



OTL-ELRF 052 Laser Range Finder Module

Long-Range Measurement • High Accuracy • Eye-Safe • Reliable Performance



Product Overview

The **OTL- ELRF 052** laser rangefinder module is developed based on the 1535nm erbium glass laser independently developed by Lumispot. It adopts a single-pulse TOF (Time-of-Flight) ranging mode, with a maximum measurement range of $\geq 15\text{km}$.

The module consists of the laser, transmitting optical system, receiving optical system, and control circuit board. It communicates with the host computer via RS422 serial port and provides host computer test software and communication protocol, which is convenient for user secondary development.

It features small size, light weight, stable performance, high impact resistance, first-class eye safety, and can be applied in handheld, vehicle-mounted, and pod-based electro-optical equipment.

Product Highlights



Long-Range Measurement

$\geq 15\text{km}$ for vehicles, $\geq 20\text{km}$ for large targets (buildings), $\geq 7\text{km}$ for personnel.



High Accuracy

Ranging accuracy $\leq \pm 1.5\text{m}$, accuracy $\geq 98\%$.



Eye-Safe (Class 1)

1535nm erbium laser, safe for human eyes.



Multiple Functions

Single / continuous ranging, range strobe, front & rear target indication, self-test function.



RS422 Interface

115200bps, easy integration and secondary development.



Compact & Rugged Design

Small size, light weight, high impact resistance.

DATASHEET



1535nm
Wavelength



$\geq 15\text{km}$
Max. Range
(Vehicle)



$\geq 20\text{km}$
Max. Range
(Large Target)



$\geq 7\text{km}$
Max. Range
(Personnel)



$\leq \pm 1.5\text{m}$
Ranging
Accuracy



1~10Hz
Ranging
Frequency



< 270g
Weight



$\leq 104 \times 61 \times 78\text{mm}$
Size



$-40^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Operating
Temperature

A compact laser rangefinder module intended for integration into electro-optical systems requiring long-range distance measurement

Added explanatory copy and review notes are highlighted in red. Technical values are reproduced from the supplied OTL-ELRF 052 specification

OTL- ELRF O52

Laser Range Finder Module | Technical Datasheet

PRODUCT OVERVIEW

The OTL- ELRF O52 laser rangefinder module is developed around a 1535 nm erbium-glass laser. It uses single-pulse time-of-flight (TOF) ranging and specifies a maximum measuring range of ≥ 15 km. The module includes a laser, transmitting optical system, receiving optical system, and control circuit board. It communicates with the host computer through an RS422 serial port; the source states that host test software and a communication protocol are provided for secondary development.

The source describes a small, lightweight module with stable performance, high impact resistance, and first-class eye safety.

Actual range depends on target size, reflectance, and atmospheric visibility; the source lists different ranges for buildings, vehicles, and personnel



PRODUCT HIGHLIGHTS

Feature	Specification from source
Laser wavelength	1535 nm $\pm$ 5 nm
Long-range measurement	≥ 15 km general maximum; ≥ 20 km large targets; ≥ 15 km vehicles; ≥ 7 km personnel under stated conditions
Measurement performance	Ranging accuracy $\leq \pm 1.5$ m; accuracy $\geq 98\%$; minimum measuring range ≤ 100 m
Flexible operation	Single and continuous ranging; 1–10 Hz adjustable continuous ranging frequency
Host integration	RS422 at 115200 bps; host test software and communication protocol
Compact module	Weight < 270 g; dimensions $\leq 104 \times 61 \times 74$ mm

Technical Specifications

Optical, electrical, mechanical, and environmental data

RANGING CAPACITY

Parameter	Source specification
General maximum measuring range	≥15 km
Large target (building)	≥20 km
Vehicle target	≥15 km; target 2.3 × 2.3 m; diffuse reflectance ≥0.3
Personnel target	≥7 km; target 1.75 × 0.5 m
Atmospheric conditions	Visibility ≥20 km; relative humidity ≤80%

OPTICAL AND RANGING PERFORMANCE

Parameter	Value
Laser wavelength	1535 nm ± 5 nm
Laser divergence angle	0.3 mrad (source line has no clearly visible inequality sign)
Continuous ranging frequency	1–10 Hz, adjustable
Ranging accuracy	≤ ±1.5 m
Accuracy	≥98%
Minimum measuring range	≤100 m
Ranging resolution	≤30 m
Laser safety	Described as eye-safe in source

ELECTRICAL, MECHANICAL & ENVIRONMENTAL

Parameter	Value
Power supply	DC 5–28 V
Standby power	≤150 mW
Average power	≤6 W
Peak power	≤14 W
Weight	<270 g
Dimensions	≤104 × 61 × 74 mm
Operating temperature	–40 °C to +60 °C
Storage temperature	–55 °C to +70 °C
Impact	75 g @ 11 ms
Vibration	Combined-wheel-vehicle vibration environment (source wording)

