Introduction

The TOFSense F2P is a professional-grade, long-range laser sensor leveraging dTOF (Direct Time-of-Flight) technology to **achieve 50m ranging (±3cm accuracy) with 100Hz refresh rate**, engineered for mission-critical outdoor and industrial applications like drone terrain mapping, highway traffic monitoring, and large-scale 3D scanning. Compatible with [Raspberry Pi](#), [Arduino](#), and [ESP32](#) via UART/I2C interfaces, it offers plug-and-play integration for robotics, smart infrastructure, and automation systems. Built to withstand extreme conditions, its 100K LUX ambient light resistance ensures robust performance in direct sunlight, while multi-interface support (UART/I2C/GPIO) enables seamless synchronization with cameras, PLCs, and sensor arrays.
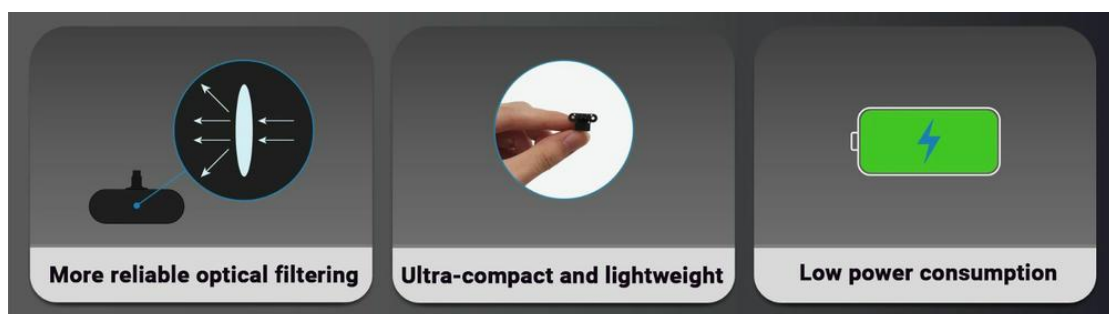

Figure: Features of ToF laser ranging sensor

50m Long-Range & ±3cm High Precision

The TOFSense F2P delivers best-in-class 50m detection capability, making it ideal for demanding applications like drone altitude hold, terrain mapping, and traffic monitoring. With ±3cm accuracy across its entire range, it ensures reliable measurements even at maximum distance, while its 1mm resolution enables fine-detailed tasks such as stockpile volume scanning and industrial inventory management. This combination of long-range and high precision sets it apart for professional-grade deployments where distance and reliability are critical.

100Hz High-Speed Refresh Rate

With an ultra-fast 100Hz refresh rate, the F2P provides real-time responsiveness for dynamic environments. This high-speed data output is essential for drone obstacle avoidance systems that require instantaneous reaction times, as well as smart traffic applications where accurate vehicle speed tracking and parking detection are crucial. The rapid updates ensure seamless performance in fast-moving scenarios, giving users a competitive edge in time-sensitive operations.

Unmatched Ambient Light Resistance (100K LUX)

Engineered to thrive in harsh conditions, the F2P operates flawlessly under direct sunlight (100K LUX) and high-intensity artificial light, making it uniquely suited for outdoor, industrial, and urban environments. Unlike conventional sensors that falter in bright settings, its advanced optics and algorithms maintain stable performance— whether deployed in sunlit construction sites, highway traffic gantries, or drone-based aerial surveys.

Multi-Interface Support (UART / I2C / I/O)

