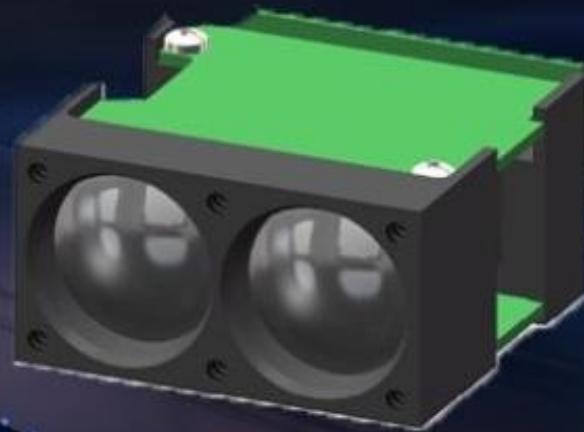


Benewake TFA1500

Datasheet



Overview

TFA1500 is a high-precision mid-to-long-range single-point LiDAR of Benewake that supports both indoor and outdoor applications. It can be used for positioning or anti-collision monitoring of shuttle vehicles, land transport vehicles, overhead cranes and lateral vehicles, reliable measurement and detection of extremely dark or shiny materials, thrust, shelf occupancy or loading height control in logistics applications, etc., the technical indicators of TFA1500 can ensure that the application needs are met.

Measurement Capabilities

TFA1500 has excellent measurement capabilities, with a working distance of up to 1500m and an error of 1% within its effective range.

Measurement Accuracy

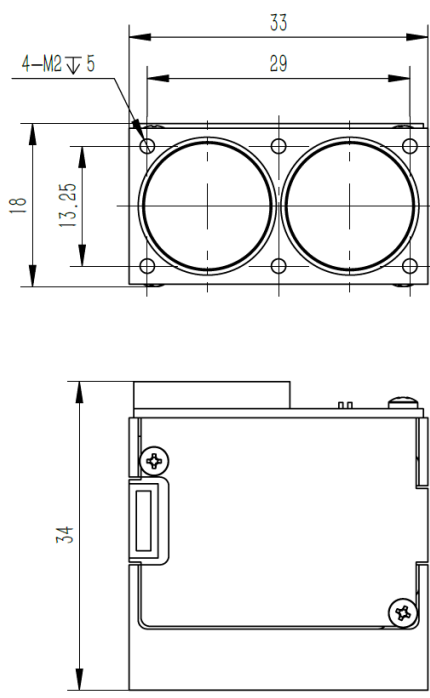
TFA1500 has good measurement accuracy. For most surfaces of objects with different reflectivity, its measurement error can be within 1% in the range of 0.05-1500 meters, and the measurement fluctuation (1σ) can be controlled within 10cm, which can meet the needs of scene measurement, positioning guidance and other applications.

Outdoor Working Ability

TFA1500 is fully designed to adapt to outdoor working environment. In terms of measurement technology, it can still measure normally even in a working environment with strong sunlight. In terms of electrical and structural design, TFA1500 has a tolerance of 15% for power supply voltage fluctuations, can resist the influence of strong electromagnetic interference, and has an operating temperature range of $-40^{\circ}\text{C}\sim+60^{\circ}\text{C}$, ensuring its outdoor performance.

Technical Specifications

Performance Parameter	
Detection range ^①	0.05m-1500m@70% reflectivity
Accuracy ^②	< 100m±10cm, 100m-500m±50cm, > 500m 1%
Distance resolution	1cm
Default frame rate	50Hz (fixed frequency)
Ambient light resistance	100KLux
Laser Parameters	
Light source	Laser diode
Central wavelength	905nm
Laser power	3mW
FoV	$8m^{-3}rad$
Eye safety	Class2
Mechanical/Electrical	
Power consumption	1.2W
Power supply	9 ~ 36V DC
Interface (UART)	3.3V TTL
Operating temperature	-40°C ~ +60°C
Storage temperature	-40°C ~ +85°C
Operating humidity	35 to 85% RH (non-condensing)
Dimensions (LWH)	33x34x18 (Unit: mm)
Weight	20g
Connector	1.25mm-4P
Protection Level	/

Communication Protocol	
Communication Interface	UART
Baud rate	460800 (configurable)
Data bit	8
Stop bit	1
Parity	None
Dimensions (Unit: mm)	
	

Pin Description

The product supports UART interface. In order to connect the sensor with communication board, the following pin description can be taken as reference.



Figure 1: Pin Sequence and Definition

Data-packet Format

The TFA1500 ranging module will automatically output data after power-on (5 bytes per frame), and outputs 0 when no object can be detected or out of range.

Example: 5C 02 11 03 E7

Where 5C is fixed frame header. 02 11 03: three bytes indicate the measured distance 200962cm, it follows Little Endian format, the range can be 0-16777215cm.

Checksum: starting from 02 and ending at 03, do the inverse of the summation of three bytes to compute checksum, it takes one byte in total.

Notes to specifications:

- ① The range is based on 25°C, 70KLux condition, and any changes in environmental conditions may cause changes in the measurement results.
- ② The accuracy is based on 25°C indoors and 70% reflectivity condition, and any changes in environmental conditions may cause changes in the measurement results.

Declaration: The copyright of this specification belongs to © Benewake (Beijing) Co., Ltd. is not allowed to copy, modify, delete or translate the content of this specification without written permission from Benewake. Our product is constantly improving and updating, so the specifications of TFA1500 product may change. Please refer to the latest version released by Benewake.