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YDLIDAR TW3 DATA SHEET



www.ylidar.com

Shenzhen EAI Technology Co.,Ltd.

CATALOGUE

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1 Product Overview

The YDLIDAR TW3 lidar is a 360 ° 2D underwater lidar (hereinafter referred to as "TW3") developed by Shenzhen EAI Technology Co., Ltd. This product is based on the pulse ToF ranging principle, combined with relevant optical, electrical, and algorithmic designs, to achieve high-frequency and high-precision distance measurement. Additionally, the mechanical structure rotates 360 °, continuously acquiring angle information, thus achieving 360 ° scanning and ranging, and outputting point cloud data of the scanned environment.

1.1 Product Features

- 360° omnidirectional scanning, with an adjustable scanning frequency of 6-12Hz
- High-speed ranging, ranging frequency 4000Hz
- The ranging error is small, and the ranging stability is good
- Strong resistance to ambient light interference
- Class 1 eye safety standard
- Waterproof rating: IP68

1.2 Application scenarios

- Robot navigation and obstacle avoidance
- Robot ROS teaching and research
- Regional security
- Environment scanning and 3D reconstruction
- Navigation and obstacle avoidance of pool cleaning robots

1.3 Installation and dimensions

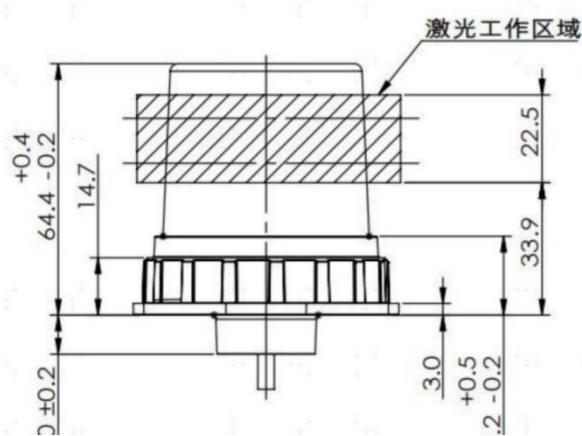


Figure 1:YDLIDAR TW3 optical window (unit: mm)

