EN: This Datasheet is presented by the manufacturer.

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GY-53 Infrared ranging module manual V1.0

1. GY-53 is a low cost digital infrared ranging sensor module. Operating voltage 3-5v, low power consumption, small size, easy to install. The working principle is that the infrared LED emits light, and after the object is irradiated, the return light is received by the MCU, and the MCU calculates the time difference to obtain the distance. Directly output the distance value.
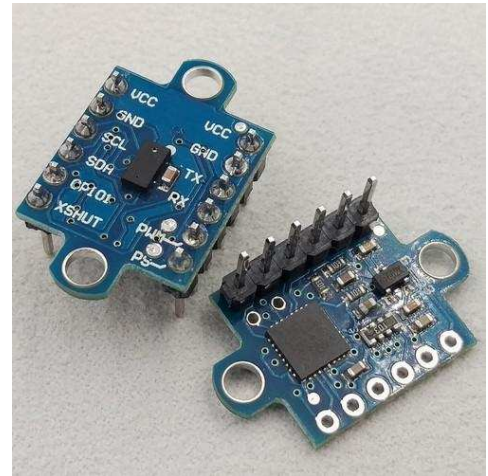
2. This module has two ways to read data, namely serial UART (TTL level) + PWM (1 line) or chip IIC mode. The baud rate of serial port is 9600bps and 115200bps, configurable, continuous, and query output. Mode, you can save the settings when power is off. Provide arduino, 51, stm32 microcontroller communication program. , does not provide schematics and internal microcontroller source code.
The module can also set the working mode of the individual sensor chip. As a simple sensor module, the MCU does not participate in data processing.。

3. **Feature**
1) High cost performance
2) Built-in MCU calculation distance
3) PWM, serial communication format
4) With corresponding PC software

4. **Applications**
1) Smart robot
2) Teaching laboratory equipment
3) Production line product testing
4) Infrared ranging

Technical Parameters

Name	Technical Parameters
Measuring range	0-2 M
Response frequency	22ms(MAX.)
Operating Voltage	3~5 V
Working current	25mA
Operating temperature	-20°～85°
Storage temperature	-40°～125°
Size	25mm×15.6mm
Sensor chip	VL53L0X

5. **Pin description**

Pin1	VCC	Power + (3v-5v)
Pin2	GND	Power GND
Pin3	TX	Serial port USART_TX

Pin4	RX	Serial port USART_RX
Pin5	PWM	Distance converted to PWM form output
Pin6	PS	Serial port /IIC Mode conversion
Pin7	XSHUT	Chip pin
Pin8	GPIO1	Chip pin
Pin9	SDA	Chip SDA
Pin10	SCL	Chip SCL
Pin11	GND	Power GND
Pin12	VCC	Power + (3v-5v)

Note: PS hardware selection module working mode

Ps=1 (default)	Serial port UART mode, Pin3 is TX, Pin4 is RX, TTL level, PWM output works.
Ps=0 (when connected to GND)	In the IIC mode, the user can operate the chip by himself. The module owns the MCU and does not operate the chip. The PWM output does not work.

6. Letter of agreement

❶,Serial protocol: Used when the GY-53 module hardware ps=1

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

Baud rate: 9600 bps   Check bit:N   Data bit:8   Stop bit:1
Baud rate:115200 bps   Check bit:N   Data bit:8   Stop bit:1

(2) Module output format, each frame contains 8-13 bytes (hexadecimal):
①.Byte0:   0x5A   The frame head logo
②.Byte1:   0x5A   The frame head logo
③.Byte2:   0x15   Frame data type
④.Byte3:   0x03   The amount of data
⑤.Byte4:   0x00~0xFF   High 8 digits before data
⑥.Byte5:   0x00~0xFF   Low 8 digits before data
⑦.Byte6:   0x00~0xFF   Module measurement mode
⑧.Byte7:   0x00~0xFF   Checksum (previous data sums up, only 8 bits left)

Byte6 Description of the meaning of the representative:

Byte6	0x03	0x02	0x01	0x00
Meaning	General measurement 0~1.2 m T≈35ms	High precision measurement (default) 0~1.2 m T≈200ms	Fast measurement 0~1.2 m T≈22ms ±3cm	Long distance measurement 0~2m T≈35ms

	±2cm	±1cm		±4cm

Data calculation method: Distance length calculation method

Distance= (Byte3<<8) | Byte4 Units mm Mode= Byte5

Example: one frame of data

< 5A-5A-15-03-04-35-02-07 >

Distance =(0x04<<8)|0x35=1077 mm

Mode=2 high precision mode

1. Command byte, sent by external controller to GY-53 module (hexadecimal)

1) Serial command instructions:

Command format: 0xA5+command+sum

①output mode setting instructions:

0xA5+0x45+0xEA--------------- Continuous output distance data

0xA5+0x15+0xBA--------------- Query output distance data

②save the configuration instructions:

0xA5+0x25+0xCA--------------- Saves the current configuration; includes baud rate, measurement mode, output mode settings

③measurement mode setting instructions:

0xA5+0x50+0xF5--------------- Long distance measurement mode

0xA5+0x51+0xF6--------------- Fast measurement mode

0xA5+0x52+0xF7--------------- High precision measurement mode (default)

0xA5+0x53+0xF8--------------- General measurement mode

④baud rate configuration:

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

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

2. PWM output:

Another form of output data for the module is the PWM output, which has a square wave period of 20 Hz. The high level corresponds to the measured distance

Formula: Distance (mm) = High time (ms) * 100 = High time (us)/10

For example, if the measured high time is 10000us, then Distance=10000/10=1000mm

Module usage

The module is a serial port and an IIC output module, and the module defaults to serial port mode. In serial mode, PWM works automatically. Serial port mode (default): PS port is pulled high, the module is powered on, the default configuration is baud rate 9600, high precision measurement, even

Continued output mode; use the host computer of the module to conveniently set the module accordingly; please select the port and baud rate before using the host computer, and then click the "Open Serial Port" button. At this time, the host computer will Display the corresponding data, click the "Help" button, the specific button usage will be displayed in the status bar below the host computer.

Note that all setup instructions will not be powered down until the save command is sent.

Use only sensor chip mode: PS port is connected to GND. In this mode, the module's MCU does not set and read the chip. In this mode, customers are requested to find the information and programs on the Internet. It is no longer available here.
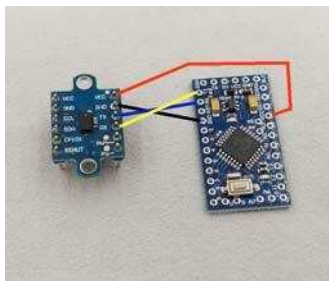
Module and mcu or USB to ttl, connection diagram:

Serial port USB to ttl:

PWM connect mcu：
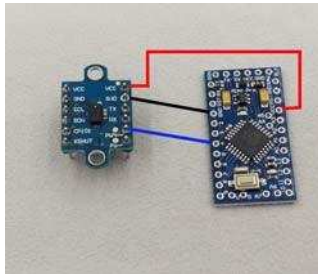
Serial port connection mcu:

Host computer use screenshot

End

The module I/O is TTL level and can be directly connected to the serial port of the MCU.

Chips such as PL2303, CH340, and FT232 are connected, but they cannot be directly connected to the computer's nine-pin serial port.