Electrochemical Hydrogen Sulfide Modul

（SC05-H_2S）

Datasheets

深圳市深晨科技有限公司

Shenzhen Shenchen Technology Co., Ltd

Electrochemical Hydrogen Sulfide Module SC05-H_2S

Product Description

The SC05-H2S electrochemical hydrogen sulfide module is a versatile and compact module. It utilizes electrochemical principles to detect H2S in the air, offering excellent selectivity and stability. It is equipped with a built-in temperature sensor for temperature compensation. The module supports both digital output and analog voltage output for ease of use. The SC05-H2S module combines mature electrochemical detection technology with sophisticated circuit design to create a universal gas module.

Module Features

High sensitivity, high resolution, low power consumption, long lifespan.
Provides UART data output.
High stability, excellent anti-interference capability, temperature compensation, outstanding,linear output.

Main Applications

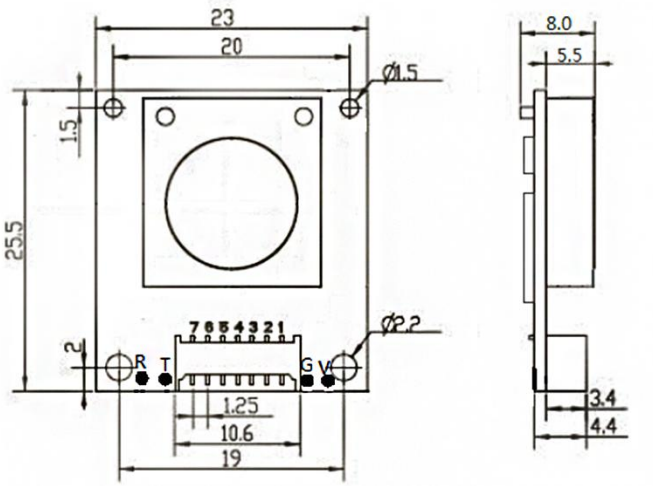
Monitoring air quality in residential areas such as community garbage stations, incineration plants, public toilets, and sewers, as well as industrial environments.

Technical Indicators

Table 1

Model	SC05-H_2S
Detect gas	hydrogen sulfide
Interfering gas	sulfur dioxide and nitrogen dioxide,etc
output data	UART output（3.3V level）
working voltage	3.7V～5.5V
Warm-up time	≤3 minute
response time	≤30 s
recovery time	≤30 s
range	0～100PPM
resolution	0.01PPM
precision	The larger of ± 0.1ppm or ± 10% of the test value
Working temperature	-20℃～50℃
Working humidity	15%RH-90％RH（No condensation）
storage temperature	0～35℃
service life	2 year（in air 0℃～35℃）
Size	23mm×25.5mm×6.5mm

Size



Pin Definition

Table2

Pin Name	Pin definition
Pin1	NC
Pin2	NC
Pin3/G	GND
Pin4/V	Vin（Voltage input 3.7V～5.5V）
Pin5/R	UART（RXD） 0～3.3V data input（Can be NC, please ensure if used 3.3VTTL）
Pin6/T	UART（TXD） 0～3.3V data output
Pin7	NC

Communication protocol

1 General settings

Table 3

Baud rate	9600
Data bits	8 bits
stop bits	1 bits
check bits	NC

2 Communication commands

Communication is divided into active upload and Q&A, with default active upload at the factory and concentration values sent every 1 second interval.

The format for displaying actively uploaded data is as follows:

Table 4

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
start bit	gas name (H2S)	unit (ppm)	decimal places NC	Gas concentration high	gas concentration low	Full rang high	full rang Low	checksums
0xFF	0x17	0x04	0x00	0x00	0x25	0x13	0x88	0x25

Note: Gas concentration value (PPM)=(high gas concentration * 256+low gas concentration)/100

If the user switches to non-automatic mode and needs to switch back to active upload, send the following command line format:

Table 5

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
start bit	reserve	Handover command	automatic	reserve	reserve	reserve	reserve	checksums
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

When users need non automatic mode, they can turn off the actively uploaded data by sending the following command format, and then send the command to read the concentration. The command line format for disabling active uploads is as follows:

Table 6

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
start bit	reserve	Handover command	Non-automatic	reserve	reserve	reserve	reserve	checksums
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

In non-automatic mode, the command format for reading concentration is as follows：

Table 7

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
start bit	reserve	command	reserve	reserve	reserve	reserve	reserve	checksums
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

The display format of the returned sensor concentration value is as follows (same as the automatic mode output format):

Table 8

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
start bit	gas name (H2S)	unit (ppm)	Decima lplaces NC	Gas concentration high	Gas concentration low	full rang high	full rang low	checksums
0xFF	0x17	0x04	0x00	0x00	0x25	0x13	0x88	0x25

Note: Gas concentration value (PPM)=(high gas concentration * 256+low gas concentration)/100

3 Checksum calculation

Checksum = （Refuse（Byte1+Byte2+……+Byte7））+ 1

Reference routines are as follows:

```
/*****************************************************************
* function name : unsigned char FucCheckSum(uchar *i,ucharln)
```

```
* functional description : summation check （Take the reverse + 1 of 1 \ 2 \ 3 \ 4 \ 5 \ 6 \
  7 for sending and receiving protocol）
function declaration:（Refuse（Byte1+Byte2+……+Byte7））+ 1
**********************************************************************/
unsigned char FucCheckSum(unsigned char *i,unsigned char ln)
{
   unsigned char
   j,tempq=0; i+=1;

   for(j=0;j<(ln-2);j++)
   {
        tempq+
        =*i; i++;
   }
   tempq=(~temp
   q)+1;
   return(tempq);
 }
```

Cross interference characteristics

The SC05-H2S sensor also responds to gases other than the target gas. The response characteristics of the sensor to several common interfering gases are listed in the table below for reference. The data in the table represents the typical response of interfering gases at a given concentration.

Table 9：Cross Interference Characteristics

Gas	concentration	SC05-H2S
CO	200ppm	＜0.5ppm
chlorine	10ppm	＜-0.7ppm
hydrogen	10000ppm	＜16ppm
alcohol	1000ppm	＜0.3ppm
ammonia	50ppm	＜-0.3ppm
sulfur dioxide	20ppm	＜1.6ppm
phosphine	20ppm	＜14ppm
formaldehyde	10ppm	＜2.5ppm
benzene	100ppm	＜0.2ppm
methanol	200ppm	＜0.15ppm

Important Notice:

- Electrolyte leakage can cause damage. Do not disassemble the sensor arbitrarily. Do not uncover or intentionally damage the sensor's waterproof breathable membrane.
- Avoid contact between the sensor and organic solvents (including silicone rubber and other adhesives), coatings, chemicals, oils, and high-concentration gases.
- Electrochemical sensors should not be completely encapsulated with resin materials or immersed in oxygen-free environments, as it may damage the sensor's performance.
- All electrochemical sensors should not be used for extended periods in environments containing corrosive gases, as corrosive gases can damage the sensor.
- During gas zero-point calibration, it should be conducted in a clean atmosphere.
- When testing and applying the sensor, avoid direct vertical intake of gases. The intake surface of the sensor must not be blocked or contaminated.
- The sensor should not be excessively impacted or subjected to vibration. Do not use if the housing is damaged or deformed.
- After long-term use in high-concentration gas environments, the sensor's recovery to its initial state may be slow.
- When storing the sensor, the working electrode and counter electrode should be short-circuited.
- Prohibit the use of hot melt adhesive or sealing glue with curing temperatures higher than 80°C for sensor encapsulation.