

TF02-i

RS485 / CAN Mid-Range Time-of-Flight LiDAR

Industrial single-point distance sensor for robotics, intelligent transportation, smart equipment and UAV applications



Parameter	Specification
Indoor range, 0 klux	0.1-40 m @ 90% reflectivity; 0.1-13.5 m @ 10% reflectivity
Outdoor range, 100 klux	0.1-40 m @ 90% reflectivity; 0.1-13.5 m @ 10% reflectivity
Accuracy	±5 cm (0.1-5 m); ±1% (5-40 m)
Distance resolution	1 cm
Frame rate	1-100 Hz adjustable; default 100 Hz
Repeatability	1 σ <2 cm (0.1-35 m @ 90% reflectivity)
Field of view	3°
Interfaces	RS485 / CAN
Protection	IP65

1. Product Overview

TF02-i is an upgraded industrial single-point LiDAR based on the TF02-Pro platform. The supplied product material states that its communication interfaces and input-voltage range were optimized for industrial deployment while retaining stable, accurate and high-sensitivity Time-of-Flight distance measurement. The module is intended for obstacle sensing and distance measurement in robotics, intelligent transportation, smart equipment and UAV systems.

2. Key Selling Points & Features

- 40 m-class ranging on 90% reflectivity targets, indoors and under the stated 100 klux outdoor condition.
- Industrial RS485 and CAN communication interfaces.
- Wide 7-30 V DC input range for industrial power systems.
- Accuracy specified as ± 5 cm from 0.1-5 m and $\pm 1\%$ from 5-40 m.
- 1 cm distance resolution.
- Repeatability specified as $1\sigma < 2$ cm over 0.1-35 m at 90% reflectivity.
- Adjustable 1-100 Hz frame rate with 100 Hz default.
- Strong ambient-light capability specified to 100 klux.
- 3° field of view for focused single-point ranging.
- 850 nm VCSEL source with Class 1 eye-safety classification per IEC 60825.
- IP65 environmental protection.
- Low power: ≤ 0.85 W @ 12 V.
- ABS/PC/PMMA construction with -20°C to +60°C operating range.
- 70 cm integrated cable and compact industrial enclosure.

3. Ranging Performance

Parameter	Specification
Indoor range @ 90% reflectivity, 0 klux	0.1-40 m
Indoor range @ 10% reflectivity, 0 klux	0.1-13.5 m
Outdoor range @ 90% reflectivity, 100 klux	0.1-40 m
Outdoor range @ 10% reflectivity, 100 klux	0.1-13.5 m
Accuracy, 0.1-5 m	± 5 cm
Accuracy, 5-40 m	$\pm 1\%$
Distance resolution	1 cm
Frame rate	1-100 Hz adjustable; default 100 Hz
Repeatability	$1\sigma < 2$ cm (0.1-35 m @ 90% reflectivity)
Ambient-light capability	100 klux
Protection rating	IP65

4. Optical Specifications

Parameter	Specification
Laser safety	Class 1 (IEC 60825)
Center wavelength	850 nm
Optical source	VCSEL
Field of view	3°

5. Electrical Specifications

Parameter	Specification
Supply voltage	DC 7-30 V
Average current	≤70 mA @ 12 V
Power consumption	≤0.85 W @ 12 V
Peak current	100 mA

6. Communication Interfaces

Parameter	Specification
RS485 default baud rate	115200
RS485 data bits	8
RS485 stop bits	1
RS485 parity	None
CAN default bit rate	250 kbps
CAN default receive ID	0x00000003
CAN default transmit ID	0x00000003
CAN frame format	Standard frame

7. Mechanical & Environmental Specifications

Parameter	Specification
Overall dimensions	69 × 40.5 × 31.5 mm
Housing materials	ABS / PC / PMMA
Operating temperature	-20°C to +60°C
Storage temperature	-30°C to +80°C
Weight	60 g including cable
Cable length	70 cm
Protection rating	IP65

8. Mechanical Reference Dimensions

The supplied mechanical drawing shows a 69 mm overall width, 40.5 mm body width/height reference and 31.25 mm depth reference, together with side mounting ears and cable exit. The source specification table defines the product envelope as 69 × 40.5 × 31.5 mm.

The original mechanical drawing is not reproduced because the user requested that source images containing Chinese text not appear in the final datasheet.

9. Functional Characteristics

TF02-i uses Time-of-Flight optical ranging to measure target distance. The 850 nm VCSEL source and receiver operate through the two front optical windows, while the integrated electronics calculate distance and transmit measurements through the selected industrial interface. Its wide input-voltage range, RS485/CAN connectivity and IP65 enclosure make the module suitable for embedded and industrial installations where a simple TTL-level sensor interface is not preferred.

10. Typical Applications

- Robot obstacle detection and ranging
- Intelligent transportation systems
- Industrial smart equipment
- UAV obstacle sensing / altitude-related ranging
- Automated machinery and presence detection
- Outdoor distance measurement under strong ambient illumination

11. Integration Guidance

- Provide a regulated DC supply within the stated 7-30 V range.
- Select RS485 or CAN communication according to the host system architecture.
- For CAN integration, the source specifies a default 250 kbps bit rate and standard-frame format.
- Account for target reflectivity when estimating practical detection range.
- Keep both front optical windows unobstructed and aligned toward the target.
- Use appropriate mounting and cable-sealing practices to preserve the intended IP65 installation performance.

12. Source Notes

This datasheet was created exclusively from the supplied product-image package. Chinese-language feature, specification and mechanical images were used only to extract technical information and are not reproduced in the final PDF. Only clean product imagery without Chinese annotations is included. Parameters not explicitly supported by the supplied material have not been invented.