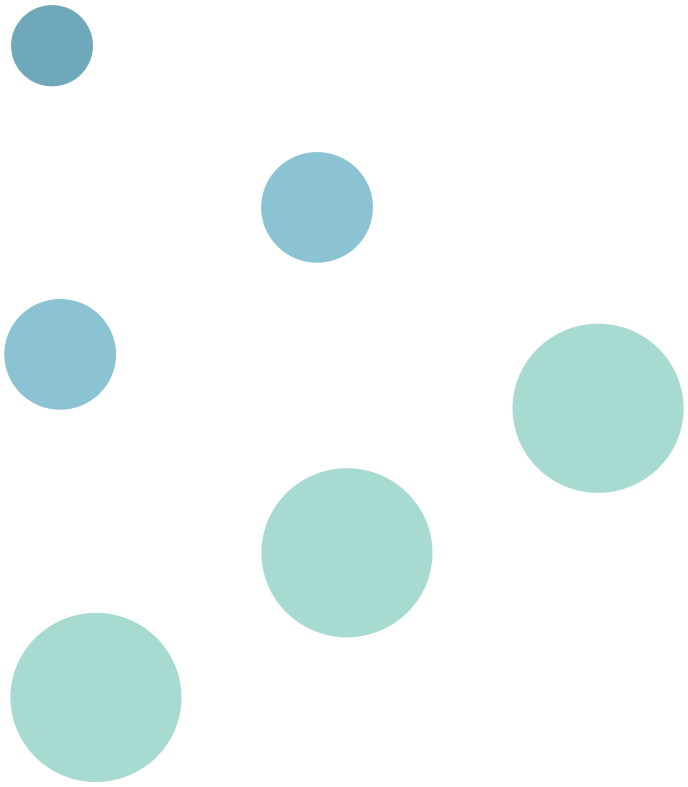
Zivid Studio User Guide

SDK 2.19



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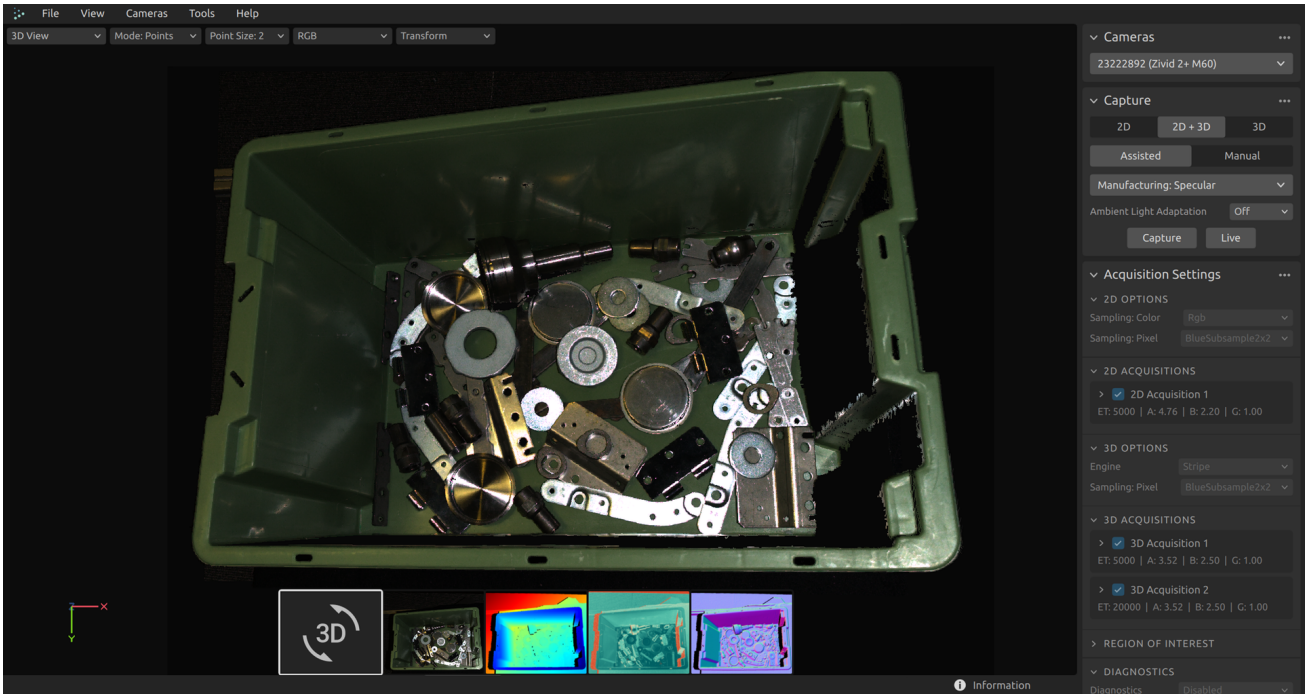
1. Studio Guide

