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.
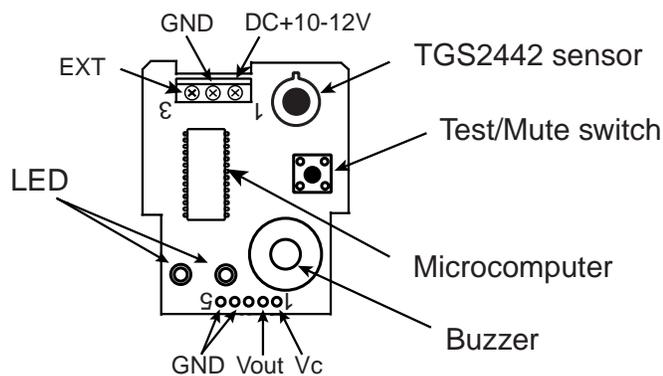

Figure 1 - COM2442 configuration

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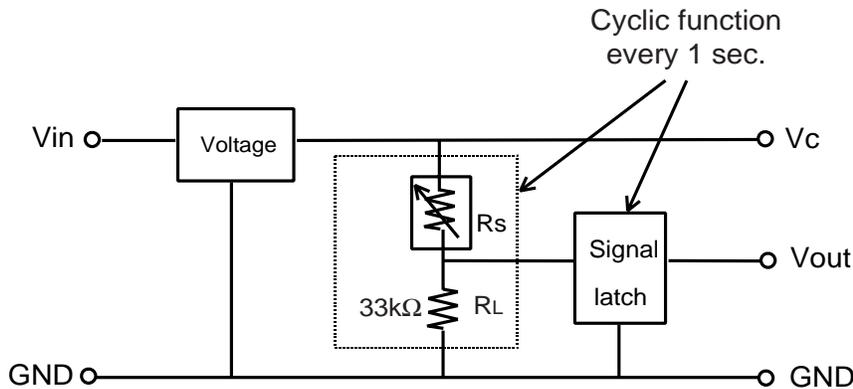
When the module is first powered on, the green LED will blink (warm-up period). The LED should stop blinking within 3 minutes, indicating the end of the warm-up period. The Vout signal will immediately begin to be output after the warm-up period and will be updated every 1 second.

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) 0V (alarm state)

Table 1 - COM2442 terminal assignment

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Equivalent Circuit

Cyclic function every 1 sec.

Vin — Voltage

Rs

33kΩ RL

Signal latch

Vc

Vout

GND

GND

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 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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