

LRF0815C 8 km 1535 nm OEM Laser Rangefinder Module

A board-level pulsed time-of-flight rangefinder for UAV gimbals, EO/IR payloads, handheld optics, reconnaissance systems, surveying instruments and fixed monitoring platforms.



Integration profile

- 15-8,000 m specified measurement envelope
- Up to 3 reported targets
- 0.5-10 Hz ranging
- TTL or RS-422 communication
- 12 V DC supply
- 65 x 46 x 86 mm, <=175 g

>=8,000 m 30% target, visibility >=10 km	1535 +/- 5 nm Class I stated in module specification	+/-2 m Ranging accuracy	<=175 g Board-level OEM format
---	--	-----------------------------------	---

Product overview

The LRF0815C emits a short 1535 nm pulse, collects reflected energy through a 40 mm receiver lens and converts round-trip delay into distance. The specified 300 microjoule minimum pulse energy and 0.3 mrad maximum divergence support long-range return collection while the host selects single or continuous ranging and interprets up to three target distances.

Range is not an unconditional distance promise. Target size, reflectance, aspect angle, visibility, receiver aperture, optical-window transmission, detector noise and acceptance thresholds all affect the usable field result. The 8 km figure is tied to the test condition stated in this brief.

Pulsed Time-of-Flight Ranging

Distance follows $R = c \times \Delta t / 2$, where Δt is the round-trip interval between pulse emission and an accepted echo. Receiver bandwidth, background-light rejection, signal-to-noise ratio and timing discrimination determine how consistently the leading edge is converted into a range value.

Multiple surfaces along one line of sight can produce several echo peaks. The LRF0815C can report up to three targets, allowing host software to apply first, main or last-return logic appropriate to the scene.

Wavelength trade space

Wavelength	Engineering strengths	Integration considerations
1535/1550 nm	Supports eye-safety-oriented long-range architectures and narrowband optical filtering.	Uses InGaAs-class detection; final laser classification must be assessed after integration.
905 nm	Broad silicon detector ecosystem and cost-effective high-volume sensing.	Accessible-emission limits, solar background and detector dynamic range require system review.
1064 nm	Common in high-energy ranging and compatible designation architectures.	Different detector, coating, safety and mission requirements; not a drop-in substitute.

Do not select a wavelength from a single claim about fog. Published measurements found less than a 10% difference between 905 nm and 1550 nm extinction coefficients at equal emitted power under the tested fog conditions. Review safety, range, detector, atmosphere, optics and cost together.

Application fit

UAV and EO/IR	Survey and mapping
Review payload mass, regulator transients, boresight stability, vibration and timing latency.	Calibrate range with attitude, position, lever arm, timing and sensor-to-sensor boresight.
Handheld optics	Fixed monitoring
Plan battery, controls, protective window and final accessible-emission assessment.	Validate grounding, surge behavior, sealing, window contamination and expected target reflectance.

Detailed Specifications

Basic ranging performance

Model	LRF0815C
Specified range	15 to 8,000 m
8 km test condition	>=8,000 m to a 2.3 m x 2.3 m target, 30% reflectance, visibility >=10 km
Accuracy / resolution	+/- 2 m / <=0.1 m reported resolution
Ranging frequency	0.5 to 10 Hz
Multi-target reporting	Up to 3 targets
Precision / false alarm	>=98% / <=1% under specified test conditions

Optical parameters

Wavelength	1535 +/- 5 nm
Laser-safety rating	Class I stated in the module specification; assess the final integrated product
Pulse energy	>=300 microjoules
Beam divergence	<=0.3 mrad
Transmit / receive lens	12 mm / 40 mm diameter

