

# Electrochemical Gas Sensor Module

Module:( SM4 )



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# Electrochemical industrial gas sensor module SM4

## ● Product Description

This product is a high-precision, general- purpose electrochemical series module. This series module uses industrial electrochemical sensors with high-performance microprocessors, and different sensors can measure the corresponding gases in the environment. Each module has UART interface, which can be calibrated separately.

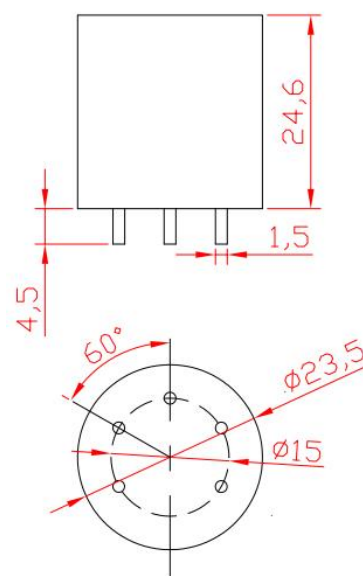


## ● Technical Parameter

## Size:

Item	Parameter
Select Gas	CO、H2S、O2、SO2、NH3、O3、NO2、PH3、HCl、H2、Cl2、ETO,etc
detection range	See Table 2 for details
Operating Voltage	DC 3.5—7.0V
Operating Current	<6mA
Output	UART (TTL level, 3.3V,Compatible 5V)
Working Conditions	0-50℃/15-90%RH (Non condensing)
Storage Conditions	-20-55℃/15-90%RH (Non condensing)
Size	Ø23.5*24.6mm
Life	2years

unit: mm

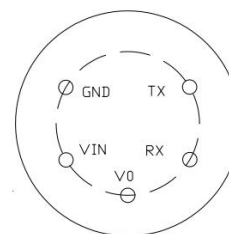


( Vertical view )

Table:1 Drawing of module

## ● PIN

GND	Ground
VIN	Power supply
VO	Original Voltage output
RX	Series port input
TX	Serial port output



PIN ( Bottom view )

## ● Routine detection range and signal output (customizable)

Gas Type	CO	O2	NH3	H2S	NO2	HCL
Detection Range	(0-500)ppm	(0-25) %VOL	(0-100)ppm	(0-100)ppm	(0-20) ppm	(0-10)ppm
Resolution	1ppm	0.1 %VOL	1ppm	1ppm	0.1ppm	0.1ppm
Response Time(T90)	≤30S	≤15S	≤30S	≤30S	≤60S	≤60S

Gas Type	H2	PH3	SO2	O3	CL2	HF
Detection Range	(0-1000)ppm	(0-10)ppm	(0-20) ppm	(0-20) ppm	(0-10) ppm	(0-10)ppm
Resolution	1ppm	0.1ppm	0.1ppm	0.1ppm	0.1ppm	0.1ppm
Response Time(T90)	≤60S	≤30S	≤30S	≤60S	≤60S	≤60S

Gas Type	CH2O	AsH3	N2H4	C6H5CH3	HCN	C2H4O
Detection Range	(0-10)ppm	(0-10)ppm	(0-100)ppm	(0-100) ppm	(0-10) ppm	(0-100)ppm
Resolution	0.1ppm	0.1ppm	1ppm	1ppm	0.1ppm	1ppm
Response Time(T90)	≤60S	≤30S	≤45S	≤120S	≤60S	≤120S

## ● Communication Protocol

### 1、General Settings

Baud Rate	9600
Data Bits	8 bit
Stop Bits	1 bit
Check Bits	NC

### 2、Communication mode

Output data sending to Host will start automatically after Power-on.  
concentration values were sent at 1S intervals:

Receive	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	Command	Gas concentration		--	--	-	-	checksums
	0xFF	0x86	High Byte	Low Byte	0	0	--	--	7A
EXP.	FF 86 00 00 00 00 00 00 7A (The concentration value is 0)								

gas concentration=(High byte\*256+Low byte)\*resolution

0x78--To modify the communication mode (0x03 is Auto response mode, 0x04 is Non-Auto response mode)

1	0x78	Modify sensor communication mode							
Send	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	address	command	communication mode	--	--	--	--	checksums
	0xFF	0x01	0x78	0x04	0	0	0	0	0x83
EXP.	FF 01 78 04 00 00 00 00 83 (Switch Non-Auto response mode)								
Receive	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	command	Return to calibration	- -	--	--	--	- -	checksums
	0xFF	0x78	Success: 1 Failure: 0	0	0	0	0	0	0x87 0x88
EXP.	FF 78 01 00 00 00 00 00 87								

Switch Auto response mode, send FF 01 78 03 00 00 00 00 84.

0x86 Read sensor concentration

1	0x86	Read sensor concentration							
Send	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	address	command	--	--	--	--	--	checksums
	0xFF	0x01	0x86	0	0	0	0	0	0x79
EXP.	FF 01 86 00 00 00 00 00 79								
Receive	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	command	Gas concentration		--	--	--	--	checksums
	0xFF	0x86	High Byte	Low Byte	0	0	0	0	7A
EXP.	FF 86 00 00 00 00 00 00 7A (The concentration value 0)								

### 3、Gas code description

Gas code	0x02	0x03	0x04	0x05	0x06	0x08	0x17	0x2A	0x2B
Gas Type	NH3	H2S	CO	O2	H2	C2H4	HCHO	O3	SO2
Gas code	0x2C	0x2E	0x2F	0x31	0x33	0x34	0x3B	0x45	0x46
Gas Type	NO2	HCl	HCN	Cl2	HF	VOC	C2H3Cl	PH3	STINK

#### 4、Checksum and calculation

$\text{Checksum(Byte8)} = (\text{Non}(\text{sending/receiving command}) + \text{Byte1} + \text{Byte2} + \text{Byte3} + \text{Byte4} + \text{Byte5} + \text{Byte6} + \text{Byte7}) + 1$

#### ● Cautions

1. Please do not take away or plug the sensor in the module.
2. It is prohibited to weld the pins of the module. The socket could be welded.
3. Sensor shall avoid organic solvent, coatings, medicine, oil and high concentration gases.
4. Excessive impact or vibration should be avoided.
5. Please keep the modules warming up for at least 5 minutes when first using