



# TL460-S1-E1 Specifications

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## Introduction

The Percipio TL460-S1-E1 is a 3D ToF industrial camera developed based on Sony's DepthSense™ pixel technology, with a built-in Horizon Sunrise X3M chip that enables real-time image processing and machine learning functions. The camera has a long measurement range and is suitable for both indoor and outdoor use. It can be efficiently and conveniently integrated into applications such as long-distance non-contact measurement, flow counting, industrial automation, logistics technology and robotics.

The documentation introduces the detailed technical specifications of TL460-S1-E1 cameras. For more specifications of Percipio's other products, please go to [Product Specifications — PercipioDC documentation](#).



Figure 1 TL460-S1-E1 3D camera

## Technical Specifications

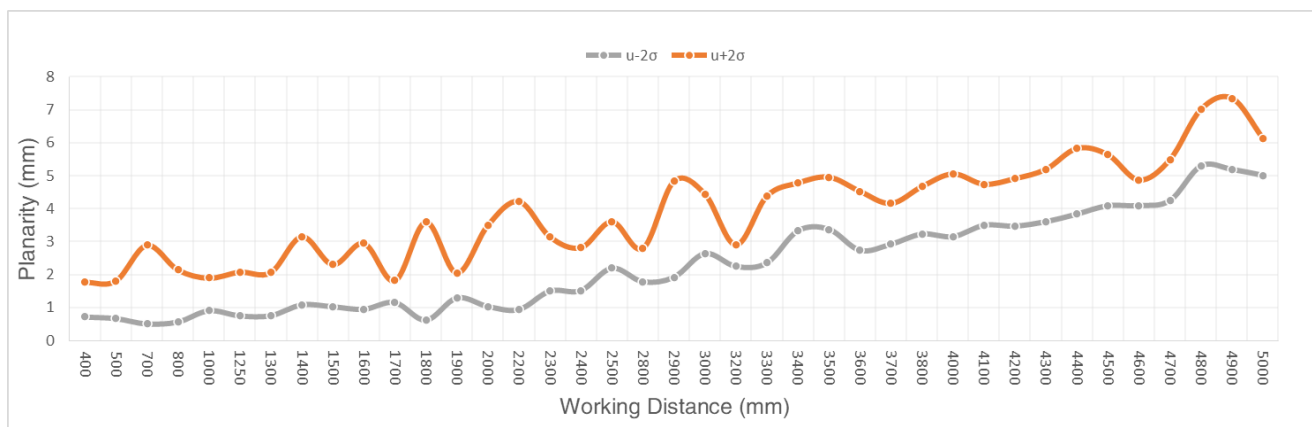
