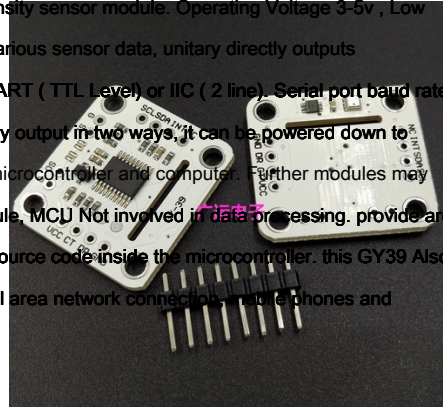


GY-39 Sensor Module Manual V1.0

I. Overview

GY-39 It is a low cost, atmospheric pressure, temperature and humidity, light intensity sensor module. Operating Voltage 3-5v , Low power consumption, easy installation. Its working principle is that MCU Collects various sensor data, unitary directly outputs calculated results, this module, there are two ways to read data, i.e., serial port UART (TTL Level) or IIC (2 line). Serial port baud rate has 9600bps versus 115200bps , Can be configured to provide a continuous query output in two ways, it can be powered down to save the settings. Can adapt to different working environment, connected to the microcontroller and computer. Further modules may be separately provided a sensor device operating mode, as a simple sensor module. MCU Not involved in data processing. provide arduino , 51 , stm32 SCM communication procedures, does not provide schematics and source code inside the microcontroller. this GY39 Also presented Andrews mobile software module app View data, and support wifi Local area network connections, mobile phones and computer displays the data.



Second, product characteristics

(1), Cost-effective (2), Built-in MCU Computing sensor data (3), IIC , Serial communication format (4), Unified data output

(5) , With the corresponding PC software

Third, the product application

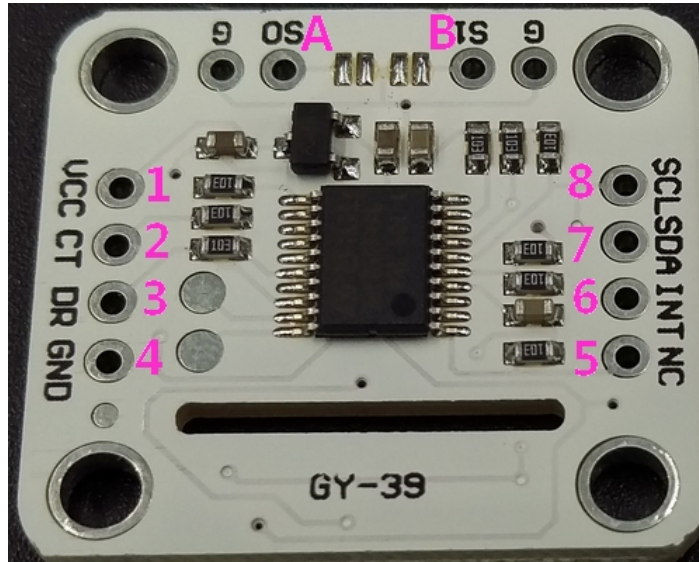
(1), Digital lighting management (2), Networking, smart home applications (3), Weather station monitoring (4), Digital light meter (5), Digital barometer, altimeter (6), thermometer (7), Greenhouse climate monitoring

Technical parameters (refer to the accuracy of the sensor chip Manual)

name	parameter
Temperature measurement range	-40 ° ~ 85 °
Humidity measuring range	From 0% to 100%
Light intensity measurement range	0.045lux? ~ 188000lux
Pressure measuring range	300 ~ 1100hpa
Frequency response	10 HZ
Operating Voltage	3 ~ 5 V
Working current	5mA
Operating temperature	- 40 ° ~ 85 °
Storage temperature	- 40 ° ~ 125 °
size	24.3mm × 26.7mm
The sensor chip	ME280 + MAX44009

Third, Pin Description

Physical picture (label):



Pin1	VCC	Power + (3v-5v)
Pin2	CT	Serial ports UART_TX / IIC_SCL
Pin3	DR	Serial ports UART_RX / IIC_SDA
Pin4	GND Power Ground	
Pin5	NC	Reserved, do not connect
Pin6	INT	max44009 Light intensity chip interrupt S1 = 0 (Pick GND When enabled)
Pin7	SDA	Chip data bus S1 = 0 (Pick GND When enabled)
Pin8	SCL	Chip clock bus S1 = 0 (Pick GND When enabled)
PinA	S0	Serial / MCU_IIC Mode selection
PinB	S1	Use only the sensor chip select