Zivid Studio is the graphical user interface (GUI) for the Zivid SDK. This allows the user to explore the functionality of Zivid cameras and the capturing of 3D point clouds.



Use Zivid Studio to learn and understand how the majority of functions available in the Zivid SDK work. This is useful when developing your application. Among others, you can:

- Capture point clouds.
- Capture color images.
- Visualize point clouds, color images, depth maps, SNR (Signal-to-Noise-Ratio) maps, and normal maps.
- Frame the scene with a live 2D view before capturing.
- Analyze and evaluate 3D data quality.
- Determine the correct capture settings for your target objects and scenes.
- Configure the camera network configuration.
- Perform infield calibration of the camera.
- Perform hand-eye calibration to relate the camera and robot.

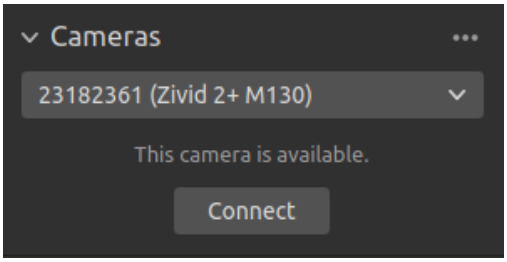
2. Control Panel

The control panel, located on the right side of Zivid Studio, is where you connect to a camera, trigger a capture, and configure capture and processing settings. It contains three main sections:

- Cameras
- Capture
- Settings

2.1. Cameras

This section is used to scan for, configure, connect to, and disconnect from available cameras.



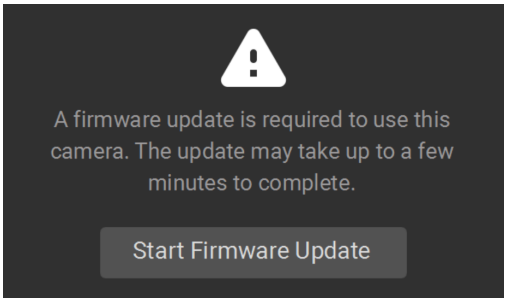
Cameras	Function
Reset camera correction	Remove the infield correction saved on the connected camera. Available when the active camera has a saved correction.
List all cameras	Open the Cameras menu and list all cameras.
Scan for connected cameras	Show all cameras plugged into the PC and list them by model and serial number.
Use captured frame as file camera	Create a file camera from the 3D frame currently displayed in the viewer. The frame must have been captured with diagnostics enabled. See File Camera.
Open ZDF file as file camera	Open a file dialog to select a ZDF file and load it as a file camera. The file must have been captured with diagnostics enabled. See File Camera.
Configure this camera	Configure the IP, subnet mask and mode of the active camera.
Disconnect from active camera	Disconnect from the active camera.

Note

If multiple cameras are physically connected, they will all appear in this section, and you can connect to all of them. However, Zivid Studio only supports capturing with one camera at a time. To capture with multiple cameras using Zivid Studio, start another instance of Zivid Studio.

Firmware Update

Each SDK version is matched with camera firmware, and the SDK will make sure that the camera runs compatible firmware. When Zivid Studio connects to a camera, it will check whether the camera has matching firmware. If the firmware does not match, you will get prompted to update the firmware on your camera.

