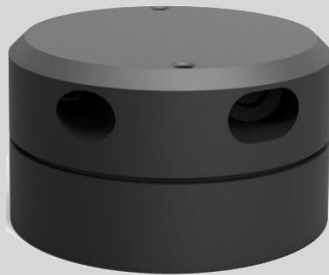


# **YDLIDAR G4 DATASHEET**



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## OVERVIEW

YDLIDAR G4 is a 360-degree two-dimensional rangefinder (hereinafter referred to as G4) developed by YDLIDAR team. Based on the principle of triangulation, it is equipped with related optics, electricity, and algorithm design to achieve high-frequency and high-precision distance measurement. The mechanical structure rotates 360 degrees to continuously output the angle information as well as the point cloud data of the scanning environment while ranging.

### Product Features

- 360 degree scanning distance measurement
- Small distance error, stable performance and high accuracy
- Ranging distance 16m (Max.)
- Strong resistance to ambient light interference
- Industrial brushless motor
- Laser power meets Class I laser safety standards
- 5-12Hz adaptive scanning frequency (support customization)
- Ranging frequency 9kHz (Max.) (support customization)

### Applications

- Robot navigation and obstacle avoidance
- Robot ROS teaching and research
- Regional security
- Environmental scanning and 3D reconstruction
- Commercial robot /Robot vacuum cleaner

