



Zivid One⁺ User Guide

Revision: 1.6

Date: 18/04/2023

Ordering code:

Zivid One+ S (ZVD1P-S)

Zivid One+ M (ZVD1P-M)

Zivid One+ L (ZVD1P-L)

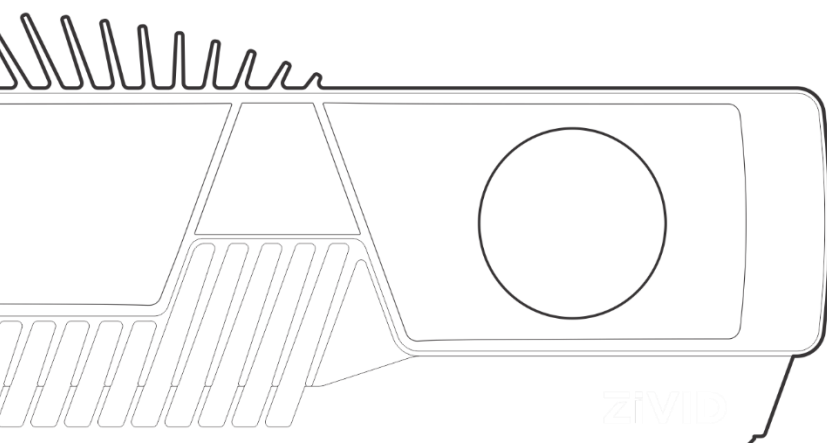


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1. Regulatory Information

1.1 Compliance

The Zivid One⁺ camera is compliant with EN 62368 ¹, FCC class A, CE, and CB environmental standards.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Connections and assembly must be performed by competent technicians. Do not connect external I/O signals to the device while it is powered; this may damage the device.

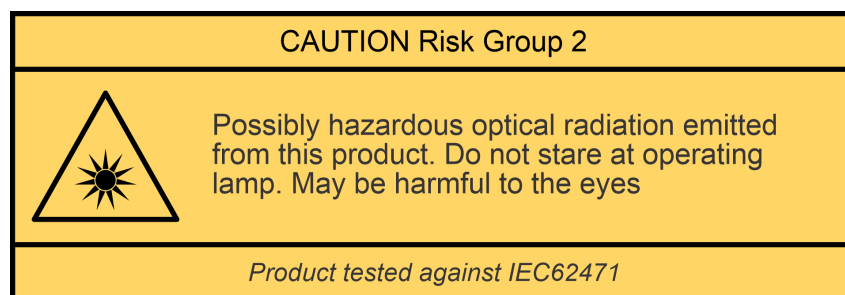
¹Cameras manufactured before January 2021 are compliant with EN 60950. Cameras manufactured in 2021 and onwards are compliant with EN 62368.

1.2 Safety Precautions

Transport the device in its original packaging or make sure it is properly cushioned during transportation.

The Zivid One⁺ camera use a white light source, which is tested against IEC62471 and is classified as Risk Group 2. IEC 62471 classifies optical radiation sources based on the level of hazard to the skin and eye. Risk group 2 is moderate risk with a maximum exposure time of 100 s.

Do not look directly into the operating lamp. The light source should not pose a hazard to the eyes, due to the aversion response (head turn or eye blink for example) to very bright light sources, but to be on the safe side, one should avoid looking into the camera/projector during operation.



2. Unboxing



In the Zivid box you will find:

- Zivid One⁺ 3D camera
- 24 V power supply

Optional/as ordered:

- Power cables (straight connector), available in 5 m, 10 m and 20 m
- Power extension cables (angled connector), available in 3 m
- USB cables (straight connector):
 - Copper USB 3.0 cable, available in 5 m
 - Active Optical USB 3.0 cable, available in 15 m

Included in Development Kit:

- 5 m USB 3.0 cable
- Calibration Board
- Mount of choice (Stationary Mount or On-Arm Mount)

Mounting accessories can be ordered separately.

