

# Quickstart Guide

## Model M1 Combustible (LEL) Gas Detector

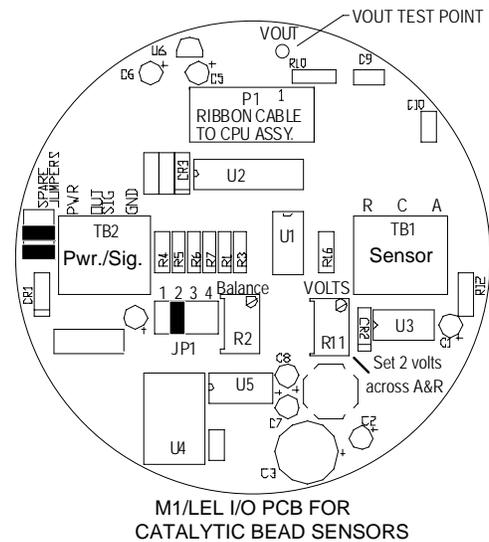


### INSTALLATION

Declassify the area to non-hazardous prior to installation by monitoring for hazardous gases. Orient the sensor housing so the sensor head is aimed down and mount securely. Use conduit and installation practices approved for the area's classification. When properly installed the M1 is rated for Class 1, DIV 1 & 2 Gr. B, C, D.

### M1 WIRING

M1 wiring terminates behind the front display assembly; removed by loosening the two captive thumbscrews. The M1 is a 3-wire transmitter with +POWER, +4-20mA and GROUND terminals on TB2 of the I/O board (at right). M1 power may range between 19 – 30 volts. The 4-20mA signal sources output current into loads up to 750 ohms (at nominal 24 VDC power). Sensor wires attach to TB1 and are typically connected at the factory unless a 10-0193 remote sensor mounting option is included. See the M1 manual for wiring to options such as ALARMS, RS-485 Modbus or ISOLATED 4-20mA.



### INITIAL INSTALLATION POTENTIOMETER SETUP

The following procedure is performed at the factory but should be checked again at initial start-up. Uncontrolled variables such as the remote mounting distance of the sensor (if equipped with this option) and “tinkering” with potentiometers or jumper positions may require attention. After installation, this procedure should only need repeating upon replacement of the sensor.

Apply M1 power and confirm 2-volts across TB1-R & A sensor terminals (monitor at SENSOR's location if a 10-0193 remote sensor mounting option is included). Use the **VOLTS** potentiometer R11 to set. Seal R11's adjustment screw with a small dollop of RTV or epoxy to prevent an accidental over-voltage condition at the sensor.

Wait at least one hour for the M1 to stabilize. Place the M1 in CAL-MODE, then UNITY MODE as described in the next section. SEE NEXT SECTION BEFORE PROCEEDING!

WITH ZERO GAS ON THE SENSOR, adjust BALANCE potentiometer R2 for a 0 reading on the LCD readout (still attached by ribbon cable). Using the GDS Corp. *CAL CUP* with barbed hose fitting, apply approximately ½ liter per minute of 50% LEL SPAN gas to the sensor and wait for the reading to stabilize.

DO NOT ADJUST MAGNETIC CONTROLS YET! The M1 must be in UNITY mode to complete this step. Confirm the LCD reads from 35 – 65 then proceed to ROUTINE CALIBRATIONS. If outside this window, move JP1's shorting strip left to increase and right to decrease the reading. Note: Shorting strips may also be combined on JP1 to provide additional GAIN combinations. For example, shorting strips in both positions 3 & 4 provide higher readings than 3 or 4 alone, but lower than one strip in position 2. JP1 shorting strips are correctly set when 50% LEL applied to a NEW sensor, in UNITY mode, provide an LCD reading of 35-65.

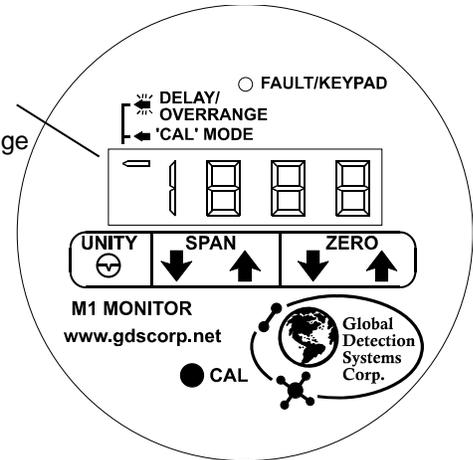
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## DELAY MODE - CAL MODE - UNITY GAIN MODE

One-minute delay modes, during which the 4-20mA signal is locked at 4mA to prevent erroneous alarm trips, are invoked after power-up and upon exiting the CAL-MODE. Delay mode is indicated by a slow flashing of the left arrow. CAL-MODE is invoked by briefly holding the magnet tool over the CAL key until CAL appears on the LCD. From CAL-MODE, UNITY GAIN mode is invoked by briefly holding the magnet over the UNITY key. UNITY simply means the magnetic controls are applying no gain and no offset (offset = 0, gain = 1). This allows viewing of the unconditioned signal from the I/O board's bridge circuit on the LCD. However, remember negative readings may only be viewed in CAL-MODE. At all other times the M1 suppresses negative readings to 0 until -10% is exceeded causing a FAULT indication.

Left Arrow Indicator  
Steady = Cal Mode,  
Slow flash = Delay,  
Fast flash = Overrange



## ROUTINE CALIBRATIONS (After Initial Setup)

Hold the magnetic wand to the CAL key until CAL appears on the LCD. With ZERO gas applied to the sensor, use the UP/DOWN ZERO keys to zero the LCD reading. Apply a known SPAN gas (typically 50% LEL) and use the UP/DOWN SPAN keys to obtain the correct gas value reading on the LCD. Hold the wand to the CAL key again to exit the CAL-MODE.

## REASONS TO READ THE ENTIRE M1 MANUAL

Learn to use the "4-20mA Source Mode" feature in section 3.8.

Learn to use the "End of Sensor Life" (ESL) feature in section 3.9.

Learn to replace sensors without throwing away the stainless steel sensor head in section 4.4.

Learn to view new *offset* and *gain* settings after calibrations in section 3.3.1.

Learn to configure the LCD full scale reading for other ranges in section 3.7.

Learn about the flashing LCD over-range indication in section 3.2.

Please see ISA publication RP12.13 Part II-1987 ([www.isa.org](http://www.isa.org)) for additional information concerning recommended operating procedures for these detectors.

## SPARE PARTS AND ACCESSORIES

10-0198	Sensor splash guard with remote calibration port
10-0203	Sensor calibration cup
10-0205	Sensor flow cell for process monitoring
10-0187	Sensor replacement tool kit
1000-0076	Small magnetic wand for NEMA enclosures

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