YDLIDAR

YDLIDAR G4

DATASHEET

YDLIDAR

Sensing
changes life

CONTENTS

OVERVIEW

The YDLIDAR G4 Lidar is a 360-degree two-dimensional distance measurement product (hereinafter referred to as G4) developed by the YDLIDAR team. This product is based on the principle of triangulation, and is equipped with relevant optics, electricity, and algorithm design to realize high-frequency and high-precision distance measurement. At the same time as the distance measurement, 360 degrees of scanning distance measurement is achieved by continuously obtaining the angle information through the 360 degree rotation of the motor.

Product Features

➢ 360-degree scanning distance measurement

➢ Small distance error; stable distance measurement and high accuracy

➢ Wide ranging range, not less than 16m;

➢ Strong resistance to ambient light interference

➢ Industrial grade brushless motor drive, stable performance

➢ Laser power meets Class I laser safety standards

➢ 360 degree omnidirectional scanning; 5-12Hz adaptive scanning frequency

➢ Optical Magnetic Fusion Technology; Wireless Communication, Wireless Power Supply

➢ High-speed ranging, ranging frequency up to 9000hz

Applications

➢ Robot navigation and obstacle avoidance

➢ Robot ROS teaching and research

➢ Regional security

➢ Environmental Scan and 3D Reconstruction

➢ Home service robot/sweeping robot navigation and obstacle avoidance
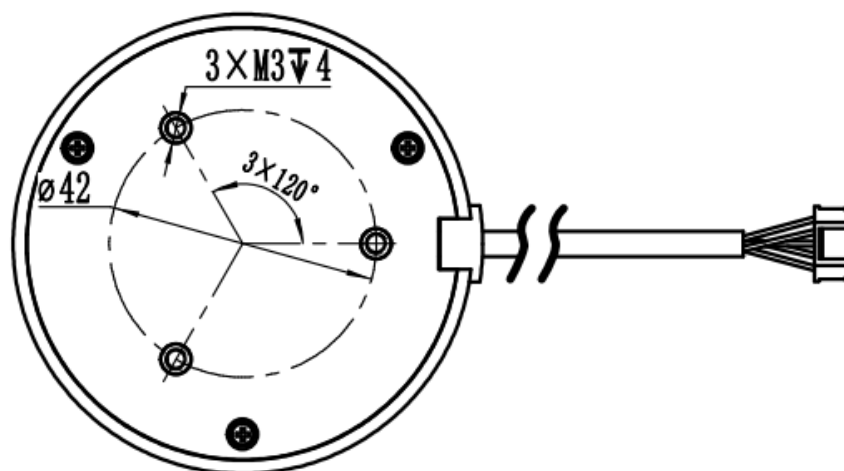
Installation and dimensions

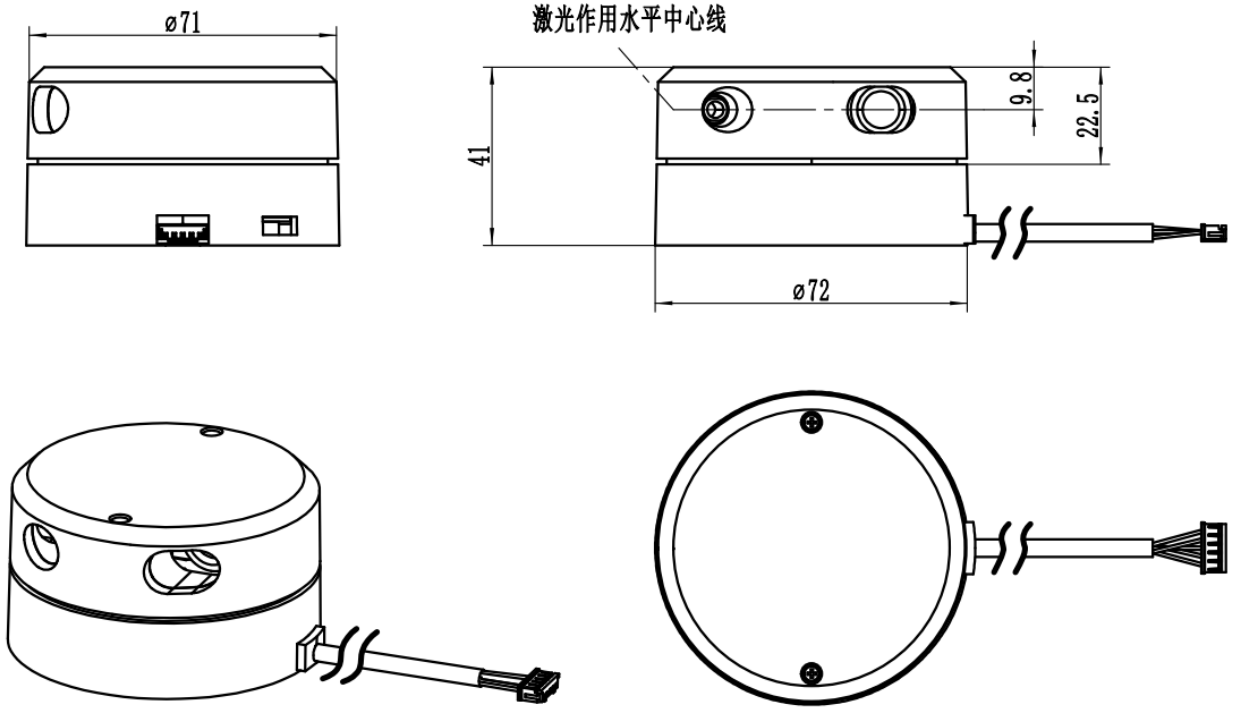FIG 1 YDLIDAR G4 INSTALLATION AND DIMENSIONS