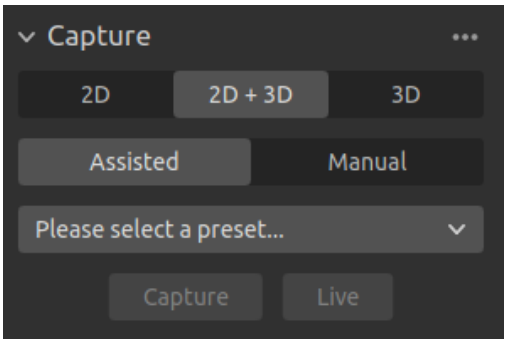


2.2. Capture

This section is used to capture 3D and 2D images. Here you can control and configure the camera settings. This section has three modes:

- 2D capture.
- 2D + 3D capture.
- 3D capture.

A 3D capture triggers the camera to capture a 3D point cloud without color information, while a 2D capture triggers the camera to capture a 2D image with or without color information. A 2D + 3D capture triggers the camera to capture both a 3D point cloud and a 2D image.



Each capture has two modes:

- Assisted Mode.
- Manual Mode.

Assisted Mode

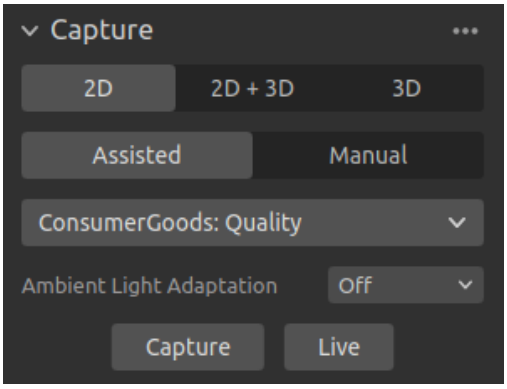
In the assisted mode you can select from a list of predefined settings from the Presets. This is the recommended way to capture 2D and 3D images.

The presets are specifically tuned for the following categories:

- **Consumer Goods**
  For any SKU in fulfillment centers, e.g., glossy packaging, semi-transparent plastics, irregularly shaped items, where surface coverage is critical.
- **Parcels**
  For matte and glossy plastic shipping bags, padded envelopes, and cardboard boxes, where speed and surface coverage are key.
- **Manufacturing**
  For shiny, dark, or textured metallic, rubber, and plastic industrial components, where surface coverage and shape trueness are required.
- **Inspection**
  For complex surfaces with fine details, weld seams, rubber gaskets, 3D printed parts, where minimal noise and high fidelity are required.
- **Depalletization**
  For matte and glossy cardboard boxes, bottles, cans, and other groceries wrapped in plastic, where surface coverage is critical.

Choose the category that best applies to your usage. This will then configure the camera settings for you based on the selected preset. Note that not all categories are available for all camera models. You can view and modify the selected settings in the Manual Mode.

Once a preset is selected, the ambient light adaptation can be chosen.



Note

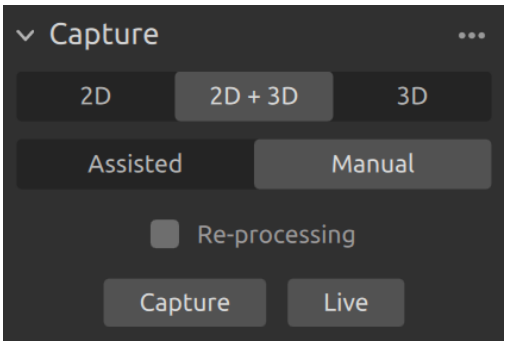
Ambient light adaptation can increase acquisition and capture time. Default presets do not adapt to any ambient light frequency.

Capture and Live

- The **Capture** button triggers a single capture with the specified settings, which is then displayed.
- The **Live** button triggers continuous captures, so you can view the scene in real-time.

Manual Mode

In the manual mode you must configure all settings manually. For more information about the settings panel, see Acquisition Settings and Processing Settings below.



Enabling **Re-processing** allows one to reprocess a capture using different processing settings without needing to re-capture. When changing any setting under Processing Settings, the point cloud will be reprocessed and updated in real time. A blinking dot next to Processing Settings indicates that reprocessing is in progress.



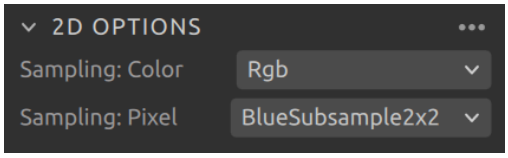
Diagnostics needs to be enabled during capture to enable re-processing.

2.3. Acquisition Settings

2D Options

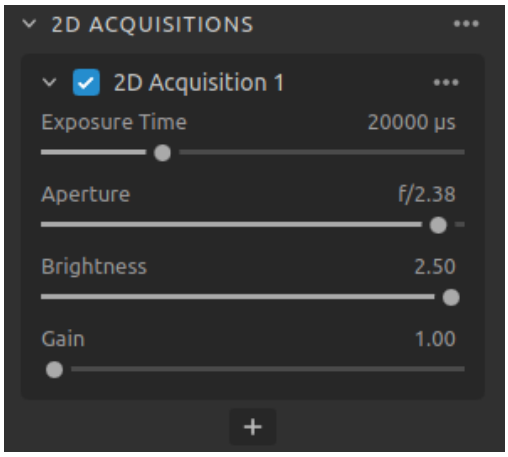
Sampling (2D)

Setting	Function
Sampling Color	Choose how to sample colors for the 2D image.
Sampling Pixel	Choose the subsampling factor to downscale 2D image.



2D Acquisitions

Setting	Function
Exposure Time	The duration a single camera image is exposed to light.
Aperture	The opening that controls the amount of light to the camera sensor through the lens.
Brightness	The output power (the amount of light) emitted by the LED projector.
Gain	The amplification of the signal from the camera sensor.

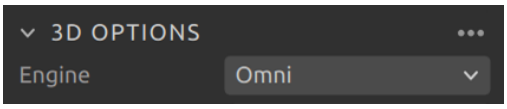


3D Options

Engine

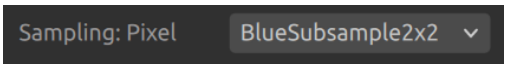
The Vision Engine is the backbone of the point cloud computation. It controls the pattern projecting, imaging, and processing of the images of the projected pattern to generate the final 3D point cloud.

Setting	Function
Engine	Choose between different pattern projections.



Sampling (3D)

Setting	Function
Sampling Pixel	Choose the subsampling factor to downscale the point cloud.



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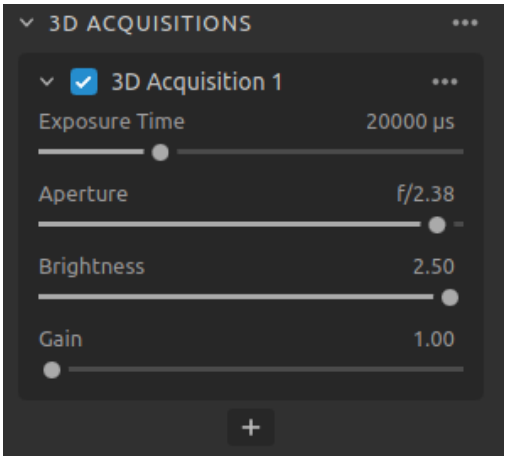
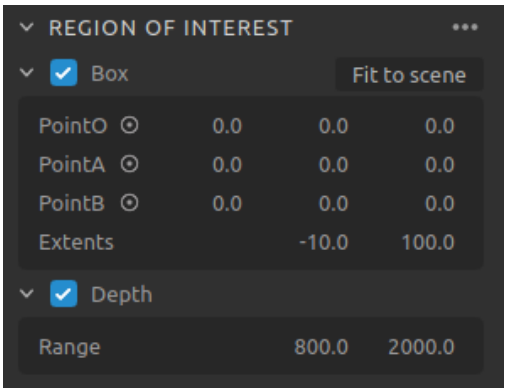


You can add multiple acquisitions within a capture by clicking the + button. This will allow you to capture the same scene with different exposure settings in an HDR capture, which can be useful for scenes with high dynamic range.

