Brantz Laser 3
BR34

The Brantz Laser 3 Rally Computer is a sophisticated high precision instrument able to show the following information:

- 24hr Time of Day (HH:MM:SSSS)
- 2 Stopwatches
  - Functions Include: Zero, Freeze, Hold and Auto Start
- Six Digit Distances (000.000)
  - Viewed via Shiftable 4 Digit Windows
  - Functions Include: Up/Down Counting, Zero, Freeze and Hold
- Current Speed
- Maximum Speed
- Average Speed

Other features include:

- Can be Calibrated in Miles or Kilometres
- Optional Hard Wired Hand (BR44) or Foot Remote (BR44F)
- Extremely Accurate 4 digit Calibration Entry
- Programmable Digital Fuel Gauge
- Optimisation of Car Performance Tuning using the Acceleration figures:
  - From: 0, 30, 50 or 70 mph/kph
  - To: 60, 100 or 120 mph/kph
- Standing Start times up to a Mile/Kilometre or Quarter Mile/Kilometre
- Data Collection Port to enable the stage to be later analysed on a PC

Set Up and Operating Instructions

In order to correctly connect up the Laser 3 it is recommended to use the **Brantz Laser 3 Wiring Kit PLUS (BR342)** – this will provide all the essential items you need to access all the features on the Laser 3.

The instructions below assume the use of the BR342 wiring kit with additional notes below for customers using their own wiring.

Connecting up the Laser 3:

- Remove the small back-plate on the reverse of the Laser 3 to expose the 3 rows of connection terminals.

These spring loaded type terminal blocks will allow stripped and tinned wire to be pushed into the block if the orange gripper is depressed firmly using a small flat ended screwdriver or other suitable tool. Releasing the gripper will clamp and connect the inserted wire.

- **Power Cable (Black Cable)**
  - Connect the Brown Core to the **+12volts** terminal block
  - Connect the Green/Yellow Core to the **-12volts** terminal block

If you are using your own cable:

- Ensure you are using good quality 2 amp mains cable – 2 Core
- Ensure each core is stripped and tinned to avoid loose strands of wire
- Ensure individual cores are well insulated from each other.

- **Sensor Cable (Grey Cable)**
  - Connect the Brown Core to the **Sensor +** terminal block
  - Connect the Blue Core to the **Sensor P** terminal block
  - connect the Green/Yellow Core to the **Sensor –** terminal block

If you are using your own cable:

- Ensure you are using good quality 2 amp mains cable – 3 Core
- Ensure each core is stripped and tinned to avoid loose strands of wire
- Ensure individual cores are well insulated from each other.

The back-plate can be re-fitted to prevent dust contamination however you will need to carefully remove a small section on the plate to allow the cables to exit.

Connecting up the Laser 3 to your Vehicle:

Please Note: The instructions below are not applicable if you are using the CANBUS Interface (BR57/BR58) to gather you information, please refer instead to the wiring instructions of these individual items.

- **Power (Black Cable):**
  - Connect up to the vehicles 12 volt power supply as directed by the label on the cable coming from the Laser 3 or Plug Kit (BR43):
    - BROWN Core to the POSITIVE Terminal
    - GREEN/YELLOW Core to the NEGATIVE Terminal.
  - **Connect straight to the vehicles battery posts via a 2 Amp fuse** (Provide in the BR342 or alternatively available direct from Brantz) **on the LIVE wire, usually the BROWN on +12V cars, however on Positive Earth vehicles it is customary to fit the fuse to the live GREEN/YELLOW wire.**
  - On initial connection to power the unit will beep once but remain OFF

- **Sensor (Grey Cable):**
  - The Sensor is connected to the GREY CABLE coming out of the Laser 3 or Plug Kit (BR43) as directed by the separate sensor instruction sheet showing how to wire the exact type of sensor you have chosen.

Please Note: These instructions are based on the assumption you are using the BR342 wiring kit, please substitute your own colours as they match with how you wired up your laser 3 in the previous section.