Designed for seamless integration, the F2P supports UART, I2C, and I/O interfaces, offering flexibility for embedded systems, PLCs, and custom hardware setups. The I/O trigger function allows synchronization with external devices like cameras or additional sensors, enabling synchronized data capture in multi-sensor arrays. This versatility makes it a go-to solution for developers needing plug-and-play compatibility across diverse architectures.
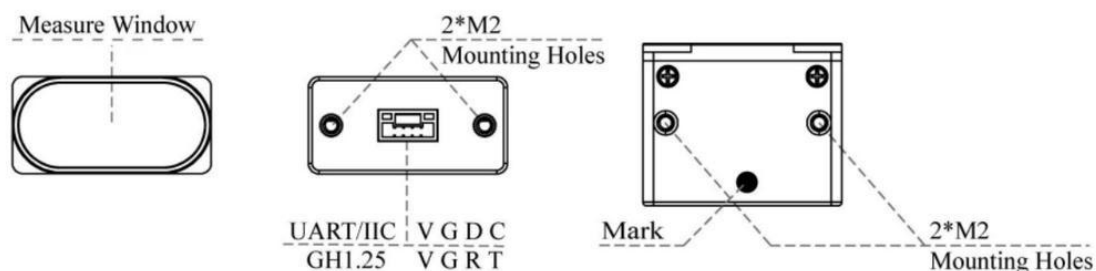

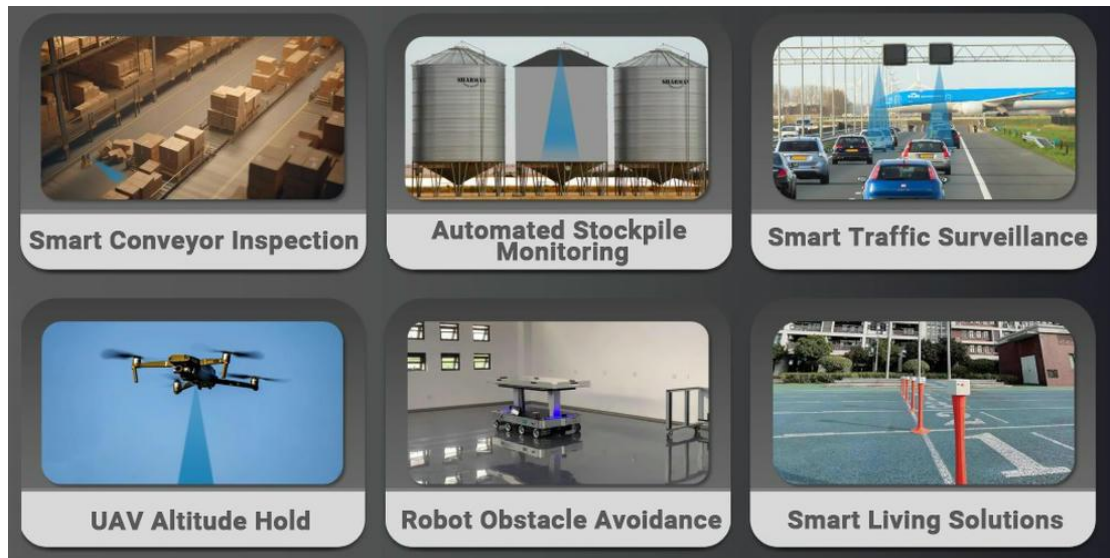Figure: Dimensions of ToF laser ranging sensor

Applications

Drone & UAV Developers – For precise terrain following, landing assistance, and obstacle detection at high altitudes.

Smart Traffic Engineers – For vehicle speed detection, parking management, and toll gate automation.

Industrial Automation – For long-range material level monitoring, conveyor belt tracking, and large-area 3D scanning.

Robotics & AGV Systems – Where long-distance navigation and dynamic path planning are critical.

Smart Conveyor Inspection · Automated Stockpile Monitoring · Smart Traffic Surveillance · UAV Altitude Hold · Robot Obstacle Avoidance · Smart Living Solutions

Specification

Refresh Rate: 100Hz

Classic Ranging Range: 0.05~50m

Classic Ranging Accuracy: ±3cm

Wavelength: 905nm

Resistance to Ambient Light: 100K LUX Illuminance

Field of View (FOV): 1~2°

Power Supply Voltage: 4.3V~5.2V

Power Consumption: 250mW

Communication Interface: UART/I2C/IO

I2C Default Slave Address: 0x80

Operating Temperature: -10℃~60℃

Dimensions: 22.7 mm *28.0 mm *13.6mm

Product Weight: 7.5g

Documents

Product wiki

Dimensions

Tutorial

[FAQ](FAQ)

Shipping List

TOF laser ranging sensor-50m x1

Wiring x2