1535nm Laser Rangefinder 3K5

SKU:LRF-1535-3K5

1. PRODUCT DESCRIPTION

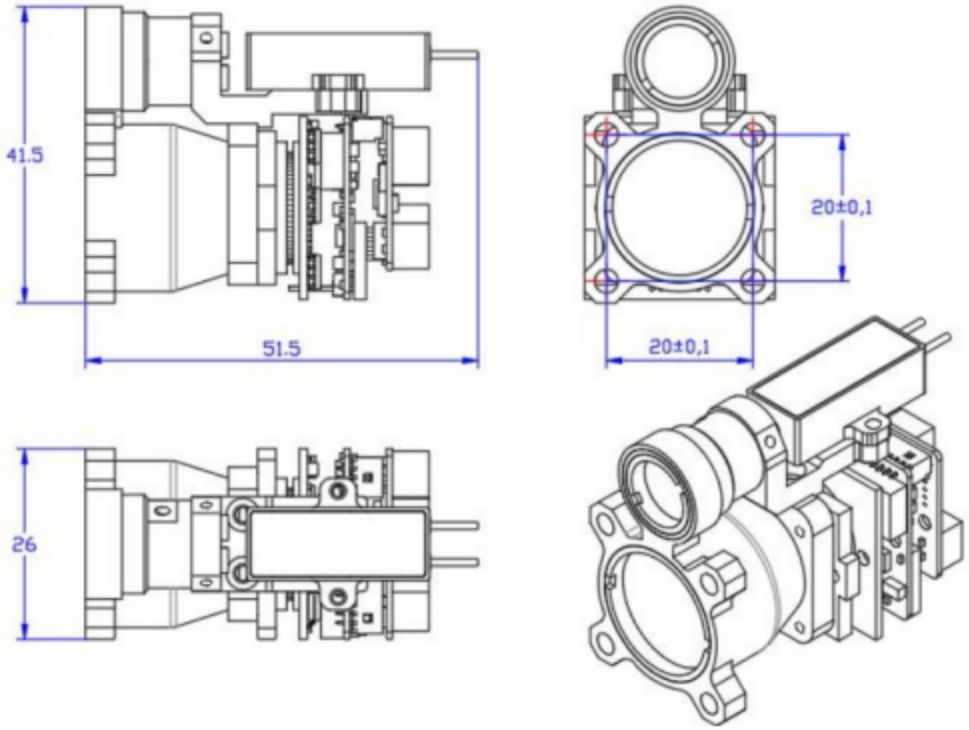
LRF-1535-3K5 laser rangefinder is the eye safety laser distance measuring machine in pod photoelectric system. It can detect the target distance and transmit the measured distance to the upper computer through serial communication. Through the conditions of visibility is not less than 5km, diffuse reflection rate ≥0.3, humidity ≤80%, the vehicle (2.3m ×2.3m target) ranging distance ≥3km; For personnel (1.75m ×0.75m target) ranging distance ≥1.5km; For large targets (buildings) ranging distance ≥5km.

2. TECHNICAL SPECIFICATIONS

Item	Technical parameter
Working wavelength	1535±5nm
Ranging range	Through the conditions of visibility is not less than 5km, diffuse reflection rate ≥0.3, humidity ≤80%, the vehicle (2.3m×2.3m target) ranging distance ≥3km; For personnel (1.75m×0.75m target) ranging distance ≥1.5km; For large targets (buildings) ranging distance ≥5km.
Ranging accuracy	≤±2m (RMS)
Ranging frequency	1~10Hz adjustable
Accuracy rate	≥98%
Divergence angle	≤0.5mrad
Minimum measuring range	≤20m
Ranging resolution	≤30m (multi-object)
Voltage	DC9~16V
Working power consumption	average power consumption ≤1.5W (1Hz operation), peak power consumption ≤5W
Size	≤52mm ×26mm ×42mm

Weight	≤55g
Operating temperature	-40℃~+65℃
Storage temperature	-55℃~+70℃

3. MECHICAL INTERFACE



4. ELECTRICAL INTERFACE

Communication interface: RS422, 115200bps.
Electrical interface: The interface model is Molex connector 51021-0700. See the following table for the interface definition.

