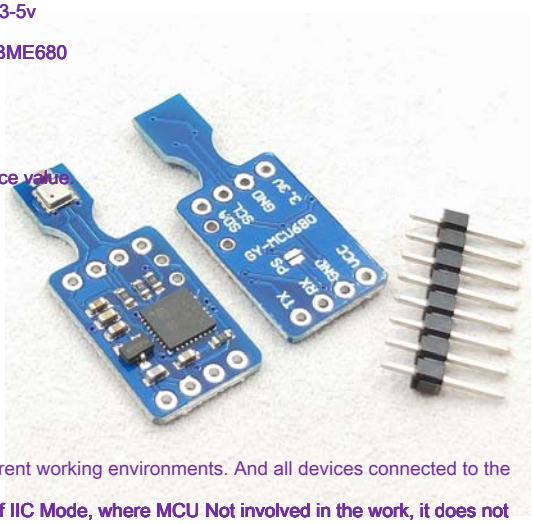
GYMCU680 Module Manual V1.0

I. Overview

GYMCU680 It is a low cost air detection module operating voltage 3-5v

Low power consumption, small size. It works, through MCU Read BME680



Sensor data, obtained through the algorithm, temperature,

humidity, atmospheric pressure, IAQ Indoor air quality, the resistance value

This module, there are two ways to read data, i.e., serial

port (TTL Level) or the chip itself IIC

way of communication. The high precision, high stability.

Practical data can be directly output, the algorithm is omitted.

Serial port baud rate has 9600bps versus 115200bps

Continuous output and query output in two ways, can adapt to different working environments. And all devices connected to the computer and when welding PS When solder, the chip module itself IIC Mode, where MCU Not involved in the work, it does not consume current. It can be used as a simple BME680 Module.

IAQ Indoor air quality is based on algorithms BME680 Chip official website of the routine transplant, the power to the test when a certain time, about 5 Minutes, the data will be normal.

Second, product characteristics

(1),small volume(2), Cost-effective (3),

Serial communication format (4), Direct

output visual data

Technical Parameters

name	parameter
Temperature measurement range	-40 ° ~ 85 °
Humidity measuring range	0% ~ 100% IAQ Measuring
range	0? To 500
Pressure measuring range	300 ~ 1100hpa
Frequency response	default 3 Every seconds
Operating Voltage	3 ~ 5 V
Average operating current	5mA
Operating temperature	- 40 ° ~ 85 °
Storage temperature	- 40 ° ~ 125 °
size	12mm × 30mm
Use chip	ME680 + STM32

Third, the product application

(1), Hand-held instruments (2), Indoor air quality

and quality testing (3), Weather forecasting

system (4), Home automation and control (5),

Networking, the Internet (6), Leisure and outdoor

sports

Fourth, Pin Description

Pin1	VCC	Power + (3v-5v)
Pin 2	GND Power Ground	
Pin3	RX	Receiving serial data (TTL Level)
Pin 4	TX	Serial data transmission (TTL Level)
Pin 5	SDA	The chip itself IIC Data pins
Pin 6	SCL	The chip itself IIC Clock pin
Pin 7	GND Power Ground	
Pin 8	3.3V	3.3V Power source, the internal power supply
Pin x	PS	The solder joints, selected IIC mode

Fifth, the communication protocol

Serial:

(1), Serial communication parameters (default baud rate value 9600 bps Can be set by software)

Baud rate: 9600 bps Check Digit: N Data bits: 8 Stop bits: 1

Baud rate: 115200 bps Check Digit: N Data bits: 8 Stop bits: 1

(2), Module output format, each frame comprising 7-20 Bytes (hex):

①. Byte0: 0x5A Preamble Flags

②. Byte1: 0x5A Preamble Flags

③. Byte2: 0X07 This type frame data (temperature, humidity, atmospheric pressure)

④. Byte3: 0x07 The amount of data

⑤. Byte4: 0x00 ~ 0xFF High temperature data 8 Place

⑥. Byte5: 0x00 ~ 0xFF Low temperature data 8 Place

⑦. Byte6: 0x00 ~ 0xFF High humidity data 8 Place

⑧. Byte7: 0x00 ~ 0xFF Low humidity data 8 Place

⑨. Byte8: 0x00 ~ 0xFF Pressure data Bit16 ~ Bit23

⑩. Byte9: 0x00 ~ 0xFF Pressure data Bit8 ~ Bit15

⑪. Byte10: 0x00 ~ 0xFF Pressure data Bit0 ~ Bit7

⑫.Byte11: 0x00 ~ 0xFF Checksum (data accumulation and front, leaving only the low 8 Bit)

Byte2 Meaning representatives description:

Byte2 : Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
meaning:	NC	NC	altitude	Gas	IAQ	Barometric pressure	humidity	temperature
Bit6 ~ Bit7 Retention							
Bit5	The location 1 It represents the output elevation data, 0 no output. (Signed data type 16 Bit: - 32768 —— 32767 ,unit m)						
Bit4	The location 1 Indicates that the output Gas data, 0 no output; Gas This means that the gas-sensitive resistor, the resistance decreases with increasing gas concentration. (Data type unsigned 32 Bit: 4294967296 0 ——— ,unit ohm)						
Bit3	The location 1 Indicates that the output IAQ data, 0 no output; IAQ Show Indoor air quality. IAQ The range 0 to 500 Larger value indicates worse quality air. IAQ Unsigned data type 16 Bit before 4 Sensor measurement indicates IAQ Accuracy, after 12 Indicates IAQ value.						
Bit2	The location 1 Indicates that the output air pressure data, 0 No output; Data range: 300 ~ 110 000 ,unit Pa ; (Unsigned data type twenty four Bit)						
Bit1	The location 1 Indicates that the output amplification 100 Humidity data times. data range: 0-100 ,unit% rH (I.e., relative humidity); (Unsigned data type 16 Bit)						
Bit0	The location 1 Indicates that the output amplification 100 The temperature data from times, 0 No output; Temperature range: - 40 to 85 , Unit ℃; (A signed data type 16 Bit: - 32768 ----- 32767)						

