电应普
BEST SENSOR

DATASHEET

Laser sensor R01 module

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1. Production introduction

1.1. Overview

The R01 module is a small size ranging sensor designed based on robot automatic control application, focus on designing for problems on the current market ranging sensor large size, long response time, poor installation adaptability ,etc.

The R01 module has a series of advantages like small size, small blind spot, short response time, high installation adaptability, dust and waterproof, long life and high reliability.

R01 module, hereinafter referred to as "module".

1.2.Functionality abstracts

- Working voltage:3.3～5V
- 2cm standard blind area
- Maximum range of 2~400cm
- A variety of output modes are available,UART auto / controlled, switch volume TTL level (3.3V),IIC
- The default baud rate is 115,200, Supports modification to 4800, 9600, 14400, 19200, 38400, 57600, 76800
- Ms-level response time, typical value of data output time is 30mS
- Detection angle of about 19 ° (φ7.5×100cm white PVC tube @100cm)
- Waterproof structure, waterproof grade IP67
- The installation adaptability is strong, exposed sensor area is circular design, installation method is simple, stable and reliable
- Working temperature -25°C to +65°C

1.3.Product advantages

- Small blind spot
- Large range
- A variety of output modes are optional
- Fast ranging response
- Support baud rate modification
- Support address modification
- High waterproof grade
- Simple to install
- Wide working temperature
- Data measurement is stable and reliable

1.4.Scope of application

- Robot avoidance and automatic control
- Human induction
- High-speed AF
- Horizontal ranging
- Object proximity and presence awareness

