



Mobile Robot Vision Expert

S10 Product

User Manual

Revision History

Revision Date	Version Number	Revision Description
13-Jan-25	V1.0	New Document
27-Feb-25	V1.1	Modify TOF Field of View

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1. Introduction

1.1 Document Purpose and Scope

This document describes the product specifications of the S10 camera, as well as some design details for developers to understand and use related products.

1.2 Terminology

RGBD Camera	The camera supports simultaneous output of RGB images and depth images, ensuring temporal and spatial synchronization.
Depth	The depth video stream is similar to the color or monochrome video stream, where each pixel has a value representing the distance from the camera, i.e., 'depth'.
FOV	Field of View, used to describe the angular range of the camera imaging a given scene, mainly including Horizontal Field of View (HFOV), Vertical Field of View (VFOV), and Diagonal Field of View (DFOV).
IR Camera	Infrared camera, or infrared camera, in this product, mainly targets near-infrared band imaging.
RGB Camera	Color camera, or color camera
Depth Camera	Depth camera, where the depth imaging module generally consists of a dot projector, an infrared camera, and a depth processing unit, while the color imaging module generally refers to the color camera.
Soc	System-on-Chip, used for processing image data, depth calculation, application algorithm operations, and other functions.
DTOF	Distance sensing technology based on time-of-flight measurement principle

1.3 Working Principle

This product is based on DTOF technology, offering a 3D depth camera with a wide-ranging distance, good precision, low cost, and excellent anti-interference, providing more stable and reliable data. It also integrates an RGB module to capture color images. The camera can align RGB and depth images internally.

2 Product Overview

This product is a compact, high-performance, cost-effective industrial-grade RGBD camera. It can provide high-performance depth data from 0.05m to 8m. The camera internally achieves spatial and temporal alignment of RGB images and depth maps. The product comes with an SOC, capable of outputting depth maps, intensity maps, RGB images, point cloud maps, and obstacle avoidance algorithm results. In terms of interfaces, it not only supports Ethernet but also allows for the switching of four obstacle avoidance zones and the output of emergency stop, deceleration, and safety signals through 2 IO outputs and 2 IO inputs.

2.1 Product Introduction



Figure 1 S10 Physical Appearance

2.2 Functional Features

DTOF has low power consumption and a compact size

Built-in computing power supports outputting obstacle detection results, enabling plug-and-play

Strong environmental adaptability: Resistant to 100KLUX sunlight interference, suitable from darkness to strong light, indoor to outdoor.

3. Specifications

3.1 Basic Specifications

Parameter	S10
Sensor Type	dTOF RGB-D Camera
Output Format	Depth/RGB/IR Amplitude Map
TOF Resolution & Frame Rate	240 x 160 @Max. 20fps (typ. 15fps)
TOF FOV (H×V)	120° × 80°
RGB Resolution & Frame Rate	1920×1080 @Max. 20fps (typ. 15fps)
RGB FOV (H×V)	120° × 90°
Range	0.05~8m (90% reflectivity) ; 0.05~5m (10% reflectivity)
Accuracy	≤3 cm
Power Consumption	≤4W (avg), 28W (peak)
Laser Wavelength	940 nm
Dimensions (L×W×H)	80 × 37 × 25 mm
Weight	190 g
Power Supply	12V~28V
Interface	Ethernet/IO
IP Rating	IP54
Operating Temperature	-20°C~60°C
Storage Temperature	-40°C~85°C
SDK Support	C/C++/ROS
OS Compatibility	Windows 7/8/10/11, Linux, Arm Linux/ROS

Parameter	S10
Ambient Light Resistance	100 kLux

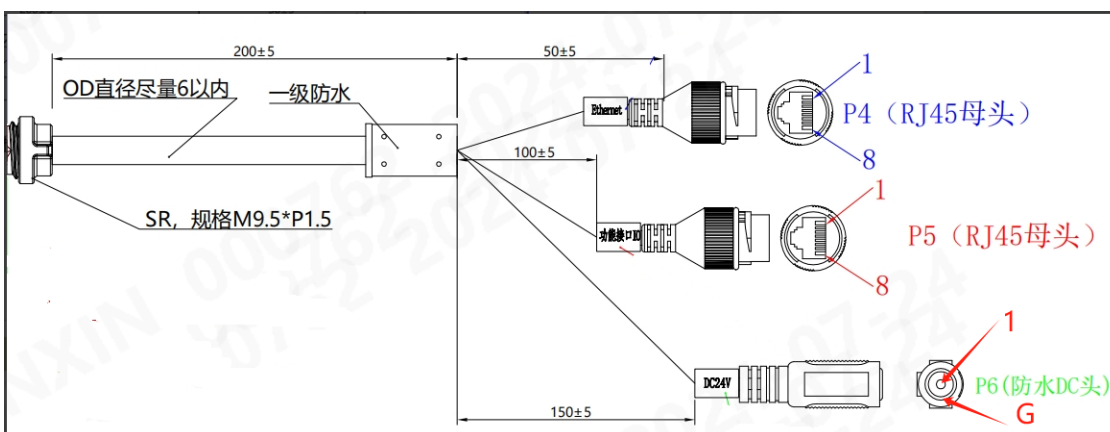
Note:

- Product dimensions are subject to the 3D model

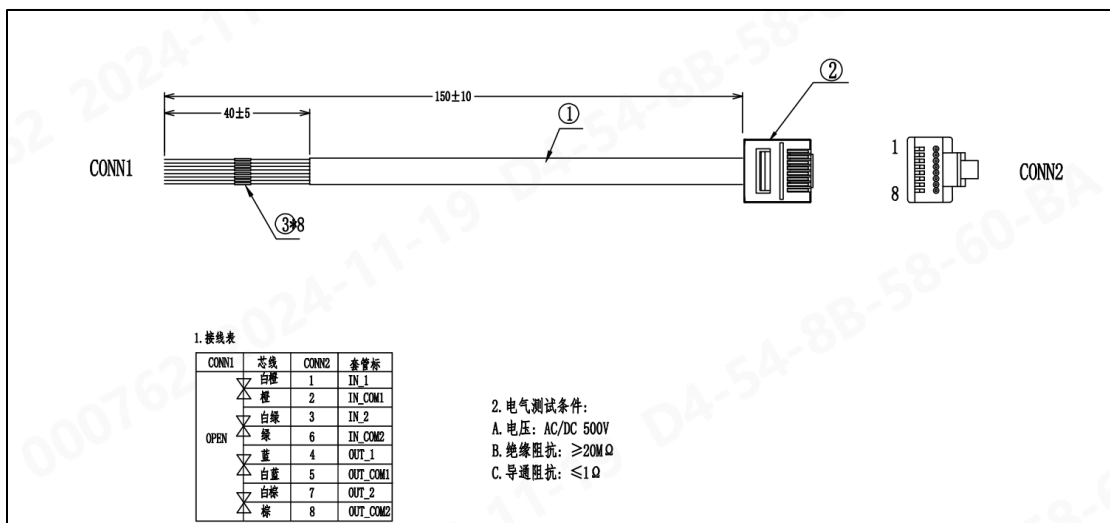
3.2 Interface Definition

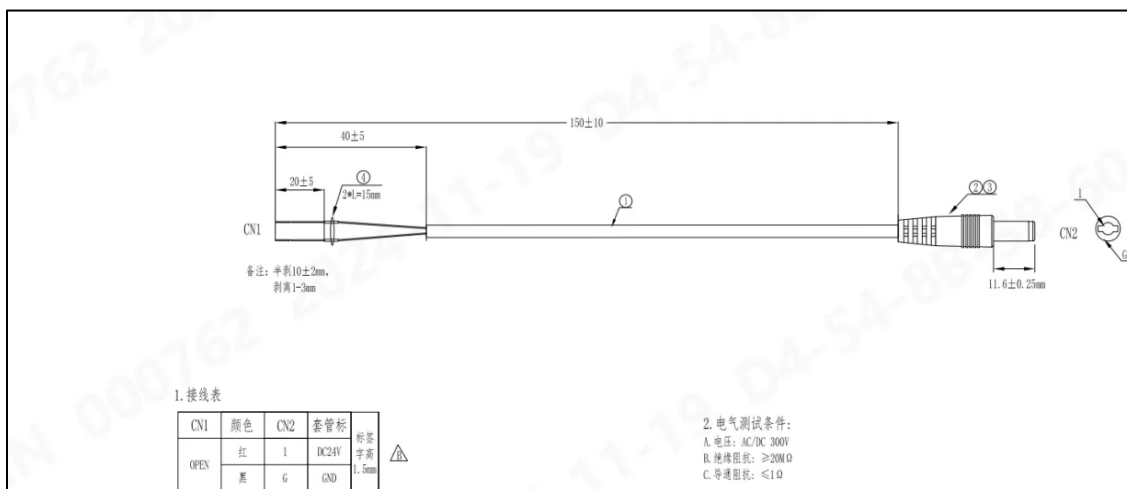
Camera Interface Description:

There are three interfaces on the camera end: DC24v power interface, 100M Ethernet interface, and function interface (8pin IO interface)



Wiring sequence description:





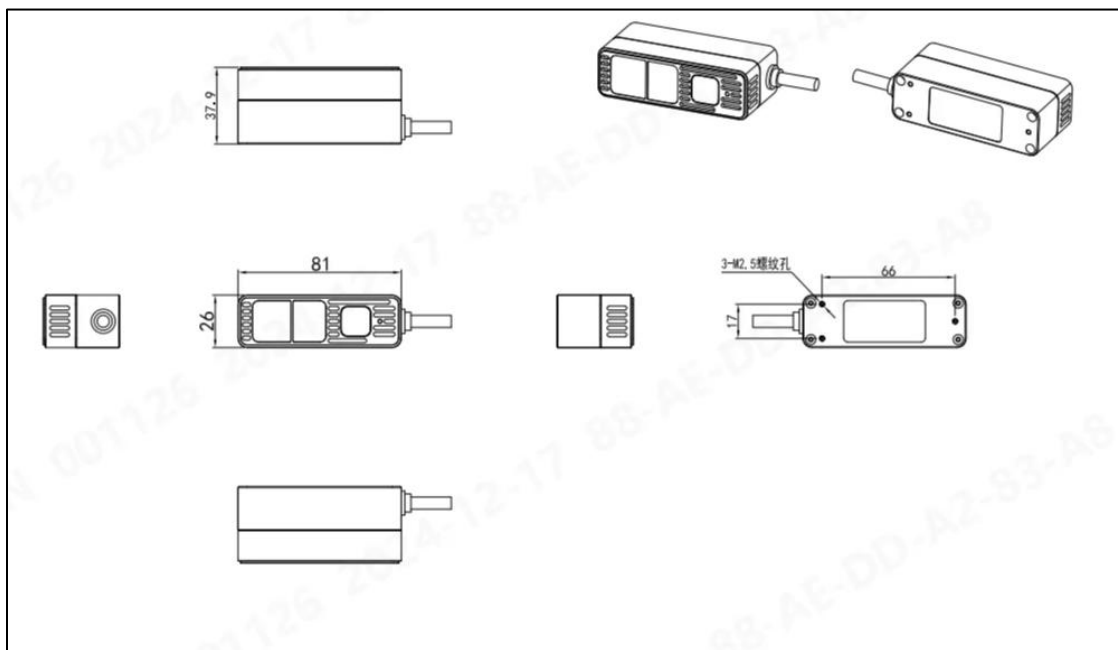
Cable	P1 Number	Color	Description
Ethernet Cable	1	Orange	OUT_COM2
	2	Yellow	OUT_2
	3	Green	OUT_COM1
	4	Blue	OUT_1
	5	Purple	IN_COM2
	6	Gray	IN_2
	7	Brown	IN_COM1
	8	White	IN_1
Power cable	1	Red	24V+
	G	Black	24V-

3.3 Camera Module Introduction



4. Camera Integration Guide

4.1 Structural Design



4.2 Software SDK

Refer to the MRDVS PC Software User Manual and MRDVS SDK Development Guide

5. Environment and Reliability

Item		Specification
Operating Environment	Temperature	-20°C to 60°C
	Humidity	Relative Humidity: 0%~95%RH, Non-condensing
	Illuminance	0KLUX--100KLUX
Storage Environment	Temperature	-40°C to 85°C
	Humidity	Relative Humidity: 10%~95%RH, Non-condensing
Normal Operating Temperature Rise		Case Temperature Rise <25°C
ESD Level		Contact Discharge ±4KV, Air Discharge ±8KV
RE Level		Complies with GB 9254 CLASS A
Operating Life		10 years
Environmental Certification		RoHS

6. Quick Start Guide

6.1 Connection Test

Connect the camera DC power to 24V/2A for power supply. The blue power indicator light flashes slowly, indicating normal power-on.

Connect the camera to the computer using a Cat6 Ethernet cable.

The camera's default IP address is 192.168.100.82.

Set the computer's IP to the same subnet as the camera and turn off the computer's firewall.

Run the accompanying host software to capture the camera's image.

6.2 IO Wiring Instructions

Interface	Attribute	Note
IN1	Input	Discrete input signal, active high, supports 24V/open connection
IN2	Input	Discrete input signal, active high, supports 24V/open connection
OUT1	Output	Discrete output signal, ground/open signal, supports 24V pull-up
OUT2	Output	Discrete output signal, ground/open signal, supports 24V pull-up
COM	GND	The common ground for discrete output signals, IN1 and IN_COM1 are used in pairs.

7. Frequently Asked Questions QA

Serial number	Question	Description
1	No response when clicking to open the camera	Please check if the firewall is turned off. The firewall needs to be turned off.
2	The host computer obtains multiple IPs	The same IP in the local area network is obtained by the camera. You need to select the desired IP to open.
3	Unstable data when opening the camera	It is recommended to use a Gigabit Ethernet cable for the camera. The initial data will be unstable when using a 100M Ethernet cable.
4	Software installation location	If installed in the default C drive, there may be permission settings.