3. System Requirements

OS	Windows 10 or Linux Ubuntu 18.04/20.04/22.04 ¹
GPU	<p>Dedicated GPU</p> <p>A dedicated GPU gives the best performance with Zivid. It is also the best choice if the GPU will be used for more than Zivid's computations. A medium to high-end AMD or NVIDIA GPU with at least 3 GB of memory is required for optimal performance. This is the preferred solution for Zivid.</p> <p>Recommendations:</p> <ul style="list-style-type: none">• NVIDIA GeForce GTX 1060 or better• NVIDIA GeForce MX150 or better• AMD Radeon RX 550 or better ^{2 3}
GPU	<p>CPU with integrated GPU</p> <p>This is the most cost-efficient solution for Zivid. The benefit of an integrated GPU is that the data transfer from GPU to CPU is fast. A high-end integrated GPU with at least 3 GB of memory available is required for optimal performance.</p> <p>Recommendations:</p> <ul style="list-style-type: none">• AMD Ryzen 5 2400G or better ^{2 4}• Intel i7 with HD630 or better
USB	SuperSpeed USB3 port

Tip

Use CPU with integrated GPU for applications that require low power consumption, e.g., battery powered mobile platforms with cameras.

¹Support for Ubuntu 16.04 is removed since SDK 2.7.

²Radeon no longer supports SPIR on some GPUs, please verify your GPU drivers support SPIR to be compatible with Zivid Software. Only relevant for SDK 2.6 and lower; SPIR is no longer required since SDK 2.7.

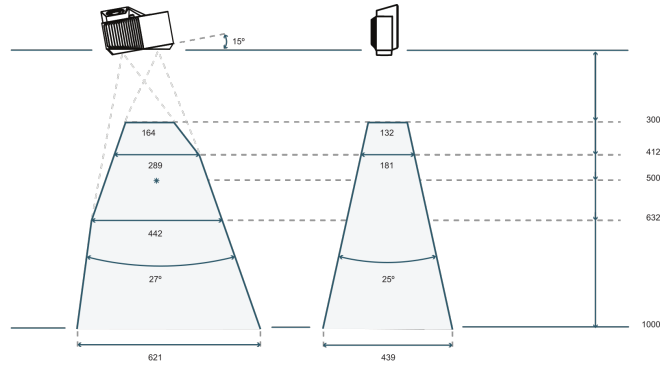
³AMD RDNA cards (such as RX 5500 and RX 5700) can be unstable on Ubuntu depending on the installed GPU driver version and OS version. We recommend to test stability carefully with your setup if you use these models.

⁴AMD integrated GPUs can be unstable on Ubuntu. We recommend to test stability carefully with your setup if you use these GPUs.

