# Introduction

This is a 64×8 matrix DTOF full-solid-state LiDAR with a measurable **field of view of 120° horizontally and 20° vertically**. It supports simultaneous **ranging at 512 points** and has a long-distance ranging capability of **up to 5m**. Its area-array detection design gives it a distinct advantage for robot forward navigation obstacle avoidance and local blind spot detection.

**DTOF Laser Ranging Principle: Unaffected by Light Interference**

The laser ranging sensor adopts DTOF (Direct Time-of-Flight) multi-line laser ranging technology, which calculates target distance by directly measuring the flight time of light. Compared with traditional infrared and ultrasonic ranging technologies, it has strong anti-interference ability against ambient light and temperature changes in daily scenarios and can work stably in regular indoor and outdoor environments.

**120° Ultra-Wide Horizontal Detection FOV: Wide Coverage**

It can accurately capture all targets within the 64×8 matrix range directly in front. The 120° ultra-wide horizontal FOV greatly improves the accuracy of obstacle avoidance decisions and enables robots to perceive the surrounding environment more comprehensively.

**Robot Forward Obstacle Avoidance and Blind Spot Detection**

This DTOF sensor is specially designed for robot navigation, and easily solves two core problems: forward obstacle avoidance and blind spot detection.

When robots move forward, collisions often occur due to narrow field of view, which makes them unable to detect furniture edges, low obstacles or narrow passages. It can be flexibly installed on the front of robots, robotic arms and other designated positions, accurately identify all obstacles in the specified direction and avoid them in time, ensuring smoother movement of robots.

**Dual-Communication Interface + Multimodal Data Visual Output**

The matrix sensor features both UART and Type-C communication interfaces, enabling direct output of measurement data. It supports selectable output modes: single-point, single-row, or full-data output. Additionally, it comes with a dedicated GUI visualization interface, which supports real-time display of measurement data, depth maps, and grayscale images, providing an intuitive presentation of ranging results and imaging effects.

# Features

- 64×8 Matrix Array (512 total ranging points)
- 120°(H) × 20°(V) Ultra-Wide Field of View
- Direct Time-of-Flight (dToF) technology for anti-interference
- Dual Interface: UART (Embedded) & Type-C (PC Visualization)

- Supports continuous ranging with data visualization GUI

# Applications

- Robot Forward Obstacle Avoidance
- Blind Spot Detection
- SLAM Mapping

# Specification

Sensor Specifications

- Ranging Range: 100 – 5000 mm @ 90 % reflective panel / indoor, 750 lux
- Detection Field of View (FOV):
  120° (H) × 20° (V) > 50 cm
  160° (H) × 20° (V) < 50 cm
- Ranging Resolution: 14 mm
- Ranging Accuracy:

  Long Range:
  ±10 cm (0.1 m ~ 0.5 m, for regular objects such as cartons);
  ±4 cm (0.1 m ~ 0.5 m, 90% reflector panel / indoor environment, 750 lux)

  Long Range:
  ±3 cm (0.5 m ~ 0.5 m ~ 5 m, 90% reflector panel / indoor environment, 750 lux)
- Ranging Frame Rate: 8 fps (64 × 8 matrix area measurement) 64 fps (1 × 8 single□row measurement)
- Ranging Mode: Continuous measurement
- Matrix Size: 64 × 8 total 512 ranging points
- Laser Wavelength: 905 nm

Power Parameters

- Supply Voltage: 5 V
- Logic Level Voltage: 3.3 V
- Operating Current: 80 mA

Interface Parameters

- Data Interface: UART / USB
- Connector Type: PH2.0□4P / Type□C
- Default Serial Baud Rate: 921600 bps

Physical Dimensions

- Module Size: 62 × 26 × 24 mm
- Mounting Hole: 3.0mm diameter
- Weight: 19.6g

# Shipping List

- Gravity: 64×8 Matrix DTOF 3D Laser Ranging Sensor x1
- Gravity PH2.0-4P Connection Cable x1

# Documents

- Product Wiki