

# G1 DATA SHEET



# CONTENTS

<b>1</b>	<b>PRODUCT OVERVIEW</b> .....	<b>1</b>
1.1	Product Features .....	1
1.2	Applications .....	1
1.3	Installation and Dimensions.....	1
<b>2</b>	<b>SPECIFICATIONS</b> .....	<b>2</b>
2.1	Performance Parameter .....	2
2.2	Electrical Parameter.....	3
2.3	Interface Definition.....	3
2.4	Data Communication .....	3
2.5	Motor Control.....	4
2.6	Optical Characteristic.....	4
2.7	Polar Coordinate System Definition .....	4
2.8	Others .....	5
<b>3</b>	<b>REVISE</b> .....	<b>6</b>

## 1 PRODUCT OVERVIEW

YDLIDAR G1 is a 360 degrees 2D LiDAR (hereinafter referred to as G1) 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.

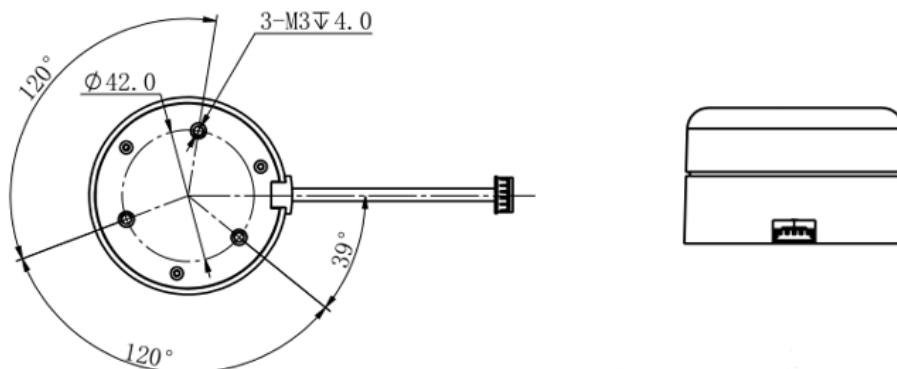
### 1.1 Product Features

- 360 degrees scan ranging
- High accuracy, stable performance
- Wide measuring range
- Strong resistance to ambient light interference
- Industrial grade brushless motor drive, stable performance
- Class I eye safety
- 360 degrees omnidirectional scanning and 5-12Hz frequency
- Using optical and magnetic fusion technology to realize wireless communication and wireless power supply
- High-speed ranging, up to 9000Hz frequency

### 1.2 Applications

- Robot navigation and obstacle avoidance
- Industrial automation
- Regional security
- Intelligent transportation
- Environmental scanning and 3D reconstruction
- Digital multimedia interaction
- Robot ROS teaching and research

### 1.3 Installation and Dimensions



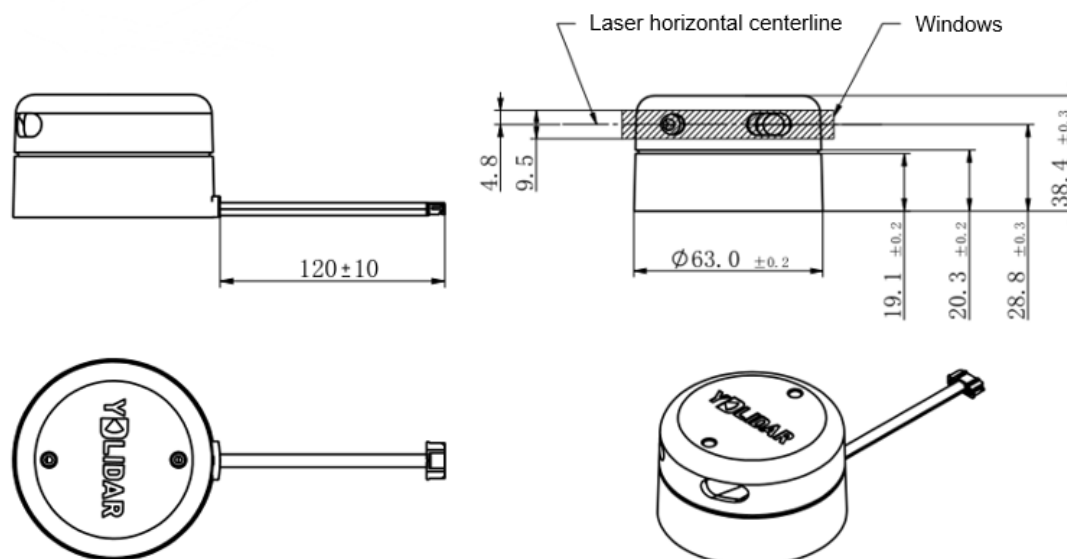


FIG 1 YDLIDAR G1 INSTALLATION&MECHANICAL SIZE

## 2 SPECIFICATIONS

### 2.1 Performance Parameter

**CHART 1 YDLIDAR G1 PERFORMANCE PARAMETER**

Item	Min	Typical	Max	Unit	Remarks
Ranging frequency	/	9000	/	Hz	Ranging 9000 times per second
Motor frequency	5	7	12	Hz	Software control
Ranging distance	0.12	/	8	m	Ranging frequency=4KHz, 80% Reflectivity
	0.22	/	8	m	Ranging frequency=8KHz, 80% Reflectivity
	0.26	/	8	m	Ranging frequency=9KHz, 80% Reflectivity
Field of view	/	0-360	/	Deg	/
Systematic error	/	2	/	cm	Range ≤ 1m
Relative error	/	2.0%	/	/	1m < Range ≤ 8m
Tilt angle	0.25	1	1.75	Deg	Laser pitch angle
Angle resolution	0.2 (Frequency @5Hz)	0.28 (Frequency @7Hz)	0.48 (Frequency @12Hz)	Deg	Ranging frequency=9KHz

Note 1: It is factory FQC standard value, 80% reflectivity material object.

