OWNER'S MANUAL

5002A

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Congratulations on your new Laptimer 5002A

Please read before use to gain maximum benefit from you new Laptimer.

Contents

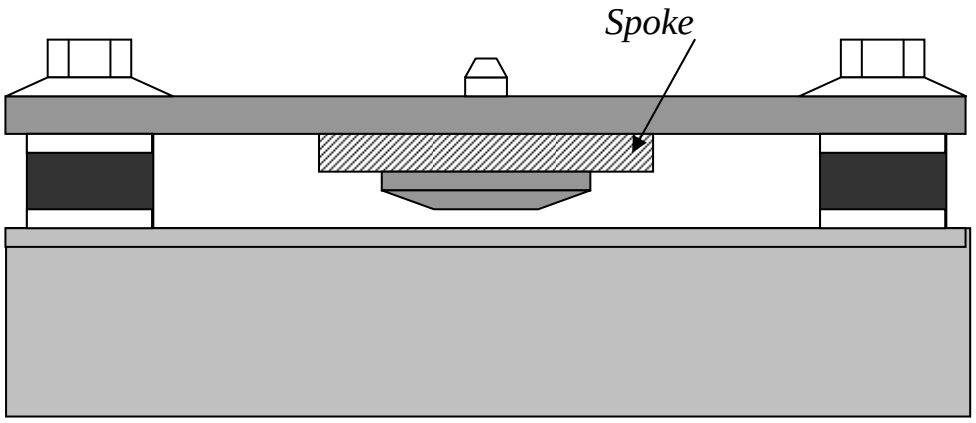
1. Installation

STANDARD EQUIPMENT (DELIVERED TOGETHER WITH THE LAPTIMER)

When installing cables, do always start where cables are connected to the cart. Wind up the extra cable as close to the data box as possible.

You must ensure that there are no sharp bends on the cable when you install the Laptimer. Furthermore do not cut and re-assemble the cable. In both cases this will lead to a destruction of the shield inside the cable, which may lead to electronic disturbances in the Laptimer. It is recommended to fix the cable with adhesive tape or wide cable ties.

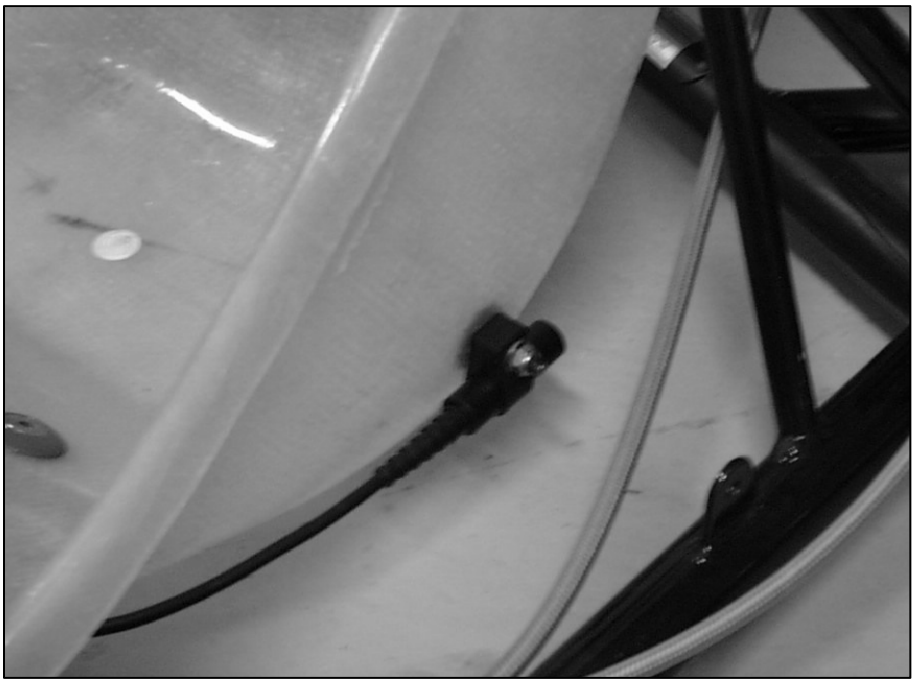
Display box: The optimum place is on the steering wheel.
Install the display box with the enclosed fittings as shown on the drawing either by mounting the screw in the slot in the spoke or by boring a hole.