A table is also provide on the next page for you sensor connection reference:

Sensor Connection Table:

Connector Terminal Sensor Type	+	P	-
BR1	BROWN	BLUE	GREEN
BR2A	N/A	BROWN	BLUE
BR2-HT	N/A	BROWN	BLUE
BR3	RED	WHITE	BLACK
BR3-HG	BROWN	BLUE	GREEN
BR4	RED	WHITE	BLACK
BR5	BROWN	BLUE	GREEN
BR52 (Pulse Doubler) ***See Calibration Section***	METER BROWN	METER BLUE	METER GREEN

For more information on sensor installation and connection please refer to the individual sensor instructions.

The Laser 3 can be either permanently mounted to your vehicle via a method of your choice or alternatively high quality Velcro has been provided in the BR342 to allow temporary mounting and minimise vibrations being transmitted from your vehicle to the unit itself.

Basic Operations:

- **Power ON:** Press the Green **ON (0)**button
  - The words **'Laser 3'** are initially display in the top window which is shortly replaced by the time of day and 00.00 on the 2 other Displays
- **Power OFF:** Press **(Esc)** to Select the Orange Keys then Press and Hold **'OFF' (0)** until all the displays go blank
  - When the tripmeter is turned off, all the modes and distance readings are remembered for the next time the laser 3 is switched on.
- **Button Selection:**
  - The GREEN buttons are selected as default.
  - The ORANGE buttons can be selected by first pressing the **(Esc) 'SELECT ORANGE KEYS'** button. **Note:** An audible beep sounds when the Orange keys are selected and the LED will turn Red.
  - After approx 2 seconds the default Green button state will resume – GREEN LED.
- **Time of Day (Top Display):**
  - **Setting the Clock:**
    - Ensure the Top Display is in Time of Day Mode (to check press **'Resume Time' (3)**)
    - Press **'Select Edit Item' (1)** repeatedly until the words '**Set-ti'** are displayed in the top display.
    - Press **(Esc)** to **'Select Orange Keys'** then **'Modify Item' (1)** to enter the time setting menu.
    - Using the numeric keys, enter each of the 6 digits of the time in 24hr format.
    - As soon as the 6th digit is entered, the clock exits the setting mode
    - If you make a mistake whilst setting the clock you can either continue to fill in all 6 digits and then repeat the procedure or press the **(Esc)** key to abort the process and start again.
  - The very last 2 digits (hundredths of a second will remain as - - until the **'Hold Time**' **(4)** button is pressed.
  - To jump back to the current rally time at any point press **(3) 'Resume Time'**
- **Dimming the Displays:**
  - Press **(Esc)** to Select the Orange Keys.
  - Hold down **'OFF' (0)** key until the bottom display shows **'LO'** then release.
  - To restore full brightness press **'ON' (0)**

- **Factory Reset:**
  - In the event of an electrical event such as large amounts of electrical interference from the vehicle the Laser 3 may 'crash'. To restore the Laser 3 press **(Esc)** then **'DEFAULT SETTINGS'** to restore the unit to its factory setting.
  - Please note if this does occur the vehicle must have a large degree of electrical interference which may also be affecting your Laser 3's accuracy and needs investigating/suppressing.
  - In extreme cases of electrical interference the unit may need to be completely disconnected from its power source in order to reactivate it. In this case the vehicle will definitely need some sort of suppression fitting to reduce the EMI
- **Auto Off:**

  The Laser 3 can automatically power down when the vehicle is parked.
  - To enable this feature, Press **'Select Edit Item' (1)** repeatedly until the display shows **'Auto – OFF'** in the top display.
  - Press **(Esc)** to Select Orange Keys then **'Modify Item' (1)** the word **'enable'** should appear in the top display. The Laser 3 will now power down if no movement is detected within 15 minutes, all data is memorised.
  - To reactivate the tripmeter press **'ON' (0)** and all the information will reappear on the screen, as it was when it was shut down.
  - **Note:** Standby current usage is around 15 milliamps, so it is advised to disconnect the Laser 3 if the vehicle is to be parked up for more than a week.
  - To disable this feature repeat the above precess so the word **'disable'** is shown in the top display.

