



FM851 Series Specifications

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Introduction

Percipio FM851 series 3D cameras, with high frame rates, are suitable for such applications as object recognition, classification and localization.

The documentation introduces the detailed technical specifications of FM851 series 3D cameras (FM851-E1 and FM851-E2). For more specifications of Percipio's other products, please go to [Product Specifications — PercipioDC documentation](#).



Figure 1 FM851-E1 3D camera



Figure 2 FM851-E2 3D camera

Technical Specifications

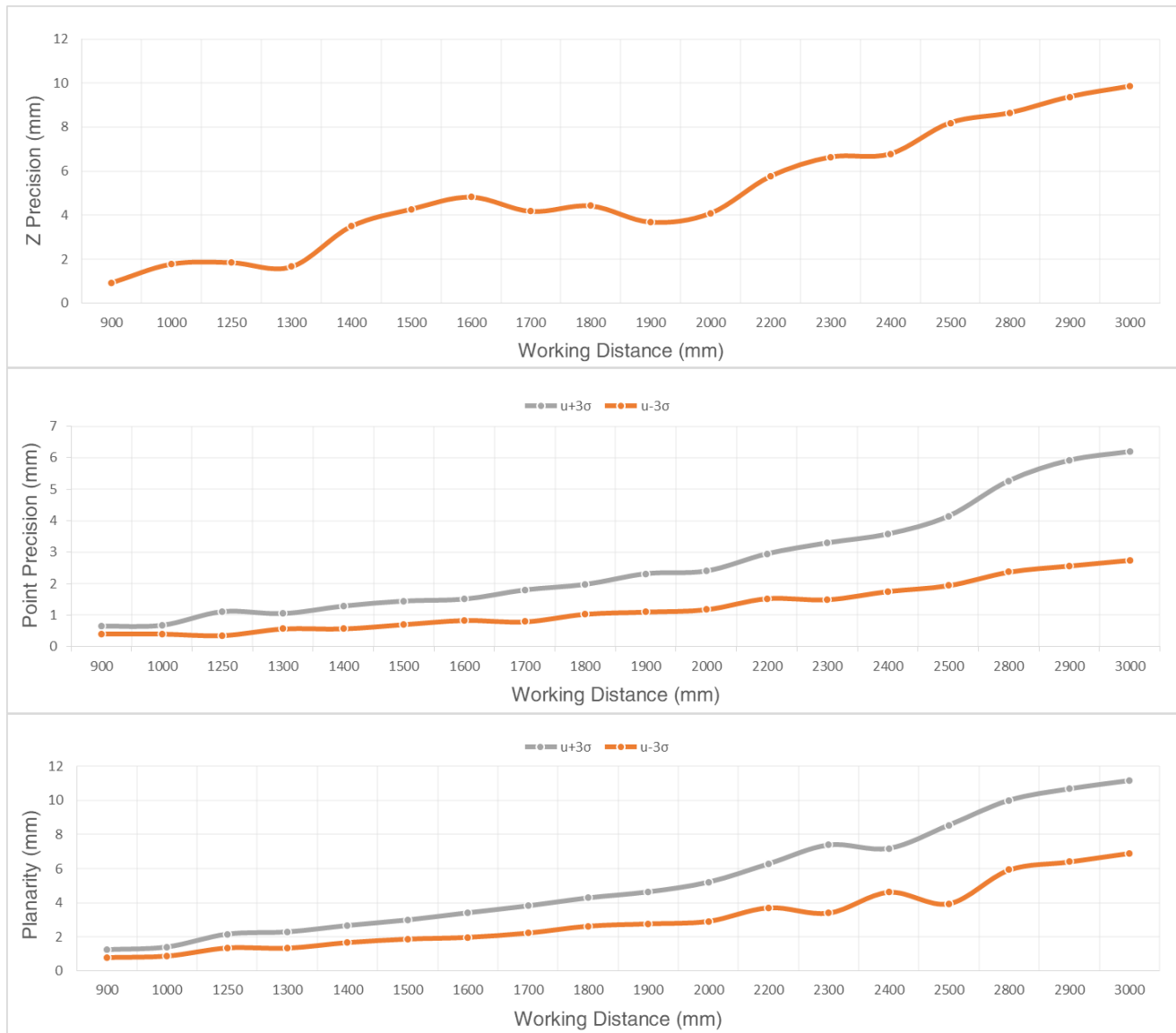
Parameters	Value
Technical principle	Active stereo
Illumination	1 x infrared laser ($\lambda = 830 \text{ nm}$)
Shutter	Global
Latency of image acquisition ¹	116 ms
Frame rate ² @ resolution (Depth)	16 fps @ 1280 x 960 26 fps @ 640 x 480 26 fps @ 320 x 240
Frame rate ² @ resolution @ image format (RGB)	FM851-E1: 16 fps @ 1280 x 960 @ YUYV 30 fps @ 640 x 480 @ YUYV 30 fps @ 320 x 240 @ YUYV FM851-E2: 28 fps @ 1280 x 960 @ BAYER8GRBG 32 fps @ 640 x 480 @ BAYER8GRBG
RGB-D synchronization & alignment	√
Output data	Depth, RGB, IR, point cloud images

