腾星传感

Laser Methane Gas Sensor

(Model: Module-TX911-A)

User Manual

Version number: 1.1

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Module-TX911-A Laser Methane Gas Sensor

Product Description

Module-TX911-A laser methane gas sensor (hereinafter referred to as the sensor) is a household methane sensor, as shown in the figure on the right, based on the tunable laser gas absorption technology (TDLAS) technology to detect methane gas, the internal use of through-beam beam structure, It has the characteristics of excellent gas selectivity, no oxygen dependence, water vapour resistance, anti-poisoning, and long life. Built-in temperature control algorithm and temperature compensation algorithm to achieve accurate measurement of methane gas; It has a serial output interface, which is convenient to use. The sensor is about to mature The laser gas absorption detection technology is closely combined with the stable optical path design and circuit design to produce a high-performance sensor.

Features

Anti-moisture, non-poisoning

Only methane gas is detected, and the ability to resist gas interference is strong

Calibration-free, long service life

High detection accuracy, resolution up to 0.1%LEL

Provide serial port (UART) output mode

Main Applications

Household gas leak detection

Product model	Module-TX911-A
Testing gas	Methane
Supply voltage	DC(3.2-3.6) V
Working current	＜300mA
Interface level	3.0V
Measurement range	0-100% LEL
Measurement error	±3% LEL @25℃
Output signal	(UART)(TTL level 3.0V)
Warm-up time	15S
Response time	T90＜15S
Operating temperature	-10℃~50℃
Operating humidity	0~95% RH(No condensation)
Working pressure	80kPa~116kPa
Storage temperature	-20~60℃
dimension	76.5mm*21mm*14.1mm
Weight	＜20g
Life	＞10 years

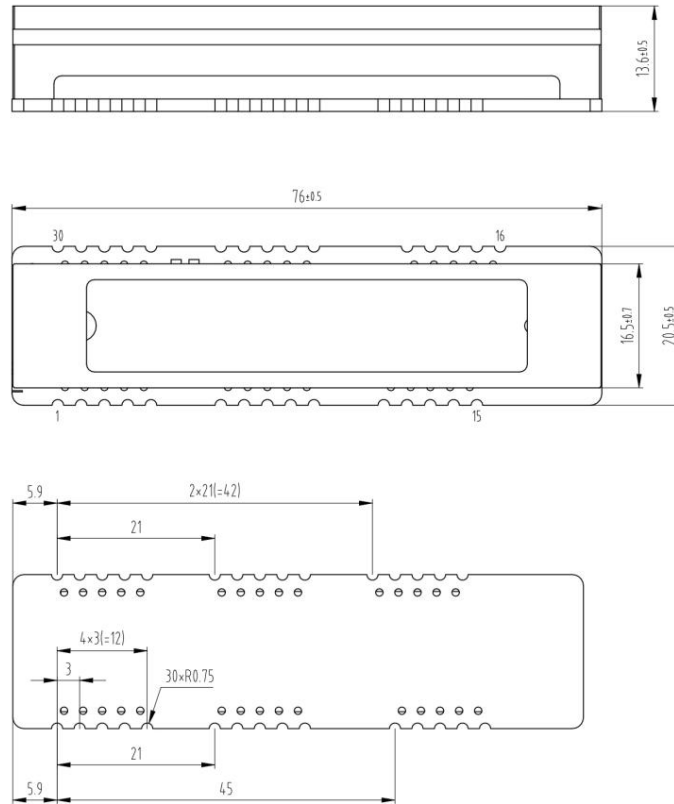| Table 2 Range and accuracy				
Gas Name	Molecular Formula	Range	Resolution	Accuracy
Methane	CH4	0-100.00%LEL	0.1%LEL	±(3%LEL)@25ÿ

Product appearance and structure diagram

Table 3: Pin Definition					
Pinout	describe	Pinout	describe	Pinout	describe
1	NC	11	NC	21	NC
2	NC	12	NC	22	NC
3	NC	13	NC	23	NC
4	NC	14	NC	24	NC
5	NC	15	NC	25	NC
6	VCC	16	NC	26	NC
7	RESET	17	NC	27	NC
8	GND	18	NC	28	NC
9	TXD	19	NC	29	NC
10	RXD	20	NC	30	NC
Note: NC pins need to be left floating NC					

NC

NC

NC

NC

NC

Table 4: Serial port output format							
Serial port configuration: 115200-8-1-N							
Function code frame header density space ambient temperature space					Reserve	Space reserved	
Byte number 0	1-7	8	9-13	14	15-21	22	23-27
Byte number 1	7	1	5	1	7	1	5
unit	.	%LEL	.	ÿ	.	ÿ	.	.
Example	A	+000.00	<SP>	+23.7	<SP>	0666.22	<SP>	+16.1
Function code space		Reserved space Fault code Space XOR check code Carriage return character Line feed character						
Byte number 28	29-35	36	37-38	39	40-41	42	43
Byte number 1	7	1	2	1	2	1	1
unit	.	In	.	.	.	.	<CR>ÿ	<LF>
Example	<SP>	B+066.0	<SP>	00	<SP>	3B	<CR>ÿ	<LF>

Note: The serial port output is an ACSII string that is actively uploaded every 4S, a total of 44 bytes

Output string parsing instructions:

Example: A+000.00 +24.0 0665.38 +16.1 B+066.0 00 13

A: frame header;

+000.00: methane concentration value, retain two decimal places, the second decimal place is always 0, unit %LEL;

+23.7: ambient temperature, unit: °C;

0666.22: Reserved;

16.1: Reserved;

B+066.0: reserved;

00: Fault code status: 0 normal; 1 abnormal.

Table 5: Fault code definitions					
BIT7-5	BIT4	BIT3	BIT2	BIT1	BIT0
Abnormal laser signal.	Weak laser signal.	Abnormal ambient temperature.	Abnormal temperature control status.		

Table 6: Fault code examples	
Fault code (HEX)	meaning
00	The sensor is working properly
01	Abnormal temperature control
02	Abnormal ambient temperature
03	Abnormal ambient temperature & abnormal temperature control
04	Weak laser signal
06	Abnormal ambient temperature & weak laser signal
10	Abnormal laser signal
12	Abnormal ambient temperature & abnormal laser signal

13: XOR check code

Precautions

During the welding, installation, and use of the sensor, the optical cavity should be prevented from being subjected to pressure in any direction.

If the sensor needs to be placed in a small space, the space should be well ventilated, especially the two diffusion windows should be in a well ventilated position.

The sensor should be kept away from heat sources.

is forbidden to wire or insulate the bottom of the sensor to prevent the sensor bottom pad from short circuiting.

Do not use the sensor for a long time in an environment with high dust density. If the sensor is dirty, clean it.To ensure the normal operation of the sensor, the power

supply voltage must be kept within the specified range. If it is not within this range, the sensor may malfunction.

The sensor output concentration is out of error range or the sensor cannot work properly.

ÿ When using a soldering iron, the temperature must be set at (350±5)ÿ and the soldering time must be less than 3S.