Calibration:

- The tripmeter is calibrated to be accurate on any vehicle fitted with any type of Brantz Sensor and using any wheel size or gearing by means of the four push-wheel switches on the front face marked **'CALIBRATION'**.
- Press the **ON** button – all 3 display should light up.
- If the tripmeter is to measure in hundredths of a Kilometre/Mile the push-wheel switch needs first to be set to 0**000**.
- As soon as the vehicle moves with this calibration figure the top display will change to **'CAL-dist'** and the middle display will go blank
- At the start of an accurately measured Kilometre/Mile, Zero the lower display by pressing the **'Zero lower'** button momentarily. Ensure the counter reads 0000.
- Drive the measured distance and stop accurately at the end of the distance – Note the figure that comes up on the readout. **(This is the Calibration Figure for this particular vehicle)**
- Enter this figure into the calibration push-wheel switches on the front of the tripmeter. e.g. If the readout is **1356** set the push-wheel switches to **1356**. N.B. If the readout is only 3 digits long i.e. **0568** than a **Brantz Pulse Doubler (BR52)** can be used to increase accuracy – please contact us on 0044 (0) 1625 669366 or Email: sales@brantz.co.uk
- The accuracy can be confirmed by re-running the measured distance from zero, the meter should read exactly 01.00. The calibration mode will be exited automatically once you have entered your new calibration figure and started the vehicle moving again.
- **If several wheel sizes and gearings are available for the vehicle; repeat the calibration procedure for each combination and note down the different calibration figures.**

Distance Mode

Total Distance Display (Middle Display):

- The distances are in **123.456** format, however only 4 of these digits can be shown at any one time.
  - **23.45** is the default view
  - Pressing the **'Mode Distance' (5)** key allows you to alternate this view to:
    - **123.4** for long distances **or**
    - **3.456** for short distances
- **Zero Upper (8)**:
  - Zeroes the Total Display.
    - **Note:** To prevent accidental zeroing of the Total Display this button needs to be depressed for at least 3 seconds before anything happens.
- **Hold Upper (7)**:
  - Holds the Total Display distance figure for noting down, the Green LED on this key lights up for the duration of the hold period. *(The Laser 3 continues to keep track of the distance on the background).*
  - A second press of the **'Hold Upper' (7)** key turns the LED light out and the Total Display jumps to the current distance recording as if it had never been pressed.
- **Freeze Upper (6):**
  - Freezes the Total Display distance figure *(This facility is useful if the competitor wishes to correct (Pre-Set) the Total Distance readout to a value that he knows should be displayed at a certain point on the road. The readout can be unfrozen at this point on the road so that the correct value is displayed from this point on. This facility is also useful if the Total Distance readout is too high; the readout can be frozen and then the vehicle driven without the displayed value increasing).*
  - The Green LED on this key lights up for the duration of the frozen period.
  - A second press of the '**Freeze Upper' (6)** key the readout out will continue the distance count from the Frozen value.

- **Split Upper (2):**
  - This key allows you to pre-set a distance into the Total Display whilst the vehicle is stationary or moving.
    - Press **'Split Upper' (2)** (the top display should show **- - - . - - -**) enter in the 6 digit distance figure you require.
    - On entering the 6th digit the distance is transferred to the Total Display window and the Top Display reverts back to Time of Day.
      - If you are stationary whilst you do this (or the **'Freeze Upper'** button is active) the window exactly replicates what you have just entered.
      - If you are moving whilst you do this, the distance travelled since the split button was initially pressed will be deducted from the set distance figure.
    - If you do not want to enter all the 6 digits, pressing the **(<┘)** key will assume all the remaining figures are zero and the split entry is complete.
    - If you make a mistake entering the split – you can back step by pressing **(↓)** and re-enter the correct figure.
    - Pressing **(Esc)** will abort the Split entering procedure.
- **- DIST (↑)**:
  - This button when active (Green LED on) will reverse the count, so your tripmeter will now count down.
  - To deactivate press '**– DIST'** again (Green LED off).
  - **Note:** This button activates Count Down/Count Up on both the Total and Trip Displays together.