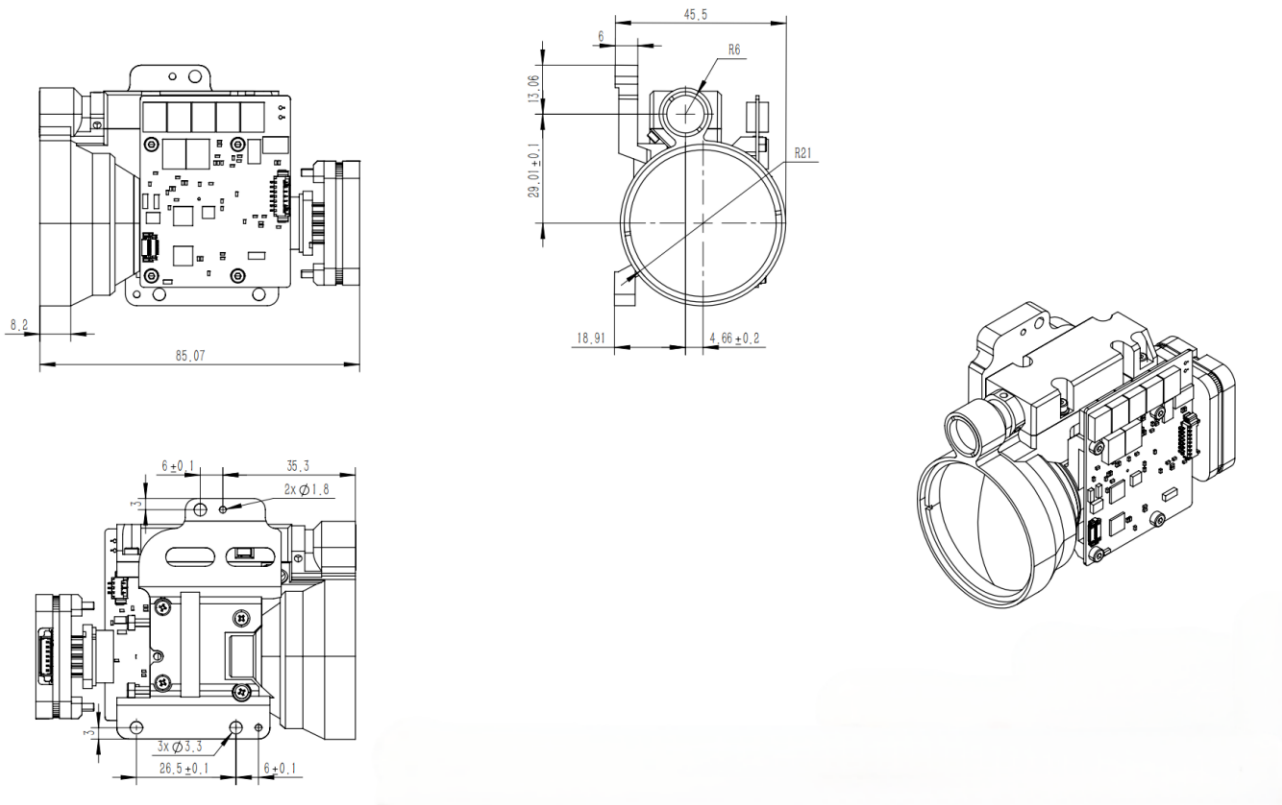
Electrical and interface

Supply	12 V DC
Communication	RS-422; TTL optional
Serial format	115200 bps, 8N1
TTL connector	Molex 51021-0500: 3.3 V RX/TX, CTRL, +12 V and GND
Power	<=1.2 W standby; <=2 W average; <=3 W peak at 10 Hz

Mechanical and environmental

Dimensions / weight	65 x 46 x 86 mm / <=175 g
Operating / storage	-40 to +70 C / -55 to +75 C
Impact and vibration	Specified to meet MIL-STD-810G testing; confirm method, severity and acceptance criteria

Mechanical Drawing and Host Checklist



Request the controlled mechanical drawing before freezing the enclosure. The marketing-page drawing is for early layout only; mounting, connector, optical-axis and tolerance details must match the ordered revision.

Host checklist

Power	Reserve regulator and wiring margin for the 10 Hz peak load.
Harness	Use the controlled TTL or RS-422 cable drawing. A legacy J30J label conflicts with the stated 12 V input.
Optical window	Specify 1525-1545 nm transmission, control ghosts and contamination, then re-test the finished system.
Host software	Define first/main/last-target logic and handle timeout, self-test and status flags.
Validation	Record target, reflectance, visibility, temperature, repetition rate and host optics for acceptance tests.

Laser-safety and qualification boundary

The module specification states Class I, but final accessible emission depends on the complete product. IEC 60825-1 places classification responsibility on the finished system where applicable. Likewise, a statement that impact and vibration meet MIL-STD-810G should be tied to the exact test method, severity, mounting and acceptance criteria.

Prepare a Useful Technical Inquiry

A complete requirement set lets ERDI confirm the correct connector, document revision, test condition and commercial configuration before a sample or production order is released.

Target definition	Target size, reflectance, aspect and required probability of detection
Range requirement	Minimum range, maximum range and expected visibility or weather limits
Update behavior	Single shot or continuous ranging, required frequency and multi-target selection logic
Host interface	TTL or RS-422, cable length, connector preference and grounding architecture
Mechanical envelope	Available volume, mass limit, mounting surfaces and optical-window geometry
Environment	Operating temperature, vibration, shock, sealing and qualification profile
Commercial plan	Sample quantity, annual volume, delivery schedule and destination market

Controlled files to request

Current product datasheet, mechanical drawing, connector and cable drawing, serial communication protocol, sample acceptance plan and the applicable impact, vibration and laser-safety evidence for the ordered revision.

Engineering references

1. Burns, Christodoulou and Boreman, System Design of a Pulsed Laser Rangefinder, Optical Engineering 30(3), 1991.
2. Ma et al., The Short-Range, High-Accuracy Compact Pulsed Laser Ranging System, Sensors 22(6), 2146, 2022. DOI: 10.3390/s22062146.
3. Duthon, Colomb and Bernardin, Light Transmission in Fog, Applied Sciences 9(14), 2843, 2019. DOI: 10.3390/app9142843.
4. IEC 60825-1, Safety of laser products - Part 1: Equipment classification and requirements.

Request controlled technical files

sales@erdicn.com | +86 28 81076698 | erdicn.com/products/lrf0815c