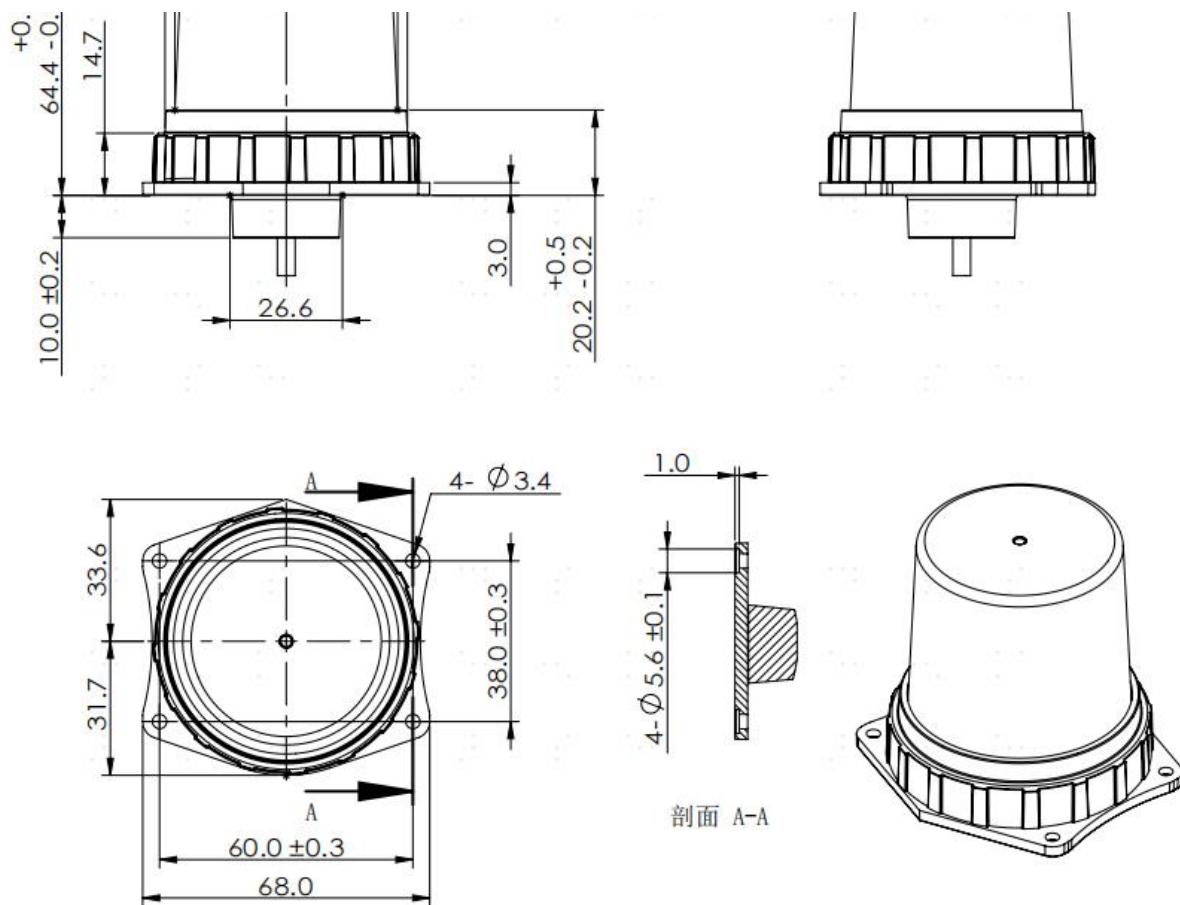


Figure 2:YDLIDAR TW3 mechanical and installation dimensions (unit: mm)

2 Specifications

2.1 Performance Parameters

Table 1: Performance Parameters of YDLIDAR TW3

Project	Minimum	Typical Value	Maximum	Unit	Remarks
Ranging frequency	/	4000	/	Hz	/
Scanning frequency	6	6	12	Hz	Software speed adjustment, factory default is 6Hz
Measuring range	0.05	/	5	m	80% reflectivity @ 0.5 NTU
	0.05	/	1.5	m	80% reflectivity @ 3NTU
Scan angle	/	0-360	/	Deg	/
Range Accuracy	/	50	/	mm	/
Angular resolution	0.54	/	/	Deg	6Hz
Pitch angle	0.3	1	1.5	Deg	/

Note 1: This is the standard value for factory FQC, for objects made of materials with 80% reflectivity.

Note 2: LiDAR is a precision device that requires protection during use. In usage scenarios involving high or low temperatures or strong vibrations, the parameter indicators for relative error may be relatively larger, potentially exceeding typical values.

2.2 Electrical parameters

Table 2: Electrical Parameters of YDLIDAR TW3

Project	Minimum	Typical Value	Maximum	Unit	Remarks
Power Supply Voltage	4.8	5.0	5.2	V	Too high will damage the equipment, while too low will affect performance or even make ranging impossible
Power on current	/	840	1000	mA	Instantaneous peak current upon power-on
Operating Current	/	440	500	mA	System operation, default motor speed
Quiescent Current	/	/	45	mA	The system is in hibernation, and the motor is not running

Note: It is recommended to use a power supply device with 5V and 1A

2.3 Interface Definition

The external physical interface terminal model of TW3 is M12-5P-F, which facilitates system power supply and data communication.



Figure 3: YDLIDAR TW3 Physical Interface

Table 3: Definition description of YDLIDAR TW3 interface

Serial Number	Pin	Type	Description	Default Value	Scope	Remarks
1	VCC	Power supply	Supply voltage positive pole	5V	4.8V-5.2V	/
2	Tx	output	System serial port output	/	/	Data flow: Radar → Peripherals
3	Reserve	/	/	/	/	/
4	GND	ground ing	Supply voltage negative pole	0V	0V	/
5	Rx	input	System serial port input	/	/	Data flow: Peripheral device Radar

