Winsen 炜盛科技

MH-Z Series Infrared CO2 Sensor Module Communication Protocol

User's Manual

(Version 1.0)

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Please keep the manual properly, in order to get help if you have questions during the usage in the future.

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1.Profile for the communication protocol

- All the data in this communication protocol is hexadecimal.
- The data length is fixed 9 bits.
- Baud rate: 9600, data bit: 8, stop bit: 1, parity bit: none.

2.Command list and meaning.

Command and meaning	
0x86	To read CO2 concentration
0x9C(for wide range)	To read CO2 concentration
0x87	To calibrate zero point（ZERO）
0x79	To turn on/off self-calibrate function

3.Command list and meaning.

0x86- Read CO2 concentration (for 0-50000ppm range)

Sending command

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Sensor No.	Command	-	-	-	-	-	Checksum
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

Return value

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Command	Concentration (High 8 Byte)	Concentration (Low 8 Byte)	-	-	-	-	Checksum
0xFF	0x86	0x01	0xF4	0x47	0x00	0x00	0x00	0xD1

CO2 concentration = HIGH * 256 + LOW

Eg. 01 in hexadecimal is equals to 1 in decimal, F4 in hexadecimal is equals to 244 in decimal.

CO2 concentration=01*256+244=500ppm

0x9C- Read CO2 concentration (for 0-150000ppm range)

Sending command

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Sensor No.	Command	-	-	-	-	-	Checksum
0xFF	0x01	0x9C	0x00 by default	0x00	0x00	0x00	0x00	0x63

Return value

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Command	Concentration (High 8 Byte)	Concentration (Low 8 Byte)	-	-	-	-	Checksum
0xFF	0x9C	Data 1	Data 2	Data 3	Data 4	0x00	0x00	

CO2 concentration= Data 1 << 24 + Data 2 << 16 + Data 3 << 8 + Data 4

0x87- Calibrate Zero point								
Sending command								
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Sensor No.	Command	-	-	-	-	-	Checksum
0xFF	0x01	0x87	0x00	0x00	0x00	0x00	0x00	0x78
No return value.								

0x79- On/Off Self-calibration for Zero Point								
Sending command								
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Reserved	Command	-	-	-	-	-	Checksum
0xFF	0x01	0x79	0xA0/0x00	0x00	0x00	0x00	0x00	Checksum
No return value.								
Note: when byte3 is 0xA0, the self-calibration function is turned on; when byte3 is 0x00, the self-calibration function is turned off.								
Self-calibration function is ON by default when the sensors leave the factory.								

Checksum calculation method								
Checksum = (Negative (Byte1+Byte2+Byte3+Byte4+Byte5+Byte6+Byte7))+1								
For example:								
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Reserved	Command	-	-	-	-	-	Checksum
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	Checksum
Calculating Checksum：								
1、Add Byte 1 to Byte 7: 0x01 + 0x86 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 = 0x87								
2、Negative: 0xFF - 0x87 = 0x78								
3、Then+1：0x78 + 0x01 = 0x79								

C language

```
char getCheckSum(char *packet)
{
    char i, checksum;
    for( i = 1; i < 8; i++)
    {
        checksum += packet[i];
    }
    checksum = 0xff – checksum;
```

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