

## COM2442 - Evaluation Module for TGS2442

To facilitate evaluation of characteristics for the TGS2442 carbon monoxide sensor, Figaro has prepared the COM2442 evaluation module. Testing is simplified by using the continuous output signal generated by this module. While the driving mode of TGS2442 involves cyclic heater control and intermittent detection (using a 1 second cycle), the periodic sensor response is converted into a continuous voltage signal by the software contained in the module's microprocessor. Please refer to Figure 1 below for description of the major components of this module.

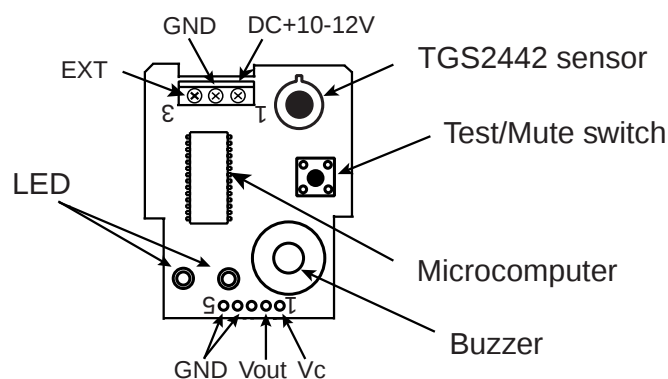


Figure 1 - COM2442 configuration

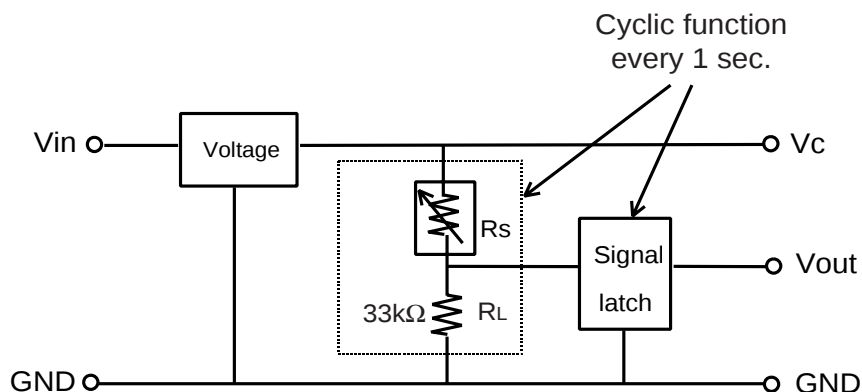
The module is equipped with a microprocessor which controls the heater cycle, records output voltage at the detection point, and converts the intermittent output signal into a continuous signal. The TGS2442 carbon monoxide sensor is mounted on the module in a socket--when changing sensors, the sensor must be inserted with the notch on its base facing to the top of the PCB (i.e. the side which contains input terminals). Refer to Table 1 for a description of each terminal and its function.

When the module is first powered on, the green LED will blink (warm-up period). The LED should stop blinking within 3 minutes, indicating the end of the warm-up period. The Vout signal will immediately begin to be output after the warm-up period and will be updated every 1 second.

| Type   | Name | Description            | Specifciation                                    |
|--------|------|------------------------|--------------------------------------------------|
| Input  | Vin  | Power supply input     | +10~12V, 300mA(max.)                             |
| Input  | GND  | Ground                 | -                                                |
| Output | Vc   | Circuit voltage        | +5±0.2V                                          |
| Output | Vout | Sensor output signal   | 0~+5V                                            |
| Output | GND  | Ground                 | -                                                |
| Output | EXT  | External output signal | +5V (no alarm/warning state)<br>0V (alarm state) |

Table 1 - COM2442 terminal assignment

### Equivalent Circuit



Vc: Circuit voltage (V)  
Rs: Sensor resistance (Ω)  
RL: Load resistance (Ω)

The sensor's output signal (Vout) and the circuit voltage (Vc) can be monitored through the Vout-GND and Vc-GND terminals respectively whenever a power source of 10VDC is applied. An input impedance of more than 1MΩ should be connected to the Vout-GND terminals in order to make precise data acquisition. Please refer to **Product Information for TGS2442** for a full description of the sensor's heating cycle.

Sensor resistance (Rs) is calculated with a measured value of Vout by using the following formula:

$$R_s = \frac{V_c - V_{out}}{V_{out}} \times R_L$$

This module has been pre-calibrated at Figaro's factory. The module can also function as a CO detector by monitoring/using the LED, the Buzzer, the external output signal (EXT), and the Test/Mute switch. Table 2 shows the functions and typical performance of the module when it is used as a CO detector.

| Sensor                       |                        | TGS2442                                                                      |                                  |
|------------------------------|------------------------|------------------------------------------------------------------------------|----------------------------------|
| Target gas                   |                        | Carbon monoxide                                                              |                                  |
| Detection cycle              |                        | 1 second                                                                     |                                  |
| Alarm points                 | Visual alarm (Warning) | First level                                                                  | Below 100ppm CO (typ. 45ppm CO)  |
|                              |                        | Second level                                                                 | Below 200ppm CO (typ. 100ppm CO) |
|                              |                        | Third level                                                                  | Below 400ppm CO (typ. 245ppm CO) |
|                              | Audible alarm          | Generated in compliance with Table 38.1 of UL2034 standard                   |                                  |
| Alarm indication             | Visual alarm (Warning) | First level                                                                  | Red LED blinks once per second   |
|                              |                        | Second level                                                                 | Red LED blinks twice per second  |
|                              |                        | Third level                                                                  | Red LED blinks continuously      |
|                              | Audible alarm          | 85 dB at 3m, Intermittent                                                    |                                  |
| Power indication             |                        | Green LED                                                                    |                                  |
| Malfunction                  |                        | Green and Red LEDs blink with audible alarm                                  |                                  |
| Buzzer test/mute             | Test                   | Red LEDs blink with audible alarm                                            |                                  |
|                              | Mute                   | Silences alarm and suppresses external output for 3 min.                     |                                  |
| External output signal (EXT) |                        | Normal and warning conditions: EXT = 5V<br>Audible alarm condition: EXT = 0V |                                  |
| Power source                 |                        | 10-12V DC                                                                    |                                  |
| Power consumption            |                        | < 0.3W                                                                       |                                  |
| Operating condition          |                        | 0-52°C and <95% R.H.                                                         |                                  |

**Table 2 - COM2442 functions as a CO detectors**

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