

LC-1 Accessories:

- LMA-3: Auxiliary Input #3 (AuxBox- RPM, Temp, Duty Cycle, Acceleration, Boost/MAP): #3742
- DL-32 (32 Channel Vehicle Mounted Data-Logging System) #3782
- XD-16 (Air/Fuel Digital Gauge) #3780
- Exhaust Clamp: #3728
- Stainless Steel Bung w/ Steel Plug" #3736
- HBX-1: Heat-sinking Bung Extender: #3729

Replacement Parts:

- Terminator Plug: #3750
- MTS 2.5mm to 2.5mm serial cable: #3760
- Bung/Plug set: #3735
- Sensor (Bosch LSU4.2): #3737
- Serial Programming Cable: #3746

Order parts, get support, find FAQ answers, and read case studies at www.tuneyouengine.com



1) The Oxygen Sensor used with this device gets very hot in operation. Do not touch the hot sensor. Do not let a hot sensor touch a combustible surface. Do not use the sensor with or near flammable liquids or gases. Failure to heed these warnings may result in severe burns, explosions or fires. 2) When installed in the exhaust, the oxygen sensor **MUST** be connected and operating with the LC-1 whenever the car is running. An un-powered oxygen sensor will be quickly damaged when exposed to hot exhaust gases.



LC-1 (Lambda Cable) QUICK START GUIDE

The complete instruction manual is on the CD

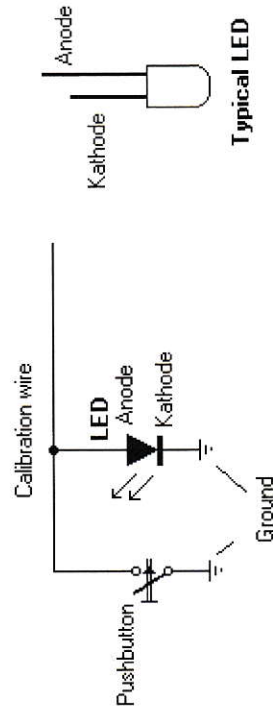


1) The Oxygen Sensor used with this device gets very hot in operation. Do not touch the hot sensor or let a hot sensor touch a combustible surface. 2) When installed in the exhaust, the oxygen sensor **MUST** be connected and operating with the LC-1 whenever the car is running. An un-powered oxygen sensor will be quickly damaged.

LC-1 (Lambda Cable) QUICK START GUIDE

1. The LC-1 has 6 stripped wires. The **RED** wire should be connected to a switched 12V power source, make sure the connection is fused with a minimum fuse size of 5A. The **BLUE** and **WHITE** wires should all be grounded to the same ground source. Optimally, these will be soldered to the same lug, and connected to a single point. When this isn't possible, connect each one to a separate lug, and attach in close proximity. Multiple lugs on the same bolt is not optimal, and can result in unwanted signal "noise." When possible, soldering is always better than crimping.
2. *Optionally*, the **YELLOW** (Analog out 1) and/or **BROWN** (Analog out 2) can be connected to the analog inputs of other devices such as data loggers, gauges, etc.
3. Connect the LED and momentary pushbutton between the LC-1's **BLACK** calibration wire and ground. Connect the red wire (Anode) of the included LED AND one side of the push button to the calibration wire (black) of the LC-1. Connect the black wire (Cathode) of the LED AND the other side of the push button to ground (preferably to the same ground point as the blue and white wires.) Refer to the schematic below.

Note: The LED will fit a 5/32" (0.155" - 0.158") hole size and a panel thickness of 28-16gauge (0.031" - 0.062").



