

## DS-HCHO Simple Guideline

DS-HCHO is digital output type formaldehyde sensor with high integration, high precision and high stability. It can real-time detect the formaldehyde contents applied in different scenarios through electrochemical method without sampling. It has the characteristics, such as accurate measurement, small size, convenient using method, etc. It can be used at home and industry, and applied in automobile, air conditioning, TV and other carriers.

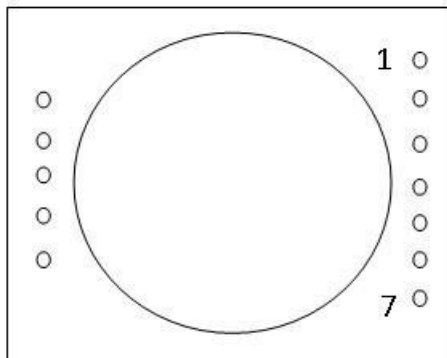
DS-HCHO adopts unique electrolyte packaging technology, with high-performance analog circuits and data processing unit internally installed and the integration of a large number of experiential arithmetic, which can directly output digital density information. The factory has processed zero and standard gas concentration calibration. The users do not need to adjust the signal of the complicated analog circuits of electrochemical sensor, neither need to process adjustment and calibration with professional. The using method is simple, convenient and rapid.

### Module parameter

Parameter	Data	Unit
Range	0-2.5	Mg/m <sup>3</sup>
Resolution ratio	0.01	Mg/m <sup>3</sup>
Accuracy	<±5%	FS
Response time(T90)	<30	S
Service time	3	Year
Working temperature	0~55	℃
Working humidity	0~95	% relative humidity
Working voltage	3.3±10%	V
Protection level	IP32	

Diameter	20	mm
Height	20	mm
Data output	It supports uart digital output and can connect a variety of switching modules externally. (RS232RS485CAN, etc.)	
Linear degree	Linear	

The definition of interface



1	VCC	Voltage input 3.3V
2	GND	
3	RESET	Low level reset
4	NC	Suspended
5	NC	suspended
6	TX	Serial port receiving pin
7	RX	Serial port delivery pin

Communication protocol

DS-HCHO adopts P2P call & answer type mechanism

There are seven bytes in the format of host sending commands.

Starting symbol 1	Starting symbol 2	Command symbol	Data H	Data L	Calibration H	Calibration L
0x42	0x4d	CMD	DHH	DLL	LRCH	LRCL

Format description:

Starting symbol 1 2 is fixed symbol 0x42 0x4d

Command symbol CMD is command parameter of hosting sending to equipment.

Data H and L are the high and low byte respectively of the data for host sending to equipment.

Calibration H and L are data package and the test of high and low bytes respectively.

Command description:

Serial number	Command descrip	Identification word
1	Query of detection value	0x01
2	Zero	--
3	SPAN calibration	--
4	Rstore the factory initial value	--
5	--	--

Sample:

Query and monitoring data instruction sent by host

0x42 0x4d 0x01 0x00 0x00 0x00 0x90

Data packets of returned module

Starting symbol 1	Starting symbol 2	Byte number sent follow-up	Gas type	Inspecti on data unit	Data equival ence	Inspecti on data high byte	Inspecti on data low byte	Calibrit ion high byte	Calibrit ion high byte
0x42	0x4d	0x08	ID	UNIT	VH	DHH	DLL	LRC H	LRC L

The definition of gas type identification

Data definition

Data content	Gas name	Data content	Gas name	Data content	Gas name
0x00	sensorless	0x0b	NO	0x16	VOC
0x01	CO	0x0c	NO2	0x17	ETO
0x02	H2S	0x0d	O3	0x18	C2H4
0x03	CH4	0x0e	O2	0x19	C2H2
0x04	CL2	0x0f	SO2	0x1a	SF6
0x05	HCL	0x10	CLO2	0x1b	AsH3
0x06	F2	0x11	COCL2	0x1c	H2
0x07	HF	0x12	PH3	0x1d	TOX1
0x08	NH3	0x13	SiH4	0x1e	TOX2
0x09	HCN	0x14	HCHO	0x1f	Gas flow L/M
0x0a	PH3	0x15	CO2	0x20	Batthey power/%

The definition of monitoring unit

Data content	Unit
0x01	ppm
0x02	VOL
0x03	LEL
0x04	Ppb
0x05	Mg/m3
--	--

The definition of data equivalence

<b>Data content</b>	<b>The definition of data equivalence</b>
0x01	1
0x02	10
0x03	100
0x04	1000

The actual data is equal to the monitoring data dividing the data equivalence.

Communication example:

Query and monitoring data instruction sent by host

0x42 0x4d 0x01 0x00 0x00 0x00 0x90

Data packets of returned module

0x42 0x4d 0x08 0x14 0x05 0x03 0x00 0x0a 0x00 0xbd

The concentration of monitoring gas, formaldehyde, is 0.10mg/m<sup>3</sup>.

Detailed description:

0x4d 0x42 steadfastly expresses symbol.

0x08 means eight bytes sent follow-up(including its own)

0x14 monitoring type indicates formaldehyde

0x05 is the data unit identification mg/m<sup>3</sup>

0x03 data equivalence represents 100

0x0a 0x00 returning data 0x000a equals to 10

Actual data equals to returning data / data equivalence, means 10/100 or 0.10

0xbd 0x00 data is to check high or low byte