AN136: Calibration Procedure for eSense FAI, LEED & OSHA

The eSense has 2 calibration modes: manual, and Automatic Background Calibration (ABC). Manual calibration is required if the sensor does not regularly sense 400ppm CO2 (fresh outdoor air) at least once every 7 days or if your organization requires certification of calibration. ABC calibration may be used to ensure maximum accuracy by automatically adjusting the zero-point. However, it requires the sensor be exposed to fresh air at least once every 7 days.

By default, SE-0010 eSense LEED is factory-preset to use ABC calibration. For all other models, manual calibration mode is pre-set at the factory.

You may request ABC calibration be enabled at time of purchase, or the calibration mode can be changed using our GasLab® Software and eSense programmable cable.

There are 2 methods of manual calibration:

1. **Fresh Air (400ppm CO2) Calibration**: if Din3 is shorted for a minimum time of 8 seconds, the internal calibration code **bCAL** *(background calibration)* is executed. The sensor must be operating in a fresh air environment (400 ppm CO_2). Do not blow or breathe near the sensor.

2. **Nitrogen (0ppm CO_2) Calibration**: If Din2 is shorted for a minimum time of 8 seconds, the operation code **CAL** *(zero calibration)* is executed. The sensor must already be purged by some gas mixture free from CO_2 (i.e. Nitrogen or Soda Lime CO_2 scrubbed air) in a sealed calibration chamber.

For the vast majority of applications, fresh air calibration is recommended. If your company has ISO, LEED or OSHA environmental systems requirements documentation, you should verify that zero calibration is not required.

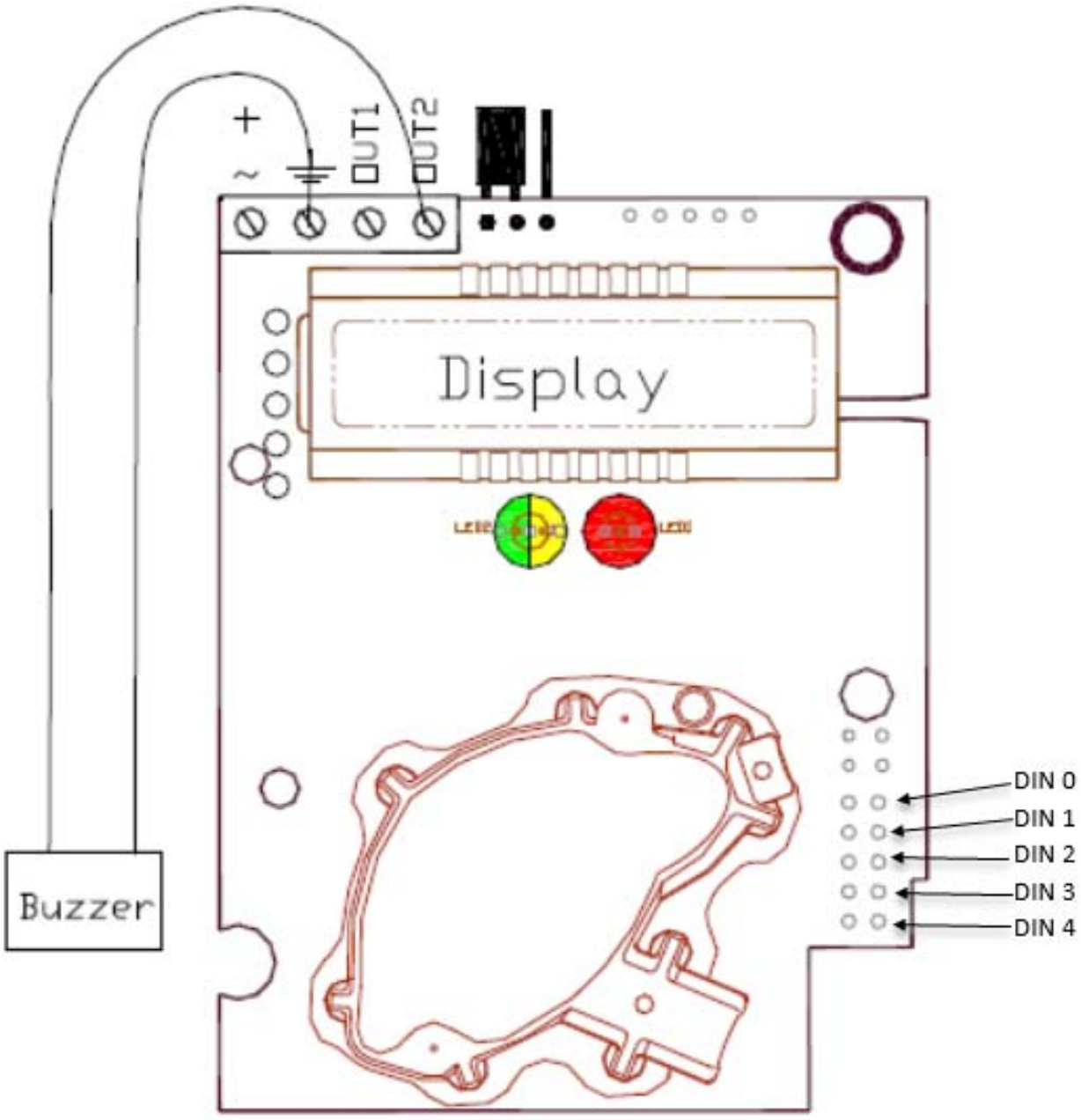
Input Switch Terminal *(normally open)*	**Default function** *(when closed for minimum 8 seconds)*
Din3	**bCAL** (background calibration) assuming 400 ppm CO_2 sensor exposure
Din2	**CAL** (zero calibration) assuming 0 ppm CO_2 sensor exposure

Table I. Switch input default configurations

Manual Calibration Procedure:

1. Separate the Top and Bottom halves of the device
2. Remove the PCB from the top half by depressing the plastic tabs
3. Reset the PCB and its pins into the bottom half of the device
4. Short either Din3 or Din2 (not both) for a minimum of 8 seconds
5. Reassemble the device

If calibration is unsuccessful, wait at least 10 seconds before repeating either procedure again. Make sure that the sensor is not exposed to human breath, or it will be mis-calibrated.



Jumper Din2 for 0 ppm CO2 calibration or Din3 for 400 ppm CO2 for a minimum of 8 seconds

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