Auto Reversing:

The Laser 3 has thee facility to connect up to the vehicles reversing lights so it automatically counts down when reversing:

- Connect the reversing lights -12v signal via the upper terminal block labelled **'REM/REV'**
- Press **'Select Edit Item' (1)** repeatedly until the display shows **'rr - setup'** in the top display.
- Press **(Esc)** to 'Select Orange Keys' then **'Modify Item' (1)** ensure the word **'- dist'** appears in the top display.
- When you start reversing the **'- dist' (↑)** key LED should light up.

Trip Distance Display (Bottom Display):

- The distances are in **123.456** format, however only 4 of these digits can be shown at any one time.
  - **23.45** is the default display
  - Pressing the **(5) 'Mode distance'** key allows you to alternate this view to:
    - **123.4** for long distances or
    - **3.456** for short distances
- **Zero Lower (↓)**: Zeroes the Trip Display.
- **Freeze Lower (<┘):** Freezes the Trip Display distance figure *(This facility is useful if the competitor wishes to correct (Pre-Set) the Total Distance readout to a value that he knows should be displayed at a certain point on the road. The readout can be unfrozen at this point on the road so that the correct value is displayed from this point on. This facility is also useful if the Total Distance readout is too high; the readout can be frozen and then the vehicle driven without the displayed value increasing).*
  - The Green LED on this key lights up for the duration of the frozen period.
  - A second press of the '**Freeze Upper' (6)** key and the display will continue from the Frozen value.
- **Split Lower (2):** This key allows you to pre-set a distance into the Total Display whilst the vehicle is stationary or moving.
    - Press **(Esc)** to select orange keys.
    - Press **'Split Lower' (2)** (the top display should show - - - . - - -) enter in the 6 digit distance figure you require.
    - On entering the 6th digit the distance is transferred to the Total Display window and the top display reverts back to Time of Day.
      - If you are stationary whilst you do this (or the **'Freeze Upper'** button is active) the window exactly replicates what you have just entered.
      - If you are moving whilst you do this, the distance travelled since the Split button was initially pressed will be deducted from the set distance figure.
    - If you do not want to enter all the 6 digits, pressing the **(<┘)** key will assume all the remaining figures are zero and the split entry is complete.
    - If you make a mistake entering the split – you can back step by pressing **(↓)** and re-enter the correct figure.
    - Pressing **(Esc)** will abort the Split entering procedure.

- **- DIST (↑)**:
    - This button when active (Green LED on) will reverse the count, so your tripmeter will now count down.
    - To deactivate press '**– DIST'** again (Green LED off).
    - **Note:** This button activates Count Down/Count Up on both the Upper and Lower displays together.

Optional Remote Wired Reset Button (Hand or Foot Operated):

The Remote reset can be connected to the Laser 3 to Zero the Trip Display:

- Connect one wire (does not matter which) from the remote reset box to the upper terminal block labelled **'REM/REV'**
- Press **'Select Edit Item' (1)** repeatedly until the display shows **'rr - setup'** in the top display.
- Press **(Esc)** to Select Orange Keys then **'Modify Item' (1)** ensure the word **'reset-tp'** appears in the top display.

Speed Mode

Speed:

- To show your Current Speed:
  - On the Total Display press **(Esc)** to Select Orange Keys then press **'Mode Speed' (5)**
  - On the Trip Display press **(Esc)** to Select Orange Keys then press **'Mode Speed' (9)**

Maximum Speed:

- To show your Maximum Speed since the Laser 3 was switched on (in the Total Display Only):
  - Press **(Esc)** to Select Orange Keys then press then press **'Mode Max Speed' (6)**
  - To reset the maximum speed calculation point press **'Zero Upper' (8)** for at least 3 seconds.

