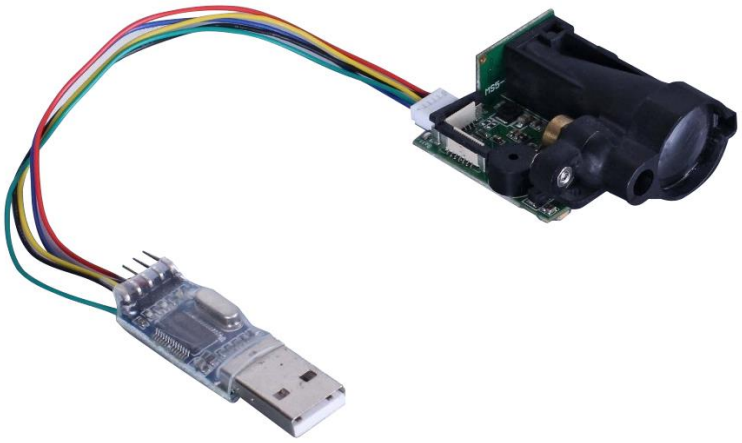
Specification

Theory: Optical Sensor
Product Name: Laser Distance Sensor
Precision: ±0.2mm
Repeat precision: 0.1mm
Measuring frequency:1Hz
Resolution: 0.1mm
Spot diameter: 6mm(10m)
Rate power: 24W
Connection: Plug(M12)
Operating Temperature: -40℃-50℃

µMeasure®



FDA / FC / CE / ISO / ISO 9001 CQC

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Manual

MSD(MSBT)-30-60-100 Specification

1. **Wiring pin-out definition**

As figure shown,there are 5 pins,external interface, interface sequence from 1 to 5.

Pin-out definition as below:

1----Vin Power positive input

2----Rx UART Rx,TTL electric level

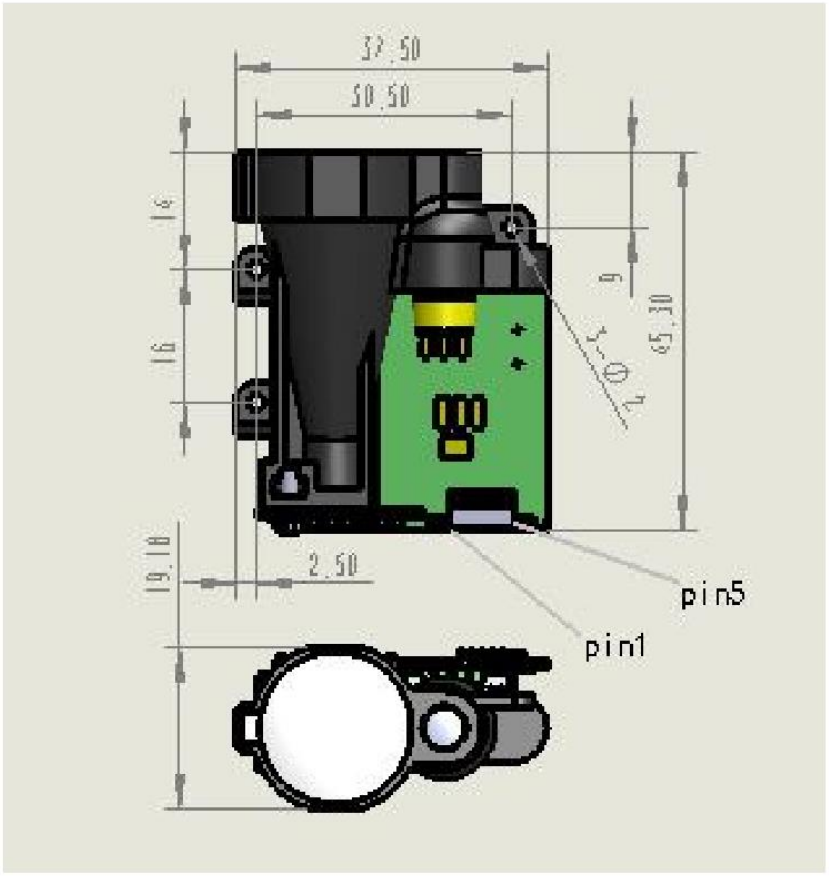
3----Tx UART Tx, TTL electric level

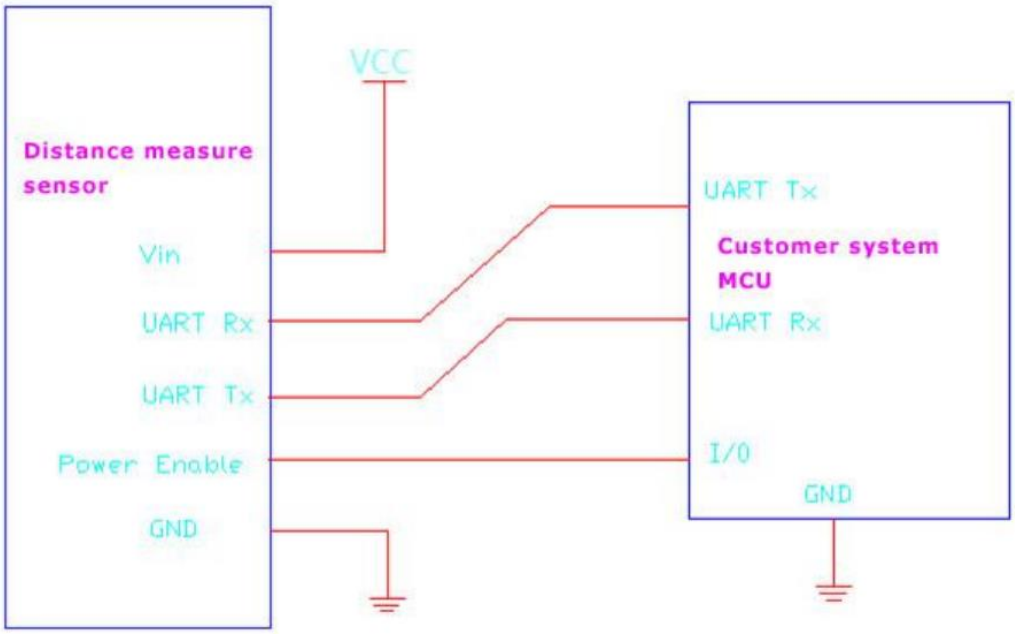
4----Power Enable,

Power supply enabled, high level system power supply main switch power on, low level off.

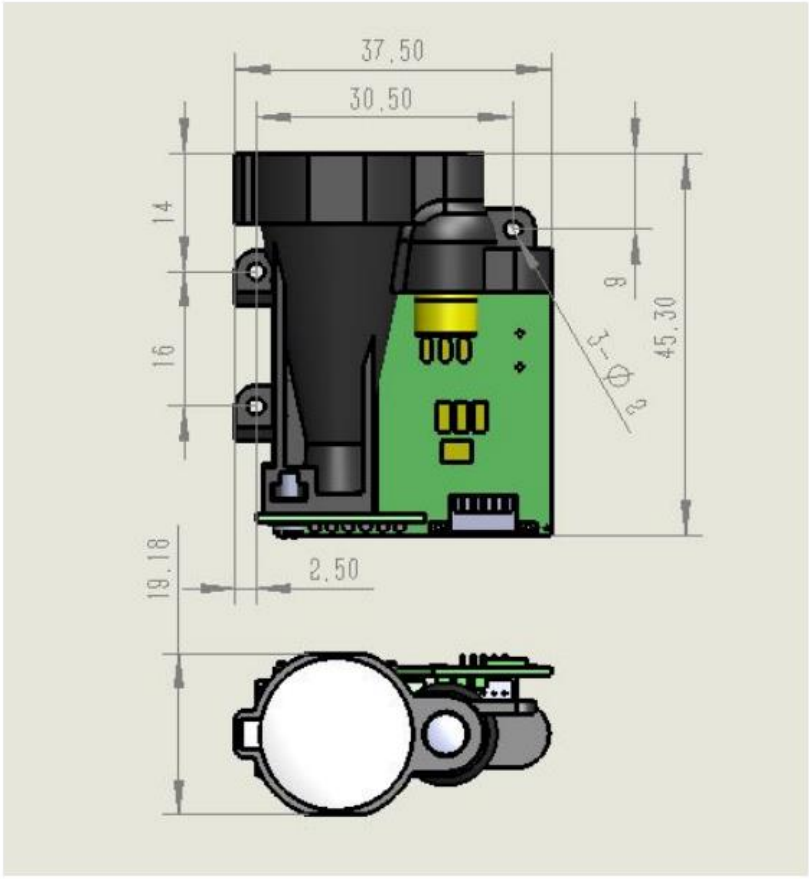
Can be used as a system switch machine control, can also be used to reset the system.