Revolution sensor: Mount it on the spark plug lead with cable ties or adhesive tape. Be careful that the sensor cable does not touch the cylinder head and/or the cylinder.

Loop-receiver: Mount as low on the left side of the seat as possible by boring a hole. The receiver must be placed parallel to the seat and must point backwards towards the rear axle. The distance from the underside of the loop receiver to the ground is to be max. **100 mm**.

IMPORTANT! Ensure that there is no material (such as frame or the like) between the receiver and the track (see picture).



Temperature sensor (water): Mount the sensor in the cylinder head (M10x1) - alternatively on the cooling coil by a T-piece (additional equipment).

ADDITIONAL EQUPMENT

IR receiver: To be mounted under the front coat with strips or screws.
Mount it on the left side of the cart in a horizontal position. The leans should be between 200 mm and 500 mm above the ground level.

On the IR receiver there are connection options for wheel sensor (measuring of speed) and loop receiver (i.e. you can use two receiver types at the same time (IR and loop).

Intermediate box
As an alternative to the IR receiver you can install an intermediate box, which also allows connection of loop receiver and wheel sensor (measuring of speed).

Wheel sensor (measuring of speed):
Sensor disc: To be mounted on the front wheel which is loaded the most. Take off the front wheel in question. Place the centering bush in the inner ring of the front wheel bearing. Place the sensor disc over the sleeve and tighten it. Remove the centering bush and remount the front wheel.

The wheel sensor: To be mounted on the steering knuckle. IT IS IMPORTANT that the distance between the sensor disc (on the wheel) and the wheel sensor is **between 2–8 mm.** Before you enter the track, make sure that the wheel sensor is connected – see chapter 3 under wheel circumference.

Temperature sensor (cylinder head): As an alternative to measuring the temperature of the water, you can measure the exhaust temperature. To mount the sensor you must demount the washer of the plug and take the plug through the sensor before the plug is remounted.

Temperature sensor (exhaust): As an alternative to measuring the temperature of the water, you can measure the exhaust temperature. Mount the sensor by welding the enclosed bush on to the exhaust manifold. The distance from the backside of the piston (exhaust gate) and the centre of the bush must be between 80-100 mm. When the bush is mounted, bore a 6 mm hole through the manifold. Place the sensor in the bush – app. 8-10 mm down in the manifold - and fasten with the union.

2. SETUP functions - list

The Laptimer has 8 main functions. When the Laptimer has been turned on by the POWER button, the following data can be entered/read or stored.
Enter the various functions by using the arrow buttons 

Swift quickly by keeping one the of arrow buttons down.

	Display shows		
1. Press SETUP	DELAY Lo	***Delay time Lo***	(1sec.-9.59 min.)
2. Press SETUP	DELAY Hi	***Delay time Hi***	(min Lo+10 sec. or OFF)
3. Press SETUP	POINT temp	***Max. temperature***	(25-600°C or OFF)
4. Press SETUP	EN.	***Hours of operation***	(engine No. 1-5)
5. Press SETUP	RECV.	***Receiver type***	(IR or loop)
6. Press SETUP	CIRC.	***Wheel circumference***	(0.6-2m or OFF)
7. Press SETUP	CONN.	***Type of connection***	(printer or PC)
8. Press SETUP	2 STRO	***Type of engine***	(2 or 4 stroke)

When data are entered they are ALWAYS stored when you exit the set-up function by the MODE button or by turning off by the POWER button or when the display turns off automatically (after 5 minutes' of torpor).

BE AWARE that the display is turned off automatically after 5 minutes if there has been no register of lap times, RPM or no button has been activated. This may have effect if e.g. a start is delayed.

3. Operation before driving / description of the set-up functions

Before you start you must set the ***delay time Lo*** and ***Hi, max. temperature, engine number, receiver type, wheel circumference*** and ***type of engine***.

Turn the Laptimer on by pressing the POWER button.

1. Delay time Lo: Delay time Lo is the minimum time between two signals to the receiver. Setting the delay time is primarily important on tracks where more than one transmitter is placed, or on tracks where the transmitter and the receiver can "see" each other more than once during a lap. (*On delivery the Laptimer's delay time is set to 1 sec.).* In order to avoid incorrect signals, you must set the delay time at approx. 2 sec. below the approx. time that a lap takes. Example: If the approx. time for a lap is 40 sec., set the delay time at 38 sec.