Average Speed:

- To show your Average Speed since the Laser 3 was switched on (in the Total Display Only):
  - Press **(Esc)** to Select Orange Keys then press **'Mode Av. Speed' (8)**
  - To reset the average speed calculation point press **'Zero Upper' (8)** for at least 3 seconds.
  - Average speed is calculated up to 1 decimal place.
  - Average speed can be calculated for up to 24 hours (at which point it will automatically zero and restart)

Stopwatch Mode

Two stopwatches are available; one in the Upper Total Display and one in the Lower Trip Display. Both stopwatches count in Minutes and Seconds (MM:SS)

- **Activate the Stopwatch Mode:**
  - On the Total Display press **(Esc)** to Select Orange Keys, then press **'Mode Stop W.' (7)**
  - On the Trip Display press **(Esc**) to Select Orange Keys, then press **'Mode Stop W.' (<┘)**
- **Start the Stopwatch:**
  - On the Upper Stopwatch Display a quick press of **'Zero Upper.' (8)**
  - On the Lower Stopwatch Display a quick press of **'Zero Lower.' (↓)**
- **Hold the Stopwatch** (with continued counting in the background):
  - On the Upper Stopwatch Display press **'Hold Upper.' (7)** – The Green LED will light
  - To return back to the current count press the button again – The Green LED will go out.
  - **Note:** this function is only available on the Upper Stopwatch Display.
- **Freeze the Stopwatch:**
  - On the Upper Display press **'Freeze Upper.' (6)** – the Green LED will light
  - On the Lower Display press **'Freeze lower' (<┘)** - the Green led will light
  - To continue counting from where the stopwatch was frozen press the corresponding button again – The Green LED will go out.
  - **Note:** If both displays are in Stopwatch mode, with one set on zero, freezing the counting stopwatch will automatically start the other stopwatch counting.
- **Zero the Stopwatch:**
  - On the Upper Stopwatch Display a 3 second or more press of **'Zero Upper.' (8)**
  - On the Lower Stopwatch Display a 3 second or more press of **'Zero Lower.' (↓)**
- **Auto Start:**

  This allows the stopwatch to be started as soon as the vehicle moves off rest. Only available in the Total Display:
  - To enable this feature, Press **'Select Edit Item' (1)** repeatedly until the display shows **'Auto – run'** in the top display.
  - Press **(Esc)** to Select Orange Keys then **'Modify Item' (1)** the word **'enable'** should appear in the top display. The Stopwatch in the Top Display (if set on zero) will now automatically start counting when the vehicle starts moving.
  - To disable this feature repeat the above precess so the word **'disable'** is shown in the top display.

Fuel Mode

This function can be used to see the remaining contents of your fuel tank.

Wiring:

- Depending on whether you would like your existing fuel gauge to still function along side the Laser 3 gauge (using the supplied stripped and tinned wire) you can either; disconnect, or tap into the wire from the fuel tank sender (not negative ground), and connect it to the upper terminal block on the back on the Laser 3 marked **'Fuel'.**
- **Note:** If a second auxiliary fuel gauge is required (say in the rear for filling purposes) then connect/disconnect it via a switch as it may affect the accuracy.

Calibration:

- Empty your fuel tank to an arbitrary point you wish to call empty (possible with a few reserve litres!)
- Ensure the vehicles fuel gauge system is powered up
- Press **'Select Edit Item' (1)** repeatedly until the display shows **'cal-fuel'** in the top display.
- Press **(Esc)** to Select Orange Keys then **'Modify Item' (1)** the display will briefly show **'CH – sensr'** then the word **'set - E'** should appear in the top display. **FUEL** in the middle display and a 3 digit figure (less than 900) in the bottom display.
- Press and Hold **(Esc)** then briefly press **'Modify Item' (1)** to store this nominal 'empty' value. Display will show **- - set - -** then you can release both buttons.
- Fill your tank with a certain volume and note it down.
- Press **'Select edit item' (1)** and the menu will move on to allow you to enter the quantity of fuel you have just put in the tank.
    - Use the **(↑) or (↓)** so the number in the top display matches the number of litres now in the tank.
    - Press the **(<┘)** when the figure is correct to store the level to memory.
- Exit the calibration procedure by pressing **'Resume Time' (3)**
- The quality of the sensor in the tank dictates the precision of the reading.
- The remaining litres in the tank is measured to 1 decimal place.
- Once programmed this fuel map is stored even when the laser 3 is switched off.

Operation:

- To view the fuel level press **(Esc)** to select orange keys then press **'Mode fuel' (2)**
- To return to rally time press **'Resume Time' (3)**

Acceleration/Performance Optimisation Mode

Entering this mode can clear the memory and calculations the Laser 3 has stored so please ensure you only perform this function outside of any rally event.

This feature allows the vehicles modifications to be assessed for their value.

- Press **(Esc)** to activate the orange keys then **'Mode Accel' (4)**
- Use **'Select Edit Item' (1)** to choose the speed range (Start and End) over which the time is to be measured.
  - Accel 0 -60
  - Accel 30 – 60
  - Accel 30 – 100
  - Accel 50 – 100
  - Accel 70 – 120
  - Accel Standing Start to 0.25
  - Accel Standing Start to 1
  - All in mph or kph depending on the which units the Laser 3 is calibrated in.
- Press **(Esc)** to Select Orange Keys and hold then briefly **'Modify Item' (1)** to select your choice then release both buttons.
  - The top Display will show your choice of test.
  - The middle Total Display with show the word RUN
  - The bottom Trip Display will show the time (initially 0.00)
- As soon as you start moving the timer will start.
- Keep driving until the middle display shows **'STOP'**
- Your time is shown in the bottom display.
- The run can be repeated by pressing the **'Zero Lower' (↓)** button.
- To exit Acceleration Mode press **'Resume Time' (3)** to restore all previous readouts.

Trouble-Shooting:

- **Tripmeter Readings randomly Zero or Jump about:**
  - Ensure:
    - You have the unit connected directly to the battery terminals not the chassis, ignition or cigarette lighter.
    - You have checked for Interference from HT Leads / Pumps / Horn / Wipers / Dynamo / Alternator **(See our Online Trouble Shooting Guide)**
    - You have checked and double checked your connections.
    - You have tested the Laser away from the vehicle on a separate battery (i.e. on a work bench) - this is a good indicator as to whether the vehicle is interfering with the electronics of the unit.
- **The Tripmeter is not counting when moving:**
  - Ensure:
    - You have checked and double checked your connections
    - You have tested you sensor off the vehicle – See Sensor Check Guide.
- **Time of Day is lost when disconnected from the Power Source:**
  - It is likely the internal back-up battery needs replacing.
- **Hard Wired Remote Button activates the '- dist' button instead of zeroing the bottom display**
  - Using the **'Select Edit Item'** key ensure the **'rr-setup'** is set to **'reset-tp'** NOT **'- dist'**
- **Fuel Gauge Does Not Calibrate:**
  - Check the fuel sender on your vehicle is generating a compatible signal.
    - If the tank sender is connected to the vehicles own level gauge (i.e. volts-on) check with a voltmeter that; when empty the signal wire is reading several volts positive with respect to the chassis, and when full, the signal wire reads a much lower voltage (probably < 1)
    - If the tank sender is not connected to the rest of the vehicle, check that the sender resistance is more than 60ohms to the chassis when empty, and less than 10ohms to the chassis when full.
    - Parameters outside of the above cannot be reliably read by the Laser 3.
- If you are having problems please see our Trouble-Shooting guide available at www.brantz.co.uk, contact your supplier or contact us directly on sales@brantz.co.uk or Phone: 0044 (0) 1625 669366

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