5----GND Power supply negative input





2. Module size (37.5x45.3x19.2mm)



Technical data

Model	MSD-30	MSD-60	MSD-100
Measurement range	0.06-30m	0.06-60m	0.06-100m
Measurement accuracy	Range<20M ±3mm Range≧20M Tolerance calculation formula：（L-20M）*0.3+2MM Speed per second:1-10Hz		
Resolution	1mm		
Supply voltage	2．5-3.0V DC		
Power consumption	<200MA		
Work Temperature	Conventional temperature0~50℃ （ Special environment with incubator-25~50℃）		
Data interface	UART TTL， Baud rate9600 （Special requirements can be customized）		
Conventional control instructions （Special requirements can be customized）	Single measurement, Continuous measurement, Stop continuous measurement,On laser,Off laser,Buzzer disabled, Read version, Read the device type, Read the device address, Set the device address, Read system status		
Data Format	For details, please refer to the instruction manual		
Laser Type	635nm,Class2,<1mW		
The diameter of emmitted Laser beam	Standard:2.5*5mm,		
Buzzer(dB)	70±10dB		
an inventory lead time	0-10pieces, in 2 working days		
	10-100pieces,in 5 working days		
	100-1000pieces,in 20 working days		
If out of stock，Custom cycle time is 25 working days	quantity of order+Ordering cycle=Delivery period (The order quantity cycle is the same as above)		

5.Communication format

Central read/Write							
Start Code	ADD	Command	Data1 (default)	…	Data (default)	CheckSum	End code
1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte

Peripheral Response							
Start Code	ADD	Command	Data1 (default)	…	Data n (default)	CheckSum	End code
1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte

Start code: 0xAA

End code: 0xA8

Add: 0 is broadcast address, 1-127 is peripheral corresponding address of bus.

The broadcast address of 0 can communicate with all peripheral.

Data: Some command maybe don't have data sender or response.

CheckSum: In order to don't have conflict between start byte or end byte.CheckSum effective value only have 7Bit. And the top digit is fixed 0. CheckSum=(Add+Command+Data 1+…+ Data n)& 0x7F.

Command:

Command	Instructions
0x01	Read version No.
0x02	Read equipment category
0x04	Read peripheral add.
0x41	Set peripheral add.
0x08	Read equipment failure code
0x42	On laser
0x43	Off laser
0x44	Single meausre
0x45	Continue measure
0x46	Stop continue measure

6.Command detal(Assume peripheral add is 0x01)

Read version No.						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x01	0x01	0x02	0xA8	
Peripheral response	Start code	Add	Command	Data1	CheckSum	End code
	0xAA	0x01	0x01	0x12	0x05	0xA8

Note: Peripheral return data significance is that version V1.2, integer part is 6:4 Bit. And the decimal part is 3:0 Bit.

Bit7 fixed set equal to 0

Read equipment category						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x01	0x02	0x03	0xA8	
Peripheral Response	Start code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x01	0x02	0x01	0x04	0xA8

Note: Peripheral return data significance is that category is sensor.

Read the equipment system status						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x01	0x08	0x09	0xA8	
Peripheral response	Start code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x01	0x08	0x00	0x09	0xA8

Note: Peripheral return data significance is that 0x00-not reset (or not reset to complete), 0x01-normal standby mode, 0x31-equipment failure. The situation of equipment failure which be suggested to reset system (Supplies power enable to foot level first pulled low wait at least 200ms, and then pulled up) to see whether it can removal fault， If still cannot，it might need to repair.

Read peripheral add						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x00	0x04	0x04	0xA8	
Peripheral response	Start code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x01	0x04	0x01	0x06	0xA8

Note: Peripheral return data significance is that peripheral is 0x01.

Set peripheral add						
Central	Start code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x00	0x041	0x02	0x43	0xA8
Peripheral response	Strart code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x02	0x041	0x01	0x44	0xA8

Note:1）Peripheral send data significance is that the add of peripheral set 0x02.

2）Peripheral send data significance is that 1 is successfully operate and 0 is unsuccessfully operate.

Shoot laser						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x01	0x42	0x43	0xA8	
Peripheral response	Strat code	Add	Command	Data 1	CheckSum	End code
	0xAA	0x01	0x42	0x01	0x44	0xA8

Note: 1) this command function is convenience for the user to aim at, is not a necessary step to measure.