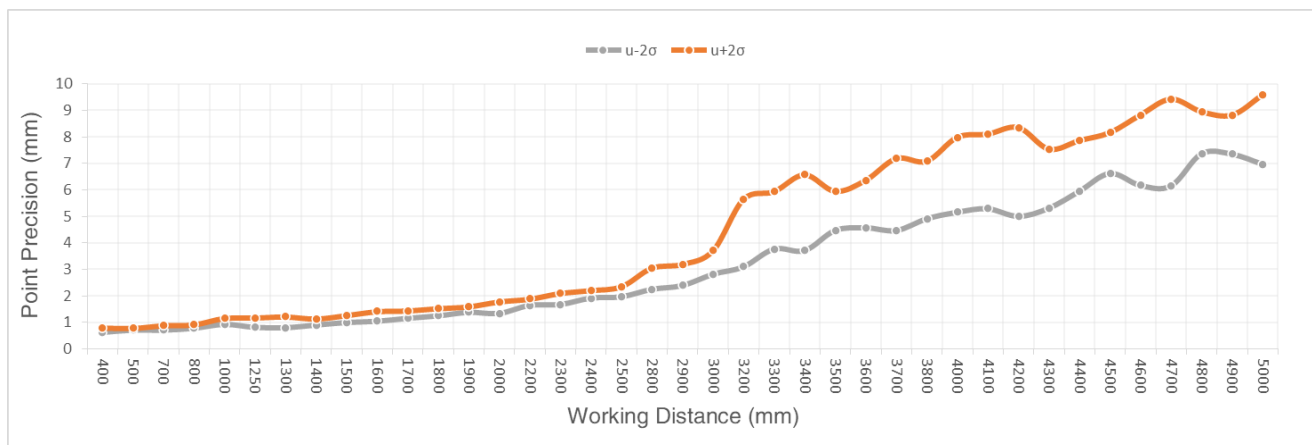
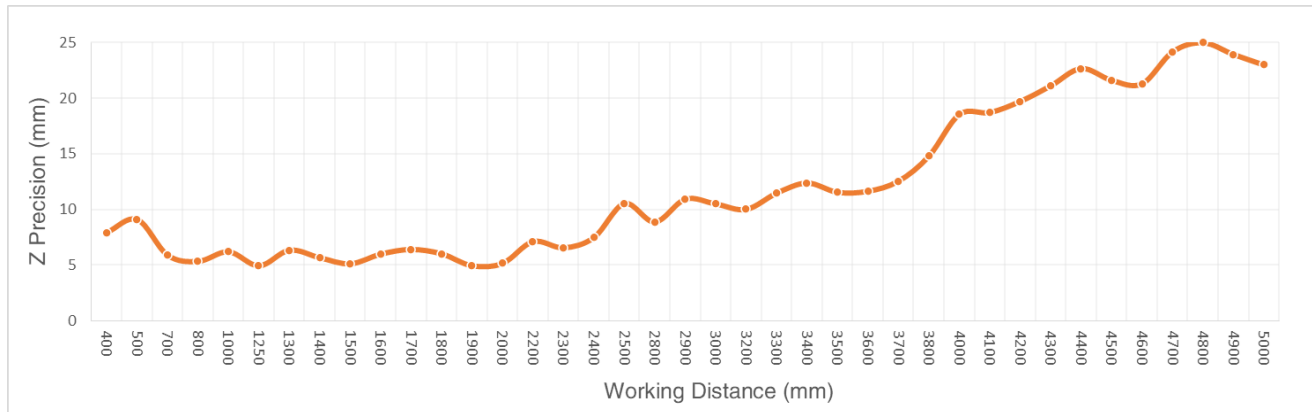
Parameters	Value
Technical principle	Indirect Time of Flight (IToF)
Illumination	2 x infrared laser ( $\lambda = 940 \text{ nm}$ )
Latency of image acquisition <sup>1</sup>	143 ms
Frame rate <sup>2</sup> @ resolution (Depth)	Supported resolution: 640 x 480, 320 x 240, 160 x 120 Supported depth quality and corresponding frame rate: HIGH (15 fps), MEDIUM (30 fps)
Frame rate <sup>2</sup> @ resolution @ image format (RGB)	28 fps @ 1920 x 1080 @ CSI BAYER8RGGB 20 fps @ 1920 x 1080 @ CSI BAYER12RGGB 16 fps @ 1920 x 1080 @ YUYV 30 fps @ 1280 x 720 @ YUYV 30 fps @ 640 x 360 @ YUYV
RGB-D alignment	√
Output data	Depth, RGB, IR, point cloud images
ToF channel	5 channels. At most 5 TL460-S1-E1 cameras with different channels are allowed to run simultaneously at the same scene.

