**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.tuneyourengine.com**

**Warning!**

**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.**

INNOVATE MOTORSPORTS

# LC-1 (Lambda Cable)
## QUICK START GUIDE

***The complete instruction manual is on the CD***

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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 an indication LED and momentary pushbutton between the **BLACK** calibration wire and ground. (Please reference chapter 2.1 in the LC-1 manual for complete instructions.)

**Sensor Calibration**

4. **Do not connect the sensor to the LC-1 or the exhaust yet.**

5. Switch 12V supply to the LC-1 on and wait for 20 seconds.

6. Switch the 12V supply off after 20 seconds.

7. Connect the sensor to the sensor interface connector. **The sensor must be exposed to air for the first time calibration.**

8. Switch the LC-1 on and wait for 2 minutes.

The LED will first blink slowly and steadily. If it blinks for a fixed number of pulses, then switches off for 2 seconds and then repeats, you have an error code. See manual for details.

Slow and steady blinking indicates that the sensor is warming up to its optimum operating temperature. The warm-up period can take up to one minute for a cold sensor.

After the sensor is warmed up the LC-1 automatically calibrates the sensor heater controller to the particular sensor. During this 20-second period the LC-1 collects, regulates, and calculates sensor specific data required to quickly reach operating temperature in the future. After the first time use the LC-1 will use these values to regulate the sensor's temperature. During the heater calibration the optional LED will blink fast and steady.

After that period the LC-1 will automatically perform a free air calibration. During this 2 second period the LED will go off. 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.

**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. The manual will contain important information such as sensor placement, programming the analog outputs, and other tips & tricks.***

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