Note 2: The relative error value indicates the accuracy of the Lidar measurement. Relative error (mean value) = (average measured distance-actual distance)/actual distance \*100%, sample size: 100pcs.

Note 3: Lidar is a precision device, please avoid using Lidar under high or low temperature or strong vibration situation, the relative error parameter index will be relatively larger, and it may exceed the typical value.

## 2.2 Electrical Parameter

**CHART 2 YDLIDAR G1 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
Startup current	1000	/	/	mA	Instantaneous peak current at start-up
Sleeping current	/	/	50	mA	System sleeps, motor stops
Working current	/	350	450	mA	System works, motor rotates

## 2.3 Interface Definition

G1 provides PH2.0-5P plug interface for system power supply and data communication.

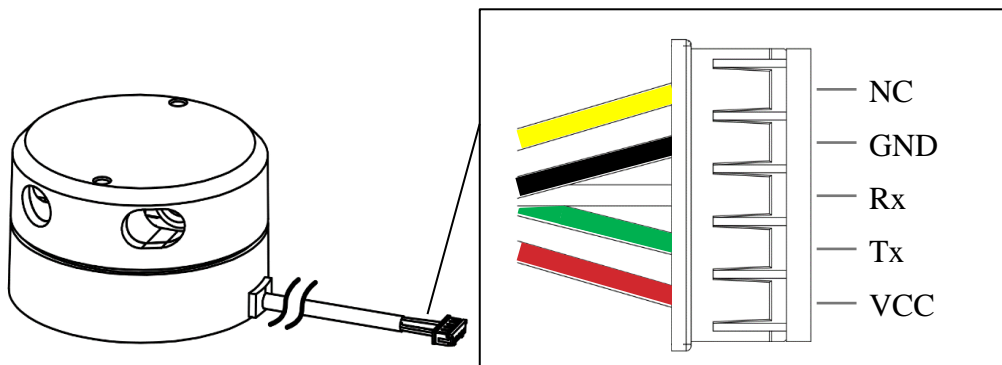


FIG 2 YDLIDAR G1 INTERFACES

**CHART 3 YDLIDAR G1 INTERFACE DEFINITION**

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

## 2.4 Data Communication

With a 3.3V level serial port (UART), users can connect the external system and the product through the physical interface. After that, you can obtain the real-time scanned point cloud data, device information as well as device status. The communication protocol of parameters are as follows:

## CHART 4 YDLIDAR G1 SERIAL SPECIFICATION

Item	Min	Typical	Max	Unit	Remarks
Baud rate	/	230400	/	bps	8-bit data bit,1 stop bit, no parity
High signal level	2.4	3.3	3.5	V	/
Low signal level	0	0.3	0.6	V	/


### 2.5 Motor Control

The G1 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.

### 2.6 Optical Characteristic

G1 uses an infrared laser that meets FDA Class I eye 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:

## CHART 5 YDLIDAR G1 LASER OPTICAL PARAMETERS

Item	Min	Typical	Max	Unit	Remarks
Laser wavelength	775	793	800	nm	Infrared band
Laser power	/	3.5	6	mw	Peak power
FDA	 Class I				

### 2.7 Polar Coordinate System Definition

In order to facilitate secondary development, G1 internally defines a polar coordinate system. The polar coordinates of the system take the center of the rotating core of G1 as the pole, and the specified Angle is positive clockwise (top view). The zero Angle is located in the direction of the outlet of the G1 PH2.0-5P interface line. Due to individual differences, there is a deviation of plus or minus 3 degrees, as shown in the figure:

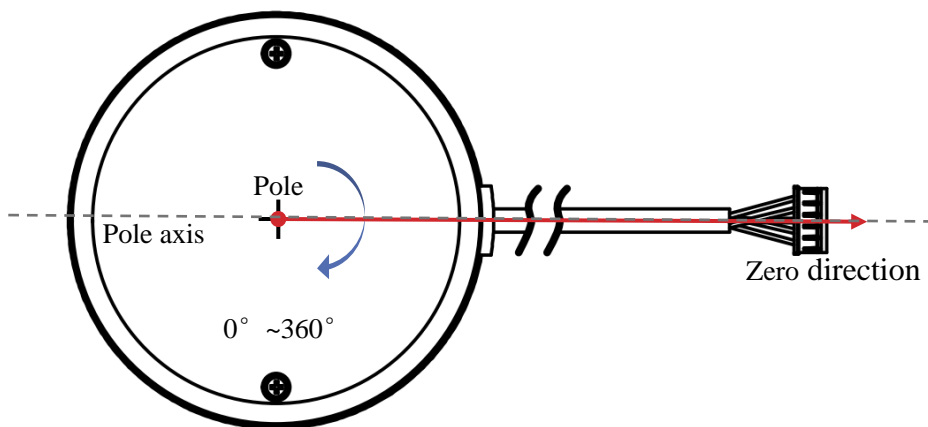


FIG 3 YDLIDAR G1 POLAR COORDINATE SYSTEM DEFINITION

## 2.8 Others

### CHART 6 YDLIDAR G1 OTHERS

Item	Min	Typical	Max	Unit	Remarks
Operating temperature	0	20	40	°C	Long-term working in a high temperature environment will reduce the life span
Storage temperature	-10	/	60	°C	/
Lighting environment	0	2000	20000	Lux	For reference only
weight	/	140	/	g	N.W.

### 3 REVISE

Date	Version	Content
2019-11-25	1.0	Compose a first draft
2021-07-14	1.1	Update electrical parameters and other parameters