Sensor Calibration

4. Do not connect the O2 sensor to the LC-1 or in to the exhaust yet.
5. Switch 12V supply to the LC-1 ON and wait for 20 seconds. The LED will flash a two blink sequence during this time.
6. Switch the 12V supply OFF after 20 seconds.
7. Connect the sensor to the LC-1's sensor interface connector but do not put the sensor in the exhaust. **The sensor must be exposed to free air for the first time calibration.**
8. Switch the 12V supply to the LC-1 ON. The LED will first blink slowly and steadily indicating that the sensor is warming up. The LED will then start a faster blinking sequence indicating a Heater calibration.
9. Once the LED is lit steadily, press and hold the push button for 30 seconds. During this period the LED will go off. Once the button is released the LED light will come back on. The LC-1 will now calibrate itself by using air as a reference gas with known oxygen content.

After the free air calibration is finished the LED should light up steady and continuously, indicating correct operation of the LC-1.

10. Install the O2 sensor in the exhaust. The system is ready for use.

Programming analog outputs

1. Connect the terminator plug (2.5mm male plug with no cable) into the Serial IN connection of the LC-1.
2. Connect the 2.5mm stereo to DB-9 cable to the serial OUT port of the LC-1.
3. Launch LM Programmer



The default analog outputs are as follows: Analog output one (yellow) is 1.1V = 14 AFR and .1V = 15 AFR. This is a simulated narrowband signal. Analog output two (brown) is setup as 0V = 7.35 AFR and 5V = 22.39 AFR.



To gain access to the complete LC-1 manual please install the software provided on the CD which was included as part of your kit.



DB Digital Air/Fuel Gauge (with Innovate Motorsports text) LC-1 Quick Start Guide

1. Wire the LC-1 per the unit's instructions
2. Connect the gauge's **RED** wire to a switched 12 volt source (ignition switched).
3. Connect the gauge's **BLACK** ground wire at the LC-1's White ground point. This ground point should ideally be an engine block ground.
4. Connect the gauge's **WHITE** wire to the LC-1's Brown analog output 2. The gauge is setup to work with the LC-1's analog output 2 factory default setting of $0v = 7.35 \text{ A/F}$ and $5v = 22.39 \text{ A/F}$.
5. Connect the **YELLOW** wire to a headlight power wire (a wire that supplies current to the headlights). This enables the display to dim for better nighttime viewing. **DO NOT CONNECT THIS WIRE TO THE HEADLIGHT DIMMING WIRE.** Connection to this rheostat type of switch will cause the gauge to malfunction. If you chose not to utilize the dimming feature, connect the yellow wire to ground.

Optional Tip/Trick *(requires connection of LC-1 to PC)*

The LC-1 can be programmed to output specific voltages during warm-up and error conditions. This can be done by connecting the LC-1 to the computer and launching **LM Programmer**. The warm-up and error condition options for the analog output are under the *Advanced...* settings. For example, if you setup the error condition at 5V your gauge will display full lean if any problem arises. Please refer to chapter 6.5.1 in the LC-1 manual for further information.



INNOVATE
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DB Digital Air/Fuel Gauge
(with Innovate Motorsports text)
LM-1/LM-2 Quick Start Guide

1. Connect the gauge's **RED** wire to a switched 12 volt source (ignition switched).
2. Connect the gauge's **BLACK** ground wire and the LM-1's or LM-2's corresponding analog ground to a solid ground point.
3. Connect the gauge's **WHITE** wire to the white analog output wire if you have an LM-1 or to the lime green wire if you have an LM-2.
4. Connect the **YELLOW** wire to a headlight power wire (a wire that supplies current to the headlights). This enables the display to for better nighttime viewing. **DO NOT CONNECT THIS WIRE TO THE HEADLIGHT DIMMING WIRE.** Connection to this rheostat type of switch will cause the gauge to malfunction. If you chose not to utilize the dimming feature, connect the yellow wire to ground.
5. **ONLY LM-1 users:** Connect the LM-1 to the computer and launch LM Programmer. Setup the analog output 2 and configure it as 0v = 7.35 A/F and 5v = 22.39 A/F. Lastly click on the "Program" button.

