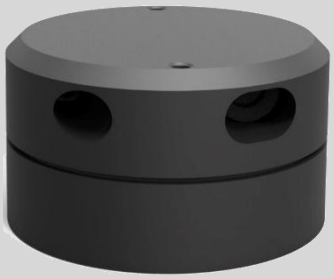
YDLIDAR G4

360 Degree Laser Range Scanner

Datasheet



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PRODUCT INTRODUCTION

YDLIDAR G4 LIDAR is a 360-degree two-dimensional laser range scanner (LIDAR) developed by Shenzhen Yuedeng Technology Co.,Ltd.. This product is based on the principle of triangulation distance measurement, together with the relevant optical, electrical, algorithm design, to achieve high-frequency high-precision distance measurement. After power on, YDLIDAR G4 start rotating and scanning. User can get range scan point cloud data through the communication interface (Serial port/USB).

PRODUCT FEATURES

- 360 degree 2D range scanning
- Stable performance, high precision
- Wide ranging range, not less than 16m
- Strong ability to resist environmental light interference
- Industrial brushless motor drive, stable performance
- Reaches FDA Laser safety standard Class I
- 360 degree omnidirectional scanning, 5-12Hz adaptive scanning frequency
- OptoMagnetic technology, Wireless data communication
- Range Sample frequency 9000hz

APPLICATIONS

- Robot navigation and obstacle avoidance
- Robot ROS teaching, research
- General simultaneous localization and mapping (SLAM)
- Environmental scanning and 3D reconstruction
- Navigation and obstacle avoidance for home service robot / floor - sweeping robot