Prees the SETUP button once and DELAY Lo appears in the display. Set the delay time by using the arrow buttons. Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

2. Delay time Hi: Delay time Hi is an extra delay time. If you set this time you avoid including measurements from laps that takes extra long time due to e.g. a pit stop. By using this facility only "true" laps are stored.

Press the SETUP button until DELAY Hi is shown in the display. Set the time by using the arrow buttons.
If you are not interested in using the delay time HI, choose DELAY HI OFF.

PLEASE NOTE that the delay time HI is automatically set to minimum the set delay time LO + 10 sec. It is not possible to set a lower delay time HI.

Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

3. Temperature: By this function you can set the desired max. temperature.
When driving LAP will flash when the entered temperature is reached. Press the SETUP button until TEMP POINT is shown in the display. Set the desired max. temperature by using the arrow buttons.
If you have not installed temperature sensors, choose TEMP INPUT OFF.

Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

4. Hours of operation: By this function you can follow up to 5 engines' total hours of operation. Hours of operation are measured as the time where signals have been received from the revolution sensor. The measured time is stored when you turn off the Laptimer by the POWER button or the display turns itself off (after 5 minutes' torpor).

Enter the desired engine number by pressing the SETUP button until EN. 1 appears in the display. Choose engine number 1 to 5 by using the arrow buttons.

Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

Choosing the actual engine number in the display and then press the black ring-button will zero the time for the engine in question.

5. Receiver type: Press the SETUP button until RECV. is shown in the display.
Set the desired type of receiver (IR or loop) by using the arrow buttons.

Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

6. Wheel circumference. Press the SETUP button until CIRC appears in the display. Measure the circumference (in mm) on the wheel on which the sensor disc is mounted. Enter the measurement by using the arrow buttons. If you have not installed the wheel sensor or if you do not want to see the speed in the display choose CIRC OFF (600 + press ▼ once).

Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

The wheel circumference must be checked after every heat/test session and also if the tyre pressure has been changed. Enter new measurement, if any. This is important to ensure that you get correct information on each lap.

7. Type of connection:
See the chapter about **Printing out of data** or the chapter about **Transfer of data to a PC**

8. Type of engine:
Press the SETUP button until 2/4 STRO appears in the display. Set the desired type of engine by using the arrow buttons.
Go to the next set-up function by pressing the SETUP button or leave (and store) the entered data by pressing the MODE button.

4. Display functions when driving

Various display functions are available when driving. They are shown in the left side of the display. You can switch between the options by pressing the ”ring-button” under the display box.

Display text	Display shows
RPM	Revolutions per minute
Nothing	Speed in km/h
* TEMP	Temperature in °C

* Only if temperature inputs are connected in SETUP. See chapter 3 item 3

The following data are shown currently during the driving

Display text	Display shows
LAP	Number of laps
LAP TIME	Actual lap time
BEST LAP TIME	Is shown if the actual lap time is the best lap time so far

5. Operating after driving

After the race/test you can go through all stored data. Press the MODE button (the Laptimer is now in pitmode) and the stored lap times are shown (with the arrow buttons you can flip through the lap times).

For each lap the following data are furthermore available. Shift between the options by pressing the ”ring-button” under the display box.

Display text	Display shows
RPM Lo	Lowest revolutions
RPM Hi	Highest revolutions
Lo	Lowest speed
Hi	Highest speed
*TEMP Lo	Lowest temperature
*TEMP Hi	Highest temperature

* Only if temperature inputs are connected in SETUP. See chapter 3 item 3.

When you have finished going through your lap times etc., you turn off the Laptimer by pressing the POWER button or the Laptimer will turn itself off after 5 minutes (see chapter 2).

When you turn your Laptimer on next time, it will automatically show the last lap stored. The Laptimer is ready to receive further signals from the transmitter.

6. The memory of the Laptimer / deletion of data

The Laptimer has a memory capacity of up to 1,000 laps!

Stored data can be deleted in the following way. The Laptimer must be on.
Press the POWER button until CLEAR LAPS appears in the display.