Note: ①, PinA (S0) Hardware modules selected operating mode, Pin2 (CT), Pin3 (DR) for GY-39 Module communication interface,

S0 = 1 (default)	Serial ports UART mode, Pin2 for TX, Pin3 for RX, TTL Level
S0 = 0 (Pick GND Time)	MCU_IIC mode, Pin2 for SCL, Pin3 for SDA,

②, PinB (S1) Using only the sensor chip BME280 + MAX44009 Mode, select MCU It is involved in data processing,

S1 = 1 (default)	MCU + Chip mode, Pin7, Pin8 Do not have any connection
S1 = 0 (Pick GND Time)	Only chip mode, Pin7 Chip SCL bus, Pin8 Chip SDA bus

Fifth, the communication protocol

❶, Serial protocols: when GY-39 Module Hardware PinA (S0) = 1 When using

(1), Serial communication parameters (default baud rate value 9600bps 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 8-13 Bytes (hex):

- ①. Byte0: 0x5A Preamble Flags
- ②. Byte1: 0x5A Preamble Flags
- ③. Byte2: 0x15 This type of data frame (described with reference to the meanings)
- ④. Byte3: 0x04 The amount of data
- ⑤. Byte4: 0x00 ~ 0xFF Data from high 8 Place
- ⑤. Byte5: 0x00 ~ 0xFF Data before low 8 Place
- ⑥. Byte6: 0x00 ~ 0xFF High data 8 Place
- ⑦. Byte7: 0x00 ~ 0xFF Low data 8 Place
- ⑧. Byte8: 0x00 ~ 0xFF Checksum (data accumulation and front, leaving only the low 8 Bit)

Byte2 Meaning representatives description:

Byte2	0x15	0x45	0x55
meaning: Light	intensity Temperature, pressure, humidity, altitude		IIC address

(3), Light intensity data calculation method ① Calculation Method (when Byte2 = 0x15 When data: Byte4 ~

Byte7):

$$\text{Lux} = (\text{High ago 8 Bit} \ll 24) | (\text{Low before 8 Bit} \ll 16) | (\text{After high 8 Bit} \ll 8) | \text{After low 8 Bit units lux}$$

Example: a data

<5A- 5A- 15 -04- 00 -00- FE- 40 - 0B> Lux = (0x00 << 24) |
 (0x00 << 16) | (0xFE << 8) | 0x40 Lux = Lux / 100 = 650.88
 (lux)

② temperature, pressure, humidity, altitude, calculated (when Byte2 = 0x45 When): Temperature: Byte4 ~

~ Byte5

$$T = (\text{high 8 Bit} \ll 8) | \text{low 8 Place}$$

$$T = T / 100 \text{ Unit } ^\circ\text{C}$$

Pressure: Byte6 ~ Byte9

$$P = (\text{High ago 8 Bit} \ll 24) | (\text{Low before 8 Bit} \ll 16) | (\text{After high 8 Bit} \ll 8) | \text{After low 8 Place}$$

$$P = P / 100 \text{ unit pa}$$

humidity: Byte10 ~ Byte11

$$\text{Hum} = (\text{high 8 Bit} \ll 8) | \text{low 8 Place}$$

$$\text{Hum} = \text{Hum} / 100 \text{ Percentile}$$

elevation: Byte12 ~ Byte13

$H = (\text{high 8 Bit} \ll 8) | \text{low 8 Bit units m}$

Example: a data

<5A -5A -45 -0A - 0B -2D -00 -97 -C4 -3F -12- 77 -00- 9C - FA> T = (0x0B << 8) |

0x2D = 2861

temperature T = 2861/100 = 28.61 (°C)

P = (0x00 << 24) | (0x97 << 16) | (C4 << 8) | 3F = 9946175

Barometric pressure P = 9946175/100 = 99461.75 (pa)

Hum = (0x12 << 8) | 77 = 4727

humidity Hum = 4727/100 = 47.27 (%)

altitude H = (0x00 << 8) | 0x9c = 156 (m)

③ MCU_IIC Address (when Byte2 = 0x55 Time):

IIC_ADD = Byte4

Example: a data

<5A-5A-55-01- B6 -C0> IIC_ADD = 0xB6

(8bit iic_add)

then 7bit iic_add for 8bit iic_add Right 1bit Get 0x5b

(4), Command byte, transmitted from the external controller to GY-39 Module (hexadecimal)