INSTALLATION AND SIZE

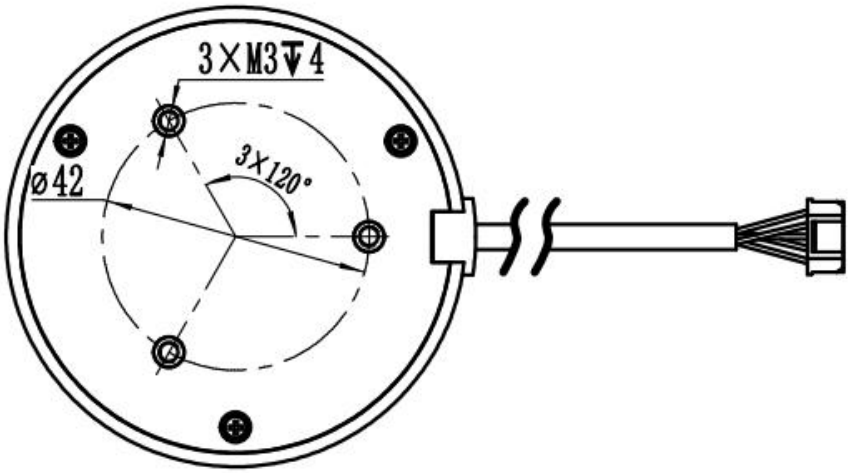

FIG. 1 YDLIDAR G4 INSTALLATION DIMENSIONS

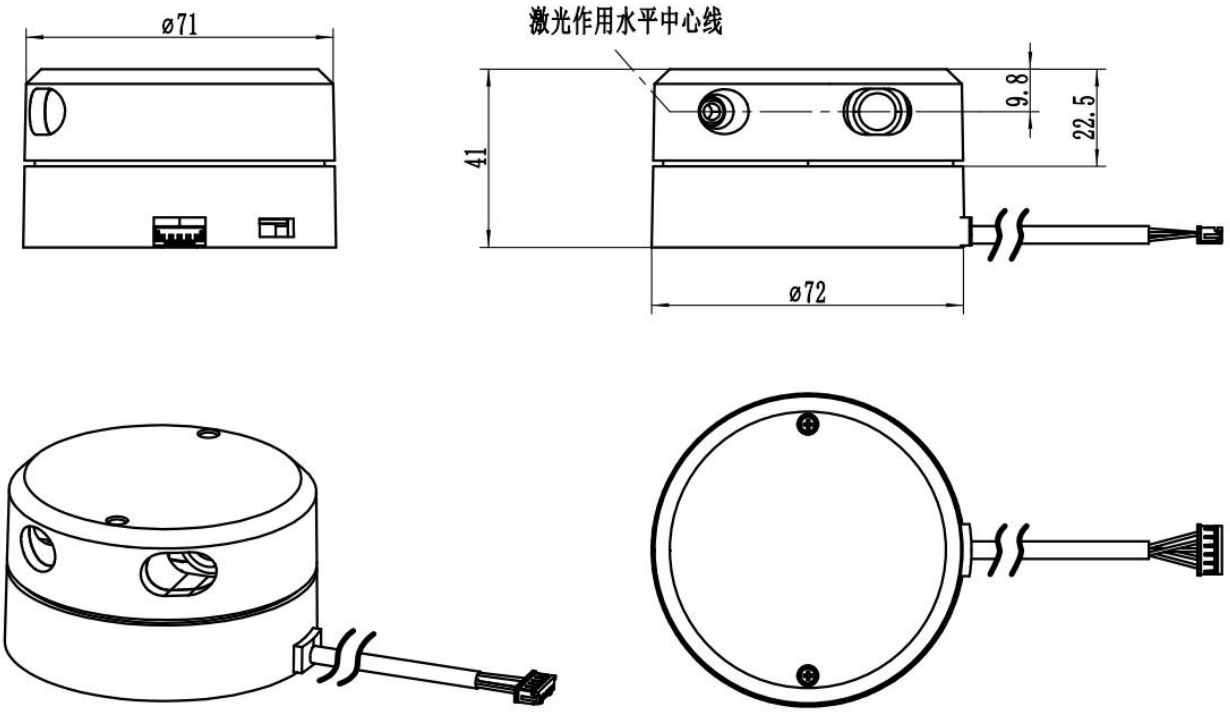

FIG. 2 THE MECHANICAL SIZE OF YDLIDAR G4

SPECIFICATIONS

Measurement Performance

Table 1 YDLIDAR G4 Measurement Performance

Subject	Minimum value	Typical value	Maximum value	Unit	Remarks
Range sample frequency	4000	9000	9000	Hz	9000 ranging times per second
Scan frequency	5	7	12	Hz	Software speed regulation
Ranging range	0.10	-	16	m	Range frequency=4KHz
	0.22	-	16	m	Range frequency=8KHz
	0.26	-	16	m	Range frequency=9KHz
Angular Range	-	0~360	-	Deg	-
Distance Resolution	-	<0.5	-	mm	Ranging range <2m
		< 1% of actual distance			Ranging range >2m
Angular resolution	0.26	0.28	0.30	Deg	Scan frequency =7 Hz

Power Supply specifications

Table 2 YDLIDAR G4 Power Supply

Subject	Minimum value	Typical value	Maximum value	Unit	Remarks
Supply voltage	4.8	5.0	5.2	V	If the voltage exceeds the max value, it may damage the core. Too low Voltage may affect performance and even stop ranging
Ripple voltage	0	50	100	mV	High ripple may cause working failure
Start current	450	500	550	mA	Relatively higher current is required at startup of the device
Sleep current	-	<50	-	mA	System dormancy with motor rotating
Working current	400	450	480	mA	

External Interface Definition

G4 provides two interfaces, USB Type-C and PH2.0-5P bus interface.

USB Type-C: Data communication and system power supply.

PH2.0-5P: System power supply, Data communication.

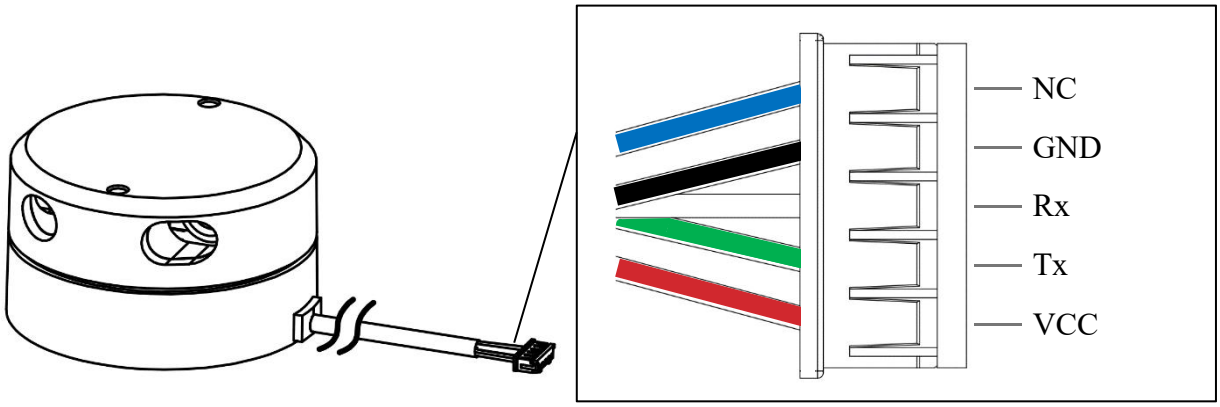

FIG.3 PHYSICAL INTERFACE OF YDLIDAR G4

Table 3 YDLIDAR G4 Interface Definition

Pin	Type	Description	Default Value	Range	Remarks
VCC	Power supply	V+	5V	4.8V~5.2V	-
Tx	Input	System serial port input	-	-	Data flow : peripheral → lidar
Rx	Output	System serial port output	-	-	Data flow: lidar → peripheral
GND	Power supply	V-	0V	0V	-
NC	Reservation	Reservation pin	-	-	-