[1] Latency of image acquisition: the latency time between the host computer sending the software trigger signal and receiving depth images (VGA, depth quality=medium) from the camera that works in software trigger mode.

[2] Frame rate of depth/RGB images: the number of depth/RGB images that the host computer receives every 1 second from the camera. This is when the camera is working in free acquisition mode.

# Measurement Performance

Parameters	Value
Working distance	300 mm ~ 9500 mm
Field of view	3605 mm x 2670 mm @ 3000 mm (H/V $\approx$ 62°/49°)



Z precision: the average deviation between the Z measured value and ground truth.

The line chart shows the Z precision at different working distances.

Point precision: the time-domain dispersion of all pixel points in the central ROI.

The line chart shows the distribution of point precision at different working distances.

Planarity: the dispersion of all pixel points in the central ROI relative to the desired plane.

The line chart shows the distribution of planarity at different working distances.

**Note:** The line charts above show the measurement performance of TL460-S1-E1 whose depth quality is set to MEDIUM and exposure time is set to 120000. Depth quality and exposure time can be adjusted for a better measurement performance.

## Software Specifications

Parameters	Value
OS	Linux/Windows/ROS
SDK	Percipio Campport SDK; Supported programming language: C, C++, C#, Python See <a href="#">PercipioDC documentation</a> for more SDK tutorials.
ToF features	Depth quality ToF channel Outlier filtering threshold ToF modulation threshold Jitter filtering threshold HDR ratio For the settings of ToF features, see <a href="#">API Guide</a> .

## Hardware Specifications

Parameters	Value
Dimension (including interfaces)	140 mm x 94 mm x 70 mm
Weight	1100 g
Data connector	M12 A-Code, 8-pin, female connector Gigabit Ethernet
Power & trigger connector	M12 A-Code, 8-pin, male connector See <a href="#">Power &amp; Trigger Connector</a> for its pinout.
Power supply	DC 24V; PoE (IEEE802.3 at)
Hardware trigger	1 trigger input/output, falling-edge trigger
Power consumption	Average: 13.60 W Max: 29.68 W
Housing material	Aluminum alloy
Ingress protection	IP67
Thermal dissipation	Passive
Temperature	Operating: 0 °C ~ 50 °C Storage: -20 °C ~ 55 °C

## Power & Trigger Connector

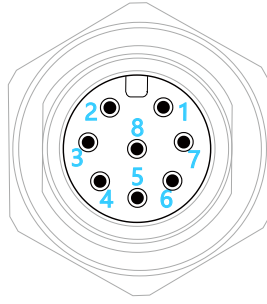


Figure 2 Pinout of the power & trigger connector

Pin No.	Name	Description	Wire Color
1	RS485_H	RS485 differential signal _H	White
2	P_24V	DC 24V power (camera or trigger circuit)	Brown
3	P_GND	GND (camera or trigger circuit)	Green
4	TRIG_IN	Trigger input signal	Yellow
5	TRIG_OUT	Trigger output signal	Grey
6	CAN_L	CAN differential signal _L	Pink
7	CAN_H	CAN differential signal _H	Blue
8	RS485_L	RS485 differential signal _L	Red

**Note:** The "Wire Color" is subject to change without notice. Please refer to the "Pin No.", which corresponds one-to-one with the interface pins of the power & trigger connector.

## Trigger Circuit Schematic Diagram

The camera supports the falling-edge trigger, and its trigger circuit schematic diagram is shown as follows (The resistance at point A is 4.7kΩ). For details about hardware connection, see [PercipioDC documentation](#).