[1] Latency of image acquisition: the latency time between the host computer sending the software trigger signal and receiving VGA depth images 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
Recommended working distance	900 mm ~ 3000 mm
Max working distance	700 mm ~ 6000 mm
Near field of view	715 mm x 600 mm @ 700 mm (H/V \approx 54°/46°)
Far field of view	6650 mm x 5340 mm @ 6000 mm (H/V \approx 58°/48°)



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.

Software Specifications

Parameters	Value
OS	Linux/Windows/ROS
SDK	Percipio Campport SDK; Supported programming language: C, C++, C#, Python See PercipioDC documentation for more SDK tutorials.

Hardware Specifications

Parameters	FM851-E1	FM851-E2
Dimension (excluding interfaces)	140.0 mm x 31.9 mm x 96.0 mm	124.0 mm x 28.6 mm x 86.8 mm
Weight	650 g	410 g
Data connector	M12 X-Code, 8-pin, female connector Gigabit Ethernet	RJ45 Gigabit Ethernet
Power & trigger connector	M8 A-Code, 6-pin, male connector See Power & Trigger Connector for its pinout.	M8 A-Code, 6-pin, male connector See Power & Trigger Connector for its pinout.
Power supply	DC 24V \pm 10%; PoE (IEEE802.3 af/at)	DC 24V \pm 10%; PoE (IEEE802.3 af/at)
Hardware trigger	1 trigger input/output, falling-edge trigger	1 trigger input/output, falling-edge trigger
Power consumption	Idle mode: 2.9 W Trigger mode: 4.0 W Continuous mode: 5.2 W	Idle mode: 2.9 W Trigger mode: 4.0 W Continuous mode: 5.2 W
Housing material	Aluminum alloy	Aluminum alloy
Ingress protection	IP65	IP54
Thermal dissipation	Passive	Passive
Temperature	Operating: 0 °C ~ 45 °C Storage: -10 °C ~ 55 °C	Operating: 0 °C ~ 45 °C Storage: -10 °C ~ 55 °C
Eye Safety	Class 1 (EN 60825-1:2014)	Class 1 (EN 60825-1:2014)

Power & Trigger Connector

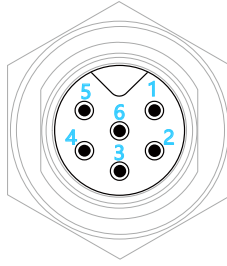


Figure 3 Pinout of the power & trigger connector

Pin No.	Name	Description	Wire Color
1	TRIG_OUT	Trigger output signal	Black
2	P_24V	Power (camera, DC 24V \pm 10%)	Brown
3	P_GND	GND (camera)	Red
4	TRIG_POWER	Power (trigger circuit, DC 12V ~ 24V)	Orange
5	TRIG_GND	GND (trigger circuit)	Yellow
6	TRIG_IN	Trigger input signal	Green

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 10k Ω). For details about hardware connection, see [PercipioDC documentation](#).