Interfaces & Integration

Host communication, connector pinout, and mounting

COMMUNICATION INTERFACE

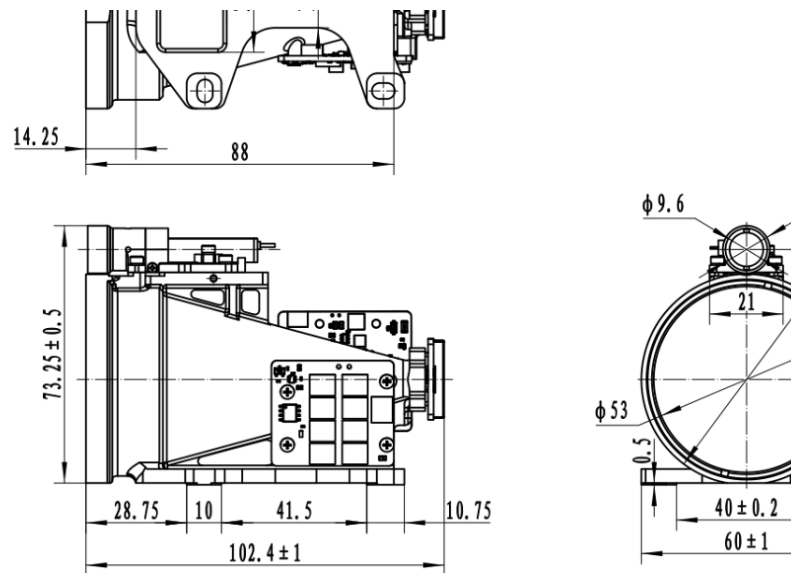
Item	Specification
Communication interface	RS422
Baud rate	115200 bps
Electrical connector	A1002WR-S-10P
Power enable logic	TTL 3.3 V; ON when >2.7 V or floating; OFF when <0.3 V

ELECTRICAL CONNECTOR PIN DEFINITION

Pin	Signal	Description / source note
1	VIN+	Power supply +
2	VIN-	Power supply -
3	POWER_EN	Module power enable; TTL 3.3 V
4	RS422 TX+	Source labels this as RS422 receive +
5	RS422 TX- (UART_TXD)	Source labels RS422 reception -; UART transmission, TTL 3.3 V
6	RS422 RX- (UART_RXD)	Source labels RS422 transmission -; UART reception, TTL 3.3 V
7	RS422 RX+	Source labels this as RS422 transmit +
8	Reserved	Reserved
9	Reserved	Reserved
10	GND	Communication ground

ENGINEERING REVIEW REQUIRED: TX/RX signal names appear inconsistent with their accompanying descriptions in the source. This catalog preserves the source wording; confirm the pinout with the manufacturer before wiring.

MOUNTING DRAWING



3. User Precautions

- The laser emitted by this rangefinder is 1575nm, which is safe for human eyes.

Original mounting drawing extracted from page 4 of the supplied specification. Consult the source drawing for dimension callouts.

User Precautions

Handling, environmental limits, and safe integration

SAFETY AND HANDLING

- The source identifies the emitted wavelength as 1535 nm and describes the laser as eye-safe; nevertheless, do not look directly into the laser.
- When adjusting optical-axis parallelism, cover the receiving lens to avoid permanent detector damage from excessively strong echoes.
- The module is not airtight. Keep relative humidity below 80% and maintain a clean environment.
- Range depends on visibility and target properties. Fog, rain, and sandstorms reduce range; increasing the beam angle to the target can also reduce range.
- Do not emit the laser at highly reflective targets such as glass or white walls within 100 m, to avoid over-strong echoes and potential APD detector damage.
- Do not plug or unplug cables while powered on.
- Check power-supply polarity carefully to avoid permanent damage.

INTEGRATION CHECKLIST

- Confirm connector pinout and RS422 signal direction with the manufacturer before wiring.
- Keep operation within stated temperature and humidity limits.
- Validate target type, reflectivity, and visibility when assessing range.
- Use the supplied communication protocol and test software for host integration.

SOURCE AND REVIEW NOTES

Source: OTL- ELRF O52 15km LRF Spec.pdf, Technical Specification, Version 2025.6.

The source states ≥ 15 km general maximum range and separately lists ≥ 20 km for large targets, ≥ 15 km for vehicles, and ≥ 7 km for personnel.

The source's laser divergence line reads 0.3 mrad without a clearly visible inequality sign. This value is reproduced with a review note and should be confirmed before formal publication.

