows 'Laps> 15 set>00' if 15 laps had been recorded. At this point pressing the 'set' key will zero all the lap records!!! To avoid this press the 'mode' key. However if you press the 'set' key and the records are cleared then you will still have to press the 'mode' key in order to continue normal operation.

#### **Mode 7 Lap log**

This mode displays all the laps that have been completed since the last lap log reset. If no laps have been completed then only lap 1 and 2 will show and they will be all zeros. The left-hand side of the display shows the lap number and is therefore always an odd number, for example 15. The next number will be the lap time for lap 15 and the number on the right hand side will be the lap time for lap 16. If 16 laps have not yet been completed it will show all zeros. At the end of a session or race the lap time will eventually get to 99.99 seconds. This is recorded by the lap log and stored as a marker. The lap timer will then stop altogether and will not restart until the magnetic strip sensor receives another input. If the display is left pointing at the most recent lap completed then as new laps are completed the LCD display will track them and always show the most recent lap.

Eventually you will have many laps recorded. In order to assist in moving around the display a 'shift move' operation can be used. For example to move down 10 laps press and hold the 'set' key. Press and release the 'mode' key. Now release the 'set' key. The display will have shifted down 10 laps. To move up 10 laps simply reverse the keys. Press and hold down the 'mode' key. Press and release the 'set' key. Now release the 'mode' key. The display will have shifted up 10 laps. If less than 10 laps are available to shift to then the display will move only to the limit of the lap log.

To clear the lap log and reset all records to zero see mode 6.

#### **Battery life**

In the sleep mode the battery is calculated to last for in excess of 25 years. In normal use (say 1 hour of use per week) we expect the battery to last for in excess of 5 years. Should the battery require replacing then it will need to be returned to the factory via your supplier.

#### **Note**

In the unlikely event that your Tachometer Plus suffers from some electrical noise from your engine then several features are built in to your Tachometer Plus to assist recovery. The most likely event is that the display is corrupted. If this should occur then the

either of the 2 keys the same action will occur and the display will reset. This method of reset does not destroy or reset any data within your Tachometer Plus. In extreme cases the Tachometer Plus may be disabled and will not function at all. If such a thing should happen then a master reset is available. On the left hand side of the case there is a small hole about 1.5mm diameter. Inside is a switch. Using a paperclip (or better still a needle or pin) just push gently inside on to activate. This will master reset the Tachometer Plus. All previous settings and data will be lost! There is a water-resistant membrane inside so be careful not to damage this. If in doubt a small piece of tape could be positioned over this hole afterwards.

To help prevent water ingress into the connectors apply grease or 'Vaseline'.