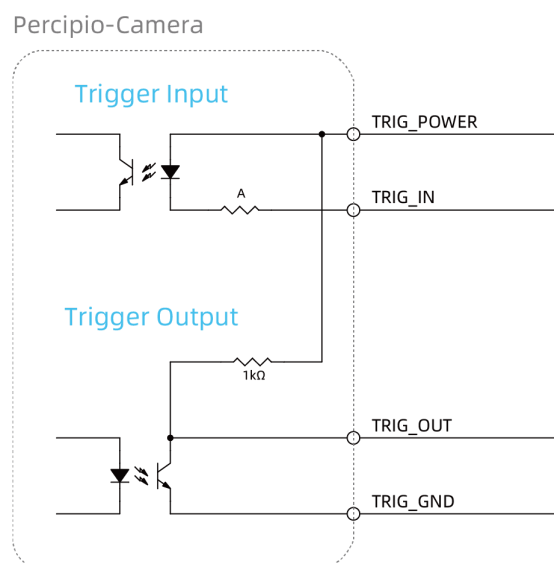


Figure 4 Trigger circuit schematic diagram

Mechanical Dimensions

FM851-E1

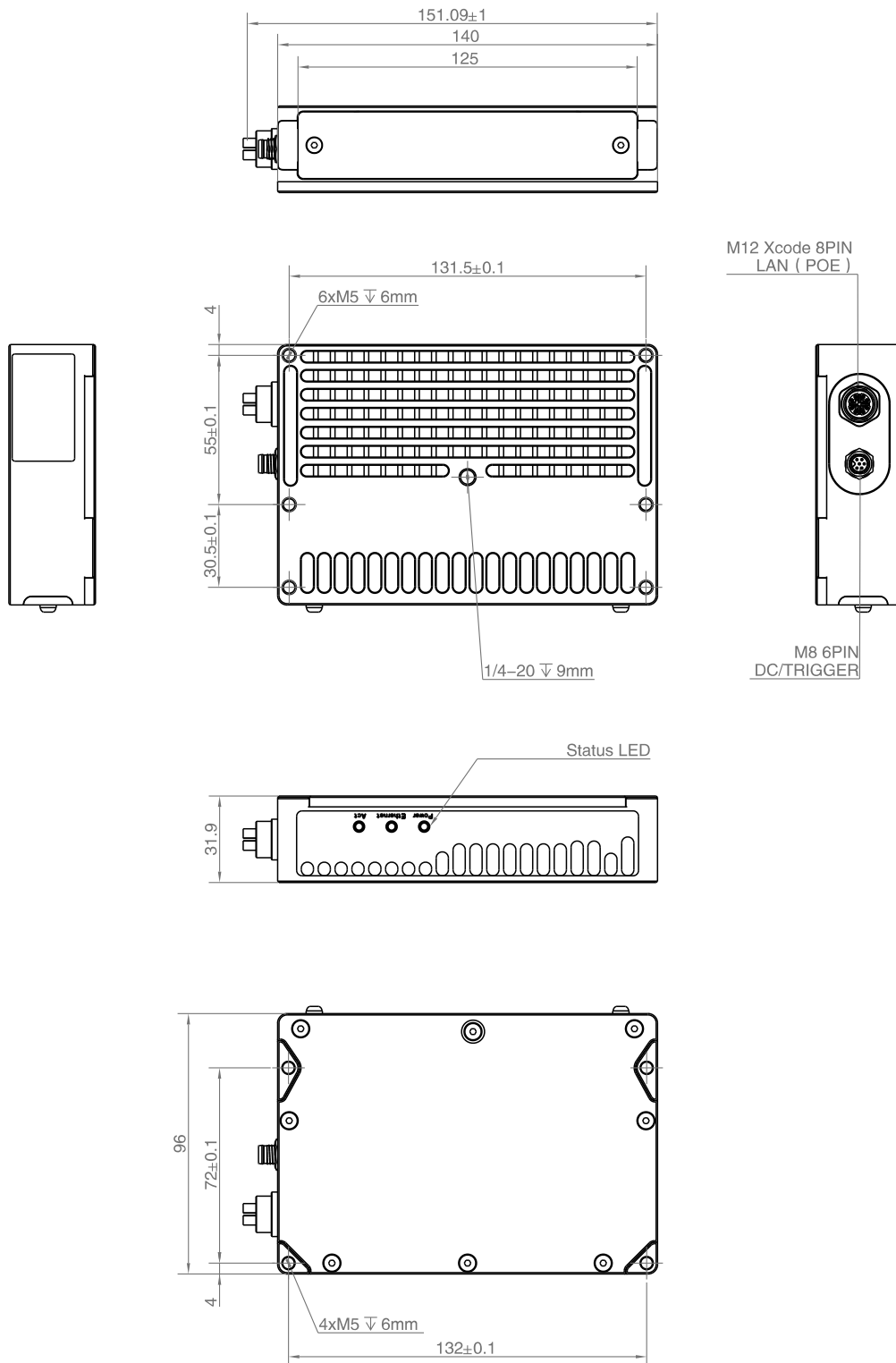


Figure 5 FM851-E1 Mechanical dimensions (unit: mm)