Data communication

G4 takes the 3.3V-TTL serial port (UART) as the communication interface. Users can connect the external system and the product through the physical interface on the product and communicate in real time according to the system's communication protocol to obtain the scanned point cloud data, device information, working status, and can set the device working mode. The communication shows as follows:

Table 4 Serial port specification of YDLIDAR G4

Subject	Mnimum value	Typical value	Maximum value	Unit	Remarks
Baud rate	-	230400	-	bps	8 bit data,1 stop bit, no check bit
Output high voltage	1.8	3.3	3.4	V	>1.8V
Output low voltage	0	0	0.5	V	<0.5V

Motor Control

G4 motor driver has motor speed regulation function, and provides command interface instead of hardware interface for Motor control. Please refer to the development document of this product.

Laser power specifications

The infrared laser power used by G4 meets the safety standard of FDA Class I laser. When the system works, laser and optical lens are used to transmit and receive laser signals, so as to achieve high frequency ranging. To ensure the performance of the system, make sure that the laser and optical lens of the G4 are clean. The specifications of the laser are as follows：

Table 5 Optical parameters of YDLIDAR G4 Laser

Subject	Minimum value	Typical value	Maximum value	Unit	Remarks
Laser wavelength	775	785	795	nm	Infrared Light band
Laser power	-	3	5	mW	Peak power
FDA	 Class I				

Scanning Polar Coordinate System Definition

For secondary development, G4 defines the polar coordinate system internal. The polar coordinates of the system are the poles at the center of the rotating core of G4 , the specified angle is clockwise, and the zero position angle is located in the direction of the outlet opening of the G4 PH2.0-P interface line, as shown in the figure:

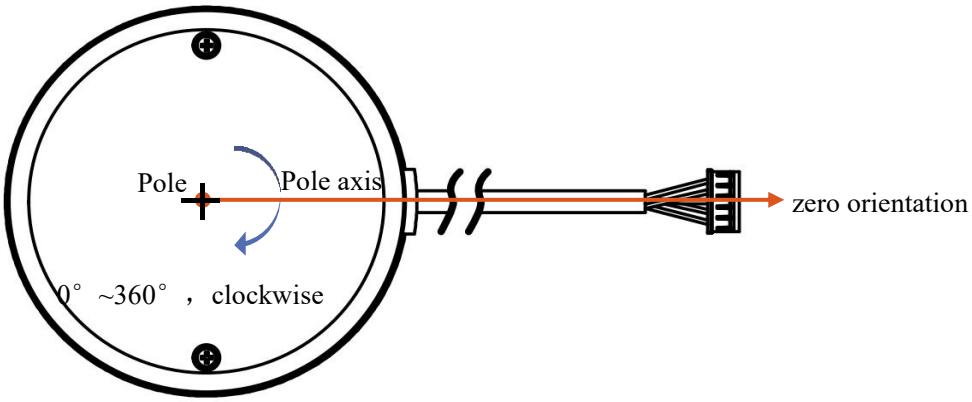

FIG.4 YDLIDAR G4DEFINITION OF POLAR COORDINATE SYSTEM

Other Specifications

Table 6 YDLIDAR G4 Working Environment

Subject	Minimum value	Typical value	Maximum value	Unit	Remarks
Working temperature	0	20	40	℃	Working in a high temperature environment for a long time will reduce the life span.
Light Environment	0	550	2000	Lux	For reference only
Weight	-	214	-	g	Net weight

SOFTWARES AND SUPPORT

G4 provides rich hardware and software interfaces, it can realize motor power control, speed control, ranging frequency enable control and output control. With those, users can control the motor and the scanner core of G4. We provide 3D model of G4 and a Windows graphical coding client for users, as well as the corresponding SDK development kit and ROS development kit. Users can download the software from the official website http://eaibot.com/. We also provides the G4 development manual, the SDK development manual and the ROS manual. Please download it at the official website.

REVISE

Date	Version	Revise content
2017-12-6	1.0	First draft