YDLIDAR 4ROS

DATA SHEET

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CONTENTS

1   PRODUCT OVERVIEW

YDLIDAR 4ROS is a 360 degrees 2D LiDAR (hereinafter referred to as 4 ROS) developed by EAI team. Based on the principle of ToF, 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 obtain the angle information and output the point cloud data of the scanning environment while ranging.

1.1   Product Features

➢ IP65 protection level
➢ 360 degrees omnidirectional scanning and 5-12Hz frequency
➢ Ranging frequency up to 20kHz
➢ High accuracy, stable performance
➢ Strong resistance to ambient light interference ➢ Class I eye safety

1.2   Applications

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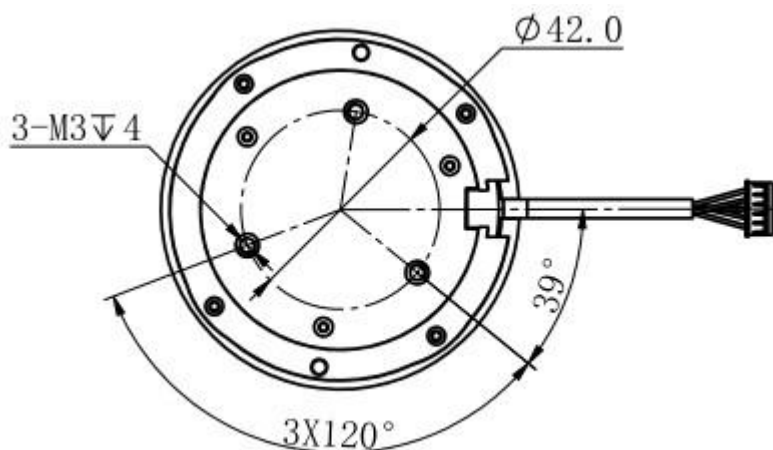➢ Robot ROS teaching and research

