TF03-100

100 m IP67 Long-Range Time-of-Flight LiDAR

High-frequency single-point laser ranging sensor with multi-interface industrial connectivity

Parameter	Specification
Measurement range	0.1-100 m @ 90% reflectivity; 0.1-40 m @ 10% reflectivity
Outdoor range @ 100 klux	0.1-80 m @ 90% reflectivity; 0.1-30 m @ 10% reflectivity
Accuracy	±10 cm within 10 m; ±1% beyond 10 m
Distance resolution	1 cm
Frame rate	1-1000 Hz adjustable; default 100 Hz
Repeatability	1σ <3 cm
Field of view	0.5°
Interfaces	UART / CAN or RS485 / RS232
Protection	IP67

1. Product Overview

TF03-100 is a long-range single-point Time-of-Flight laser ranging sensor designed for stable, precise and high-sensitivity distance measurement. The supplied product material emphasizes 100 m-class ranging, strong ambient-light capability, narrow field of view, high adjustable frame rate, industrial protection and multiple communication-interface options.

2. Key Selling Points & Features

- Up to 100 m measurement range on 90% reflectivity targets.
- Strong outdoor capability: up to 80 m at 90% reflectivity under 100 klux illumination.
- High adjustable measurement rate from 1 to 1000 Hz; default 100 Hz.
- Narrow 0.5° field of view for focused long-range detection.
- 1 cm distance resolution and repeatability specified as 1σ <3 cm.
- Accuracy specified as ±10 cm within 10 m and ±1% beyond 10 m.
- IP67 protection for demanding industrial and outdoor installations.
- Wide 5-24 V supply range and ≤1 W power consumption.
- Multiple interface configurations: UART/CAN or RS485/RS232.
- 905 nm laser source with Class 1 eye-safety classification per EN 60825.
- Aluminum-alloy housing and -25°C to +60°C operating range.
- 70 cm integrated cable for installation flexibility.

3. Ranging Performance

Parameter	Specification
Range @ 90% reflectivity	0.1-100 m
Range @ 10% reflectivity	0.1-40 m
Range @ 90% reflectivity & 100 klux	0.1-80 m
Range @ 10% reflectivity & 100 klux	0.1-30 m
Accuracy ≤10 m	±10 cm
Accuracy >10 m	±1%
Distance resolution	1 cm
Frame rate	1-1000 Hz adjustable (default 100 Hz)
Repeatability	1σ <3 cm
Ambient-light capability	100 klux
Protection rating	IP67

4. Optical Specifications

Parameter	Specification
Light source	LD
Center wavelength	905 nm
Laser safety	Class 1 (EN 60825)
Field of view	0.5°

5. Electrical & Communication Specifications

Parameter	Specification
Supply voltage	5-24 V
Average current	≤150 mA @ 5 V; ≤80 mA @ 12 V; ≤50 mA @ 24 V
Power consumption	≤1 W
Peak current	150 mA
Logic level	LVTTL (3.3 V) for UART/CAN configuration
Alternative communication levels	RS485 level (RS485 version); RS232 level (RS232 version)
Communication interfaces	UART / CAN or RS485 / RS232

6. Mechanical & Environmental Specifications

Parameter	Specification
Overall dimensions	44 × 43 × 32 mm (L × W × H)
Housing material	Aluminum alloy
Operating temperature	-25°C to +60°C
Storage temperature	-40°C to +85°C
Weight - UART/CAN configuration	89 g ±3 g
Weight - RS485/RS232 configuration	92 g ±3 g
Cable length	70 cm
Protection rating	IP67

The original mechanical drawing contains Chinese annotations and is intentionally not reproduced in this datasheet.

7. Functional Characteristics

TF03-100 performs non-contact single-point distance measurement using a 905 nm laser source. Its narrow 0.5° field of view supports focused target detection at long range, while the adjustable 1-1000 Hz frame rate allows the sensor to be configured for slower monitoring or high-speed control and detection tasks. The range specification varies with target reflectivity and ambient illumination, as shown in the performance table.

8. Interface Options

The supplied parameter table shows two interface configurations. One configuration uses UART/CAN with 3.3 V LVTTL communication level; another provides RS485/RS232 electrical interfaces. This allows the same sensor family to support embedded controllers as well as industrial serial networks.

9. Typical Applications

- Long-range obstacle and presence detection
- Industrial distance measurement
- Outdoor robotics and autonomous equipment
- Vehicle / traffic detection
- Level and position monitoring
- Warehouse and logistics sensing
- High-speed ranging and control systems

10. Integration Guidance

- Provide a regulated supply within the specified 5-24 V range.
- Select the correct interface version before system wiring: UART/CAN and RS485/RS232 use different electrical levels.
- Account for target reflectivity and ambient illumination when estimating usable range.
- Keep the optical window unobstructed and aligned with the target direction.
- Select the frame rate according to system response-time and communication-bandwidth requirements.
- Use suitable sealing and cable routing practices to preserve the intended IP67 installation performance.

11. Source Notes

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