FM851-E2

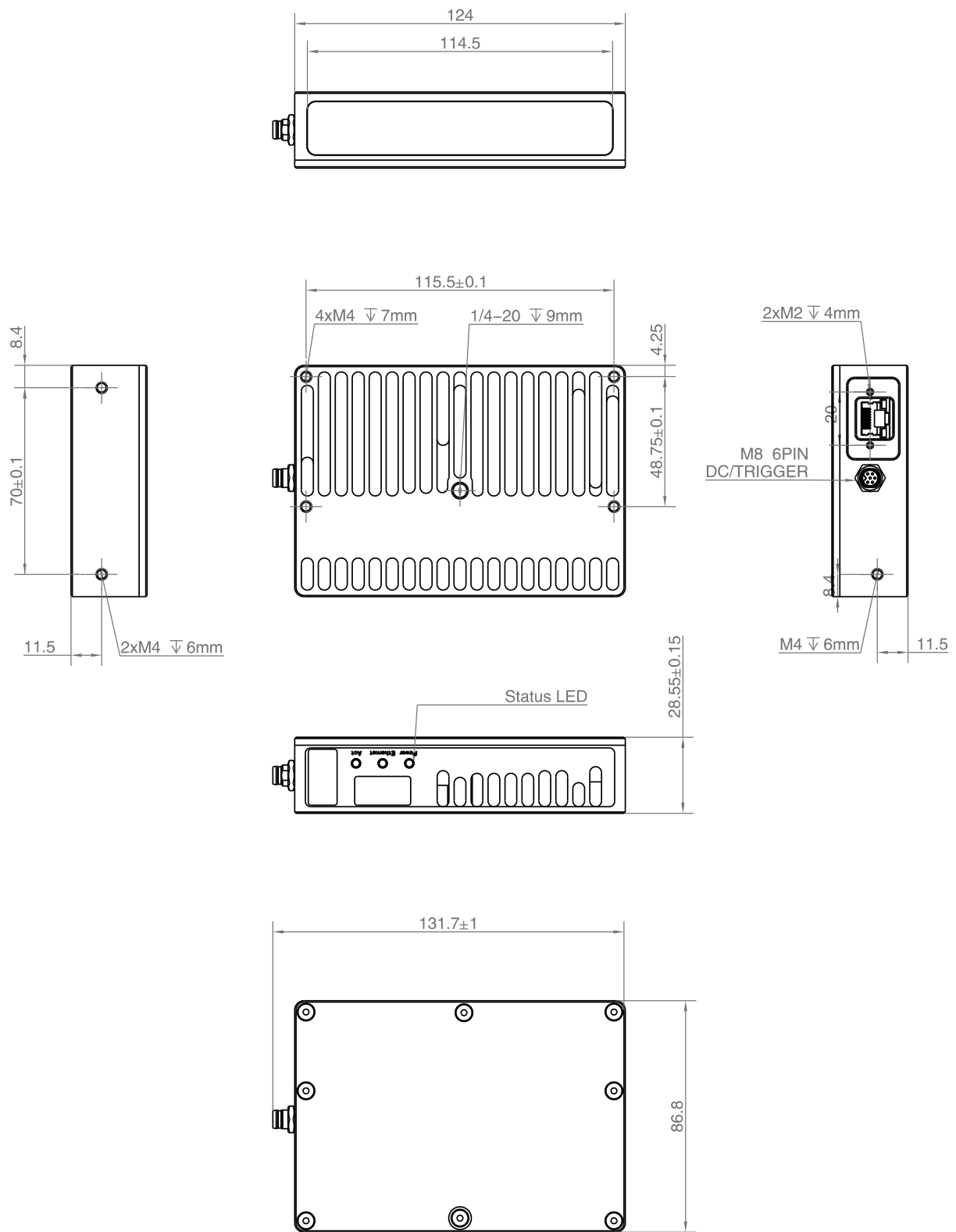


Figure 6 FM851-E2 Mechanical dimensions (unit: mm)

Percipio.XYZ is an industry leading provider of 3D cameras. We provide a broad range of 3D camera products to meet requirements from various applications, such as industrial, automotive, inspection, logistics, medical, education, security and commercial etc. We will continue to develop and optimize our product roadmap to support more 3D vision applications.

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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Documentation : doc.percipio.xyz/cam/latest/

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