7P Socket connection definition

Line sequence number	Definition	Line color	Remarks
1	RS422 TX+	brown	RS422 send +
2	RS422 TX-	blue	RS422 Send -
3	RS422 RX-	yellow	RS422 Receive -
4	RS422 RX+	The purple	RS422 Receive +

5	GND	white	Communication interface
6	+12V	red	Power supply
7	GND	black	Powered ground
8	Reserved	empty	Reserved

5.COMMUNICATION PROTOCOL

1.Transmissionprotocol:asynchronousserialcommunication;

2.Baudrate:115200;

3. Data bit: 10bit: a start bit, 8 data bit, a stop bit, no validity;

4. Data structure: data by the header byte, command part, data length, parameter part, check byte composition;

5. Communication mode: the master sends control commands to the rangefinder, and the rangefinder receives and executes instructions. In the ranging state rangefinder according to the ranging period up to send back the rangefinder data and state, communication format and command content as shown in the following table.

a) Main control sending

The format of the send message is as follows:

STX0	CMD	LEN	DATA1H	DATA1L	CHK

Table 2 Format instructions for sending messages

Serial number	name	Instructions	Code	Remarks
1	STX0	Message start flag	A5(H)	
2	CMD	Command word	See Table 3	
3	LEN	Data length	The number of bytes except for the start flag, command word, check	
4	DATAH	Parameters	See Table 3	
5	DATAL			
6	CHK	Xor check	Xor other bytes except for the validation byte	

The command is described as follows:

Table 3 Command and data word description sent by the master to the rangefinder

Serial number	Command word	Function	Data bytes	remarks	Length	Sample code
1	0x00	Stop	DATAH=00 (H) DATAL=00 (H)	Rangefinder stops ranging	6 bytes	A5 00 02 00 00 57
2	0x01	Single ranging	DATAH=00 (H) DATAL=00 (H)		6 bytes	A5 01 02 00 00 56
3	0x02	Continuous ranging	DATAH=XX (H) DATAL=YY (H)	Datal = yy (h	6 bytes	A5 02 02 03 E8 BE(1Hz Ranging)
4	0x03	Self test	DATAH=00 (H)		6 bytes	A5 03 02 00 00 54

Serial number	Command word	Function	Data bytes	remarks	Length	Sample code
			DATAL=00 (H)			
5	0x04	Distance Gate Closest setting	DATAH=XX (H) DATAL=YY (H)	DATA indicates the value of the blind area, in 1m	6 bytes	A5 04 02 00 64 37 (100m closest)
6	0x06	Total number of outgoing light queries	DATAH=00 (H) DATAL=00 (H)	Datal = 00 (h	6 bytes	A5 06 02 00 00 51
7	0x11	APD power on	DATAH=00 (H) DATAL=00 (H)		6 bytes	A5 11 02 00 00 46
8	0x12	APD power off	DATAH=00 (H) DATAL=00 (H)		6 bytes	A5 12 02 00 00 45
9	0xEB	Number query	DATAH=00 (H) DATAL=00 (H)	Number query	6 bytes	A5 EB 02 00 00 BC

b) Master Receive Format

The format of the received message is as follows:

STX0	CMD	LEN	DATAn	DATA0	CHK

Table 4 Formats of received packets

Serial number	Name	Instructions	Code	Remarks
1	STX0	Message start flag 1	A5 (H)	
2	CMD_JG	Data command word	See Table 5	
3	LEN	Data length	The number of bytes except for the start flag, command word, check	
4	Dn	Parameters	See Table 5	
5	D0			
6	CHK	Xor check	Xor other bytes except for the validation byte	