1 All serial instruction format, header: 0xA5

Instruction Format: Preamble + command + checksum (8bit) 2 ,

Serial command instructions: ①, serial output configuration register:

command	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1		Bit0
Output command	AUTO	0	0	0	0	0	0	BME MAX	
AUTO (default 1) 1: After power-output configuration in accordance with the previous output, 0 : Does not automatically output after power									
bit6-bit2	Required Zero: 00000								
BME (default 1)	1: Continuous output temperature, pressure, humidity, altitude 0: Not output; if Auto Put 1 , Power-down save								
MAX (default 1)	1: Continuous output light intensity 0: Not output; if Auto Put 1 , Power-down save								

Format: 0xA5 + command + sum

example: bit7 (Auto = 1), bit0 (MAX = 1)

send command: 0xA5 + 0x81 + 0x26 , Represents the continuous output light intensity, power down to save the settings, after automatic re-power continuous output light intensity;

②, set IIC :(instruction address of the instruction after the power-down to save the changes IIC address)

0xAA + XX + sum ----- XX Show 7bit IIC address, sum equal 0xAA + XX The sum of the low 8 Bits, such as the original IIC 7bit Address 0x5B,

Then send 0xAA + 0x5B + 05 To the module, 7bit Left one address, this module

8bit IIC Address 0xB6

③, query output instruction:

0xA5 + 0x51 + 0xF6 ----- Output light intensity (Module returns data type 0x15)

0xA5 + 0x52 + 0xF7 ----- Output temperature, pressure, humidity, altitude (module returns data type 0x45) Note: Consult your instruction does not save power down, as with query output, please note that before this is configured in the command = 0x00

④, baud rate configurations:

0xA5 + 0xAE + 0x53 ----- 9600 (default)

0xA5 + 0xAF + 0x54 ----- 115200

⑨, MCU_IIC protocol: when GY-39 Module Hardware PinA (S0) = 0 When using

① IIC Address, default 7bit Address 0x5B, then 8bit Address 0xB6

IIC Address, through the serial port can be configured to modify, can be modified 128 Different address, power-down save.

② IIC register:

0x00 (Read Only) H	LUX_H	High light intensity before 8 Place
0x01 (Read Only) H	LUX_L	Low light intensity before 8 Place
0x02 (Read Only) L	LUX_H	After the high light intensity 8 Place
0x03 (Read Only) L	LUX_L	After the low-intensity light 8 Place
0x04 (Read Only) T	H	High temperature 8 Place
0x05 (Read Only) T	L	Low temperature 8 Place
0x06 (Read Only) H	P_H	High pressure front 8 Place
0x07 (Read Only) H	P_L	Low air pressure before 8 Place
0x08 (Read Only) L	P_H	After high pressure 8 Place
0x09 (Read Only) L	P_L	After the low air pressure 8 Place
0x0a (Read Only) H	JM_H	High humidity 8 Place
0x0b (Read Only) H	JM_L	Low humidity 8 Place
0x0c (Read Only) H	H	High altitude 8 Place
0x0d (Read Only) H	L	Low altitude 8 Place

Sixth, the use of module

Module data update frequency of about 10Hz;

The serial port module and an output module IIC module defaults **Serial Port Profile** .

Serial mode (default): PinA was in the OFF state and PinB serial mode, the upper module supporting

Machine module can be easily set accordingly; first select a good port and baud rate used before the PC, and then click

"Open serial port" button; a host computer "module settings" screen, corresponding to the third column of the command module serial command

Register, tick in the corresponding position, and then the "Apply" button to the right point, i.e. the module has been set, according to the module

Instruction react (particularly with reference to command Output register); user may also lower left "transmission instruction box" lose

The corresponding instruction, and then click the send button to the right, with the baud rate change method;

MCU_IIC communication mode: The module then left PinA S0 pin GND, IIC mode module enters. **IIC Communication clock**

It must be less than 40 KHZ By reading the register corresponding to all the data reading interval should be less than 10Hz;

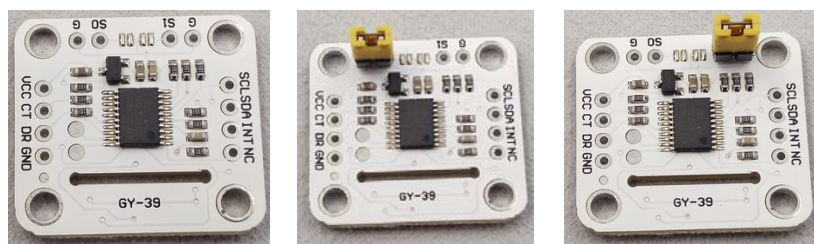
Use only the sensor chip mode: the S1 pin PinB right module connected GND, BME280 on the module and MAX44009

Devices share the IIC SCL, SDA pin, to the INT interrupt pin MAX44009, the MCU module in this mode does not chip

Setting and reading. In this mode your customers to find information and program their own chips BME280 and MAX44009 online,

Here is no longer available.

