

25mJ Laser Target Designator Product Specification

SUK:LDR1064-25



1. TECHNICAL SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Laser wavelength	1.064 μ m
Pulse average energy	≥ 25 mJ
Pulse capacity fluctuation	within a cycle, adjacent pulse fluctuation $\leq 8\%$ (statistics after 2 seconds of light output)
Laser beam dispersion Angle	≤ 0.5 mrad
Laser optical axis stability	≤ 0.05 mrad
Pulse width	≤ 20 ns
Power-on preparation time	≤ 3 s

RANGING PERFORMANCE

Ranging frequency	1Hz, 5Hz, single time
Continuous ranging time	5min(1Hz), 1min(5Hz)
5Hz maximum continuous operating time	2min
Minimum range	≤ 100 m
Typical ranging capacity	≥ 2000 m
Ranging accuracy	± 2 m
Accurate measurement rate	$\geq 98\%$
Ranging logic: first and last target	first and last target

IRRADIATION PERFORMANCE

Irradiation distance	≥ 2 km
Irradiation frequency	fundamental frequency 20Hz
Coding	in line with system requirements; With the ability to customize coding extension
Encoding mode	precise frequency code
Encoding accuracy	$\leq \pm 2.5$ μ s

Irradiation mode	one irradiation time $\geq 20s$, start irradiation again, interval $\leq 15s$, can be continuously irradiated for 8 cycles
WEIGHT AND SIZE	
Weight	$\leq 450g$
Size	$\leq 67.4mm \times 51mm \times 90mm$
POWER SUPPLY VOLTAGE	
Voltage	19.6V ~ 25.2V
POWER CONSUMPTION	
Standby power consumption	$\leq 4W$
Average power consumption	$\leq 50W$
Peak power consumption	$\leq 90W$
ENVIRONMENTAL ADAPTABILITY	
Working temperature	$-40^{\circ}C \sim 55^{\circ}C$
Storage temperature	$-55^{\circ}C \sim 70^{\circ}C$

2. CONTROL FUNCTION

- 2.1 With laser ranging function;
- 2.2 Provide target laser irradiation;
- 2.3 Be able to communicate with the host computer according to the requirements of the communication protocol.

The laser imager can realize the following functions through the serial communication interface:

- 2.3.1 Response laser ranging instruction, and can be stopped at any time according to the stop instruction;
- 2.3.2 Distance data and state information are output per pulse when ranging;
- 2.3.3 Ranging with distance gating function;
- 2.3.4 Start continuous ranging did not receive stop instruction 5min(1Hz)/1min(5Hz) after the automatic stop ranging;
- 2.3.5 Irradiation mode and coding can be set;
- 2.3.6 In response to the laser irradiation command, according to the mode, encoding, irradiation has been set, and can stop irradiation at any time according to the stop instruction;
- 2.3.7 If no stop instruction is received after starting irradiation, it will stop automatically after one cycle of irradiation;
- 2.3.8 When the laser irradiation, each pulse output a distance value and state information;
- 2.3.9 Power-on self-check and cycle self-check and output status information;
- 2.3.10 Respond to start self-check instruction and output status information;
- 2.3.11 Able to report the cumulative number of laser pulses;
- 2.3.12 Head and end target ranging function.