2) The peripheral returns data meaning: 1- operation success, 0- operation failure

Off laser						
Central	Start code	Add	Command	CheckSum	End code	
	0xAA	0x01	0x43	0x44	0xA8	
Peripheral response	Start code	Add	Command	Data1	CheckSum	End code
	0xAA	0x01	0x43	0x01	0x45	0xA8

Note: Peripheral send data significance is that 1 is successfully operate and 0 is unsuccessfully operate.

Single Measure											
Central	Strat code	Add	Command	CheckSum	End code						
	0xAA	0x01	0x44	0x45	0xA8						
Peripheral response	Start code	Add	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	CheckSum	End code
Case 1	0xAA	0x01	0x44	0x30‘0’	0x32‘2’	0x33‘3’	0x34‘4’	0x35‘5’	0x36‘6’	0x79	0xA8
Case 2	0xAA	0x01	0x44	0x45‘E’	0x52 ‘R’	0x52 ‘R’	0x32‘2’	0x35‘5’	0x35‘5’	0x74	0xA8

Note:1）Code of data Byte is ASCII;

2）Suppose the result is 23.456mm, the peripheral will return the Situation 1);

3）Suppose the result is failed, and the ERR code is 255, the peripheral will return the situation2, and so on.

Single Measure											
Central	Strat code	Add	Command	CheckSum	End code						
	0xAA	0x01	0x45	0x46	0xA8						
Peripheral response	Start code	Add	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	CheckSum	End code
Case 1	0xAA	0x01	0x45	0x30 ‘0’	0x32 ‘2’	0x33 ‘3’	0x34 ‘4’	0x35 ‘5’	0x36 ‘6’	0x7A	0xA8
Case 2	0xAA	0x01	0x45	0x45 ‘E’	0x52 ‘R’	0x52 ‘R’	0x32 ‘2’	0x35 ‘5’	0x35 ‘5’	0x75	0xA8

Note：

1)The meaning of the peripheral Response is： Code of data Byte is ASCII.

When continuous measurement start，the device will be enter the continuous measurement.Every time the measurement results will continue to return， there are 2 ways to stop the continuous measurement：.a） to stop the continuous command. b）Power off the device.

2)Suppose the result is 23.456mm, the peripheral will return the Situation 1);

3)Suppose the result is failed, and the ERR code is 255,the peripheral will return the Situation 2)，and so on.

Stop Continuous measurement						
Central	Start Code	ADD	Command	CheckSum	End Code	Central
	0xAA	0x01	0x46	0x47	0xA8	
peripheral Response	Start Code	ADD	Command	Data1	CheckSum	End Code
	0xAA	0x01	0x46	0x01	0x48	0xA8

Note:The peripheral returns data meaning: 1- operation success, 0- operation failure.

Enable/Disable Buzzer						
Central	Start Code	ADD	Command	Data1	CheckSum	End Code
	0xAA	0x01	0x47	0x01	0x49	0xA8
peripheral Response	Start Code	ADD	Command	Data1	CheckSum	End Code
	0xAA	0x01	0x47	0x01	0x49	0xA8

Note.

1)Some sensor models with a buzzer board, if the user wants / does not want to use, you can use the command to enable / disable. The host to send data: 0- disable, 1- enable.

The above example is to enable the buzzer.