### Installation and dimensions

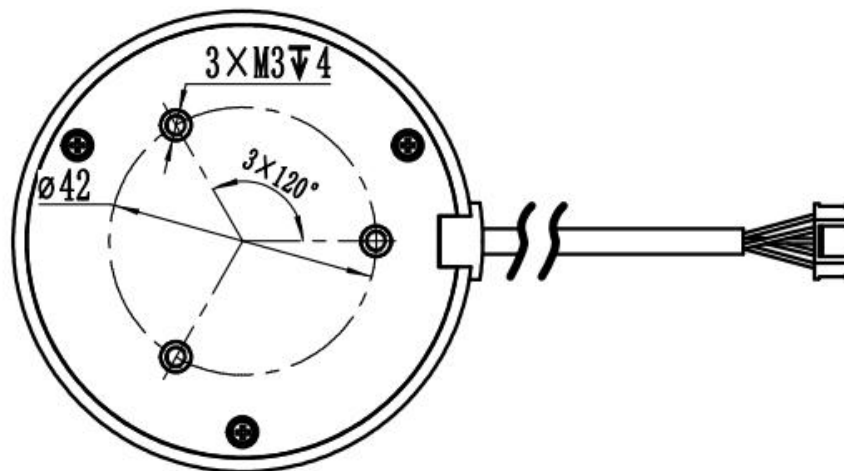


FIG1 YDLIDAR G4 INSTALLATION SIZE

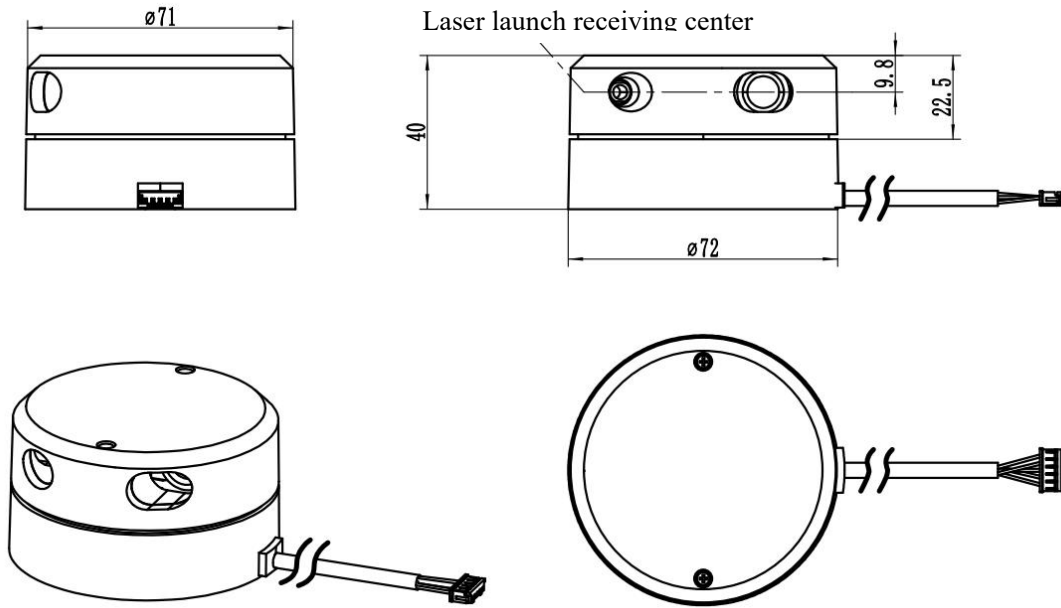


FIG2 YDLIDAR G4 MECHANICAL DIMENSIONS

## SPECIFICATIONS

### Product Parameter

CHART1 YDLIDAR G4 PRODUCT PARAMETER

Item	Min	Typical	Max	Unit	Remarks
Ranging frequency	4000	9000	9000	Hz	Support customization
Motor frequency	5	7	12	Hz	Software speed control, customizable
Ranging distance	0.10	-	16	m	Motor frequency=4KHz
	0.22	-	16	m	Motor frequency=8KHz
	0.26	-	16	m	Motor frequency=9KHz
Scanning angle	-	0~360	-	Deg	-
Absolute error	-	2	-	cm	Distance ≤ 0.5m
Relative error	-	1.0%	-	-	0.5m < Distance ≤ 6m
	-	1.5%	-	-	6m < Distance ≤ 8m
Angle resolution	0.26	0.28	0.30	Deg	Scanning frequency=7

Note 1: The ranging range and relative accuracy above are the factory inspection standard;

Note 2: The relative error value indicates the accuracy of the Lidar measurement.

*Relative error = (Measuring distance - Actual distance) / Actual distance \* 100%.*

*Please avoid using Lidar under high-temperature, high-low temperature or strong vibration uses, which might cause a 3% relative error.*

**Electrical Parameter**

**CHART2 YDLIDAR G4 ELECTRICAL PARAMETER**

Item	Min	Typical	Max	Unit	Remarks
Supply voltage	4.8	5.0	5.2	V	Excessive voltage might damage the Lidar while low affect normal performance
Voltage ripple	0	50	100	mV	Excessive ripple affect normal performance
Starting current	700	800	850	mA	Higher current required at start-up
Standby current	-	<50	-	mA	System sleep, motor stops
Working current	350	400	450	mA	System work, motor rotation

**Interface Definition**

G4 provides a PH1.25-4P female connector with functional interfaces for system power, data communication and motor control.

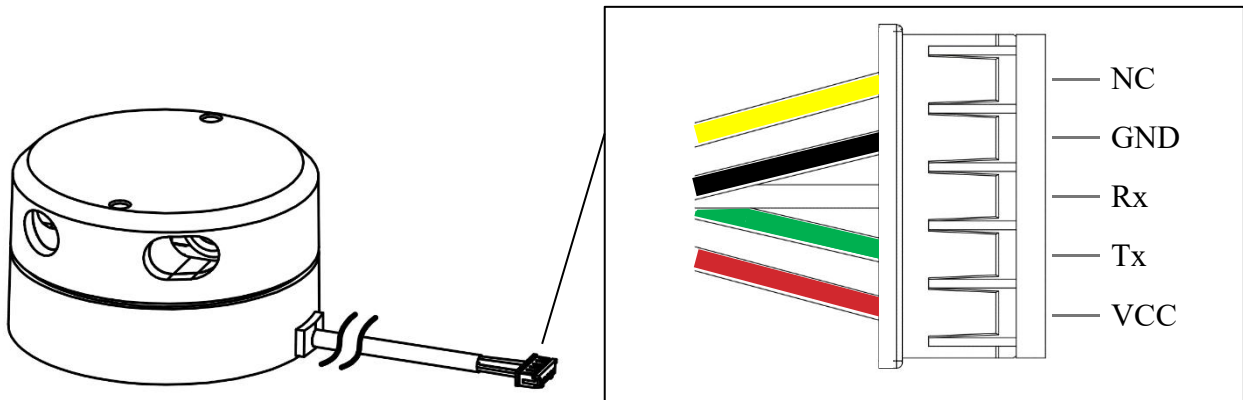


FIG3 YDLIDAR G4 INTERFACES

**CHART3 YDLIDAR G4 INTERFACE DEFINITION**

Pin	Type	Description	Defaults	Range	Remarks
VCC	Power Supply	Positive	5V	4.8V~5.2V	-
Tx	Output	System serial output	-	-	Data stream: Lidar→Peripherals
Rx	Input	System serial port Input	-	-	Data stream: Peripherals→Lidar
GND	Power Supply	Negative	0V	0V	-
NC	-	Reserved pin	-	-	-

**Data communication**

With a 3.3V level serial port (UART), users can connect the external system and the product through the physical interface. Users can obtain the real-time scanned point cloud data, device information as well as device status.