FIG 2 YDLIDAR G4 DIMENSIONS

SPECIFICATIONS

Product parameters

CHART 1 YDLIDAR G4 PRODUCT PARAMETERS

Item	Min.	Typical Value	Max.	Unit	Remark
Range Frequency	4000	9000	9000	Hz	9000 range sampling per second
Scanning Frequency	5	7	12	Hz	Configurable by software
Range	0.10	-	16	m	Ranging frequency = 4KHz
	0.22	-	16	m	Ranging frequency = 8KHz
	0.26	-	16	m	Ranging frequency = 9KHz
Scanning Angle	-	0~360	-	Deg	-
Range resolution	-	<0.5	-	mm	Ranging range <2m
		< 1% of actual distance			Ranging range >2m
Angle resolution	0.26	0.28	0.30	Deg	When the scanning frequency is 7Hz

Electrical parameters

CHART 2 YDLIDAR G4 ELECTRICAL PARAMETERS

Item	Min.	Typical Value	Max.	Unit	Remark
Supply voltage	4.8	5.0	5.2	V	Excessive voltage can damage the device. Low voltage can affect performance.
Voltage ripple	0	50	100	mV	High ripple affects performance and can even cause Lidar to fail to range
Starting current	450	500	550	mA	High current at startup
Sleep current	-	<50	-	mA	System sleeps, motor does not rotate
Working current	400	450	480	mA	System work, motor rotates

Interface definition

The G4 provides two external interfaces: USB Type-C and PH2.0-5P female connector. When used, either one of them is selected.

USB Type-C: Data communications and system power.
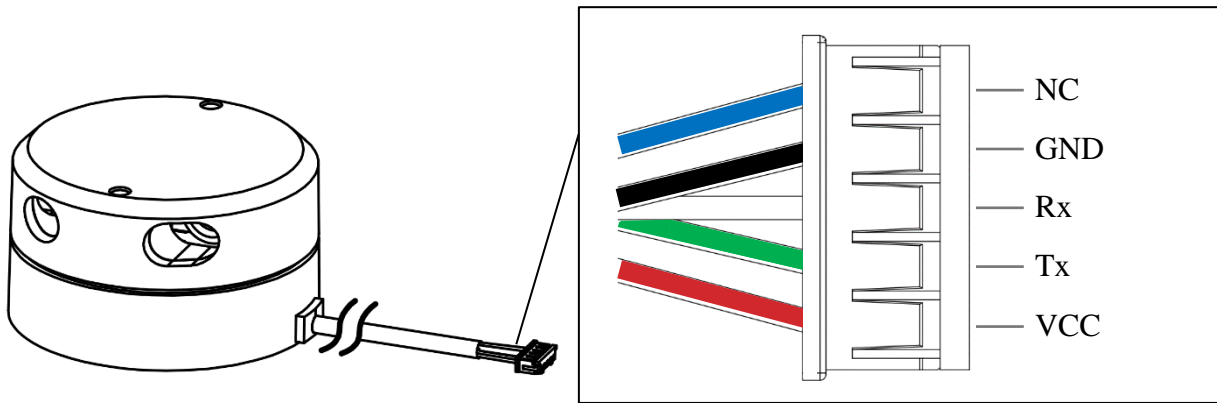
PH2.0-5P: System power supply, data communication.