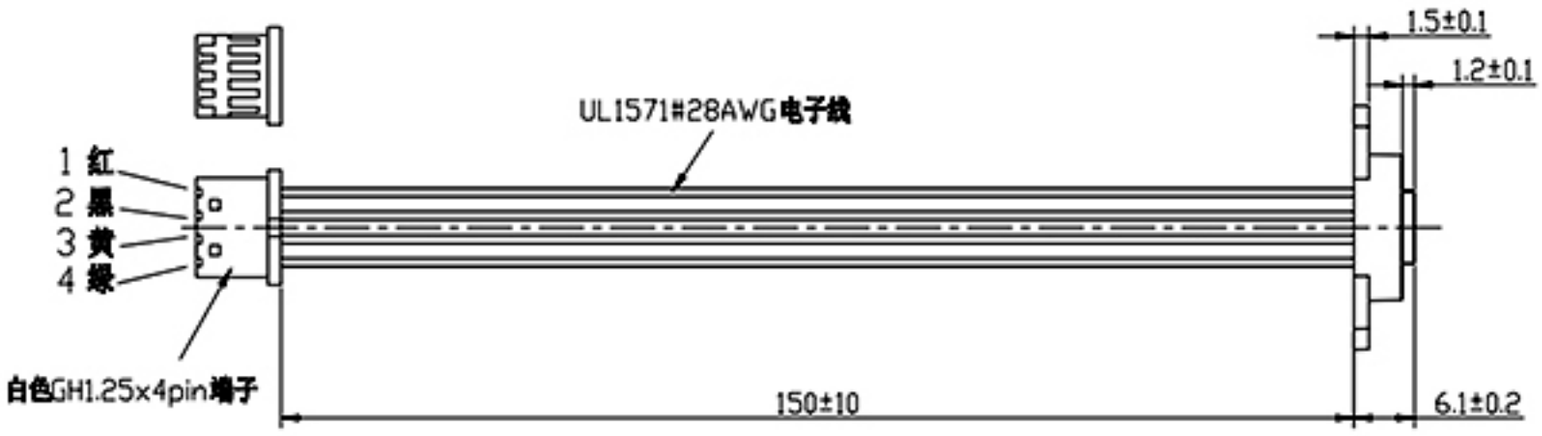
1.5.Basic parameters

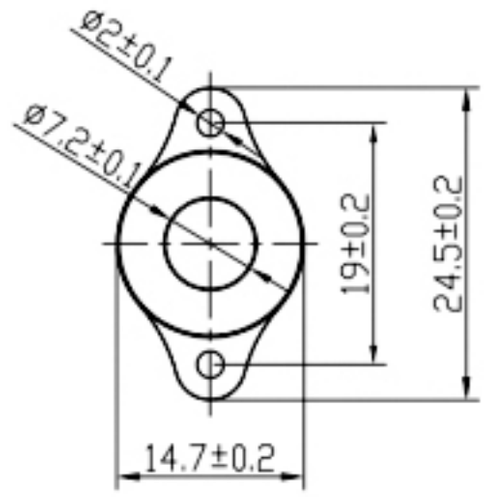
Parameters	UART auto	UART controlled	Switch volume	IIC	Unit	Remark
Working voltage	3.3～5	3.3～5	3.3～5	3.3～5	V	DC
Communication level	3.3(TTL)	3.3(TTL)	3.3(TTL)	3.3(TTL)	V	
Standby current	-	≤5	-	≤5	mA	(1)
Average working current	≤19	≤19	≤19	≤19	mA	(2)
Blind area distance	2	2	2	2	cm	
Indoor range	2～400	2～400	2～400	2～400	cm	(3)
Outdoor range	2～200（3000lx Light intensity） 2～90（15000lx Light intensity）				cm	
Output response time	30～10000 (can set)	19～38 (real-time value)	300～2500	19～38	ms	
Power-on delay working time	≤800				ms	
Working period	30～10000 (can set)	Controlled	100	Controlled		
Working method	Auto	Controlled	Auto	Controlled	-	
Accuracy at normal temperature	Distance ≤25cm： 1cm Distance≥25cm： S*4%cm				cm	(3)
Temperature compensation	built-in					
Single angle	≈19(φ7.5×100cm White PVC Tube @100cm)				°	

Remarks：
(1) The module does not receive the control instruction is in the free state, when the power consumption current is the standby power consumption current;
(2) Typical data obtained by testing with temperature 25°C, humidity 65% RH, power supply 5V, and 100ms working cycle;
(3)) In the room, the temperature is 25℃, the humidity is 65% RH, the fluorescent lamp or LED lamp light intensity is less than 700lx, the measured object is more than 88% reflectivity, 1m×1m whiteboard, where S represents the measured distance;
(4) Outside, the temperature is 25℃, the humidity is 65% RH, the outdoor natural light, the measured object is more than 88% reflectivity, 1m×1m whiteboard;

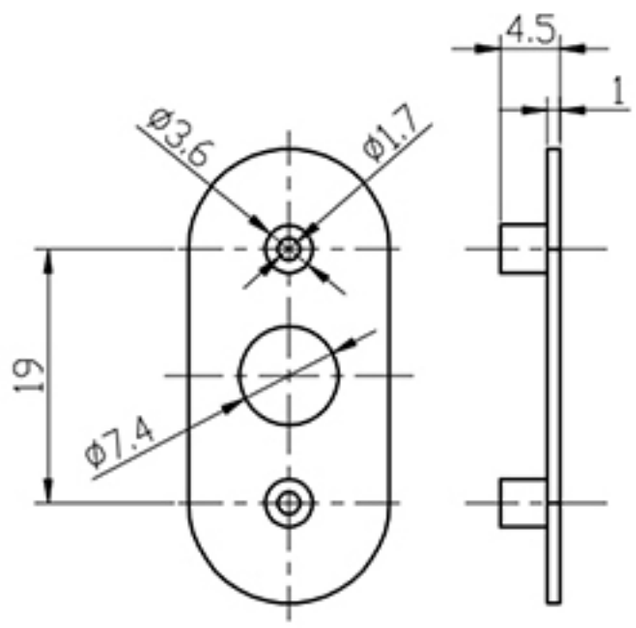
1.6.Mechanical characteristics

Product structure size：(Unit: mm)

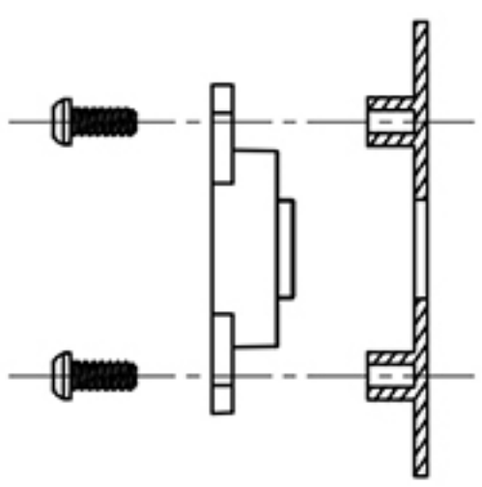




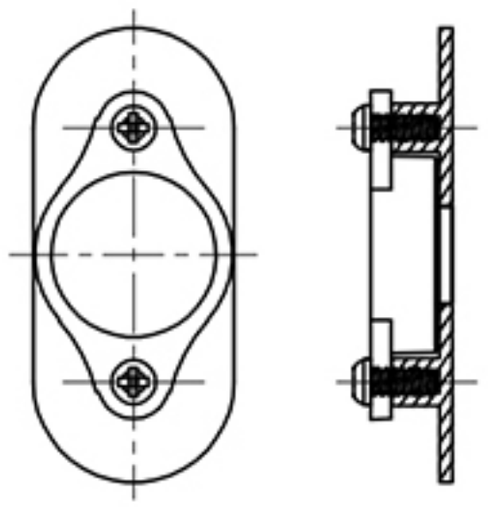
Recommendations of installing the opening：



