Benewake TFA1200-L

Datasheet

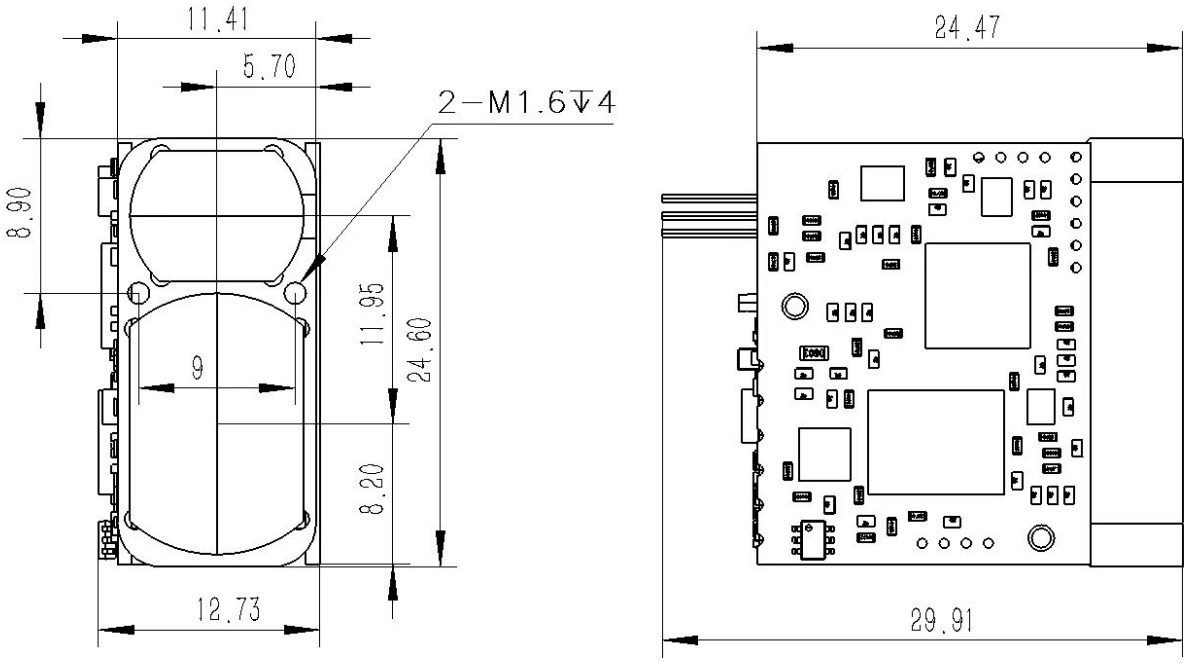
The TFA1200-L is a long-range distance measurement dToF LiDAR that can achieve high-precision measurements for targets with varying reflectivity, even in strong sunlight conditions. It features a compact size and lightweight design, making it particularly suitable for integration into UAV gimbals. Additionally, it is widely used in industries such as perimeter security, overhead crane hook collision prevention, and engineering surveying.

1 Technical Specifications

Performance Parameter	
Detection range①	3 m~1200 m
Accuracy①	1% @≤200 m
Repeatability①	6 cm @＜200 m
Distance resolution	10 cm
Frame rate	3 Hz
Optical Parameter	
Light source	EEL
Central wavelength	905 nm
FoV	＜0.5°
Eye safety	Class 1 [EN60825]
Ambient light resistance	100 KLux
Mechanical/Electrical Parameters	
Average power consumption②	＜1.1 W
Power supply	DC 2.7 V ~ 5.0 V
Data output	3.3V TTL
Operating temperature	-40℃ ~ +65℃
Storage temperature	-40℃ ~ +70℃
Operating humidity	≤70%
Dimensions	TYP. 25 * 25* 13 mm^3
Weight	11 g ± 0.5 g

Communication Protocol	
Communication interface	UART
Baud rate	Default 115200
Data bit	8
Stop bit	1
Parity	None

Dimensions (Unit: mm)



Notes to the specifications:

1. Measured during the day outdoors, with a target reflectivity of 90%, and when the laser spot is entirely on the target object;
2. Measurements were taken at a temperature of 25°C.

2 Communication Protocol

2.1 Pin Diagram

Communication interface: UART(TTL_3.3V), 115200bps.
The terminal pin numbers for the interface are numbered from top to bottom as 1 to 6.

Table 1 The interface definition table

Line serial order	Definition	Line color	Description
1	GND	Green	Power supply input- / serial port ground
2	VIN+	Yellow	Power input + （DC2.7V~5.0V）
3	NC	Orange	Pin Suspension
4	UART_TX	Red	TTL serial port transmitter, 3.3V level
5	UART_RX	Brown	TTL serial port receiver, 3.3V level
6	POWER_EN	Black	Module power enabled, TTL 3.3 V level; Module on (> 2.5V or suspended), module off (less than 0.3V)

2.2 Custom configuration

The master controller and the range finder use a master-slave communication method, where the master controller sends control commands to the range finder, which receives and executes the instructions. In the ranging state, the range finder periodically sends data and status back to the host computer.The communication format and command content are shown in Table 2.

The format of command message to LiDAR is as follows:

STX0	CMD	LEN	DATAH	DATAL	CHK

The data message format of the LiDAR is as follows:

STX0	CMD_JG	LEN	DATAn	DATA0	CHK

Table 2 Description of sending message format

Index	Send message	Receive message	Code	Description
1	STX0	STX0	55（H）	Message Start Flag
2	CMD	CMD_JG	See table 3/4	Command
3	LEN	LEN	Length of the parameter	Data length
4	DATAH	DATA n	See table 3	/
5	DATAL	DATA 0		
6	CHK	CHK	All bytes except for the checksum byte are XOR	XOR Check

Table 3 Command word description

Index	Command	Function	Downlink Data Byets	Demonstration
1	0x00	Standby (Continuous ranging stopped)	00 00 (6 bytes)	55 00 02 00 00 57
2	0x01	Single ranging	20 00 (6 bytes)	55 01 02 20 00 76
3	0x02	Continuous ranging	20 00 (6 bytes)	55 02 02 20 00 75
4	0x03	Self-check	00 00 (6 bytes)	55 03 02 00 00 54
5	0x07	High voltage reference setting	DATAH=XX(H) DATAL=YY(L) (6 bytes)	55 07 02 05 AA FF (Voltage value1450)
6	0xE8	Check version number	00 00 (6 bytes)	55 CB 02 00 00 9C

Table 4 Command word description

Index	Command	Function	Uplink Data Bytes	Description
1	0x00	Standby (Continuous ranging stopped)	00 00 (6 bytes)	/
2	0x01	Single ranging	D6-D0 (11 bytes)	D6 Flag Byte; D5-D3 Target Distance (the parsed distance value is divided by 10, unit: 0.1m); D1 APD High Voltage Value (V); D0 APD Temperature (℃).
3	0x02	Continuous ranging	D3-D0 (11 bytes)	D6 Flag Byte; D5-D3 Target Distance (the parsed distance value is divided by 10, unit: 0.1m); D1 APD High Voltage Value (V); D0 APD Temperature (℃).
4	0x03	Self-check	D7-D0 (12 bytes)	D6 APD High Voltage Reference Value (V); D5-D4 Blind Zone Value (V); D3 Temperature Compensated APD High Voltage Value (V); D2 APD Temperature (℃).
5	0x07	High voltage reference setting	D1 D0 (6 bytes)	D1 High Byte of Temperature Compensated APD High Voltage Value; D0 Low Byte of Temperature Compensated APD High Voltage Value.