**CHART4 YDLIDAR G4 SERIAL SPECIFICATION**

Item	Min	Typical	Max	Unit	Remarks
Baud rate	-	230400	-	bps	8-bit data bit,1 stop bit, no parity
High Signal Level	1.8	3.3	3.4	V	Signal voltage>1.8V
Low signal Level	0	0	0.5	V	Signal voltage<0.5V

**Motor control**

The G4 has its own motor drive with motor speed control function and a command interface instead of a hardware interface for motor control. Please refer to the development manual of this product for details.

**Optical Characteristic**

G4 uses an infrared point pulsed laser that meets FDA Class I laser safety standards. The laser and optical lens finish the transmission and reception of the laser signal to achieve high- frequency ranging while working. To ensure system ranging performance, please keep the laser and optical lens clean. The detailed optical parameters are as follows:

**CHART5 YDLIDAR G4 LASER OPTICAL PARAMETERS**

Item	Min	Typical	Max	Unit	Remarks
Laser wavelength	775	785	795	nm	Infrared band
Laser power	-	3	5	mW	Peak power
FDA	⚠ Class I				

**Polar coordinate system definition**

For secondary development, G4 internally defines a polar coordinate system.

Pole: the center of the rotating core of the G4;

Positive direction: clockwise;

Zero angle: The zero angle is offset from the exit of the G6 PH2.0-5P interface line by 4° counterclockwise (top view)

Due to individual differences, there is a +/- 3° deviation exists as shown below:

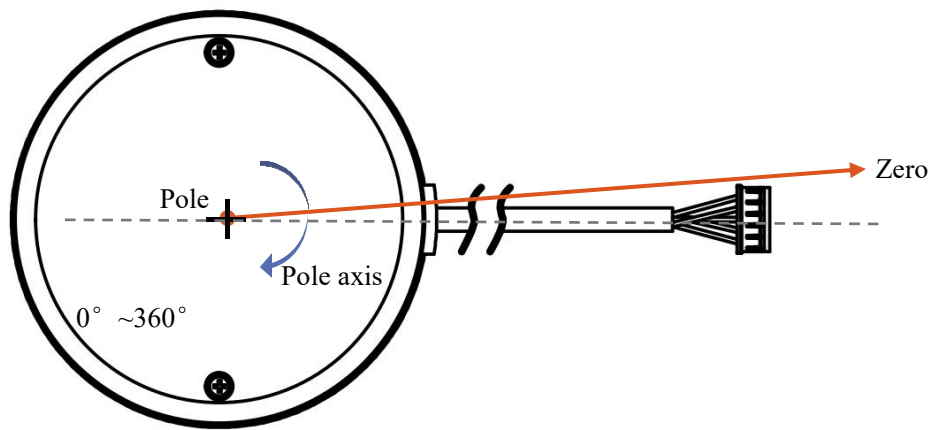


FIG4 YDLIDAR G4 POLAR COORDINATE SYSTEM DEFINITION

*Note: When the Lidar is assembled on the machine, the deviation of the assembly may cause slight difference in the consistency of the zero position. For the convenience of use, we provide zero calibration software, which can customize the zero direction and assemble to the machine. The Lidar is calibrated twice. For details, please refer to the instruction manual.*

**Others**

**CHART7 YDLIDAR G4 OTHERS**

Item	Min	Typical	Max	Unit	Remarks
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Operating temperature	0	20	50	°C	Please do not use the lidar in overheat or low temperature.
Lighting environment	0	550	2000	Lux	For reference only
weight	-	214	-	g	Net weight

### Development and support

With a wealth of hardware and software interfaces, G4 can support motor enable control, speed control, and enable control output control of the ranging core. Thus, users can also implement the power control and scan control purpose.

Also, the 3D model is available for users. YDLIDAR provides the graphical debugging client-PointCloud Viewers, together with the corresponding SDK development kit and ROS development kit.

For the G4 development manual, SDK development manual and ROS manual, please download from our official website: [www.ydlidar.com](http://www.ydlidar.com)

### Revision

Date	Version	Contents
2017-12-06	1.0	First writing
2018-01-15	1.1	The working temperature is adjusted to 0-50 degrees, The interface definition is corrected. See Table 3 for details.
2018-07-24	1.2	The range resolution is modified to 1% accuracy within 8m; Zero 4° deviation
2019-02-15	1.3	Modify the relative error; The modification period is 2015-2019
2019-03-12	1.4	The new board removes the USB Type-C interface, Corrects the page number to 8 pages, Increases the relative error.
2019-09-16	1.5	Adjust starting current and working current
2019-10-24	1.6	Adjust zero