1.Reserve the sensor mounting hole and the screw hole position



2.Install the sensor and tighten the screws

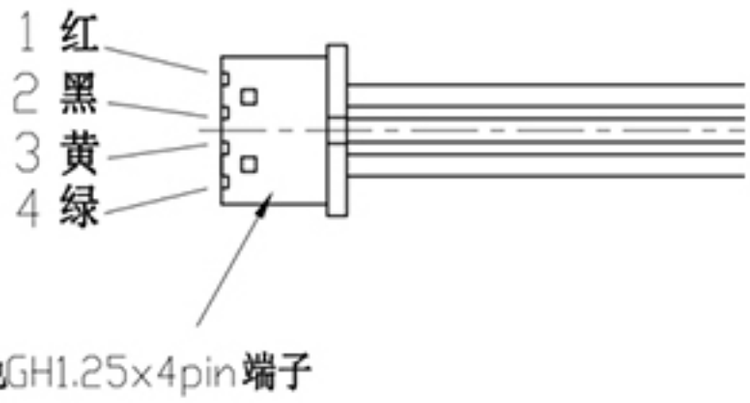


3.Installation completed

1.7.Installation and use matters

1. Please fully expose the middle round lens according to the opening suggestion;
2. When the module lens cannot be flush with the user structure surface, the surrounding guide cone mouth is recommended; if the vertical depression installation is done, the drop between the lens plane and the user shell surface shall not exceed 5mm;
3. The module shell is too brittle, and the tightening strength of the screws should not be too large to prevent cracking. If the electric batch is used, the recommended strength value is 0.2N.m;
4. During use, maintaining the cleanliness of the window mirror will make the module achieve the best performance;
5. If the surface of the lens is found dirty, it is recommended to use a soft cloth to gently wipe and clean it in time, but please avoid the lens damage caused by repeated friction;
6. The strong ambient light and the deep color of the measured object will have some impact on the module performance.

1.8.Interface definition



PIN #	PIN Colour	PIN name	PIN description	Remarks
1	red	VCC	Power input PIN	(1)
2	black	GND	Ground	(1)
3	yellow	RX	Function PIN	(2)
4	green	TX	Function PIN	(2)

Remarks:
(1) Do not reverse the power pin, otherwise it will cause irreversible damage to the module!
(2)Lead wire, pin function and output mode of product model correspond one-to-one, and cannot coexist with other output modes.

2.Limit parameters

2.1.Rated environment conditions

Item	Minimum value	Typical value	Maximum	Unit	Remark
Storage temperature	-30	25	80	℃	
Storage Humidity		65%	90%	RH	(1)
Operating temperature	-25	25	65	℃	
Operating Humidity		65%	80%	RH	(1)

Remark:

(1) a. When the ambient temperature is 0-39°C, the maximum humidity is 90% (non-condensing)

b. When the ambient temperature is 40-50°C, the highest humidity is the highest humidity in nature at the current temperature (no condensation)

2.2.Rated electrical conditions

Parameter	Specification			Unit	Remarks
	Minimum	Typical value	Maximum		
Operating voltage	3.3	5	5.5	V	
Peak current			40	mA	(1)
Input ripple			50	mV	Peak to peak
Input noise			100	mV	Peak to peak
ESD			4000	V	