Byte3 Represents the number of data bytes, each byte of the specific number of the following table of data:

name	altitude	Gas	IAG	Barometric pressure	humidity	temperature
Quantity	2 Bytes	4 Bytes	2 Bytes	3 Bytes	2 Bytes	2 Bytes
Output order	When multiple data output, the data output order from right to left (→ temperature elevation) ;					

(3), Magnification data calculated data: temperature, humidity, are amplified 100 Times and outputs; data analysis:

Data, for example, a < 5A5A 3F0F 0835 198A 018 854 30D2 00032BE1 004A 1A>

Byte0 ~ Byte1 --- 0x5A0x5A Expressed header;

Byte2 — 0x3F There outputs data indicating the altitude, Gas , IAQ , Barometric pressure, humidity, temperature;

Byte3 — 0x0F Expressed 15 Bytes of data: Altitude 2 Bytes, Gas 4 Bytes, IAQ 2 Bytes, pressure 3 Bytes, humidity 2 Bytes, temperature 2 Bytes; data output by the Byte2 Right to left in the order defined as: Temperature (red) → humidity (green) → pressure (blue) → IAQ (purple) → Gas (gold) → elevation (dark blue);

Temperature Data Temperature :

Temp = (0x08 << 8) | 0x35 = 2101; Temperature = Temp / 100 = 21.01 ℃;

Humidity Humidity Data :

Temp = (0x19 << 8) | 0x8A = 6538; Humidity = Temp / 100 = 65.38%;

Pressure data Pressure :

Pressure = ((0x01 << 16) | (0x88 << 8) | 0x54) = 100436 Pa

IAQ data :

4 is a front IAQ accuracy Accuracy: IAQ_accuracy = 0x30 >> 4 = 3; IAQ = (((0x30 & 0x0f) << 8) | 0xDA) = 218

Gas data :

Gas = (0x00 << 24) | (0x03 << 16) | (0x2B << 8) | E1 = 207841 ohm

Elevation data Altitude :

Altitude = (0x00 << 8) 0x4A = 74 m

(4), Command byte, transmitted from the external controller to the module (hex) instruction to the module is four bytes:

Output data setting command ------- 0xA5 + 0x55 + 0xXX + sum

0xXX correspond Byte2, The corresponding position 1 It represents the output; sum Unsigned 8bit Checksum

Auto / query settings instructions:

Automatically output data instructions ------- 0xA5 + 0x56 + 0x02 + 0xFD

Query output data instructions ------- 0xA5 + 0x56 + 0x01 + 0xFC

Baud Rate Set command:

115200 Set command --------- 0xA5 + 0x58 + 0x01 + 0xFE 9600 Set command ---------- 0xA5 + 0x58 + 0x02 + 0xFF

Save / Restore Settings command:

Save Settings command ---------- 0xA5 + 0x5A + 0x01 + 0x00

Save setting instruction: indicates the current output data settings, auto / query set the baud rate to save settings flash During and after the restart operation in accordance with the saved settings.

Restore Settings command ---------- 0xA5 + 0x5A + 0x02 + 0x01

Restore Settings command: that restore the factory settings, the baud rate 9600 , All data is automatically output.

IIC Mode: When the module PS Welds can be shorted, as a function of the user himself to read BME680 Chip data. The default chip address pins connected GND, Can be connected arduino ,raspberry pie, IIC Interface, this is no longer the provider.

PC:

PC details, see the help page.

Computers FT232 After the connection module, the step of using the host computer (shown above):

1 : Select the appropriate port number, the baud rate, port open.

2 : Set the output data Byte2 It corresponds to the required output data selection check box.

Byte2 代表的含义说明：

Byte2：	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
含义：	NC	NC	海拔	Gas	IAQ	气压	湿度	温度

3 : After that you need to select the output data, click on the "Write" button, the PC will write command module configuration.

4 : Configuration module automatically and continuously outputting data, click on the "continuous output" button, the host computer module will write "instruction data is continuously output" In this case, the host computer module will upload the data.

5 : Click the "Save" button, the PC is written to the module "Save Settings command." Module will save the current settings for the module. Restart the power to set the updated execution.

6 : Baud rate settings, click Save and restart to take effect;

Sixth, the end of the

(1), The electrical module is automatically default output power 5 Minutes or so IAQ Just normal. (2), PS Pin to ground, after re-power module into the IIC Mode, the customer may operate the sensor itself,

Module MCU Sensor does not perform any operation. (3), The module I / O Yes TTL Level, the serial port can be directly connected to the microcontroller, and can be directly

PL2303, CH340, FT232 And other chip connection, but it can not be directly connected to a computer nine-pin serial port.

Dimensions: