

ziVID

Zivid 2+ User Guide

Rev 1.8

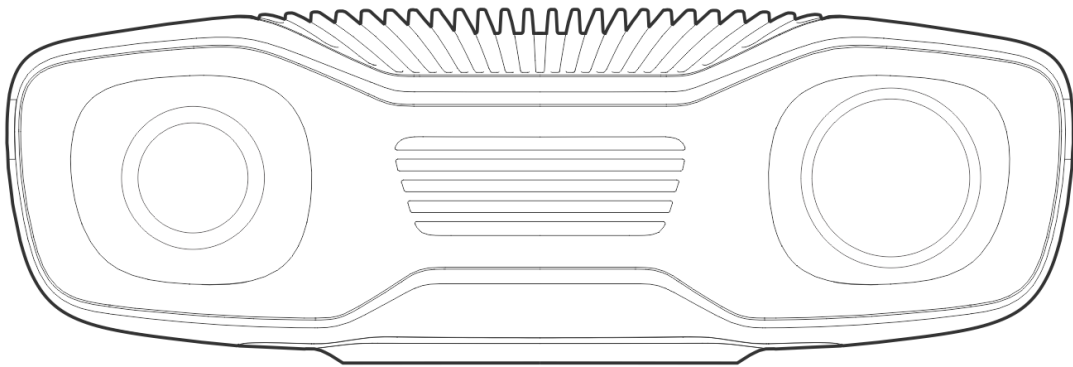


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1. Regulatory Information

1.1. Compliance

The Zivid 2+ camera is compliant with EN 62368, FCC class B, Canada ICES-003 (B) / NMB-003 (B), KC, CE, and CB environmental standards.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

1.2. Safety Precautions

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

The Zivid 2+ camera is tested against IEC 62471-5:2015 and is classified as Risk Group 2. IEC 62471 classifies optical radiation sources based on the level of hazard to the skin and eye. As with any bright light source, do not stare into the beam.

CAUTION | Do not stare into the beam, RG2

2. Unboxing

In the Zivid box you will find:

- [Zivid 2+ 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
- [Ethernet \(CAT-6A\) cables](#) (straight connector), available in 5 m, 10 m and 25 m
- [Ethernet \(CAT-6A\) extension cables](#) (angled connector), available in 3 m
- [Calibration Board](#)
- Mount of choice ([Stationary Mount](#) or [On-Arm Mount](#))
- [Tripod Adapter](#)

All accessories can be [ordered separately](#) .



3. System Requirements

OS Windows 10/11, Linux Ubuntu 20.04/22.04/24.04 [1] or Jetson Linux 35/36

Dedicated GPU It is also the best choice if the GPU will be used for more than Zivid's computations. A medium to high-end NVIDIA GPU with at least 3 GB of memory is required for optimal performance. This is the preferred solution for Zivid.

Recommendations:

- NVIDIA GeForce GTX 1060 or better
 - NVIDIA GeForce MX150 or better
-

CPU with integrated GPU The benefit of an integrated GPU is that the data transfer from GPU to CPU is fast. It is also beneficial for applications that require low power consumption, e.g., battery-powered mobile platforms. A high-end integrated GPU with at least 3 GB of memory available is required for optimal performance.

Recommendations:

- Intel i7 with HD630 or better
-

Ethernet Full performance:

- 10GBASE-T (10G Copper Ethernet) adapter connected via PCI Express or Thunderbolt 3

Reduced performance:

- 1000BASE-T and NBASE-T (1G, 2.5G, and 5G over copper) connections

Recommendations:

- ASUS XG-C100C 10G Network Adapter PCI-E x4 Card
- QNAP QNA series Thunderbolt 3 to 10GbE Adapter

[1] Support for Ubuntu 18.04 is removed since SDK 2.10.

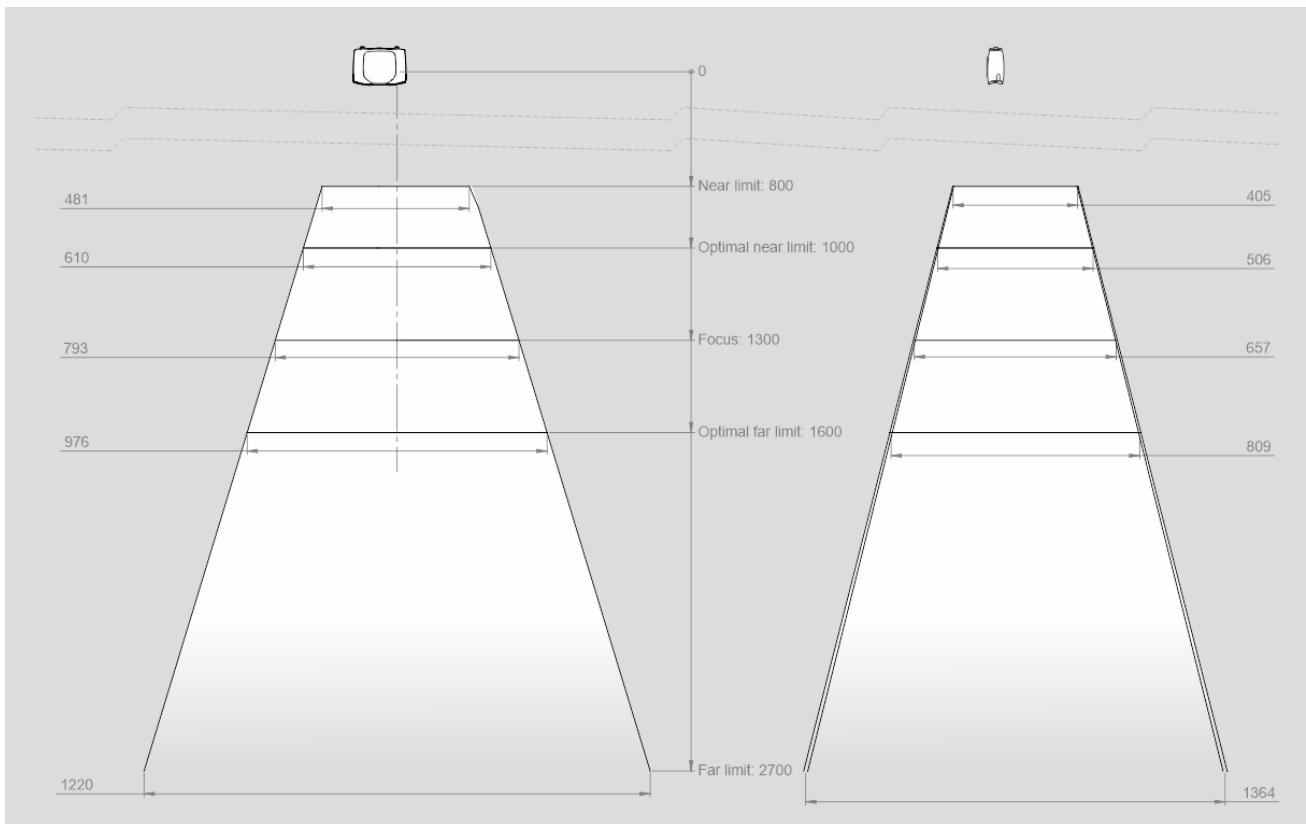
Check out the [Recommended Industrial PCs](#) if you need recommendations for compute devices.

4. Mechanical Installation

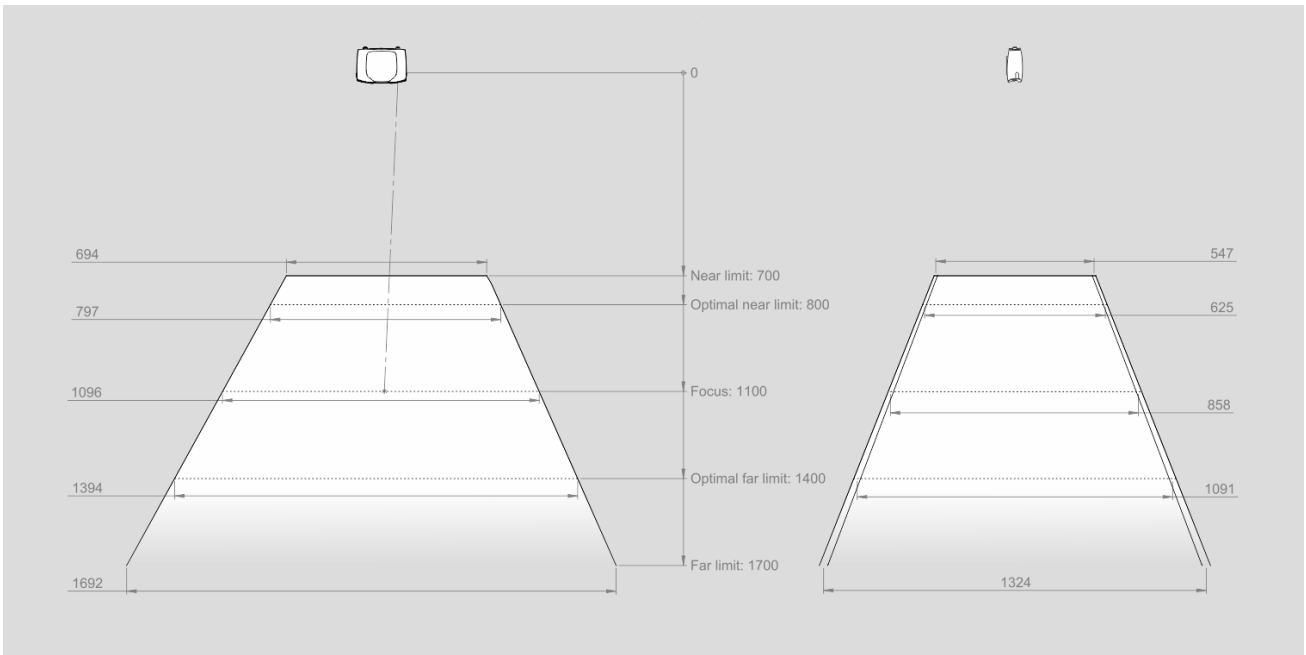
4.1. Working Distance and Field-of-View

Check out our [FOV and imaging distance calculator](#) to find the relation between distances and FOV for the Zivid cameras.

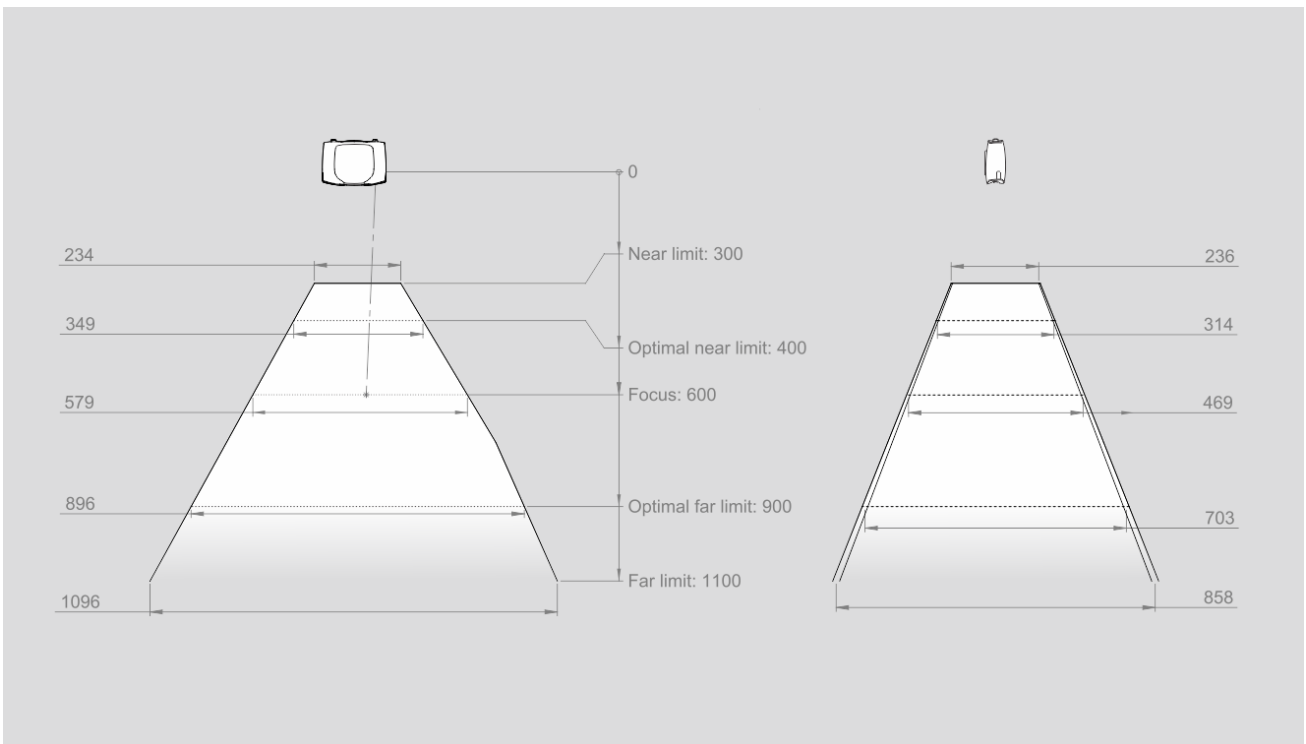
M130



L110



M60



CAD model information

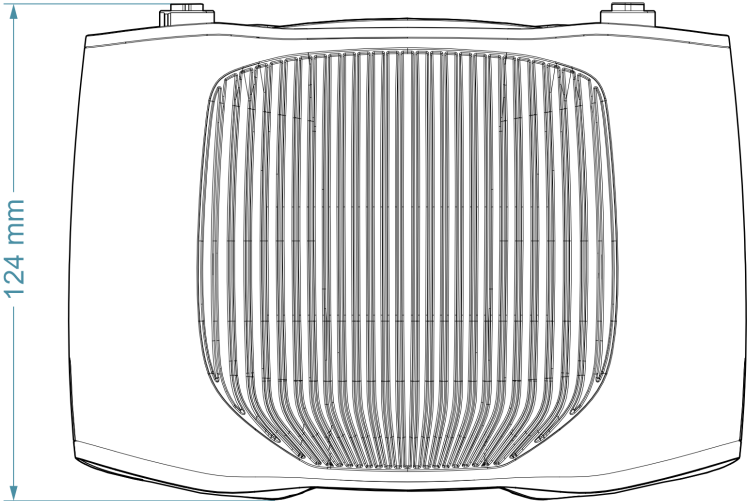
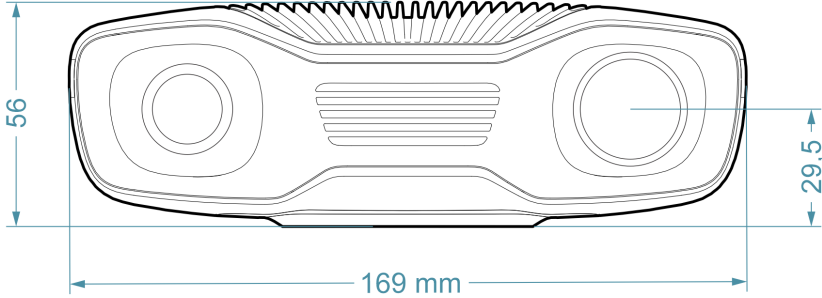
The datum reference of the Zivid 2+ CAD models is at the center of the Ø5 positioning hole as shown below.



The [Optical Center Label](#) is found relative to the datum reference.

4.2. Mechanical Interface

Dimensions



Mounting Specifications

This Zivid camera has three M5 mounting holes, one $\varnothing 5$ positioning hole, and one $\varnothing 5 \times 1$ obround (a shape consisting of two semicircles connected by parallel lines tangent to their endpoints) alignment hole. 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 damaging the threads, we recommend not exceeding the specified maximum torque value when fastening the screws.



Flatness of Mounting Surface

For optimal performance we recommend a mounting surface flatness of $\pm 0,05$ mm or better. Mounting the camera to an uneven surface can in some cases affect the calibration.

We recommend using one of the [Zivid Camera Mounts](#) to ensure problem free installation of the camera.



4.3. Mounting

Read our guidelines about mounting options for Zivid cameras.

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.

Mounting Accessories

Mounting accessories can be ordered at shop.zivid.com.

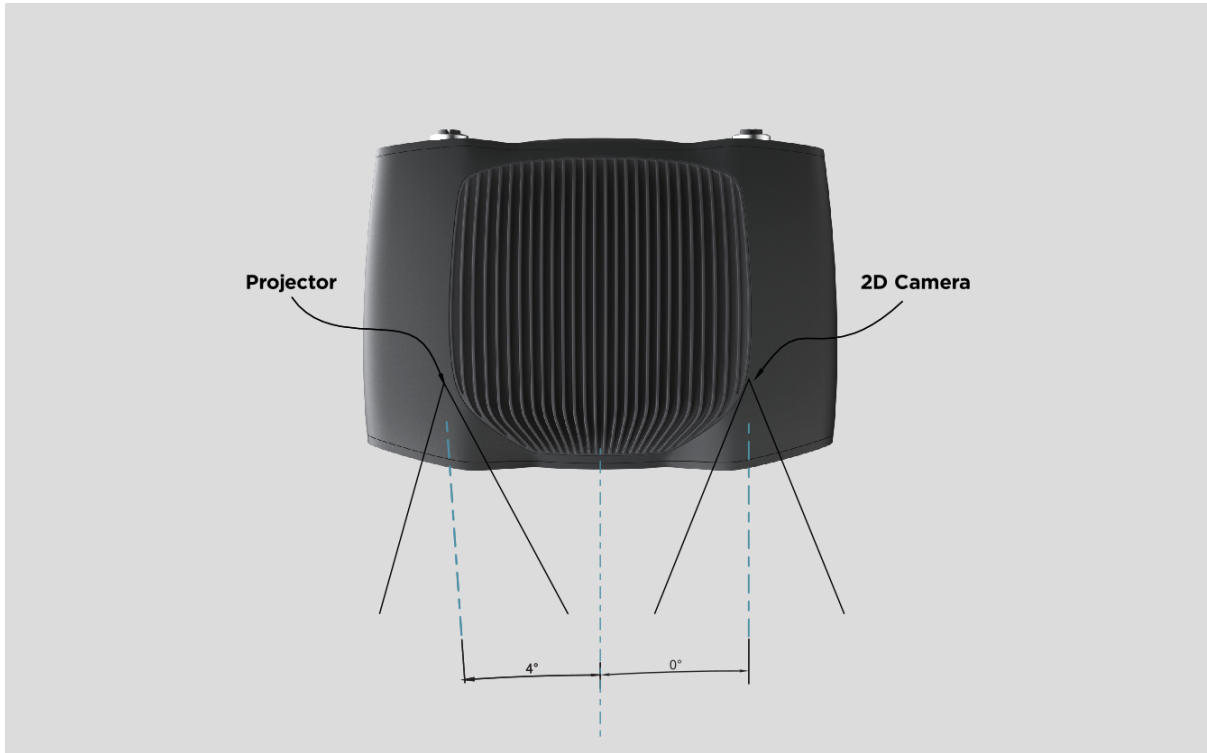


4.4. Positioning Correctly

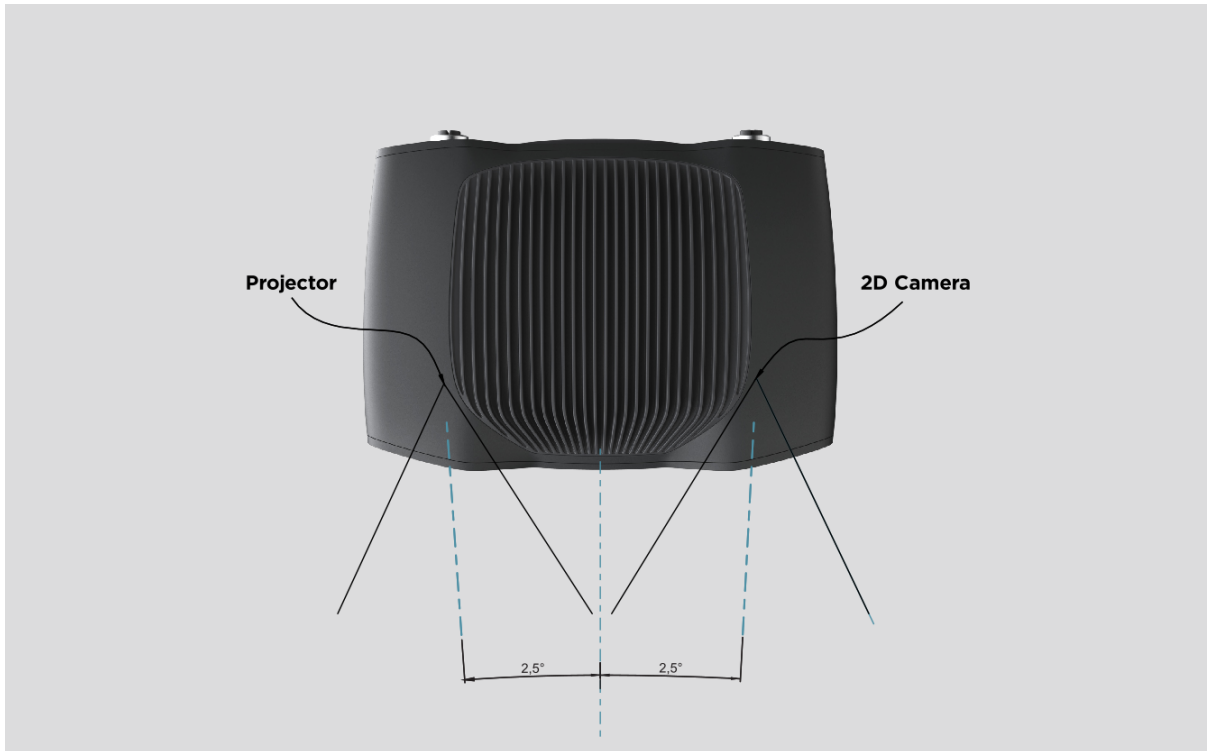
The 2D camera and the projector have an angle with respect to the center axis.

This should be considered if it is desired to have the camera perpendicular to the scene.

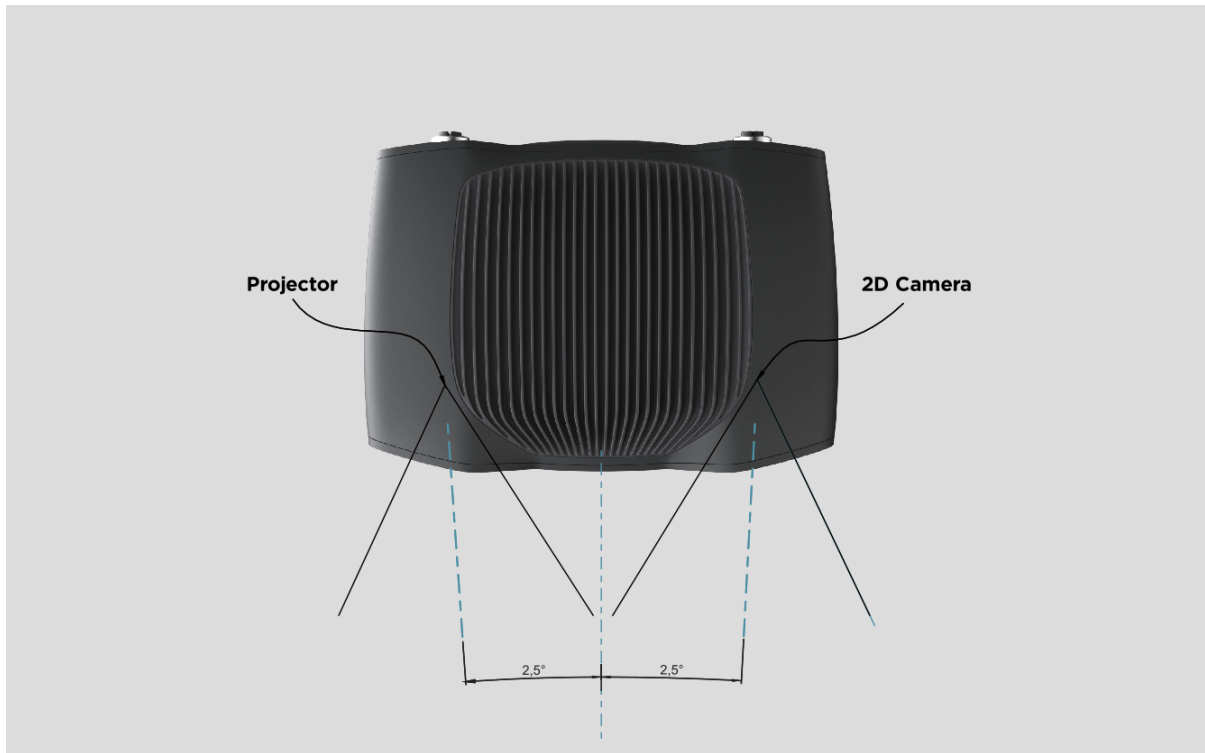
M130



L110

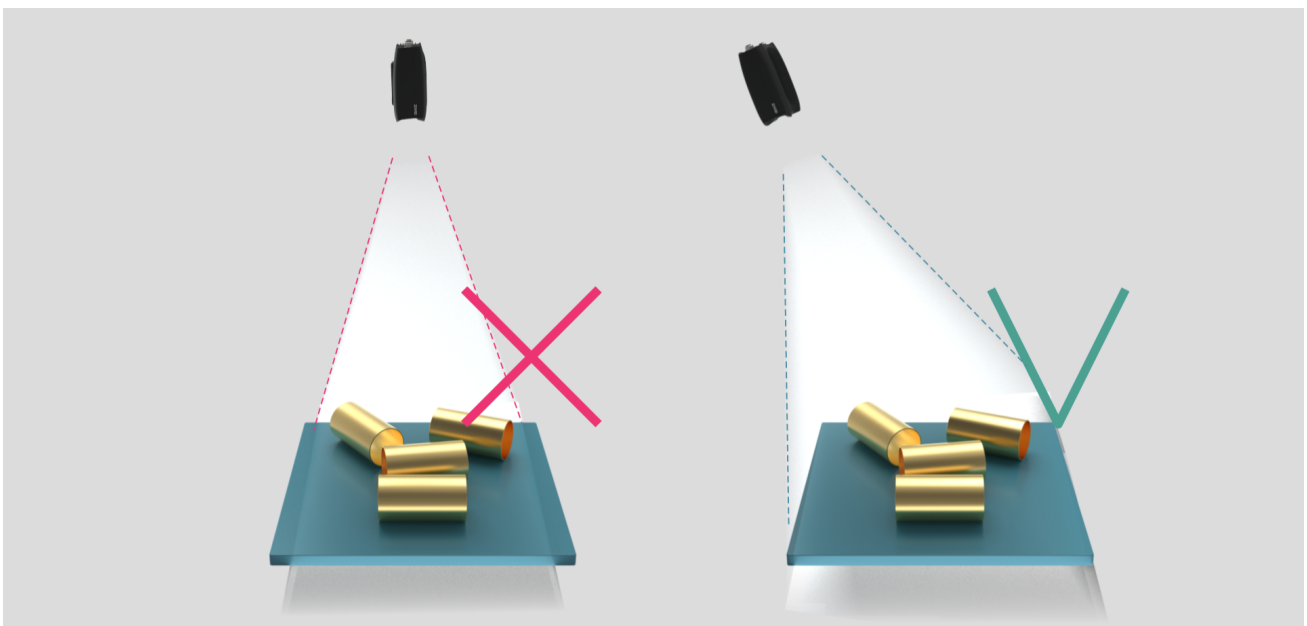


M60



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. With [Zivid mounts](#) it is straightforward to adjust camera mounting angles.

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



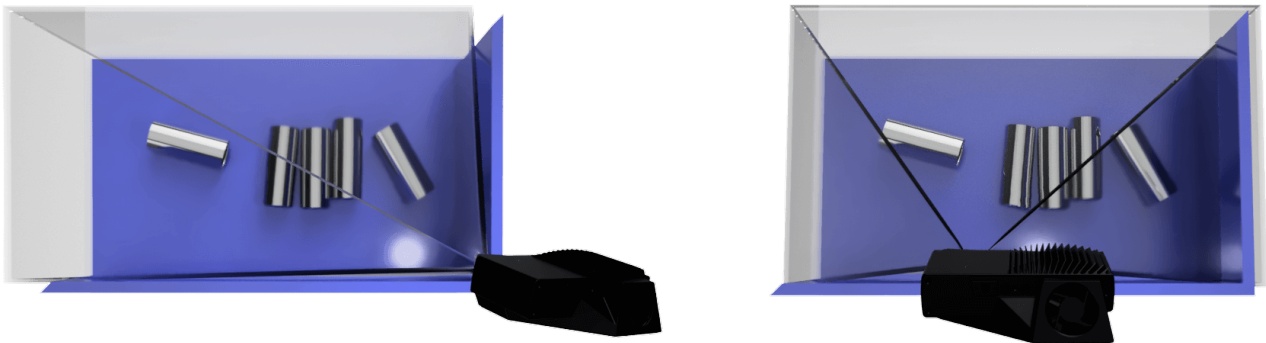
Note

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

Please check out [Working Distance And Camera Positioning](#) for more information on how to correctly position your camera.

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 center of the bin. 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

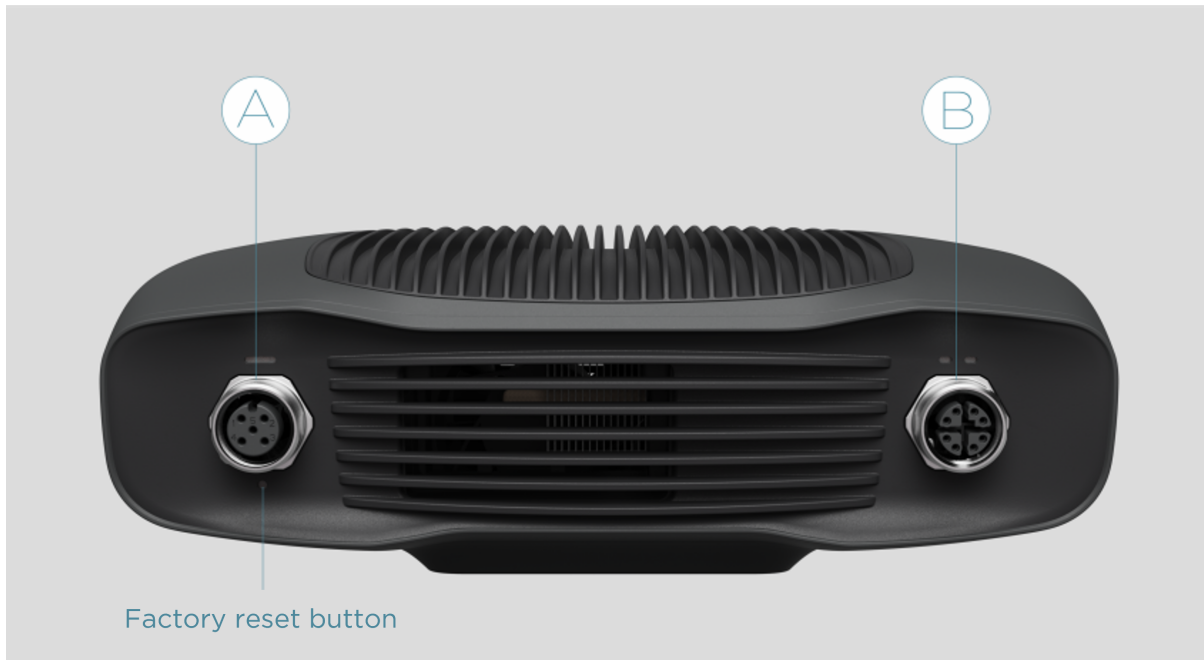
Zivid cameras use active and passive cooling, allow some space around the device for airflow, and do not block the air opening on its front and rear sides. See the [datasheets](#) for the operating temperature range for your camera.

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. M12-5: Power Connector 24V, 5A DC

B. M12X: Ethernet Connector CAT 6A

Check Zivid [Approved Ethernet Cables](#) for more information.

Factory reset button

Reset (power cycle):

Intermittent press or hold for less than 5 seconds.

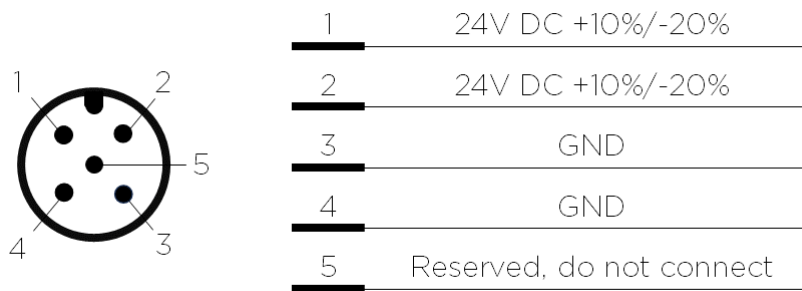
Reset to factory IP address:

Hold for 5 to 10 seconds until the Power LED turns green

Revert to factory installed firmware:

Hold for more than 10 seconds until the Power LED turns yellow.

Power supply interface



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

Tip

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

For more information about power supply and cables please see [Approved Power Supply And Power Cables](#).

Data cable

Zivid camera uses a dedicated ethernet cable for data transmission. See [Zivid Approved Ethernet Cables](#) for more information.

The table below provides the Zivid Ethernet cable pinout.



5.2. Connecting to the computer

- Plug the power supply first into the “24V”.
- Plug the Ethernet cable into the camera and connect it to your computer.
- Plug the power supply into a power outlet.

Note

On disconnect, follow the procedure in reverse, disconnect mains power first.

Ensure that all connections are screwed in tightly. The coupling nut of the M12 screw connectors can in some cases be hard to screw in. However, when installed correctly they provide a robust and reliable connection.

Check [System Requirements](#) for performance considerations and review performance by observing the [status Indication LEDs](#).

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

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

The Zivid camera uses Ethernet communication and needs 10 Gbps for best performance. Your computer may not have a port for 10 Gigabit Ethernet. In that case, you can connect to it using an adaptor for 10GBASE-T (10 Gbps copper Ethernet) to Thunderbolt 3. At a reduced performance you can also use 1000BASE-T and NBASE-T (1 Gbps, 2.5 Gbps, and 5 Gbps over copper) to USB adapters.

