YDLIDAR F4PRO

DATASHEET

Doc#：01.13.000031

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PRODUCT OVERVIEW

The YDLIDAR F4PRO Lidar is a 360-degree two-dimensional distance measuring product developed by Yuedeng technology (YDLIDAR). This product is based on the principle of triangulation, and is equipped with relevant optical, electrical, and algorithm design to realize high-frequency and high-precision distance measurement. At the same time of distance measurement, the motor rotates 360 degrees to continuously acquire angle information, thereby realizing 360-degree scanning, output point cloud data of the scanning environment.

Product Features

- 360-degree ranging
- Small error, good stability, high precision
- Wide ranging range up to 12m
- Strong resistance to ambient light interference
- Class I Laser Safety Standard
- 5-12Hz adaptive scanning frequency
- Optical magnetic fusion technology, wireless communication, wireless power supply
- Ranging frequency up to 6000hz

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

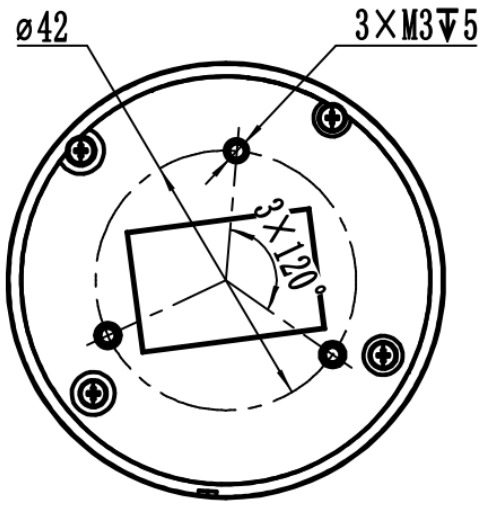

FIG 1 YDLIDAR F4PRO SIZE

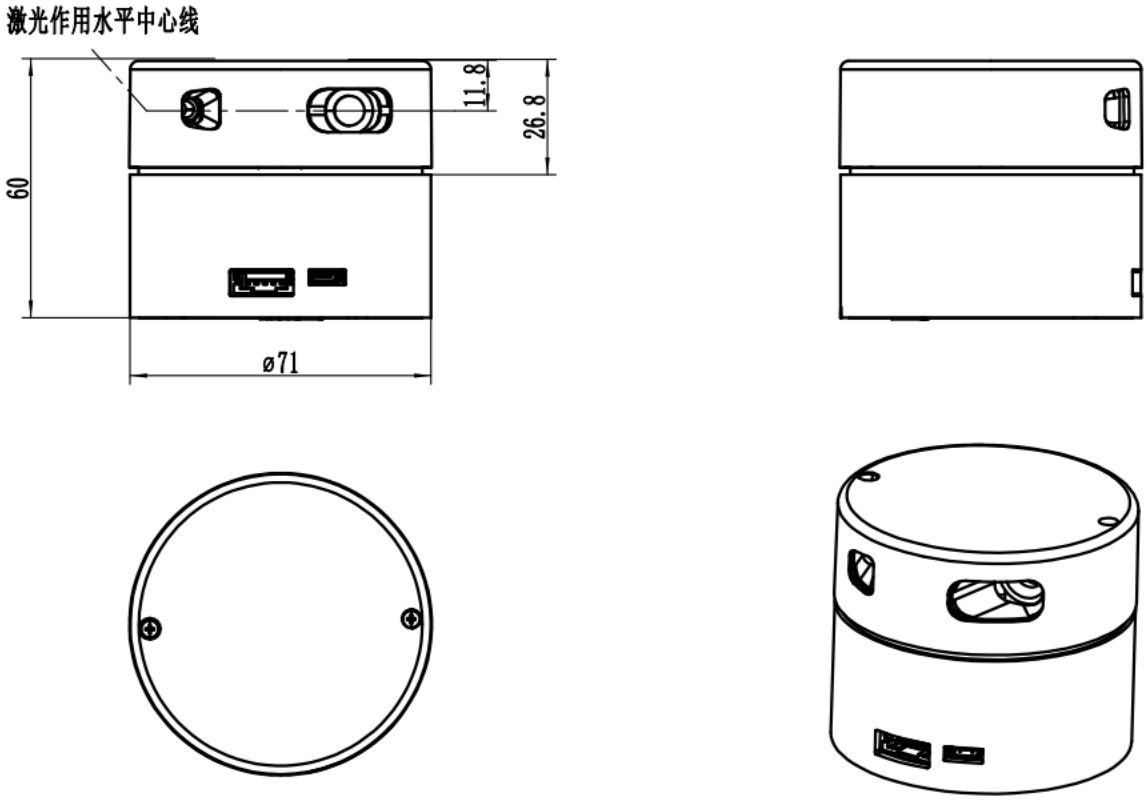

FIG 2 YDLIDAR F4PRO SIZE 2

SPECIFICATIONS

Performance parameters

CHART 1 YDLIDAR F4PRO PERFORMANCE PARAMETERS

Item	Min.	Typical value	Max.	Unit	Note
Ranging frequency	4000	4000	6000	Hz	Ranging 6000 times per second
scanning frequency	5	8	12	Hz	
Ranging range	0.1	-	>12	m	Indoor
Scan angle	-	0~360	-	Deg	-
Range resolution	-	<0.5	-	mm	Range<2m
		< 1% of actual distance			Range>2m
Angle resolution	0.46	0.48	0.50	Deg	Scan Frequency at 8Hz

Electrical parameters

CHART 2 YDLIDAR F4PRO ELECTRICAL PARAMETERS

Item	Min.	Typical value	Max.	Unit	Note
Supply voltage	4.8	5.0	5.2	V	Excessive voltage can damage the device Low voltage can affect performance and even unable to measure
Voltage ripple	0	50	100	mV	
Starting current	450	500	550	mA	High current at startup
Sleep current	-	<50	-	mA	System sleeps, motor does not turn
Working current	400	450	480	mA	System work, motor rotation

Interface definition

F4PRO provides two external interfaces, MicroUSB and PH2.0-5P female connector.