Region Of Interest

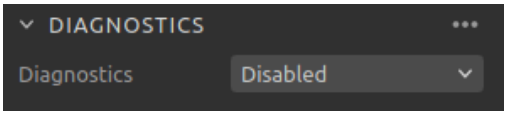
Setting	Function
Box	Create and configure a box in 3D and remove the points outside the box.
Depth	Remove points outside a user-defined depth range.



Diagnostics

The diagnostics setting collects extra diagnostic data from a capture that can be saved in the .zdf file. Enable it when reporting issues to Zivid's support team.

Enabling diagnostics is required for reprocessing of a capture using different processing settings without needing to re-capture.



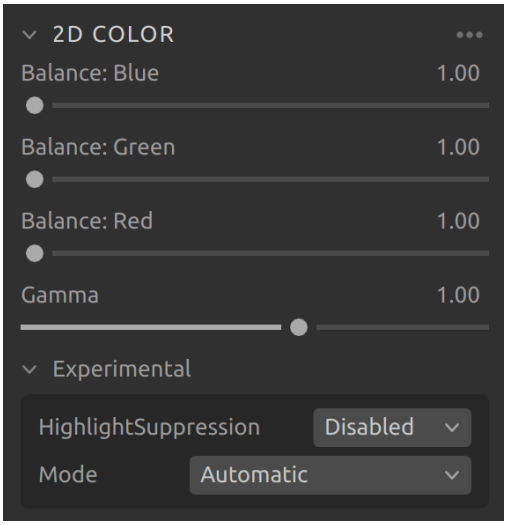
⚠ Caution

Diagnostics increases the capture time, the RAM usage, and the size of the .zdf file.

2.4. Processing Settings

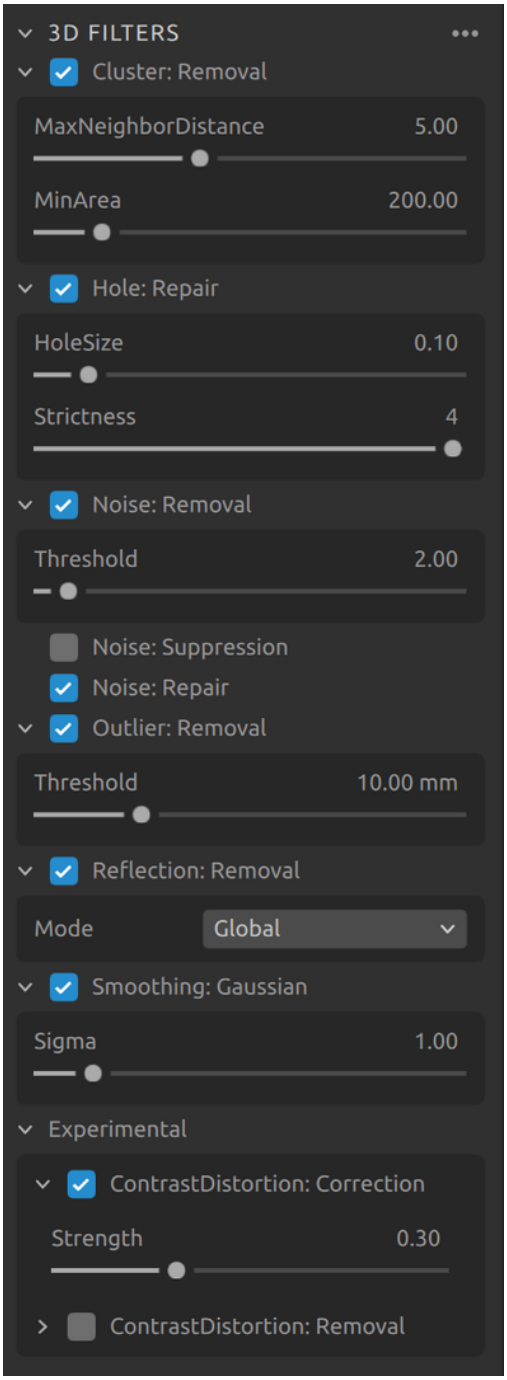
2D Color

Setting	Function
Balance	The color temperature of ambient light affects the appearance of the color image. Adjust blue, green, and red color balance to make color images look natural.
Gamma	The output color image can appear too dark. Adjust the brightness of the color image.
Color Mode	Control how the color image is computed. The options are Automatic and ToneMapping.
Highlight Suppression	Remove bright spots that the projector causes in the color image.