1.3   Installation and Dimensions

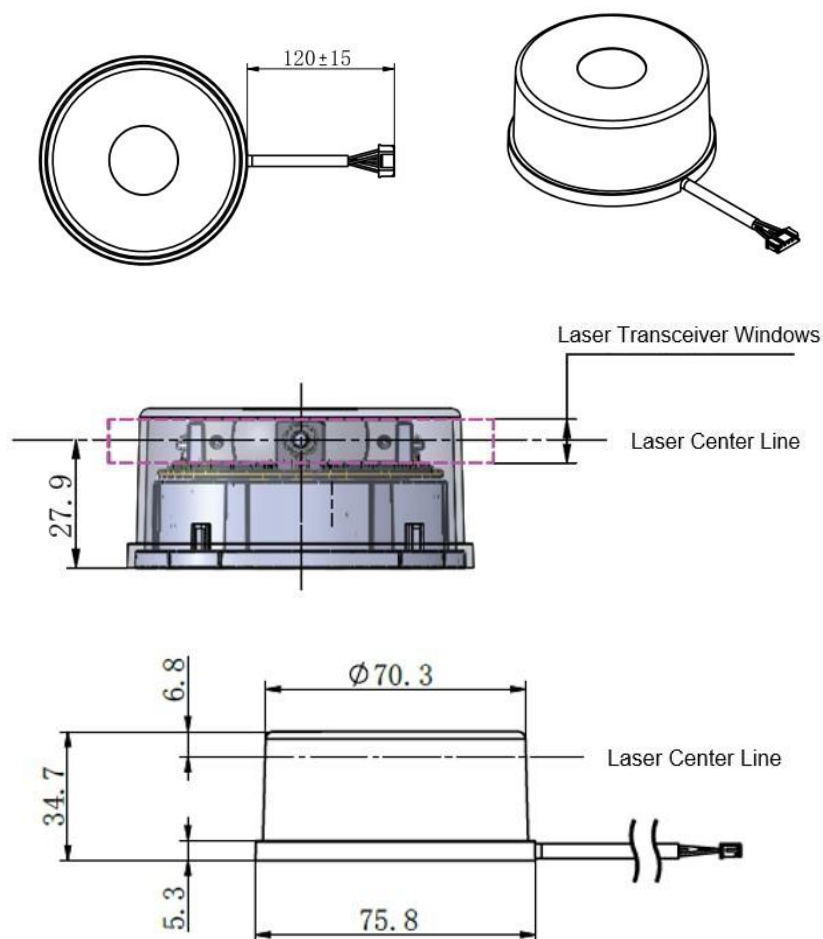
FIG 1 YDLIDAR 4ROS INSTALLATION SIZE

FIG 2 YDLIDAR 4ROS MECHANICAL SIZE

2 SPECIFICATIONS

2.1 Performance Parameter

CHART 1 YDLIDAR 4ROS PERFORMANCE PARAMETER

Item	Min	Typical	Max	Unit	Remarks
Ranging frequency	/	20000	/	Hz	/
Motor frequency	5	7	12	Hz	Software control, factory setting 7Hz
Ranging distance	0.05	/	30	m	80% reflectivity
Fileld of view	/	0-360	/	Deg	/
Angle resolution	0.09 (Frequency @5Hz)	0.13 (Frequency @7Hz)	0.22 (Frequency @12Hz)	Deg	Ranging frequency=20kHz
Tilt angle	0	/	1	Deg	/

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

Note 2: Lidar is a precision device, please avoid using Lidar under high or low temperature or strong vibration situation, the systematic error parameter index will be relatively larger, and it may exceed the typical value.

2.2 Range Accuracy

CHART 2 YDLIDAR 4ROS RANGE ACCURACY

Distance (mm)	Mean error (mm)
50-5000	≤±60
5000-20000	≤±40
20000-30000	≤±100

2.3 Electrical Parameter

CHART 3 YDLIDAR 4ROS 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	/	840	1000	mA	Instantaneous peak current at startup
Working current	/	340	480	mA	System works, motor rotation
Sleeping current	/	/	50	mA	System sleeps, motor stops

Note: 5V 1A power supply device.

2.4 Interface Definition

4ROS provides PH2.0-5P interface terminal for system power supply and data communication.
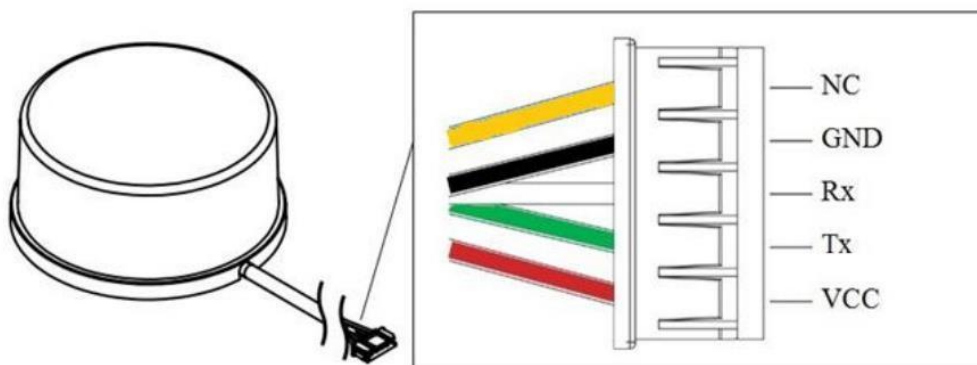

FIG 3 YDLIDAR 4ROS INTERFACES

CHART 4 YDLIDAR 4ROS 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	Reserve	Reserved pin	/	/	/

The product is equipped with Type-C USB transfer module to realize Type-C USB connection.

Type-C USB: data communication and power supply.
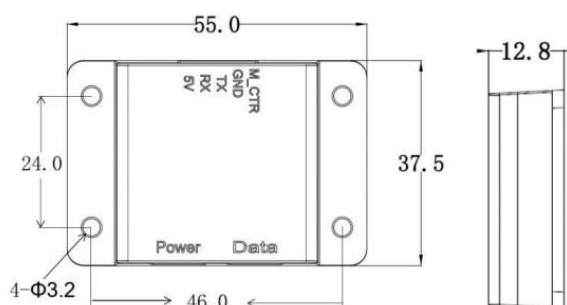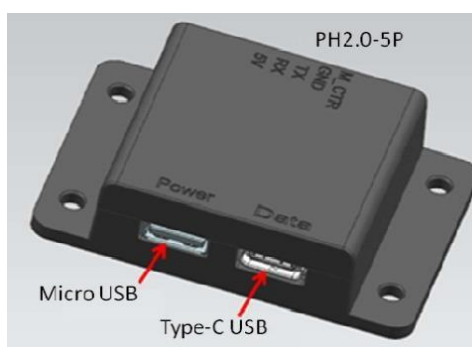
Micro USB: Only power supply.