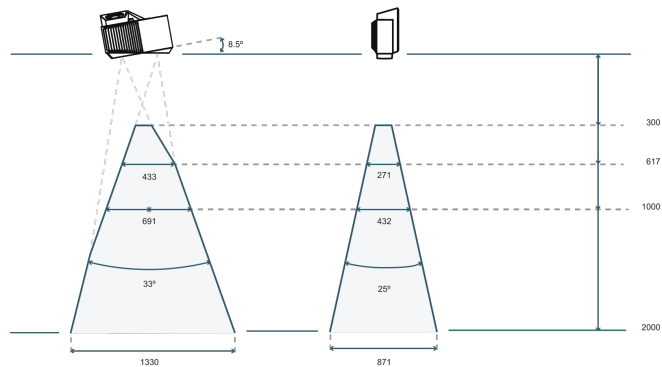
4. Mechanical Installation

4.1 Working Distance and Field-of-View

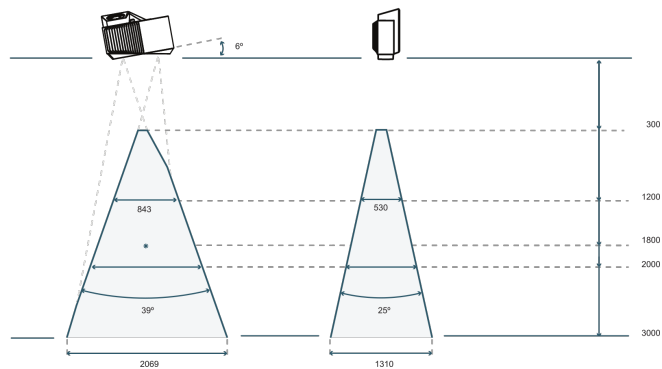
Zivid One+ S



Zivid One+ M

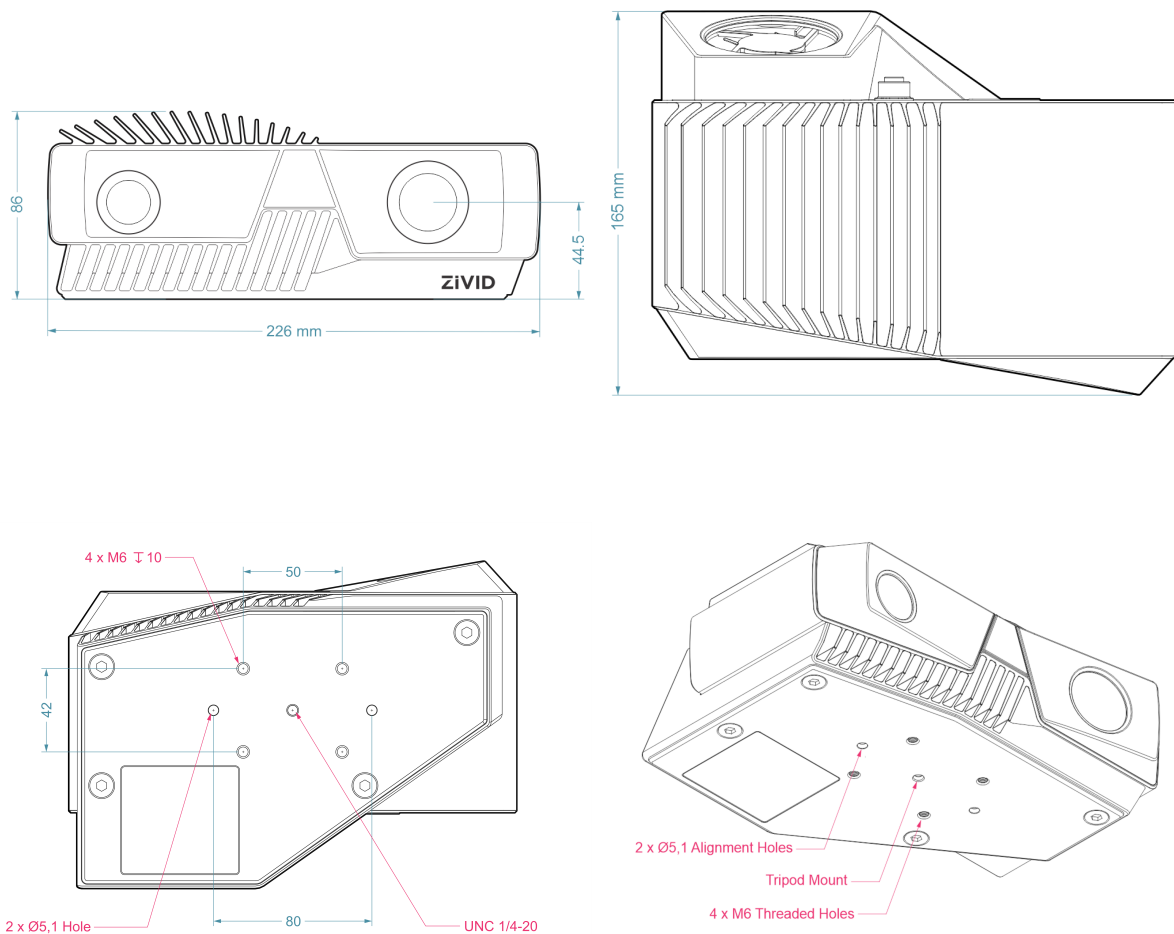


Zivid One+ L



4.2 Mechanical Interface

The Zivid One⁺ camera has four M6 mounting holes and two Ø5 alignment holes. Use the threaded holes on the bottom side of the device to mount it to a bracket. We recommend using DIN 912 / ISO 4762 Hexagon or ISO 14579 Hexalobular socket head cap screws in stainless steel (A2 or A4). To ensure not to damage the threads, we recommend not exceeding the specified maximum torque value when fastening the screws (5 Nm).



Note

The camera must be completely still during the acquisition to deliver the specified 3D image quality. Otherwise, it is completely safe to move it, e.g. when mounted on a robot or any other moving platform.

4.3 Mounting Accessories



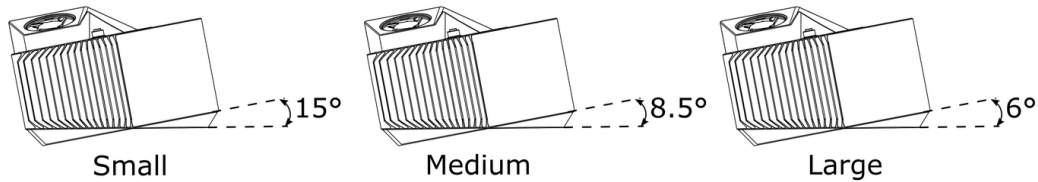
Mounting accessories can be ordered at:

shop.zivid.com

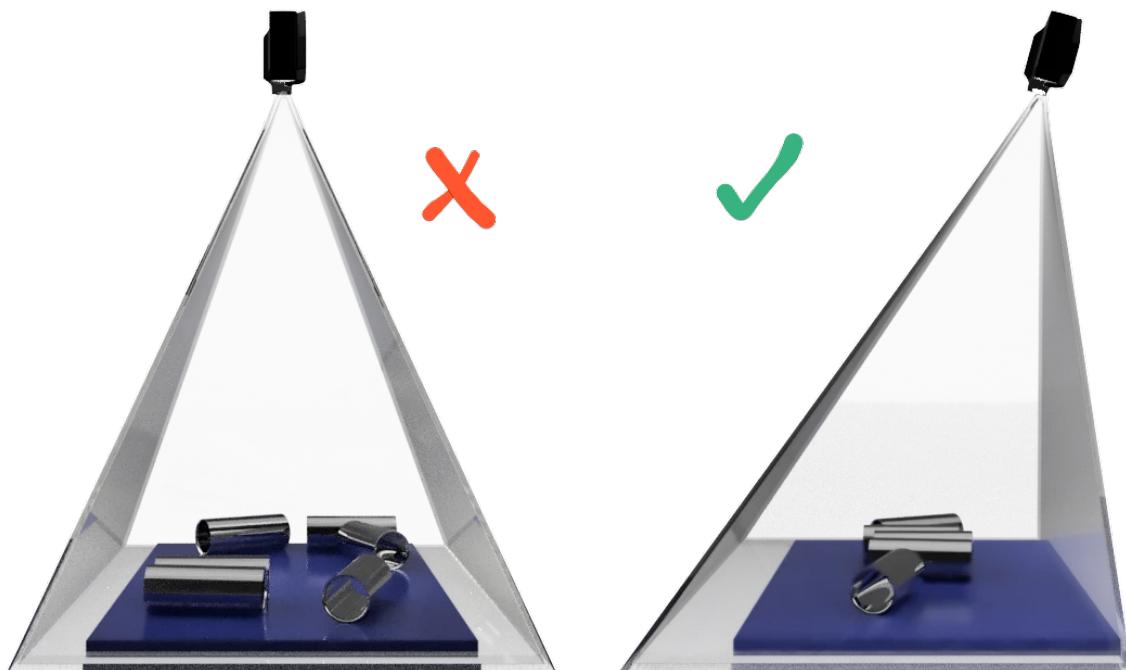


4.4 Positioning Correctly

The 2D camera and the projector have an angle with respect to the center axis. This should be considered if it is desired to have the camera perpendicular to the scene.



If possible, mount the camera at a slight tilt angle to avoid reflections and interference from the background. This also frees up space above the scene for easier access for tools and robots.



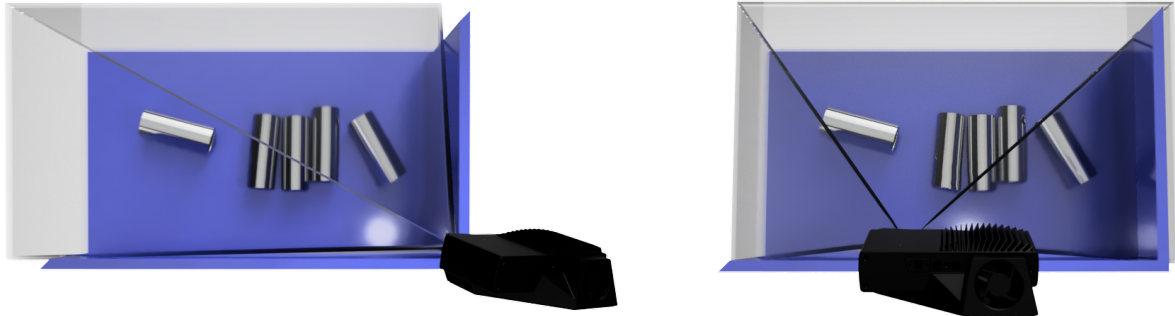
Ambient light might reduce performance. Consider blocking direct light affecting the scene.

Note

Camera tilting is more important if the scene contains specular surfaces.

In bin-picking applications

For bin-picking applications, place the Zivid camera projector above the back edge or above the rear corner of the bin (see images below). Pan and tilt it so that the 2D camera is looking at the bin center. The projector rays should not fall on the inner surfaces of the two walls closest to the projector; they should almost be parallel to those two walls. Mounting the camera this way minimizes interreflections from the bin walls.