MicroUSB：For data communications and system power

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

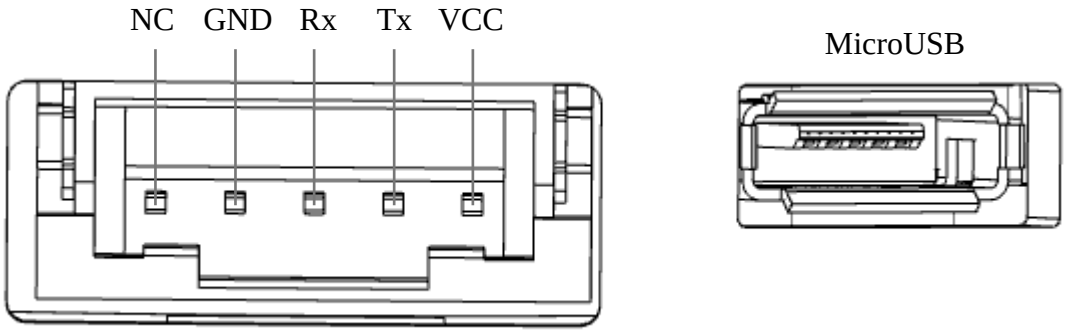

FIG 3 YDLIDAR F4PRO INTERFACES

CHART 3 YDLIDAR F4PROINTERFACE DEFINITION DESCRIPTION

Pin	Type	Des.	Defaults	Range	Note
VCC	Power supply	Positive voltage	5V	4.8V~5.2V	-
Tx	Output	System serial output	-	-	Flow：lidar➔device
Rx	Input	System serial port input	-	-	Flow：device➔lidar
GND	Power supply	Negative voltage	0V	0V	-
NC	Reserve	Reserved pin	-	-	-

Data communication

The F4PRO uses a 3.3V serial port (UART) for data communication. The user can connect the external system and the product through the physical interface on the product. The communication is performed according to the communication protocol of the system to acquire 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 F4PRO SERIAL SPECIFICATIONS

Item	Min.	Typical value	Max.	Unit	Note
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

F4PRO comes with a motor drive with motor speed control. And F4PRO provides a command interface to replace the hardware interface for motor control. For details, see the development documentation of this product.

Optical characteristics

The infrared point pulse laser used by F4PRO 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 F4PRO's laser and optical lens are kept clean. The laser optical parameters are as follows:

CHART 6 YDLIDAR F4PROLASER OPTICAL PARAMETERS

Item	Min.	Typical Value	Max.	Unit	Note
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, F4PRO internally defines the polar coordinate system. The polar coordinate of the system is based on the center of the rotary core of F4PRO. The specified angle is clockwise positive. The zero angle is located at the exit of the F4PRO PH2.0-5P interface cable, as shown in the figure:：

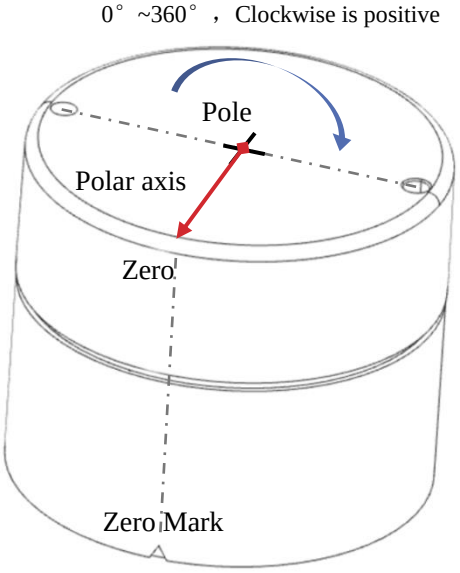

FIG 4 YDLIDAR F4PRO POLAR COORDINATE DEFINITION

Other parameters

CHART 7 YDLIDAR F4PRO OTHER PARAMETERS

Item	Min.	Typical Value	Min.	Unit	Note
Operating temperature	0	20	40	℃	Long-term work at high temperatures will reduce the life of F4pro
Lighting environment	0	550	2000	Lux	
Weight	-	182	-	g	Net weight

DEVELOPMENT AND SUPPORT

F4PRO provides a wealth of hardware and software interfaces that enable motor-enable control, speed control, and ranging control and output control of the system. Users can implement power control and scan control on the F4PRO. The 3D model of the product is also disclosed, 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. Users can download http://www.eaibot.com from the official website.

In order to facilitate user development, F4PRO development manuals, SDK manuals, and ROS manuals are also provided. Please download them from the official website.