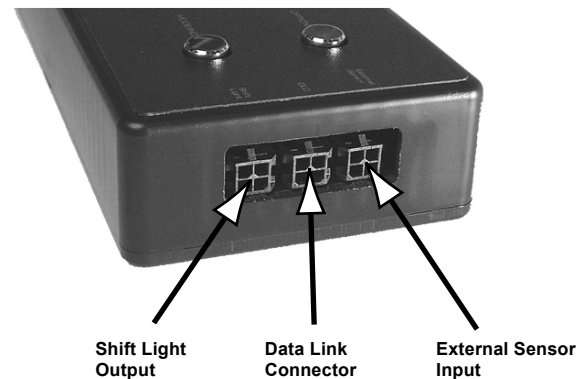


## R920 User Manual



### Installation

The R920 only requires one cable. Connect the 4-pin connector to the middle header on the R920 labeled "DLC". The other end of the cable connects to the vehicle Data Link Connector. This is always located under the dash on the drivers side of the vehicle.

The R920 should power up immediately. If the vehicle ignition is not on, then the R920 will go to sleep after about 5 seconds. After the ignition is turned on and the R920 starts communicating with the ECU, then it will initialize and start retrieving sensor data.

### Operation

To change the screen display mode, depress the MODE/INC button. The display will increment to the next screen mode. Here is a list of the available screen modes.

MODE 1 - Any, Any (custom screen mode)

MODE 2 - RPM, VSS and RPM MAX Hold (displays peak RPM for about 3 seconds)

MODE 3 - ECT, IAT

MODE 4 - RPM, O2 (voltage or A/F ratio)

MODE 5 - RPM and Bar Meter

MODE 6 - RPM, MAP/MAF and boost pressure (boost only available on vehicles with a MAP sensor)

MODE 7 - RPM, BAT

MODE 8 - VSS and Fuel Economy

MODE 9 - VSS and Acceleration Timer (only available if AM1 is installed)

Note: The R920 will display either the MAP or the MAF but not both. If the vehicle has a MAF sensor, then it will be displayed. Otherwise the R920 will default to MAP. If the vehicle has both a MAP and a MAF sensor, then you can choose which one to be displayed in the option menu.

## Sensor Description

RPM - Engine RPM.

TPS - Throttle Position Sensor. Displayed in %. Most vehicles read around 8% at closed throttle and around 90% at full throttle. This is perfectly normal and actually recommended in the OBD-II specification.

MAP - Manifold Absolute Pressure. Displayed in kPa (kiloPascals).

MAF - Mass Air Flow. Displayed in g/s (grams per second).

IGN - Ignition timing advance. Displayed in degrees.

ECT - Engine Coolant Temperature. Displayed in degrees (Celsius or Fahrenheit).

IAT - Intake Air Temperature. Displayed in degrees (Celsius or Fahrenheit).

O2 - Oxygen Sensor. Displayed in volts or A/F ratio. There is currently a Honda LEV-II conversion available for Honda/Acura vehicles with K-series engines. Vehicles factory equipped with wideband O2 sensors will always display A/F ratio.

A/F ratio will be displayed when using an Innovate! LC-1.

VSS - Vehicle Speed Sensor. Displayed in mph or km/h.

BAT - Battery Voltage

## Option Menu

To select an option, depress the OPTION button. The display will increment through the options and then return back to the previous screen mode. To change an option value, depress the MODE/INC button.

## Available Options

Metric/English Units - Metric or English. This option effects VSS, ECT and IAT.

Mode 1 Line 1 and Line 2 sensor selection.

Shift Light RPM 1 and 2 - increments by 100 rpm from 3,000 to 11,500.

Vehicle Speed Set - increments by 10 mph or km/h from 10 to 200.

Shift Light Output type - On/Off signal or serial data.

O2 Sensor Display - Voltage or A/F ratio (Honda LEV-II or Innovate! LC-1)

MAP/MAF sensor display - MAP, MAF or External MAP (AP1)

Fuel Weight

LT AVG (Long Term Average)

Stored DTC's

DTC status

## Shift Light

The shift light illuminates whenever the engine rpm is above the RPM 1 setting and below the VSS Set Speed.

The shift light illuminates whenever the engine rpm is above the RPM 2 setting and above the VSS Set Speed.

The R920 must be in screen mode 2 in order for this option to work. The shift light output is intended to be used with the SL1 LED shift light or the S100 sequential shift light meter.