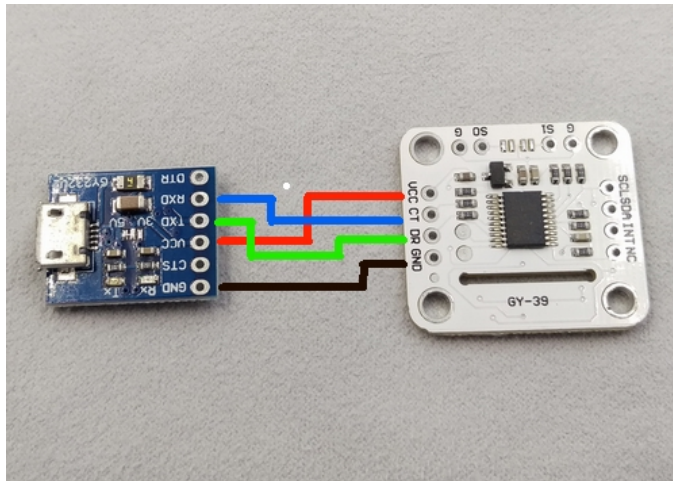
Mode selection below 3 Kind :



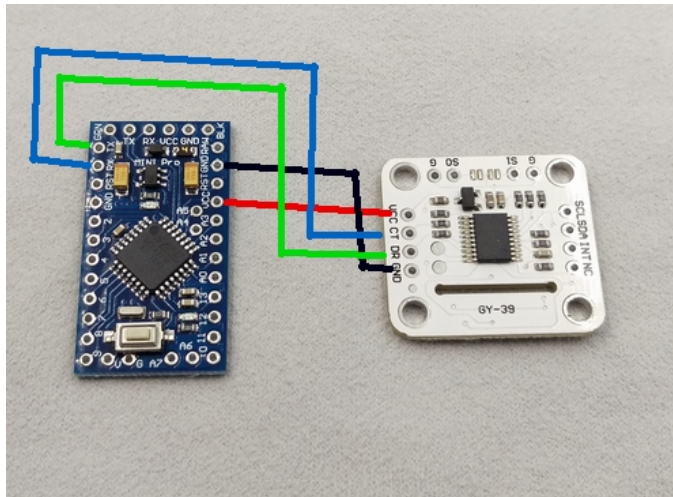
1 , Serial operating mode (default) 2 , MCU_IIC mode 3 ,chip IIC mode

Module and mcu or USB turn ttl ,Connection Diagram:

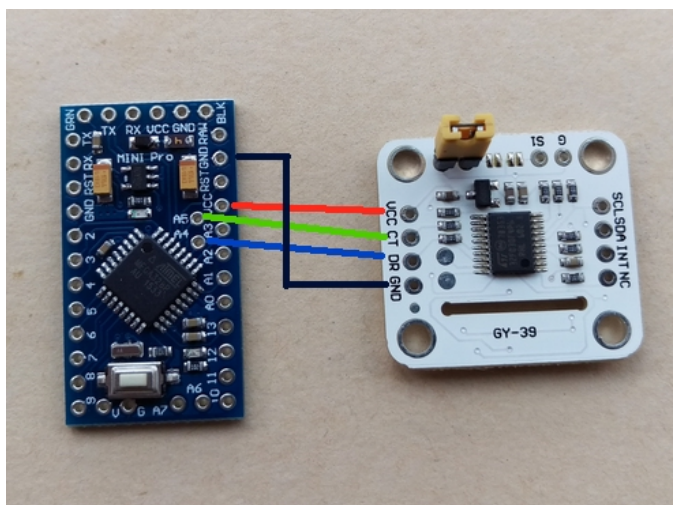
FT232 usb turn ttl connection:



Arduino pro mini Serial connection:



Arduino pro mini iic Connection (Note jumper caps):



PC Screenshots:



Android phone app Screenshot:



PC software, mobile software, follow the instructions and use the video reference provided. Even when the computer needs a separate module USB turn TTL Module, Bluetooth module requires a separate module connected to a mobile phone.

CONCLUSION OF THE

GY39 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.