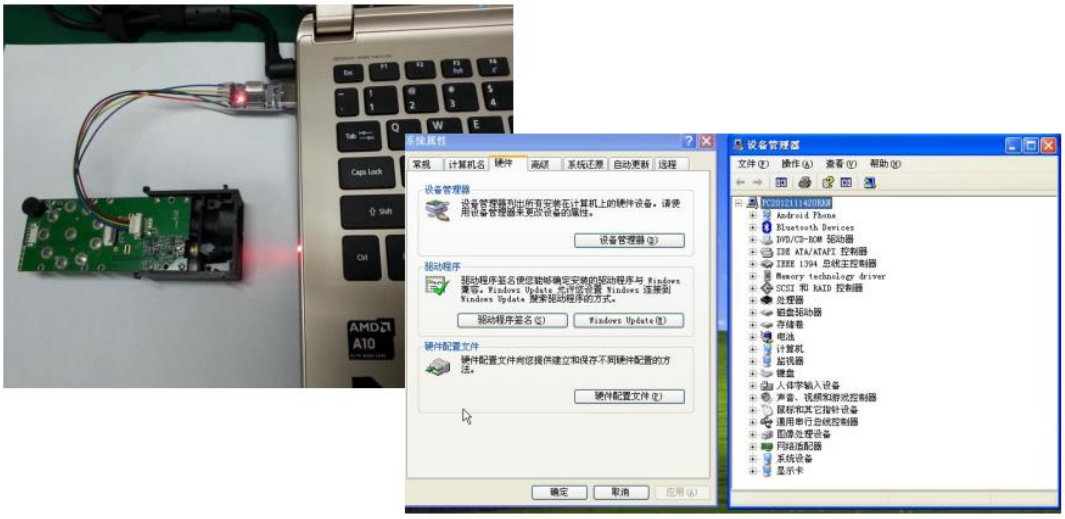
2)The meaning of returning data from the machine is: 1- operation is successful, 0- operation failed.

7. Note

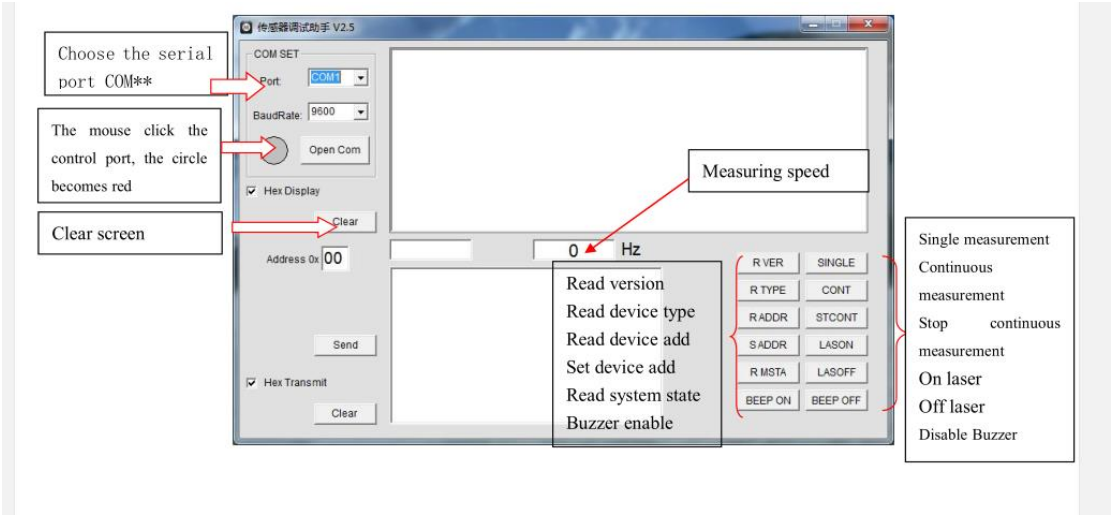
Sensor module power supply switch control is depends on the interface “Power Enable” lead foot electric level to control. Laser module will life loss in the working state of the module, the light receiving element in working state system will supply a reverse voltage, there is loss of life. Therefore, in order to protect the service life of the module, suggest user shutdown the moudule when you finished meausre or not in use.

The first step, install the first RS232 adapter board driver, PC system WinXP, Win7 flagship service pack1
If there is any abnormality during installation, please let us know.
Some systems have compatibility issues.

The second step, insert the RS232 adapter board to the PC USB port, the system will prompt to find the new hardware, select the automatic installation, the installation will be successful in the system hardware, Device Manager which found the serial port, see the serial port is how much COM.



The third step, install the RS232 test software, start after the interface as follows, support system XP, Win7 flagship service pack1


Choose the serial port COM**
The mouse click the control port, the circle becomes red
Clear screen
传感器调试助手 V2.5
COM SET
Port: COM1
BaudRate: 9600
Open Com
Hex Display
Clear
Address 0x 00
Send
Hex Transmit
Clear
Measuring speed
0 Hz
R VER
R TYPE
R ADDR
S ADDR
R MSTA
BEEP ON
SINGLE
CONT
STCONT
LASON
LASOFF
BEEP OFF
Read version
Read device type
Read device add
Set device add
Read system state
Buzzer enable
Single measurement
Continuous measurement
Stop continuous measurement
On laser
Off laser
Disable Buzzer