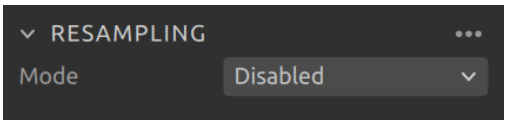
3D Filters

Setting	Function
Cluster Filter	Remove floating points and isolated clusters from the point cloud.
Hole Repair	Fill in removed points, by interpolation between the remaining points.
Noise Filter	Remove or correct points where the projected pattern signal-to-noise-ratio is low.
Outlier Filter	Remove points if the distance to their neighboring pixels within the small local region is larger than the threshold specified in mm.
Reflection Filter	Remove points impacted by reflections and thus erroneous.
Gaussian Smoothing	Perform Gaussian smoothing on the point cloud.
Contrast Distortion	Correct or remove points affected by blurring in the camera lens, or both.


3D FILTERS
Cluster: Removal
MaxNeighborDistance 5.00
MinArea 200.00
Hole: Repair
HoleSize 0.10
Strictness 4
Noise: Removal
Threshold 2.00
Noise: Suppression
Noise: Repair
Outlier: Removal
Threshold 10.00 mm
Reflection: Removal
Mode Global
Smoothing: Gaussian
Sigma 1.00
Experimental
ContrastDistortion: Correction
Strength 0.30
ContrastDistortion: Removal

Resampling

Setting	Function
Mode	Reduce or increase the number of points in the point cloud.



3. Available Views

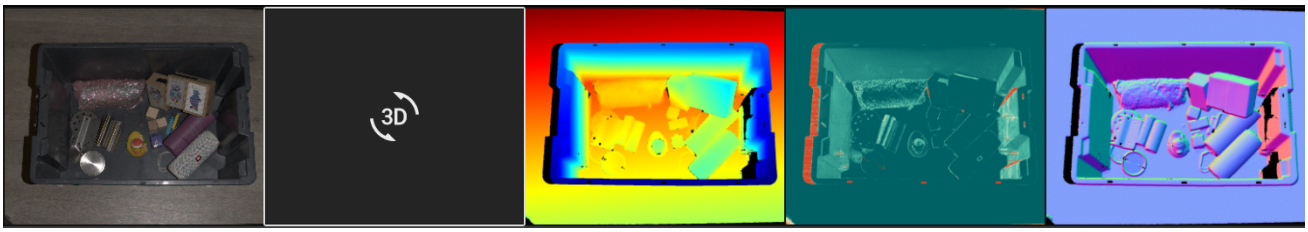
There are five views available at the bottom of Zivid Studio.

- 3D View
- 2D Color Image
- Depth Map
- SNR Map
- Normal Map

To navigate between views you can either

- Use the keyboard shortcuts `1` through `5`.
- Change manually at the bottom of the GUI by clicking on the thumbnails.
- Select from the drop-down menu in the top left corner.

Each view has its own set of drop-down menus in the top left corner with different features to explore.



3.1. 3D View

This view displays the point cloud of the scene after a 3D capture or after loading a ZDF file.

- Use the left mouse button to rotate the point cloud.
- Use the right mouse button to pan.

- Zoom in or out by rolling the mouse wheel or, if available, by the middle mouse button followed by dragging the mouse.



Choosing how the point cloud is colored (`C`, `D`, `R`, `S` and `N`) and toggling the mesh (`M`) on and off in this view helps evaluate the point cloud quality.