Cooling clearance

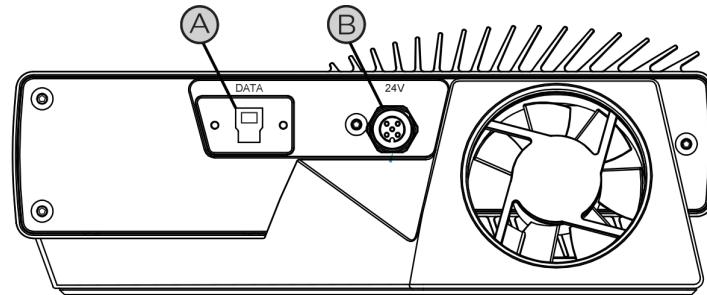
Zivid cameras use active and passive cooling, allow some space around the device for airflow, and do not block the air opening on its front and rear sides. Advise the technical specifications for the operating temperature range for your camera.

Signal protection

Do not install Zivid cameras and cables next to high voltage devices that can generate high levels of electromagnetic disturbance. Do not route camera cabling through the same trunks/conduits with AC power cables and cables emitting high levels of disturbance.

5. Connectivity and Power Supply

5.1 Connectors



A) USB3: Data

SuperSpeed USB3 type-B receptacle for PC connection.

Note

Cables need to be “USB3 Vision” compliant.

PC must support USB 3.0 SuperSpeed.

B) M12-5: Power Connector 24V, 5A DC

Power supply interface

Pinout	Pin	Purpose
	1	24V DC +/- 20% (Max 5A)
	2	24V DC +/- 20% (Max 5A)
	3	GND
	4	GND
	5	Reserved, do not connect

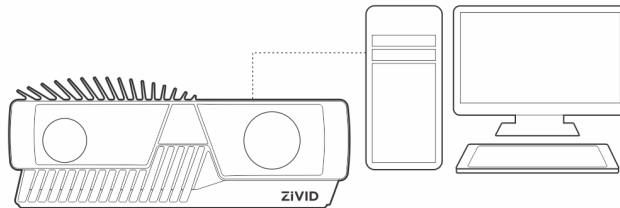
Optional mating connector: TE Connectivity AMP 1838275-3 (Digikey: A97645-ND)

Tip

It is required to use both pins for 24V and for GND.

5.2 Connecting to the Computer

1. Plug the power supply into the “24V” port and into a power outlet.
2. Plug the USB cable into the “DATA” port and into a USB 3.0 port on your PC.



Note

Ensure that all connections are screwed in tightly.

Use the AC/DC adapter supplied with the unit to ensure compliance with emission and immunity standards.

The Zivid unit is protected against reverse polarity and against overheating by a thermistor that physically removes the power.

Caution

Using a direct cable from the PC to the Zivid camera works better than connecting the camera via a USB hub. Use only Zivid approved cables and extenders.

6. Software

To download the latest software for your camera, navigate to:

www.zivid.com/download-software



Visit the Knowledge Base for the installation guide, and then navigate to the Zivid Studio user guide to learn how to capture your first point clouds:

support.zivid.com

7. Support and Troubleshooting

For more information, visit:

support.zivid.com



The Zivid Knowledge Base provides answers for commonly seen issues and questions related to Zivid products, for both software and hardware. You will also find in depth articles about our camera technology, best use practices, different types of 3D imaging methods and structured light, to get a better understanding for how to use this product.

8. Service and Maintenance

The device contains no user-serviceable parts inside. The product warranty will be void if opened.

Follow the below instructions to ensure that your Zivid camera is well maintained:

- Check screw connections and connectors at regular intervals.
- Do not block the air opening on the front and rear sides of the product.
- The unit uses active and passive cooling, allow some space around the device for airflow.
- Use a small vacuum cleaner or a small canister of compressed air to remove dust or other accumulated particles from the glasses or in between the ribs of the heat sink.
- Regularly clean optical glass parts of the device.
- Check and update the calibration on a yearly basis by performing Infield Correction (and Hand-Eye Calibration) when necessary.

9. About Zivid

Zivid is a market-leading provider of 3D machine vision cameras and software for next generation robotics and industrial automation systems. Its Zivid One⁺ and Zivid Two products are regarded as the world's most accurate real-time 3D color cameras and bring human-like vision to the smart factories and warehouses of Industry 4.0.

To find out more about Zivid, visit:

www.zivid.com



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