FIG 3 YDLIDAR G4 INTERFACES

CHART 3 YDLIDAR G4 INTERFACE DEFINITION DESCRIPTION

Pin	Type	Description	Defaults	Range	Remark
VCC	Power supply	voltage 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	voltage negative	0V	0V	-

| NC | Reserved pin | Reserved | - | - | - |

Data communication

The G4 communicates using a 3.3V level serial port (UART). The user can connect the external system and the product through the physical interface on the product, and communicate according to the communication protocol of the system to obtain the scanned point cloud data, device information, and device status in real time. And can set the working mode of the equipment. The communication parameters are as follows:

CHART 4 YDLIDAR G4 SERIAL SPECIFICATIONS

Item	Min.	Typical Value	Max.	Unit	Remark
Baud rate	-	230400	-	bps	8 data bits, 1 stop bit, no parity
Signal high	1.8	3.3	3.4	V	When the signal voltage is >1.8V, it is high level
Signal low	0	0	0.5	V	When the signal voltage is <0.5V, it is low level

Motor control

G4 has a motor drive with motor speed control and provides a command interface instead of a hardware interface for motor control. For details, please refer to the development manual of this product.

Optical characteristics

The infrared point pulse laser used by G4 meets FDA Class I laser safety standards. When the system is working, lasers and optical lenses complete the transmission and reception of laser signals to achieve high-frequency ranging. To ensure the performance of the system ranging, please make sure that the G4's laser and optical lens are kept clean. The laser optical parameters are as follows:

CHART 5 YDLIDAR G4OPTICAL CHARACTERISTICS

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

Polar coordinate definition

In order to facilitate the secondary development, G4 internally defines the polar coordinate system. The polar coordinate of the system is based on the center of the rotating core of G4. The specified angle is clockwise positive. The zero angle is located at the exit of the G4 PH2.0-5P interface cable, as shown in the figure:
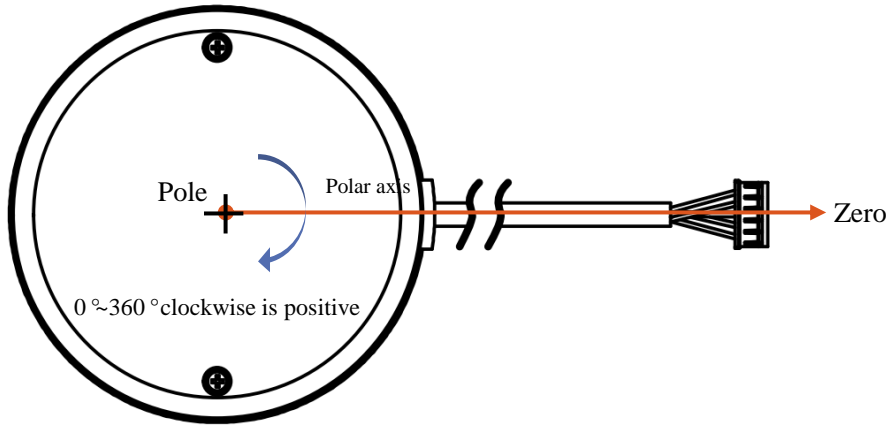
FIG 4 YDLIDAR G4 **POLAR COORDINATE DEFINITION**

Other

CHART 6 YDLIDAR G4 OTHER

Item	Min.	Typical Value	Max.	Unit	Remark
Working temperature	0	20	50	℃	Long-term work in high temperature environment will reduce the working life
Lighting environment	0	550	2000	Lux	For reference only
N.W.	-	214	-	g	-

DEVELOPMENT AND SUPPORT

G4 provides a wealth of hardware and software interfaces that enable motor-enable control, speed control, ranging control, and output control of the system. Users can implement power control and scan control on the G4. At the same time, the 3D model of the product is also open, and the user is provided with a graphical debugging client under Windows, as well as a corresponding SDK development kit and a Ros development kit. The user can download from the official website.。
http://ydlidar.com/