Other features that affect the visualization of the point cloud are found in the top left drop-down menus:

- The point size can be adjusted, which can be helpful for inspecting areas where textures are important.
- If Depth (`D`) point cloud coloring is enabled, you can adjust the Z range to display only a specific section of the point cloud.
- A transform can be applied to the point cloud, moving all points from the camera's coordinate system to a chosen one. Load the transform from file, or set it with the Region Of Interest.

> **Note**
>
> This also affects the Depth and Normals views, since they are relative to the current coordinate system.

- If you have enabled the Region Of Interest Box, you can modify the visibility of it.

3.2. 2D Color Image

This view displays the color image of the scene after a 2D capture or after loading a ZDF file.

- Position the mouse pointer over a pixel in the image to get image coordinates and RGB values. The pixel values are displayed in the status bar in the bottom left corner of the window.
- Zoom in or out by rolling the mouse wheel or, if available, by the middle mouse button followed by dragging the mouse.
- Use the left mouse button to pan the view.



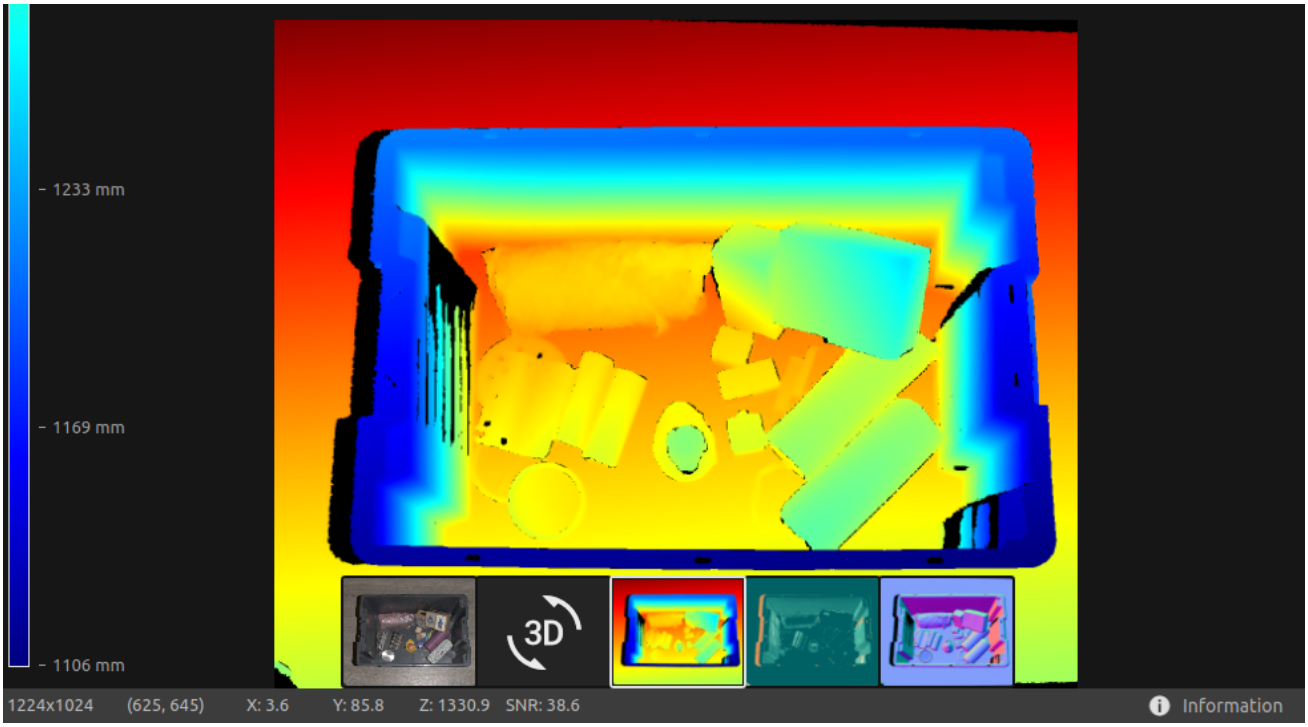
When doing a 2D+3D capture with different pixel sampling you can switch between the 2D image from the 2D capture and 3D capture in the top-left drop-down.