2.4 Data Communication

TW3 utilizes a 3.3V level serial port (UART) for communication. Users can connect external systems to this product through its physical interface and communicate according to the system's communication protocol to obtain real-time scanned point cloud data, device information, and device status. Additionally, users can set the device's operating mode. The communication parameters are listed in the table below:

Table 4: YDLIDAR TW3 Serial Port Specifications

Project	Minimum	Typical Value	Maximum	Unit	Remarks
Baud rate	/	230400	/	bps	8 data bits. 1 stop bit . no parity
Signal high level	2.4	3.3	3.5	V	/
Low signal level	0	/	0.6	V	/

2.5 Motor Control

TW3 comes with a motor driver featuring motor speed control, allowing for software speed adjustment. For specific command interfaces, please refer to the development documentation of this product.

2.6 Optical Properties

The green dot-pulse laser used in TW3 ensures the safety of humans and pets. The product has been tested and passed the FDA Class 1 laser safety standards, complying with 21 CFR 1040.10 and 1040.11, and meeting the requirements of 2019

Except for the parts that are compliant with the IEC 60825-1 Ed.3 standard as stated in the Laser Notice No. 56 dated May 8, 2021.

During system operation, the laser and optical lens are utilized to transmit and receive laser signals, thereby achieving high-frequency ranging. The optical parameters of the laser are as follows:

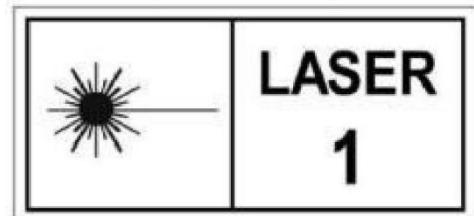


Table 5 :Optical parameters of YDLIDAR TW3 laser

Project	Minimum	Typical Value	Maximum	Unit	Remarks
Laser wavelength	510	520	530	nm	Green light band
Level certification			Class 1 IEC60825- 1		

Note: Adjusting or modifying this product on your own may result in hazardous radiation exposure.

2.7 Definition of polar coordinate system

In order to facilitate secondary development, TW3 internally defines a polar coordinate system. The polar coordinate of the system takes the center of the rotating core of TW3 as the pole. The deviation of plus or minus 3 degrees, as shown in the figure:

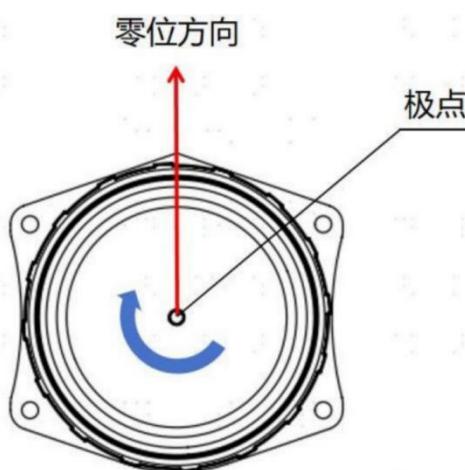


Figure 4: Definition of YDLIDAR TW3 Polar Coordinate System

2.8 Other parameters

Table 6: Other Parameters of YDLIDAR TW3

Project	Minimum	Typical Value	Maximum	Unit	Remarks
Operating Temperature	-10	25	50	°C	/
Storage temperature	-20	25	70	°C	/
Light Environment	/	/	100000	Lux	≥3m@80% 0.5NTU, underwater The 0.5m laser transceiver window should not be directly facing strong light sources such as the sun
Noise	/	60	/	dB	Measure at a distance of 40cm
Protection level	/	IP68	/	/	
Weight	/	About 142g	/	g	

3 Development and support

TW3 provides a rich set of software interfaces that enable control over the system's motor enablement, speed control, as well as enablement and output control of the ranging unit. Based on this, users can implement power consumption control and scanning control for TW3. Additionally, the product's 3D model is made available, and users are provided with a graphical debugging client for Windows, as well as corresponding SDK development kits and ROS development kits. For specific details, please refer to the development manual.

4 REVISE

Date	Version	Revised Content
2025-09-05	1.0	Initial