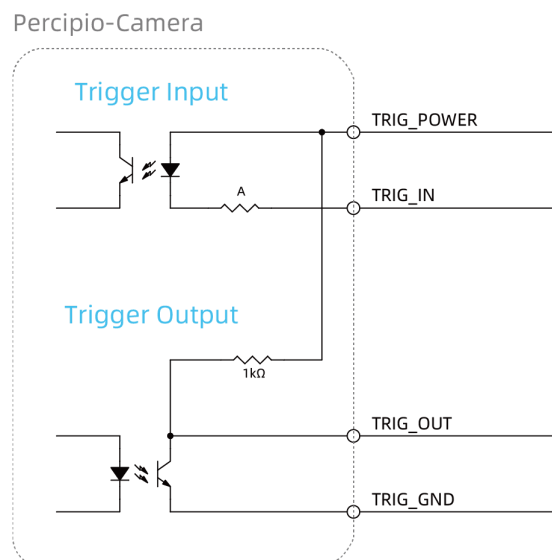


Figure 3 Trigger circuit schematic diagram

# Mechanical Dimensions

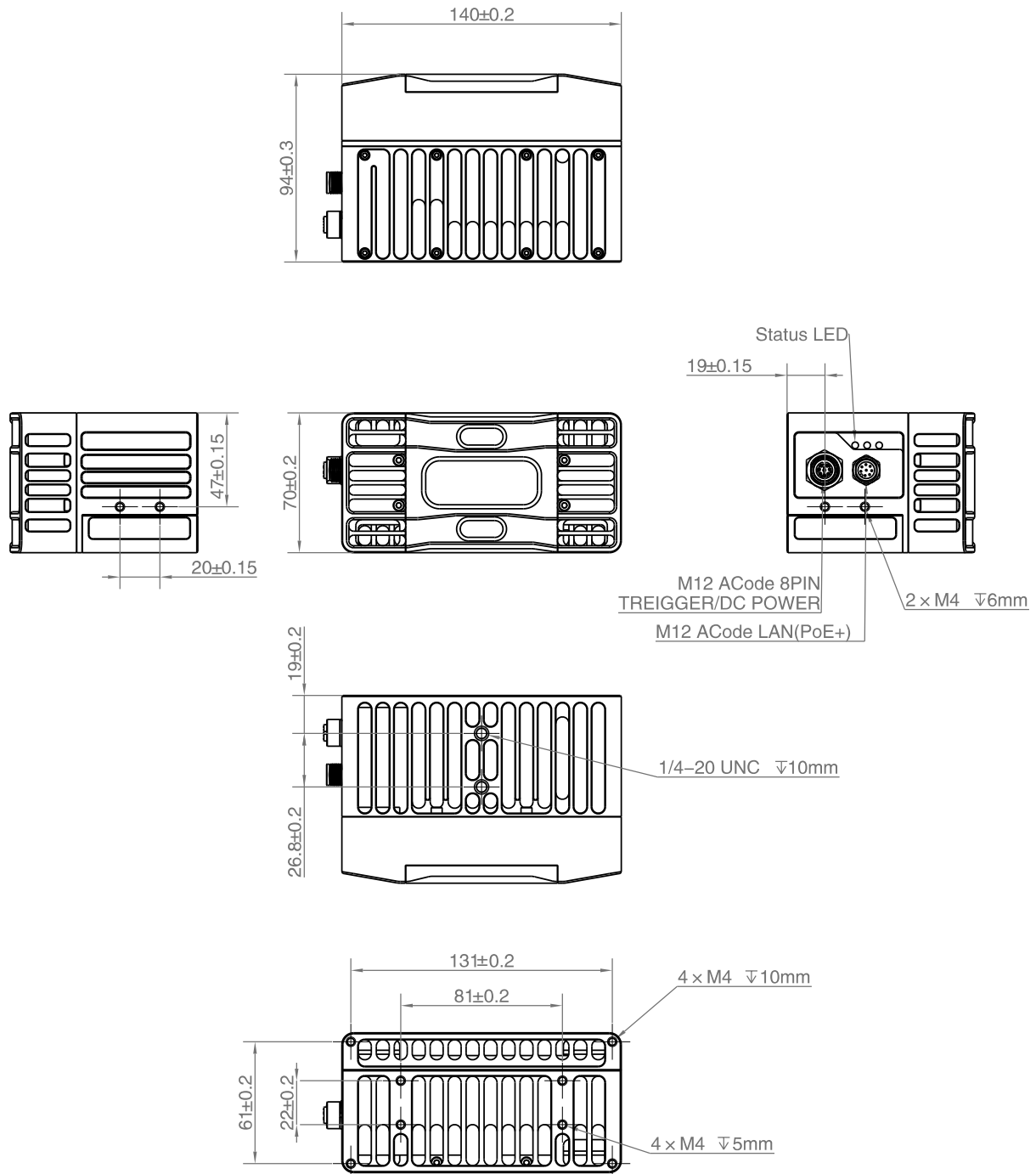


Figure 4 TL460-S1-E1 Mechanical dimensions (unit: mm)

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Percipio is an independent vendor of 3D machine vision solutions. We provide products and services to system integration customers rather than end users. This marketing strategy allows us to serve multiple sectors and segments, and also means that our success will be based on our customer's success. Together with our customer's industry specific expertise, we can support end users with implementing machine intelligence, which will improve productivity and/or reduce cost.

## Make 3D Machine Vision Everywhere

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