

# TG30 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      | Range Accuracy .....                     | 3        |
| 2.3      | Electrical Parameter.....                | 3        |
| 2.4      | Interface Definition.....                | 3        |
| 2.5      | Data Communication .....                 | 4        |
| 2.6      | Motor Control.....                       | 5        |
| 2.7      | Optical Characteristic.....              | 5        |
| 2.8      | Polar Coordinate System Definition ..... | 5        |
| 2.9      | Others .....                             | 6        |
| <b>3</b> | <b>DEVELOPMENT AND SUPPORT</b> .....     | <b>6</b> |
| <b>4</b> | <b>REVISE</b> .....                      | <b>7</b> |

## 1 PRODUCT OVERVIEW

YDLIDAR TG30 is a 360 degrees 2D LiDAR (hereinafter referred to as TG30) 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

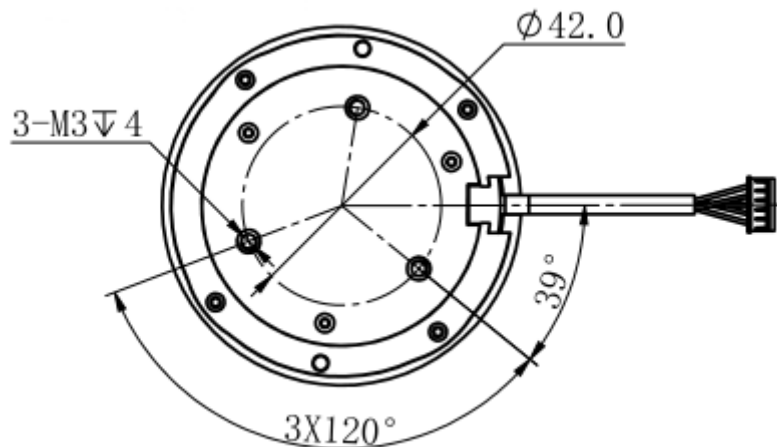


FIG 1 YDLIDAR TG5 INSTALLATION SIZE

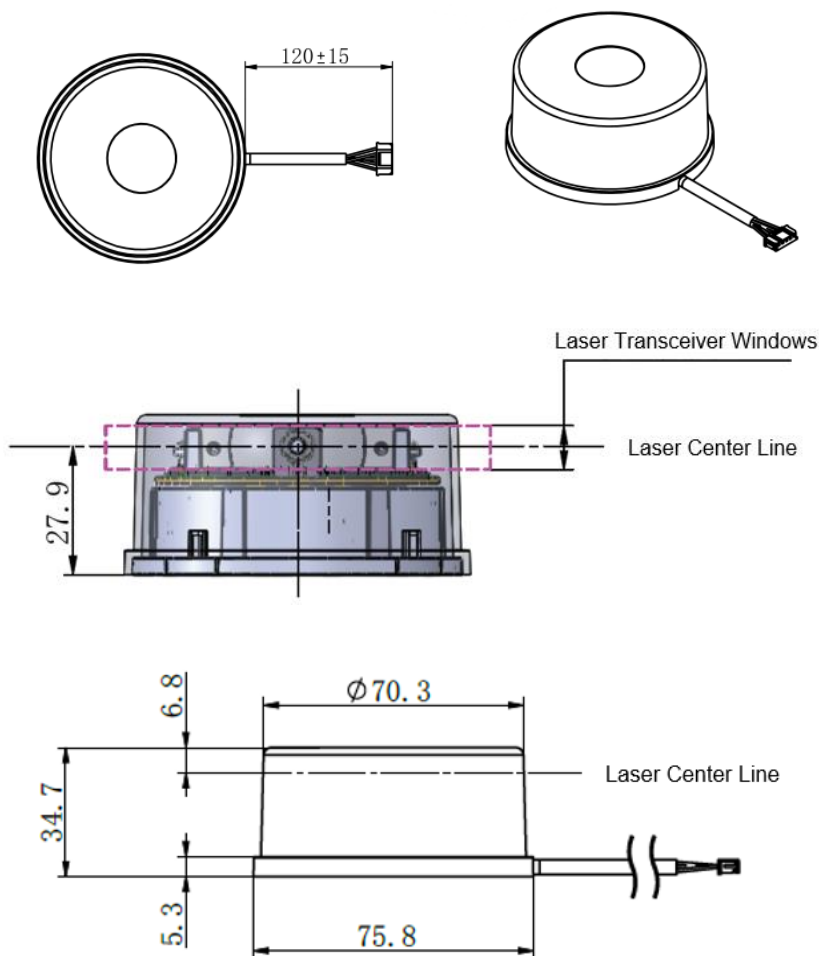


FIG 2 YDLIDAR TG5 MECHANICAL SIZE

## 2 SPECIFICATIONS

### 2.1 Performance Parameter

**CHART 1 YDLIDAR TG30 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                      |
| Field of view     | /                        | 0-360                    | /                         | Deg  | /                                     |
| Angle resolution  | 0.09<br>(Frequency @5Hz) | 0.13<br>(Frequency @7Hz) | 0.22<br>(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 TG30 RANGE ACCURACY**

| Distance (mm) | Mean error (mm) |
|---------------|-----------------|
| 50-5000       | $\leq \pm 60$   |
| 5000-20000    | $\leq \pm 40$   |
| 20000-30000   | $\leq \pm 100$  |

## 2.3 Electrical Parameter

**CHART 3 YDLIDAR TG30 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 start-up                                       |
| 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

TG30 provides PH2.0-5P interface terminal for system power supply and data communication.