FIG 4 YDLIDAR 4ROS SUPPORTING ADAPTER MODULE

2.5 Data Communication

YDLIDAR 4ROS with a 3.3V level serial port (UART), users can connect the external system and the product through the physical interface. After that, it can obtain the real-time scanned point cloud data, device information, device status and device working mode can be set etc. The communication protocol of parameters are as follows:

CHART 5 YDLIDAR 4 ROS SERIAL SPECIFICATION

Item	Min	Typical	Max	Unit	Remarks
Baud rate	/	512000	/	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	/

2.6 Motor Control

The 4ROS 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.

2.7 Optical Characteristic

4ROS 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. The detailed optical parameters are as follows:

CHART 6 YDLIDAR 4ROS LASER OPTICAL PARAMETERS

Item	Min	Typical	Max	Unit	Remarks
Laser wavelength	895	905	915	nm	Infrared band
Laser power	/	1.5	/	mW	Average power
FDA	⚠ Class I				

2.8 Polar Coordinate System Definition

In order to facilitate secondary development, 4ROS internally defines a polar coordinate system. The polar coordinates of the system take the center of the rotating core of 4ROS 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 4ROS interface line, as shown in the figure:
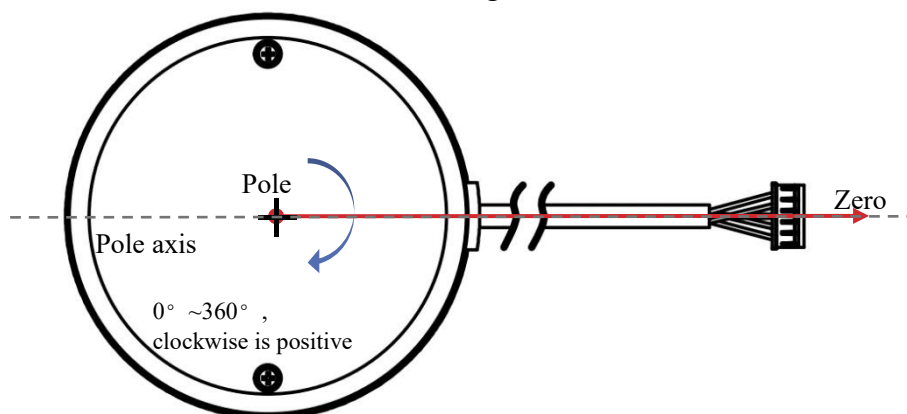

FIG 5 YDLIDAR 4ROS POLAR COORDINATE SYSTEM DEFINITION

2.9 Others

CHART 7 YDLIDAR 4ROS OTHERS

Item	Min	Typical	Max	Unit	Remarks
Operating temperature	0	25	50	℃	/
Storage temperature	-10	/	60	℃	/
Lighting environment	0	70000	100000	Lux	For reference only, the laser transceiver cannot be directly towads the strong light source such as the sun
weight	/	140	/	g	N.W.

3 DEVELOPMENT AND SUPPORT

4ROS provides a wealth of software interfaces, which can realize the motor enabling control, speed control, range unit enabling control and output control of the system. On this basis, users can also implement the power control and scan control purpose.

Also, the 3D model of 4ROS is disclosed. YDLIDAR provides the graphics debugging Workstation under Windows, as well as the corresponding SDK and ROS development kit to users, which could be downloaded from our website: https://www.ydlidar.com/.

In order to facilitate users' development, 4ROS development manual, SDK development manual and ROS user manual are also provided. Please download them from our website.

4   REVISE

Date	Version	Content
2022-07-01	1.0	Compose a first draft