Recommended network cards and adapters

We have successfully tested and recommend the following hardware:

- [ASUS XG-C100C 10G Network Adapter PCI-E x4 Card](#)
- [QNAP QNA series Thunderbolt 3 to 10GbE Adapter](#)

Caution

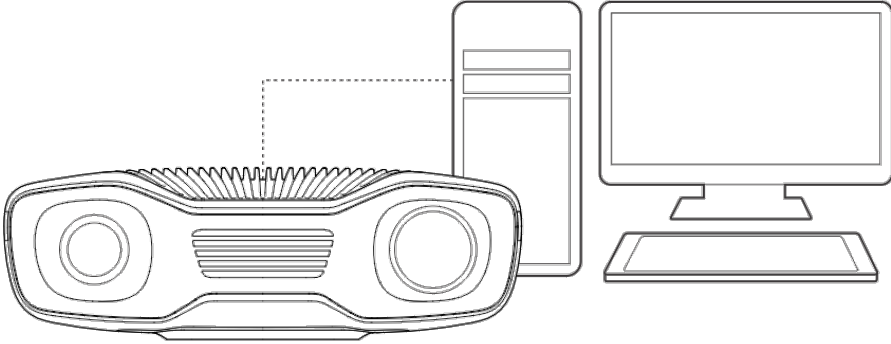
USB-based network adapters have reduced and more variable capture speed, and can occasionally give errors when using the camera. Our recommendation is to use 10Gb PCI Express cards for optimal performance.

Warning

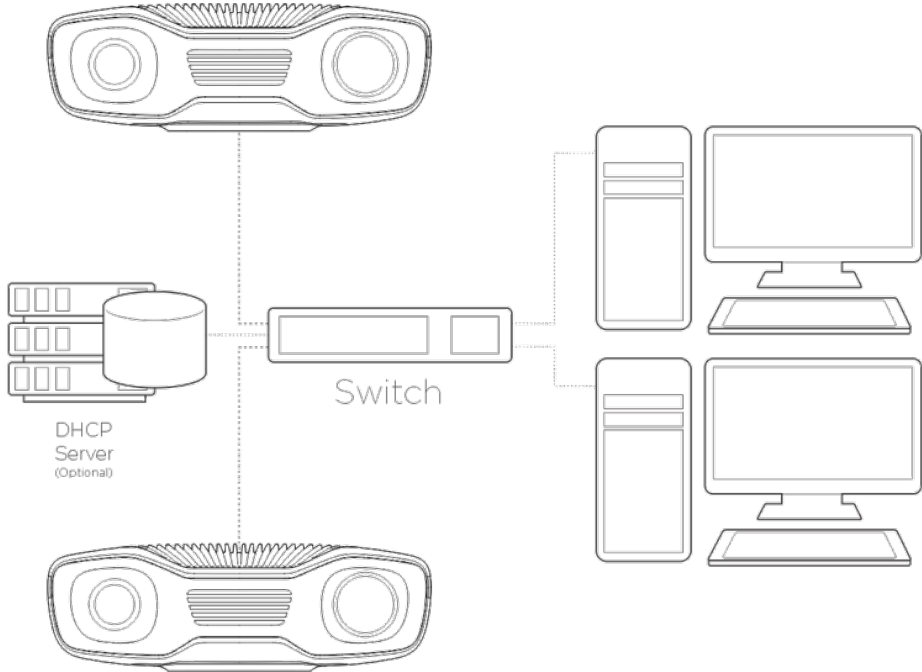
Use only [Zivid approved Ethernet cables](#).

Network Topology

Direct connection



Connection via switch



6. Support

For more information, visit:

support.zivid.com



The Zivid Knowledge Base offers solutions to frequently encountered issues and questions concerning Zivid products, encompassing both software and hardware aspects. Additionally, you'll discover comprehensive articles exploring our camera technology, best practices, and various 3D imaging techniques, including structured light. These resources aim to enhance your understanding and utilization of our product.

7. 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:

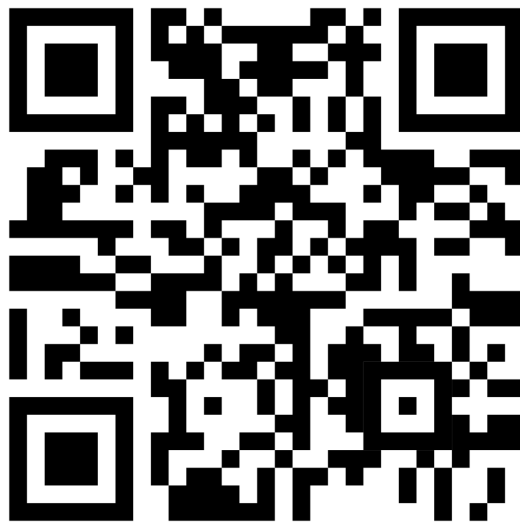
- Check screw connections and connectors at regular intervals.
- Do not block the air opening on the front and rear sides of the product.
- The unit uses active and passive cooling, allow some space around the device for airflow.
- Use a small vacuum cleaner or a small canister of compressed air to remove dust or other accumulated particles. This applies to both the glasses and 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](#)) when necessary.

8. 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 2+ and Zivid 2 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



E-mail

Technical support: customersuccess@zivid.com

Sales: sales@zivid.com

General: info@zivid.com

Phone

Zivid HQ-Oslo, NO | +47 21 02 24 72

Zivid Sales-Stuttgart, DE | +49 151 72 939 674

Zivid Sales-Austin, TX, US | +1 (847) 345-7691

Zivid Sales-Xiamen, CN | +86 139 5012 9074

Zivid Sales-Seoul, KR | +82 10 8984 5350

Zivid AS
Cjerdrums vei 10A
0484
Oslo, Norway

See everything.

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