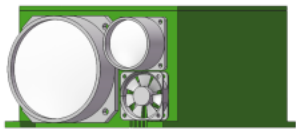
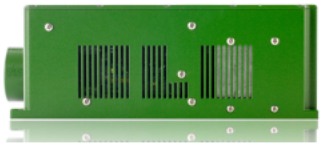
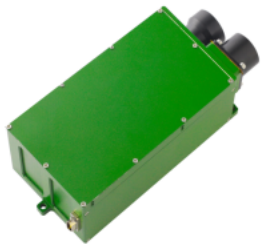
1570nm Laser Rangefinder-30K65

Parameters

Parameters	Specification	Note.
Wavelength	1570±5nm	
Ranging capability	200m~30km	
Ranging ability	≥30km(2.3m×2.3m, 0.3 reflectivity vehicle, visibility≥40km)	Humidity≤80%
	≥65km(for large targets, visibility≥40km)	
Ranging accuracy	±5m	
Ranging repetition rate	1~10hz(adjustable)	
Accuracy	≥98%	
Divergence angle	≤0.6mrad	
Receiving aperture	80mm	
Communication interface	RS422	
Supply voltage	DC18~32V	
Operating power	≤50W(@1hz)	Tested under room temperature
Stand-by power	≤30W	Tested under room temperature
Dimension	≤225mm×150mm×100mm	
Weight	≤3.8kg	
Temperature	-40℃~65℃	
Heat-dissipating	Air-cooling	

Communication interfaces

Line NO.	Definition	Note.
1	Direct current	+24V Direct current
2		
3		
4		
5	GND(direct current)	+24V GND
6		
7		

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8		
9	Serial port T+（from a laser rangefinder to upper computer+）	RS422
10	Serial port R-（from upper computer to a laser rangefinder-）	
11	Serial port T-（from a laser rangefinder to upper computer-）	
12	Serial port R+（from upper computer to a laser rangefinder+）	
13	RS422 GND（connection is not necessarily required）	
14	SYN+	RS422 differential external trigger, width ＞10us
15	SYN-	

Calculation of ranging ability

(1)Targets and condition requirements

Visibility≥40km

Humidity≤80%

For vehicles with 2.3m×2.3m dimension

Reflectivity=0.3

Ranging ability≥30km

(2)Analysis and verification

The main parameters that affect ranging ability are peak power of lasers, divergence angle, transmitting and receiving transmittance, wavelength of laser, etc.

For this laser rangefinder, it takes ≥ 5MW peak power of lasers, 0.6mrad divergence angle, 1570nm wavelength, transmitting transmittance≥90%, receiving transmittance≥ 80% and 80mm receiving aperture.

It is a laser rangefinder for small targets, ranging ability can be calculated by the following formula. Ranging formula for small targets:

$$P_r = \frac{4P_t\tau_t\tau_r A_s A_r \rho}{\pi\theta_t^2 R^4}\cdot e^{-2\sigma\frac{R}{V}}$$

P_r : Detectable optical power

P_t : Transmitting power of laser rangefinder(5MW)

τ_t : Transmitting transmittance(0.9)

τ_r : Receiving transmittance(0.8)

A_r :Optical receiving area(80mm receiving aperture)

A_s : Effective reflection area of targets(5.29 ㎡)

ρ : Target reflectivity(0.3)

σ : Atmosphere attenuation coefficient(0.02)

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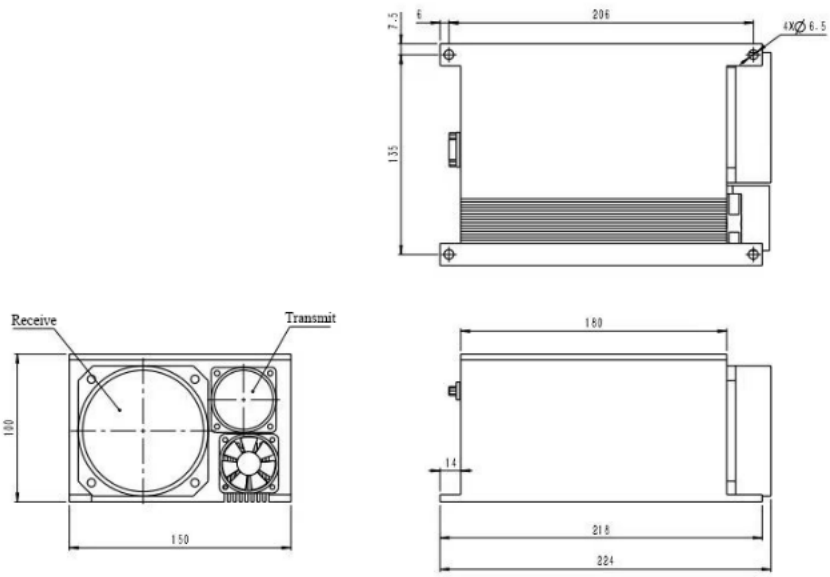
V : Visibility(according to testing condition)

R : Distance to targets

As long as detectable optical power that reflected by targets is larger than minimum detectable power $M.D.S$, a laser rangefinder is able to range distance to a target. For a laser rangefinder with 1570nm wavelength, generally, the minimum detectable power(M.D.S) of APD is 5×10^{-9}W.

Under 40km visibility with 32km distance to targets, the minimum detectable power is lower than M.D.S of APD(5×10^{-9}W), therefore, under a condition with 40km visibility, a laser rangefinder can range distance for (2.3m × 2.3m) targets up to 31~32km(might be close or less than 32km).

Dimension



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