All stored set-up functions are NOT deleted by above action

7. Change of batteries

Two 1.5V batteries size AA are required (must be alcaline batteries). (Duracell batteries are recommended). Battery life is 60-80 hours depending on battery type/product.
When you want to change batteries, loosen all cables. Remove the sheet at the back of the main box. Change batteries.
Important: When replacing the sheet at the back of the main box, be sure it is placed correctly. Check that the mark in the rubber seal turns the right way.

The Laptimer has indicators to show low power:

- When the battery symbol appears in the display, it indicates low power (does not appear before the Laptimer bas been on for more than 10 sec.) .
- When the symbol starts flashing, app. 10 minutes of operation remains.
- When the complete display flashes, only 5 minutes of operation remains.

Stored data are not lost at battery change!

8. Maintenance

The Laptimer can be used in all weathers. However, if you have been driving in rainy weather, the Laptimer should be dismantled after driving. Remove the back plate of the display box and place all parts in a warm place for 24 hours. Then all parts can be re-assembled and re-installed. Do not seal with liquid packing or with any other kind of sealing compound.

9. Printing out of data

In order to print out the stored data, you need a Seiko DPU 414 or the like with printer cable (is available at your dealer).

Connect the printer cable to the printer and the Laptimer (at the under side) and turn the Laptimer on.

Choose CONN PRINT in the set-up menu. Leave (and store) the entered data by pressing the MODE button.

Press the POWER button (if the Laptimer is not already on). Press the MODE button twice and the Laptimer is now in PRINTMODE.

The order of options at the **first** printout:

PR. SETUP	You get a printout where you can enter the set-up of the cart, hours of operation and wheel circumference
PRINT ALL	All data are printed out

The order of options at the **second** printout**:**

PR. LATEST	Prints all data since the last printout This option is possible only after the first printout has been made and therefore only shown from the second printout.

When you have chosen the desired printout, start printing by pressing the ”ring-button”.

When data have been transmitted to the printer, the next option appears in the display. You can switch between the options mentioned above by pressing the SETUP button.

On the printout a mark is shown every time the MODE button has be activated to indicate that the Laptimer has been in pit-mode (the time when you have interrupted your training, a race or been in pit. The best time on each printout is marked with an asterix (*).

10. Transfer of data to a PC

In order to transfer the stored data to a PC, the programme on the enclosed disc must be installed.

Insert the disc in the drive and choose RUN, choose “A:” in the start menu. The programme can alternatively be copied into your PC if you wish.

Choose the programme icon and the installation is started.

Place the PC cable in the COM gate on the backside of the PC and in the Laptimer. (Choose the COM gate you use in the programme).

Choose CONN PC in the set-up menu on the Laptimer. Leave (and store) the entered data by pressing the MODE button. Press the MODE button twice until the display shows PC 0 SENT.

The transmission is started when you press START on the tab TRANSFER. All data in the Laptimer have now been transferred to the PC and you can analyse, store or print out from here.

Data can be stored in Excel as well where you have the option of making graphs and curves as you wish.

The use of the programme is obvious in each display in the various menus.

11. Troubleshooting

The Laptimer is switched on but does not register lap times:

- Is the IR/loop transmitter switched on?
- Is the IR/loop receiver placed horizontally and at the correct height?
- Is the distance between the transmitter and the receiver correct (should be between 2-3 metres)?
- Is the battery power sufficient?
- Does the Laptimer not receive a signal every time the transmitter/loop is passed? Check if the delay time is set too high

The Laptimer does not register the speed:

- Check if the distance between the wheel sensor and the sensor disc is correct (2-8 mm)

Printing out is not successful

- Press the SETUP button and check that CONN PRINT has been chosen
- Check that the cable is correctly connected

Transfer to a PC does not work:

- Check by pressing the SETUP button that CONN PC has been chosen
- Check that the cable is correctly connected

You are stuck and are not sure where in the programme you are:

- Press the POWER button and turn the Laptimer off. Turn it on again by pressing the POWER button and the Laptimer is back in “driving-mode”.

The serial number is needed when you order spare parts

You find the serial number by pressing the SETUP button and the POWER button at the same time. When the Laptimer is on let go of both buttons. The display now shows VER XXXX. Press the SETUP button once and the display will show SER XXXX = serial number.