Master receive status description:

Table 5 Description of data words sent by the rangefinder to the master

Serial number	Command word	function	Data bytes	Remarks	Total length
1	0x00	Stop	D1=00 (H) D0=00 (H)		6 bytes
2	0x03	Self test	D8 ~D1	D8-D7: -5V voltage, in 0.01V. D6-D5: blind zone value, unit 1m D4: high voltage value of APD, unit V; D3: type char, APD temperature, unit: Celsius;	12 bytes

Serial number	Command word	function	Data bytes	Remarks	Total length
				D2-D1:+5V voltage, in 0.01V	
3	0x04	Distance Gate closest setting, in m	D1 D0	DATA indicates the nearest distance, in 1m; It is first high and then low	6 bytes
4	0x06	Total number of outgoing light queries	D3~D0	DATA expresses the number of lights,4 bytes, high bytes first	7 bytes
5	0x11	APD power on	D1=00 (H) D0=00 (H)	APD power on	6 bytes
6	0x12	APD power off	D1=00 (H) D0=00 (H)	APD power off	6 bytes
7	0xED	Work overtime	0x00 0x00	The laser is in laser working protection and cannot be ranging.	6 bytes
8	0xEE	Validation error	0x00 0x00		6 bytes
9	0XEF	Serial port communication timeout	0x00 0x00		6 bytes
10	0x01	Single ranging (zero for single target, zero for second and third targets, zero for first and last targets)	D9 D8 D7 D6 D5 D4 D3 D2 D1 D0	D8-D6 First target distance (unit 0.1m) D5-D3 Second Target distance (unit 0.1m) D2-D0 Third target distance (unit 0.1m) 3 Target distance from near to far D9 (bit7-bit0) flag bytes: The 7th bit of D9 represents the main wave; 1: there is a major wave, 0: there is no major wave. D9 The 6th bit indicates the echo; 1: echoes are present, 0: no echoes D9 bit 5 indicates laser status; 1: the laser is normal, 0: the laser is faulty D9 fourth timeout flag bit, 1: normal, 0: timed out D9 bit 3 invalid (set 1); The second bit of D9 indicates the APD status. 1: normal, 0: error D9 The first digit indicates whether there is a former target; 1: there is a previous target, 0: there is no previous target (target in the blind zone). D9 The 0th digit indicates whether there is a back target; 1: there is a rear target, 0: there is no rear target (the target after the main target is the rear target)	14 bytes

Serial number	Command word	function	Data bytes	Remarks	Total length
11	0x02	Continuous ranging (zero for single target, zero for second and third targets, zero for first and last targets)	D9 D8 D7 D6 D5 D4 D3 D2 D1 D0	D8-D6 First target distance (unit 0.1m) D5-D3 Second Target distance (unit 0.1m) D2-D0 Third target distance (unit 0.1m) 3 Target distance from near to far D9 (bit7-bit0) flag bytes: The seventh bit of D9 represents the main wave; 1: there is a major wave, 0: there is no major wave. D9 The 6th bit indicates the echo; 1: echoes are present, 0: no echoes D9 bit 5 indicates laser status; 1: the laser is normal, 0: the laser is faulty D9 fourth timeout flag bit, 1: normal, 0: timed out D9 bit 3 invalid (set 1); D9 bit 2 indicates APD status; 1: normal, 0: error D9 The first digit indicates whether there is a former target; 1: there is a previous target, 0: there is no previous target (target in the blind zone). D9 The 0th digit indicates whether there is a back target; 1: there is a rear target, 0: there is no rear target (the target after the main target is the rear target)	14 bytes
12	0xEB	Number query	D16... D0	D16 D15 reserved () D14 D13 Machine model code D12 D11 Product number D10 Indicates the D7 software version D6 D5 APD number D4 D3 laser number D2 D1 FPGA version	21 bytes
Notes: ① Data bytes/bits not defined, default is 0;					