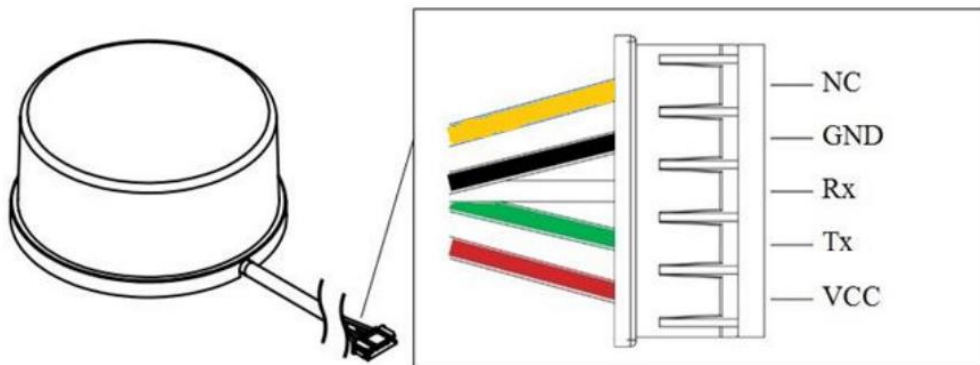


FIG 3 YDLIDAR TG30 INTERFACES

## CHART 4 YDLIDAR TG30 INTERFACE DEFINITION

| Pin | Type         | Description              | Defaults | Range     | Remarks                           |
|-----|--------------|--------------------------|----------|-----------|-----------------------------------|
| VCC | Power supply | Positive                 | 5V       | 4.8V-5.2V | /                                 |
| Tx  | Output       | System serial output     | /        | /         | Data stream:<br>LiDAR→Peripherals |
| Rx  | Input        | System serial port Input | /        | /         | Data stream:<br>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.

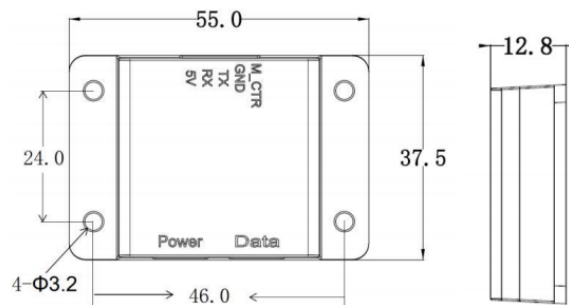
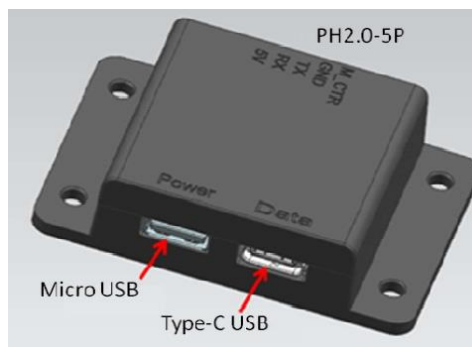


FIG 4 YDLIDAR TG30 SUPPORTING ADAPTER MODULE

## 2.5 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, 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 TG30 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 TG30 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

TG30 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 TG30 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, TG30 internally defines a polar coordinate system. The polar coordinates of the system take the center of the rotating core of TG30 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 TG30 interface line, as shown in the figure:

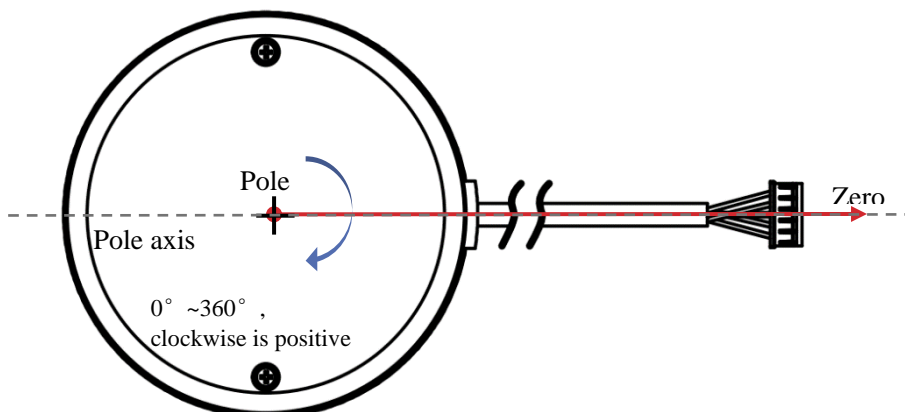


FIG 5 YDLIDAR TG30 POLAR COORDINATE SYSTEM DEFINITION

## 2.9 Others

**CHART 7 YDLIDAR TG30 OTHERS**

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

## 3 DEVELOPMENT AND SUPPORT

TG30 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 TG30 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, TG30 development manual, SDK development manual and ROS user manual are also provided. Please download them from [our website](#).



## 4 REVISE

| Date       | Version | Content  |
|------------|---------|--|
| 2019-05-26 | 1.0     | Compose a first draft  |
| 2020-09-02 | 1.2     | Update the interface connector diagram to change the connector to a bayonet          |
| 2021-06-10 | 1.3     | Electrical parameters, laser parameters, performance parameters comprehensive update |
| 2021-07-08 | 1.4     | Inserted the segmented ranging accuracy of section 2.2                               |