## **Acceleration Timer**

The acceleration timer is active in screen mode 9. This screen mode is only available if the Acceleration Timer module (AM1) is installed. The timer is completely automatic. The timer resets when the vehicle speed is at 0. The vehicle must be stopped for about a second before the timer is ready, at which time an "R" will be displayed in the upper rightmost position of the display. The timer starts as soon as the vehicle starts moving and stops at either 60 mph or 100 km/h. The value is then displayed in seconds and tenths of a second. This value will continue to be displayed until the vehicle comes to a complete stop, at which time it will be reset. The timer is exceptionally accurate and very repeatable (within a tenth of a second), however it's "true" accuracy cannot be guaranteed due to variations in tire diameter and speed sensor gearing.

## **Stored DTC's**

If there are no DTC's stored, then 0 is displayed. If there are DTC's stored in the ECU, then the number of DTC's is displayed on the first line and "Retrieve DTC's?" is displayed on the second line. Depressing the MODE/INC button will retrieve the DTC's and display them. Up to 6 DTC's will be displayed.

## **Clear DTC's**

If there are DTC's stored in the ECU, then depressing the OPTION button will display this screen. "Clear DTC's?" is displayed. Depressing the MODE/INC button will clear the DTC's. After the DTC's have been cleared, then "DTC's Cleared" is displayed. Depressing the OPTION button exits the Option Menu.

## **Fuel Economy**

The R920 can calculate and display instant economy and average economy. This feature only works on vehicles equipped with MAF sensors. The economy is derived from the MAF reading divided by the A/F ratio. Economy is displayed in screen mode 8. The top line on the LCD display shows the vehicle speed (VSS). The second line on the LCD display shows the instant economy (MPG or KPL) and the average economy (AVG). This average is updated approximately every 50 seconds and is a running average. The average value is not updated while the vehicle speed is 0. To view or reset the Long Term Average, you must enter the Option Menu. Step through the options until "LT AVG" is displayed. This running average is updated approximately every 15 minutes. This is useful on long trips. To reset this value, simply depress the MODE/INC button. If the R920 is unplugged, both average values will reset to 0. Fuel economy calculations are based on an average fuel weight. This fuel weight will fluctuate based on temperature. The fuel weight that the R920 uses can be adjusted for greater accuracy. To adjust the fuel weight, step through the Option Menu until "Fuel Weight" is displayed. Depressing the MODE/INC button will increment the weight by 1 gram. The range is 2500 to 3100 grams if in English mode or 500 to 1000 grams in Metric mode. Economy is displayed in miles per gallon (MPG) for English mode and kilometers per liter (KPL) for Metric mode. If the vehicle has a standard oxygen sensor, then "E" will precede the "MPG" or "KPL". This is because the A/F ratio is assumed to be 14.7:1, thus resulting in an Estimated fuel economy. If the vehicle has a wideband oxygen sensor, then the "E" will not appear. This means that the calculation is based on the actual A/F ratio and will be very accurate... even at wide open throttle.

## **Stand-alone Mode**

The R920 can be operated without vehicle ECU communication. To do this, you must depress both buttons before plugging the unit into the Data Link Connector. The unit will then start up in Stand-alone Mode. This mode is for A/F ratio display and wideband sensor calibration. The A/F ratio is displayed on the top line and a bar meter is displayed on the bottom line. The range is 10:1 to 20:1. The R920 is designed to operate the calibration function of an Innovate! LC-1 wideband sensor. To do this press the OPTION button. The display will read "Calibrating". After about 2 seconds, the calibration is complete. This is the "Free Air" calibration. Consult the LC-1 manual for more information. After calibrating, depress the OPTION button to return to the A/F ratio display. At any time, you can depress the MODE/INC button to exit the Stand-alone mode and enter the normal Data Monitor mode. When in the Stand-alone mode, the upper rightmost character on the display should be a full block when the LC-1 is connected and operating normally. If there is an error with the LC-1, then this block will blink according to the error code. Consult the LC-1 manual for more information.

## **Precision Engineered and Manufactured in USA.**

### **Limited One Year Warranty**

Brockway Engineering, LLC hereby warrants that this product will be free of defects in materials and workmanship for a period of one year after date of purchase.

At it's option, Brockway Engineering, LLC will repair or replace the defective product.