Quick Guide for Interfacing with Innovate LC-1/LC-2 Wideband Controller

The SYL-1813 gauge can work with Innovate LC-1 or LC-2 controller to read air/fuel ratio (AFR). This quick guide will show you how to wire and setup with SYL-1813 gauge with LC-1 controller.

Wiring the meter as shown in Fig 1. Connect 12 VDC to terminal 1 (+) and 2 (-). Connect the ground wire of LC-1 to terminal 6 and signal wire to terminal 9. Connect the power supply wire of the LC-1 to +12V power (or terminal 1, which is +12V). The 12V DC buzzer is optional.

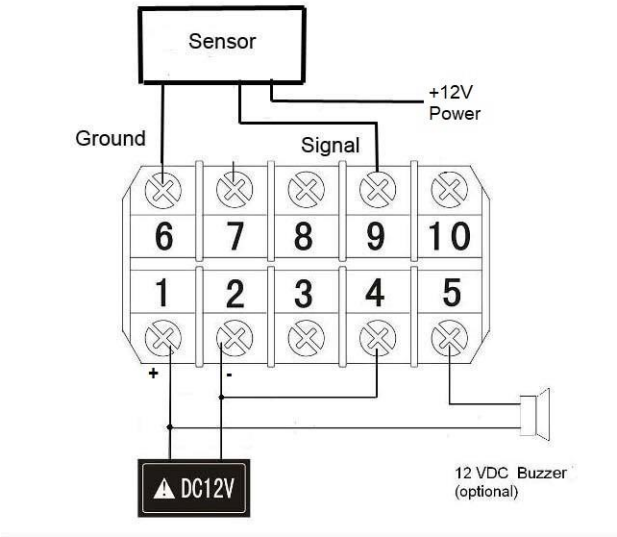

Fig 1. Wiring diagram

1) Configure the meter input. The factory configuration for the signal input type was set for K type thermocouple. It needs to be changed to 0 - 5V input before using it. To do that, Press SET, enter code 0089. Press SET again to get in the parameter setting mode, It will display Inty. Press SET again, then, use ^ key until you see 5v. Press SET again. Press ^ until display show END. Press SET again. The detail can be found in section C1 of the instruction manual.
2) Set the resolution, dot. The default resolution of the meter is set to 0.01. This is also the commonly used resolution for AFR or Lambda. If that is not the resolution you want to use, you can change the setting for dot. Otherwise, just leave it as is.
3) Set the display scale, PuL and PuH determine what the meter should display when input signal is at zero and maximum (5v). Most oxygen sensor does not output higher than 4.5V. You need to extend the factory provided data to find out what is the supposed APR or Lambda value at 0 and 5V, assuming the output is linear to the full 0-5V range. e.g. For the LC-1 to display AFR, we need to set PuL = 7.37 and PuH=22.35 (see Appendix 1 for how to obtain these data).

4) To set the alarm on at 17 and off at 16.9 , Enter code 0001 to set AH1=17 and AL1=16.9. The detail can be found in section C 2 of the instruction manual.
5) The peak holding function is set for display the Maximum value. To display the peak value from the last run, or display the value in the peak holding mode continuously, press the “>” key once. The MAX (MIN) LED will be on, indicating the display is in the peak mode. Press “>” again to change back to display the current value. Press and hold “Λ” for 3 second will reset the memory. Three additional peak parameters have been turned off for this meter. They are, the time that the maximum value was recorded, the minimum value and its recording time. If you want see them, use code 0037 to turn on these functions. The detail can be found in section C3 of the instruction manual.

Appendix 1, Determine the scale parameter for LC-1.

From LC-1 installation Tutorial, the analog output of the sensor is
0.88333 Volts at AFR: 10, or Lambda 0.68
4.21667 Volts at AFR: 20, or Lambda: 1.36
Note, the Lambda is for Gasoline engine, based on stoichiometric ratio= 14.7

Displaying in AFR,
We assume the AFR is linear in the entire 0-5V range. It can be described as
A= aV+b
where, A is the air fuel ratio (AFR), V is the voltage signal, a and b are constant.
From the data above, we can find
a= 10/(4.21667-0.88333)=3.000, and b=7.35
A=3V+7.25
Therefore, when V=0, R=7.35. When V=5, R=22.35
We set PuL = 7.37 and PuH=22.35

Displaying in Lambda,
We assume the Lambda is linear in the entire 0-5V range. It can be described as
L= aV+b
where, L is the Lambda, V is the voltage signal, a and b are constant.
For gasoline, the stoichiometric ratio is 14.7. From the data above, we can find
a=0.68/(4.21667-0.88333)=0.20, and b=0.52
L=0.2V+0.52
Therefore, when V=0, L=0.52. When V=5, L=1.52
We set PuL = 0.52 and PuH=1.52