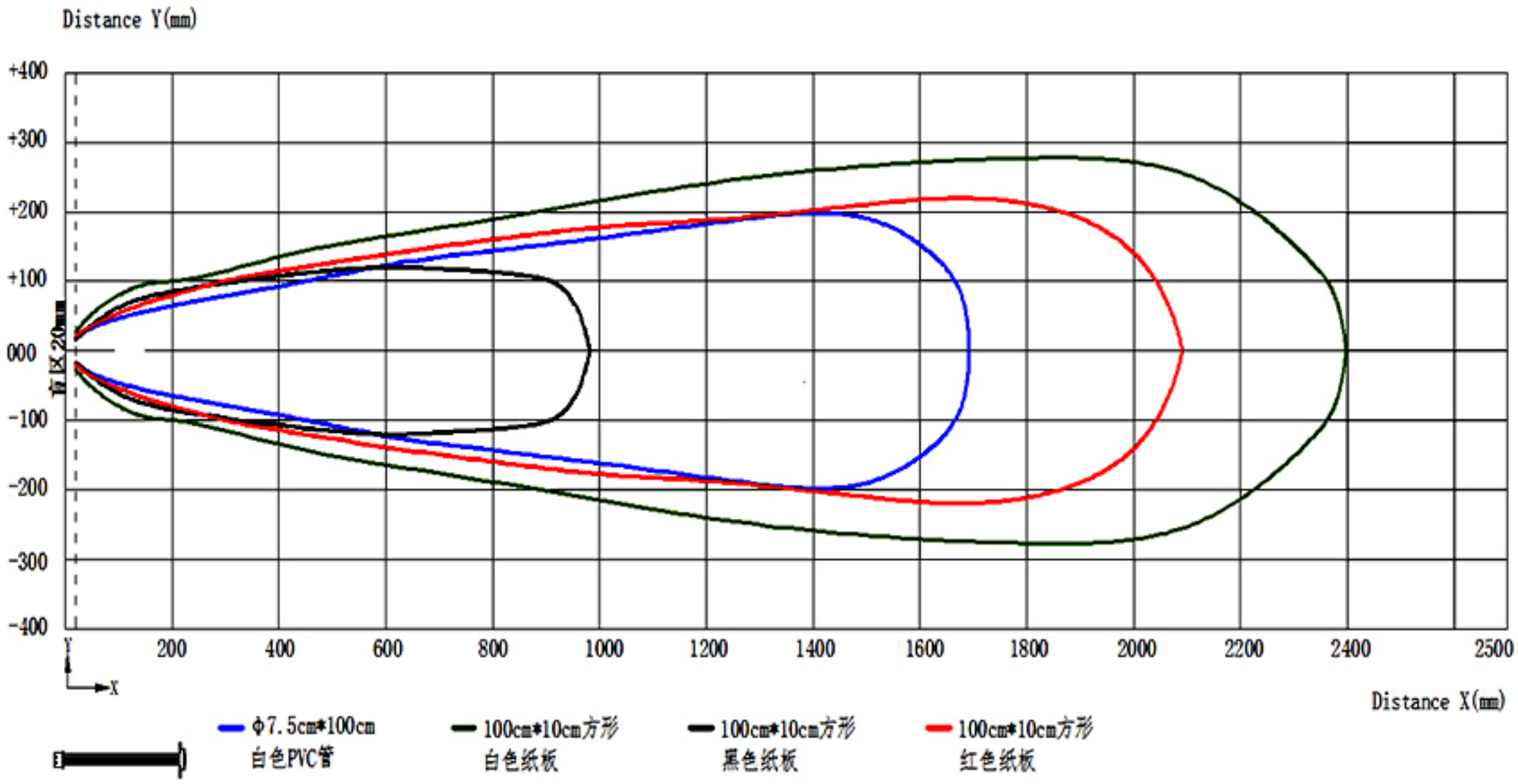
3.Model selection description

The output format of this series of ranging modules is divided into four types, and users can choose the corresponding model according to the actual application. If there are special requirements to modify the communication protocol, etc., you need to communicate with our FAE engineers during purchasing.

Serial	R01series model	Feature	Output method	Remarks
1	DYP-R01UW-V1.0	waterproof case	UART auto	
2	DYP-R01TW-V1.0	waterproof case	UART controlled	
3	DYP-R01GDW-V1.0	waterproof case	Switch output	
4	DYP-R01CW-V1.0	waterproof case	IIC	

4.Reference diagram of the effective detection range

（1）**Under the normal temperature of the laboratory, the following four tested objects and color test reference data are obtained.**



5.Matters needing attention

1. The company reserves the right to change this document and update the functions without notice;
2. Please pay attention to the structural tolerances when designing. Unreasonable structural design may cause transient abnormalities in module functions;
3. Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause abnormal module function;
4. When the boundary application of the product limit parameter is involved, you can contact our FAE to confirm the relevant precautions.

6.Packaging specification

1. The default is DYP's conventional packaging method;
2. Packaging materials can be customized according to customer IQC related standards;
3. The container transportation method needs to adopt the staggered consolidation method, and at the same time, the outer edge of the single stack needs to be wrapped with a reinforced gusset to provide sufficient support.