3. MECHICAL INTERFACE

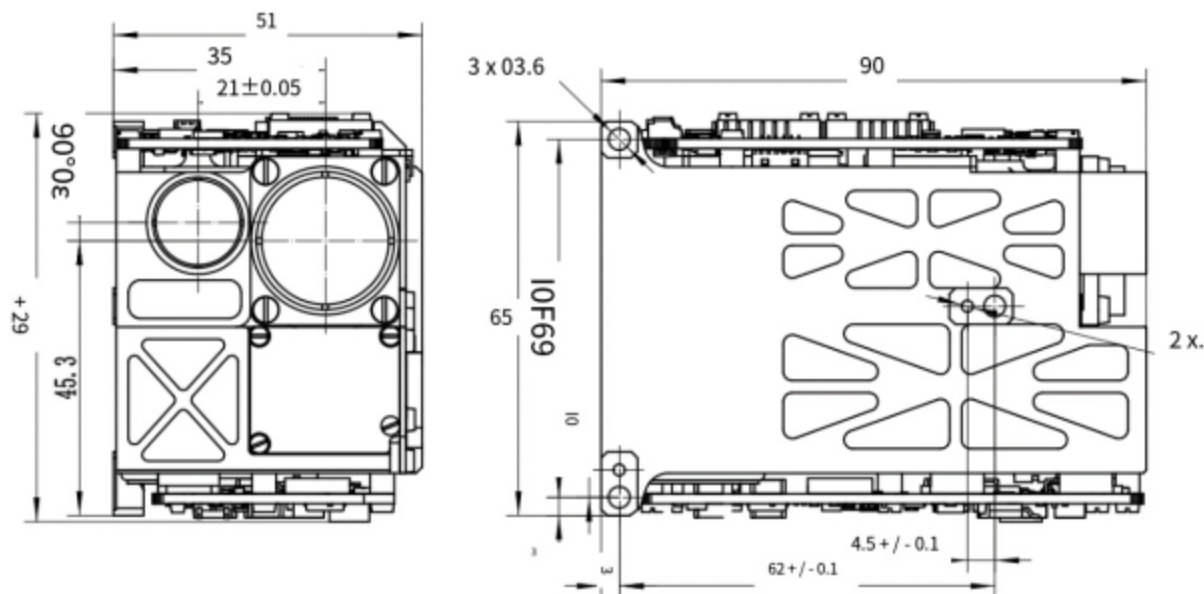


Figure 1 Interface diagram

4. COMMUNICATION PROTOCOL

4.1 Communication Protocol Definition

4.1.1 Asynchronous serial communication standard: RS422;

4.1.2 Baudrate: 115200bps;

4.1.3 Transmission format: 8 data bits, 1 start bit, 1 stop bit, no check bit;

4.1.4 For each byte of information, the lowest position (lsb) is transmitted first, and if it is a multi-byte message, the lowest byte is transmitted first.

4.2 The command sent by the upper computer system to the laser photometry module

4.2.1 Information header (0x55);

4.2.2 Command word 1;

4.2.3 Command word 2;

4.2.4 Command word 3;

4.2.5 The "message tail" is the checksum, the result of the xor operation of 1-4 bytes.

Table 1 Command word 1 definition

BUT00	BIT01	BIT02	BIT03	BIT04	BIT05	BIT06	BUT07
0x00: Standby							
0x01: Start self-test							
0x02: Single ranging							
0x03: Continuous Ranging (1Hz)							
0x04: Continuous Ranging (5Hz)							
0x05: Irradiation							
0x08: Stop ranging/Irradiation							
0x09: Gate setting							
0xAA: Reports the cumulative number of laser pulses							

Table 2 Command word 2 definition

BIT07	BIT06	BIT05	BIT04	BIT03	BIT02	BIT01	BUT00
When illuminated by laser: Laser code 1 to 8 When laser ranging: 1- first target 2- end target When the gating value is set: The distance gating value is low in bytes							

Table 3 Command word 3 Define

BIT07	BIT06	BIT05	BIT04	BIT03	BIT02	BIT01	BUT00
Fast hair: Laser exposure time setting (1 ~ 47) When the gating value is set: the distance gating value is high in bytes							

4.3 The laser photometer sends data to the system software

4.3.1 Information header (0x55);

4.3.2 Status word;

4.3.3 Target distance/cumulative number of laser pulses (2 bytes);

4.3.4 Current temperature of laser measuring module;

4.3.5 The "message tail" is the checksum, which is the xor operation result of 1-5 bytes.

Table 4 Information header description

BIT07	BIT06	BIT05	BIT04	BIT03	BIT02	BIT01	BUT00
0: No laser 1: Laser is present	0: Ranging effective 1: Ranging invalid	Laser mark 1/0 alternate	1: Overtemperature alarm 0: The temperature is normal			00: Standby 01: Ranging 02: Indication	

Target distance information Definition: The distance value is represented as an integer by 2 bytes (16BIT), which can be converted directly to decimal.

Cumulative laser pulse times definition: because the range of 16 bits of binary number is 0 ~ 65535, and the service life of the laser detector is one million times, so the agreed laser emission times for the multiple of the number of 20, the range is 0 ~ 1310700;

Laser measuring module current temperature: d7-d0: complement expression, value range -128°C ~ +127°C.

5. ELECTRICAL INTERFAC

One RS422 interface, signal level in line with MAX488 chip characteristics. The interface definition is shown in Table 5:

Table 5 Interface definition

Socket MOLEX 53048-0810		
Corresponding plug MOLEX 51021-0800		
Pin number	Signal name	Instructions

25mJ Laser Target Designator

1	24V	Power supply +
2	24V	Power supply +
3	24VGND	Power supply -
4	24VGND	Power supply -
5	422_A	Upper computer -> Laser photometry Assembly +
6	422_B	Upper computer -> Laser photometric Assembly -
7	422_Z	Laser photometry Assembly -> Upper computer -
8	422_Y	Laser photometry Assembly -> Upper computer +
Socket MOLEX 530480210		
Corresponding plug MOLEX 151340201		
Pin number	Signal name	Instructions
1	SYNC_IN+	The external sync_in signal is a differential signal with an interface type of RS422
2	SYNC_IN-	