

The ZD-4 Series Of Industrial Electrochemical Modules

Key Features:

- Low-Power Consumption
- High Sensitivity
- Anti-Interference
- High-Precision
- Provide The Uart and Analog Voltage Signal Output Mode

Typical Applications:

- The Urban Pipe Gallery
- Petrochemical Industry
- The Industrial Environment
- Environmental Protection Field

Product Introduction:

ZD-4 series industrial electrochemical module using high performance microprocessor, built-in temperature sensor for temperature compensation, carrying different gas sensor can measure the corresponding gas, with digital output and analog voltage output two ways, widely used for portable, fixed gas detector, and all kinds of gas detection occasions and equipment.



Technical Specifications:

Project	Parameter
Measuring Gas:	CO, H ₂ S, O ₂ , SO ₂ , NH ₃ , O ₃ , NO ₂ , PH ₃ ,
Scope Of Detection:	See Table 3 for details
Service Voltage:	DC 3.5—7.0V
Working Current:	< 6mA
Output Mode:	UART output / TTL level, 3.3V compatible
ENVIRONMENTAL:	
Operating Temperature:	-40°C to +50°C
Operating Humidity:	15% -90% RH (no-condensation)
LIFETIME:	
Recommended Storage Temp:	-20-55°C / 15-90% RH (no-condensation)
Expected Operating Life:	For 24 months in the air
Size:	
Size:	Ø23.5*24.6mm

Table 1: Performance Parameters

Product Dimensions:

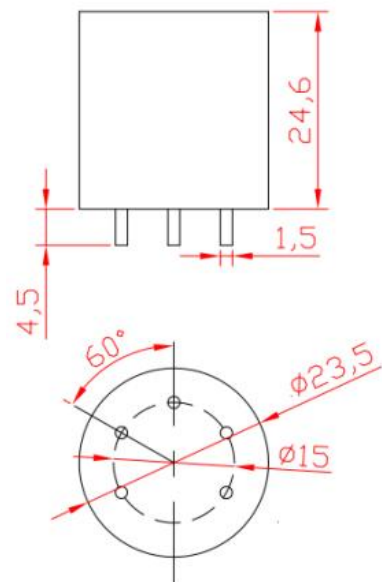


Figure 1: Unit: mm

Pin Definition:

GND	Power anode
VIN	Power positive pole
VO	Sensor original signal voltage
RX	String mouth input
TX	Serial port output

Table 2: pin definition

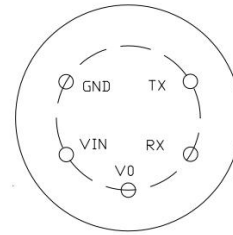


Figure 2: pin definition figure

Routine Detection Range and Signal Output (customizable)

Gas Type	CO	O2	NH3	H2S	NO2	HCL
Detection Zone	(0-500)ppm	(0-25) %VOL	(0-20)ppm	(0-100)ppm	(0-20) ppm	(0-10)ppm
Resolution Ratio	0.1ppm	0.1 %VOL	0.01ppm	0.1ppm	0.1ppm	0.1ppm
Response Time (T90)	≤30S	≤15S	≤30S	≤30S	≤60S	≤60S

Gas Type	H2	PH3	SO2	O3	CL2	HF
Detection Zone	(0-1000)ppm	(0-10)ppm	(0-20) ppm	(0-20) ppm	(0-10)ppm	(0-10)ppm
Resolution Ratio	1ppm	0.05ppm	0.1ppm	0.1ppm	0.1ppm	0.1ppm
Response Time (T90)	≤60S	≤30S	≤30S	≤60S	≤60S	≤60S

Table 3: Detection of gases

Protocol

1. General Settings

Baud rate	9600
data bit	Eight
stop bit	One
check bit	not have

2. Communication Mode

Communication mode is default to automatic upload mode, and the concentration value is sent every about 1 second:

	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
receive	start bit	order	Sensor concentration value		Gas code	The decimal point	Raw signal AD value		Calibration value
	0xFF	0x86	high-order	low-order	0	0	high-order	low-order	7A
EXP.	FF 86 00 00 00 00 00 00 7A (concentration value = 0)								

Gas concentration = (high * 256 + low) * resolution

Note: If decimal place is 0, resolution is 1; if decimal place is 1, resolution is 0.1; if decimal place is 2, resolution is 0.01.

0x78--Modify sensor communication mode (Communication mode: 0x03 Active upload, 0x04 Question and answer style)

1	0x78	Modify the sensor communication mode							
Transmit by radio	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	address	order	Communication mode	--	--	--	--	Calibration value
	0xFF	0x01	0x78	0x04	0	0	0	0	0x83
EXP.	FF 01 78 04 00 00 00 00 83 (Switch to Q & A mode)								
Receive	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	order	Return the calibration	--	--	--	--	--	Calibration value
	0xFF	0x78	Success: 1 Failure: 0	0	0	0	0	0	0x87 0x88
EXP.	FF 78 01 00 00 00 00 00 87								

If you need to switch to the active mode, send a FF 01 78 03 00 00 00 00 84.

0x86 Read the sensor concentration.

1	0x86	Read the sensor concentration							
transmit by radio	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
	start bit	address	order	--	--	--	--	--	Calibration
	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	order	Sensor concentration		Gas code	decimal	Raw signal AD value		Calibration
	0xFF	0x86	high-order	low-order	0	0	high-order	low-order	7A
EXP.	FF 86 00 00 00 00 00 00 7A (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. Check-Sum Calculation

Checksum (Byte 8) = (take reverse (Byte 1 + Byte 2 + Byte 3 + Byte 4 + Byte 5 + Byte 6 + Byte 7)) + 1

Matters Need Attention:

- 1.This product belongs to electronic products, it is recommended to wear anti-static equipment during operation;
- 2.If stored for a long time, it is recommended to recalibrate when used again;
- 3.Prohibit unplugging sensors and changing components on the module;
- 4.Avoid contact with organic solvents, paints, high concentration gases, etc.
- 5.The module should be kept away from heat sources, avoid direct sunlight and other heat radiation.