CELL GUARD

Overview

Cell Guard is a CAN based sensor that can measure absolute pressure, air temperature, Volatile Organic Compounds (VOCs), H_2 (Hydrogen), absolute air water content, relative humidity, dew point temperature and 3 axis acceleration.

The configurable CAN bus speed and address along with the supplied CAN DBC file allows easy integration into almost any battery system to detect early failures due to cell venting or formation of moisture within a battery pack. The unit features a low power mode in which it monitors the environment but does not transmit on CAN unless a threshold is reached at which point it reverts to normal mode. It also features a low side drive function pin capable of 500mA that can be triggered if a wake signal is generated.

The 5-pin automotive rated Molex Nano-Fit Power connector, small size and mass allows easy interface into most vehicles and energy storage systems. The unit is developed in accordance with ISO26262 and has been tested to automotive standards which include: ISO7637-2 2011, ISO 16750- 2 2012 and ISO 16750-4 2010.

Pressure Sensor	Range	0.3 to 1.2	Bar
	Resolution	0.0001	Bar
	Accuracy (0.3 to 1.1 Bar)	0.0005	Bar
	Max Update Rate	50	Hz
Air Temperature [1]	Range	-40 to 125	˚C
	Resolution	1	˚C
	Accuracy	+-1 (+-2 at 24VDC)	˚C
	Max Update Rate	5	Hz
Volatile Organic Compounds (VOC's)	Range	0 to 65535	Raw
		0 to 6553.5	ppm
	Accuracy (Worse Case)	15 [2]	%
	Max Update Rate	1 (Response Time: τ(63) <1s)	Hz
Hydrogen [11]	Range	0 to 20% Vol. concentration	%
	Resolution	0.002	%
	Accuracy	0.4 vol% + 10% m.v.	%
	Max Update Rate	1 (Response Time: τ(63) <1s)	Hz
Absolute Humidity [3]	Range	0 - 35000	mg/m^3
	Resolution	70	mg/m3
	Accuracy (Worse Case)	5	%FSS
	Max Update Rate	5	Hz
Dew Point	Range	0-100	˚C
	Resolution	0.5	˚C
	Accuracy (Worse Case)	+-3	˚C
	Max Update Rate	5	Hz
Relative Humidity [3]	Range	0-100	%
	Resolution	0.5	%
	Accuracy (Worse Case)	3	%
	Max Update Rate	5	Hz
Accelerometer [4]	Range	-24 to +24	g
	Resolution	0.01	g
	Accuracy (Worse Case)	0.1	g
	Max Update Rate	200	Hz

Environment	Operating temperature [5]	-20 to +70 (VOC) or -40 to +85 (H2)	˚C

Mass		15	grams
Dimensions	Height x Width x Length	11.5 x 55 x 63	mm

CAN	Baud Rates [6]	1000, 500, 250, 125	kbps
	Address Range [7]	1 (0x01) to 2042 (0x7FA). Default = 0x30A	decimal (Hex)

Power	Voltage Range	9 to 32[10]	VDC
	Current (low power)	35mA (7.5 mA) (VOC) 24mA (0.75mA) (H2)	mA @ 12V
Power – LSD Wake Pin	Voltage Range [8]	9 to 32	V
	Current	500	mA
	Type	Low Side Drive	NA

Connector	
MF (family)	Molex (Nano Fit)
On Unit	1053131205
Mating	1053071205
Crimp	1053001200 (24-26 AWG) 1053002200 (20-22 AWG)
Pin Outs	
Pin No.	**Function**
1	Ground
2	Supply Voltage
3	CAN Low
4	CAN High
5	SW Configured Function [9]

[1] Air Temperature accuracy is dependent on installation, heat from the sensor itself can affect this

[2] % of meas. value, sensor drift is 1.3% of measured value per year of operation, 90% of the sensors will be within the typical accuracy tolerance, stated accuracy is valid up to 100ppm

[3] Humidity accuracy valid from 0 to 80 deg C IC temperature and 5 to 95% RH

[4] Not fitted as standard – optional extra

[5] For the VOC the stated accuracy is achievable between -10 and 50 degrees C. Nominal max temperature range is -20 to 55 degrees C for maximum life, absolute max for sensor die temperature is 70 degrees C (air temp can be greater)

[6] The default settings are 500kbps and start address 778 (0x30A), the unit has no CAN termination

[7] The unit uses 4 CAN address which are in consecutive order from address that the unit is set to

[8] The function pin is protected to transients up to 40VDC but is not current limited, please ensure load is not above 500mA

[9] The function of this pin is assigned when configuring the unit please refer to the manual

[10]Only the range of 9-16V has been tested to ISO standards. Outside of this range is not tested to ISO standards.

[11] Not fitted as standard – optional extra

Part Number Ordering Details

Default Part Number: **CGA0P1G1H1V1**

CG - AX - P1 - GX - H1 - VX

Accelerometer
0 = Not Fitted
1 = Tripple Axis +-24g

Pressure
1 = 0.3 to 1.2 Bar

Gas
1 = VOC
2 = VOC + H_2

Humidity
1 = Humidity 5% to 95%

Version
1 = Full Wake Features
2 = No Wake Feature on Gas