

**LM-1 Accessories:**

- LMA-2: Auxiliary Input #2 (RPM converter): #3726
- LMA-3: Auxiliary Input #3 (AuxBox- RPM, Temp, Duty Cycle, Acceleration, Boost/MAP): #3742
- Exhaust Clamp: #3728
- Inductive Clamp: #3727
- HBX-1: Heat-sinking Bung Extender: #3729
- XD-1: Digital Display with Remote Record Control: #3743
- Power Cable w/ battery Clips: #3734

**Replacement Parts:**

- Analog Output Cable: #3730
- Power Cable w/ Cigarette-lighter adapter: #3740
- Bung/Plug set: #3735
- Sensor (Bosch LSU4.2): #3737
- Sensor Cable: #3738
- Serial Cable: #3741

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## LM-1 QUICK START GUIDE

*The complete instruction manual is on the CD*



1) The Oxygen Sensor used in 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 LM-1 whenever the car is running. An un-powered oxygen sensor will be quickly damaged when exposed to hot exhaust gases.



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1. **Verify that the included 9V battery is installed in the battery compartment on the bottom of the LM-1.** The cover is located on the back of the unit. Install if necessary.
2. **Connect the power cable to the 12V Power connector and plug the other end in your cigarette lighter socket in your car.** Note that the 9V battery is for powering the LM-1 electronics and display, but it cannot power the oxygen sensor. You must have a 12V power supply available to power the oxygen sensor.
3. **Do not connect the oxygen sensor yet.**
4. **Switch the meter on.**

The display shows either:

Error 02  
Heater open

when connected to 12V Power, or

No Sensor Power  
Connect 12V PWR

In the second case, switch the ignition of your car on.

5. **Switch the meter off after 10 seconds.**
6. **Connect the sensor to the sensor interface connector.** The sensor must be exposed to air for the first time calibration.
7. **Switch the meter on.** The display should show now read:

Warming up  
57.6% Bat 13.1V

Indicating that the oxygen sensor is warming up to its optimum operating temperature. The display shows what percentage of the temperature is reached and what the battery voltage is that the meter

sees on the power connector. The warm-up period will last for about 30 seconds for a cold sensor, depending on the sensor type used.

After the sensor is warmed up the meter automatically calibrates the sensor heater controller to the particular sensor. During this 20-second period the LM-1 collects and calculates sensor specific data required to quickly reach operating temperature in the future. After the first time use the meter will use these values to regulate the sensor's temperature. During the heater calibration the display will show:

Calib Htr 9

Counting to 0. After that the display will show:

Calibr. needed

Note: When using the Bosch Sensors the LM-1 may perform multiple calibration passes. This is normal and need not cause concern. When it completes, continue to step 8.

8. **Press the Calibration button.**

The meter will now calibrate itself by using air as a reference gas with a known oxygen content. After the calibration period is over (2-3 seconds), the instrument is ready to operate.

9. **Attach the oxygen sensor to your vehicle's exhaust.** (See chapter 4 of the installation manual for details on how to do this for your vehicle)
10. **The LM-1 is ready. Lambda/AFR measurements can now be taken.**



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