3.3. Depth

This view displays the depth image of the scene after a capture or after loading a ZDF file.

- Position the mouse pointer over a pixel in the image to get image coordinates, XYZ values, and SNR values. The pixel values are displayed in the status bar in the bottom left corner of the window.
- Use the drop-down menu located at the top left corner of the view to modify the Z range.

- Use zoom and pan features in the same way as described in the Color View.



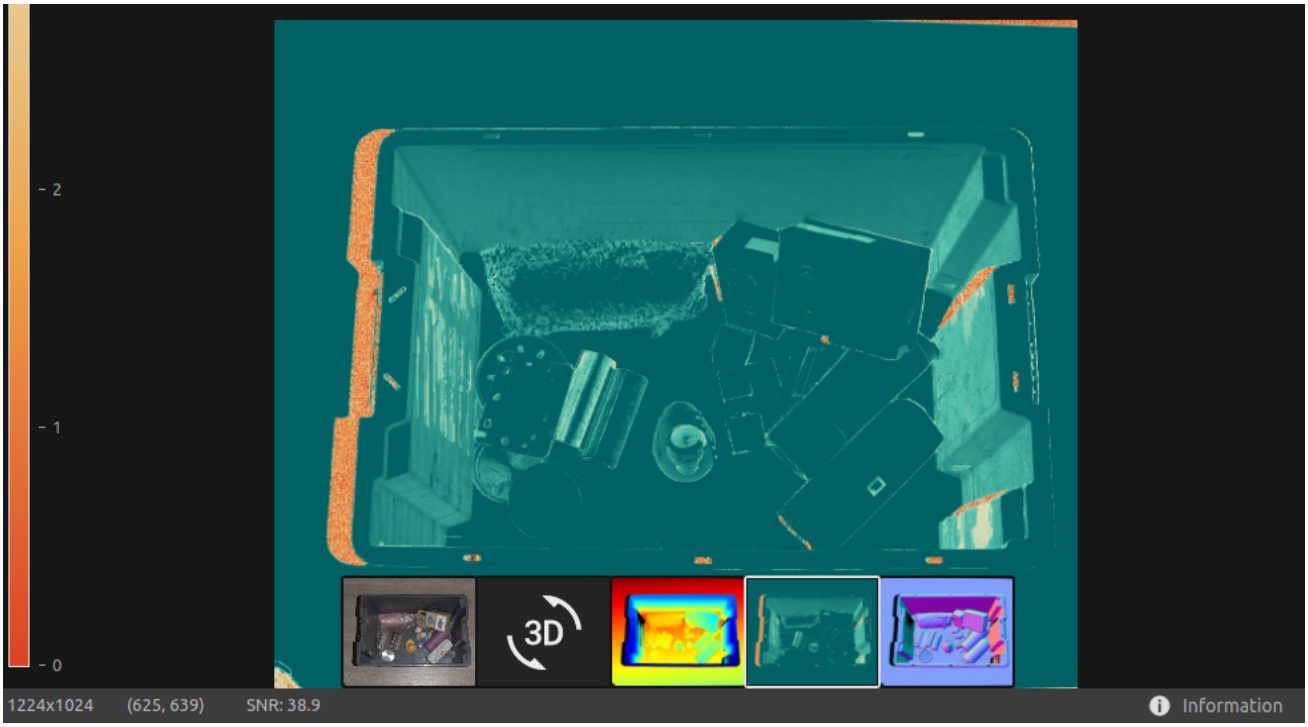
The color scale represents the distance variation along the z-axis from the camera to the surfaces of the imaged objects. To modify the range along the z-axis, you can use a fixed Z range in the top-left drop-down to narrow the color scale.

3.4. Signal-to-Noise-Ratio

This view displays the SNR map of the scene after a capture or after loading a ZDF file.

- Position the mouse pointer over a pixel in the image to get image coordinates and SNR values. The pixel values are displayed in the status bar in the bottom left corner of the window.

- Use zoom and pan features in the same way as described in the Color View.



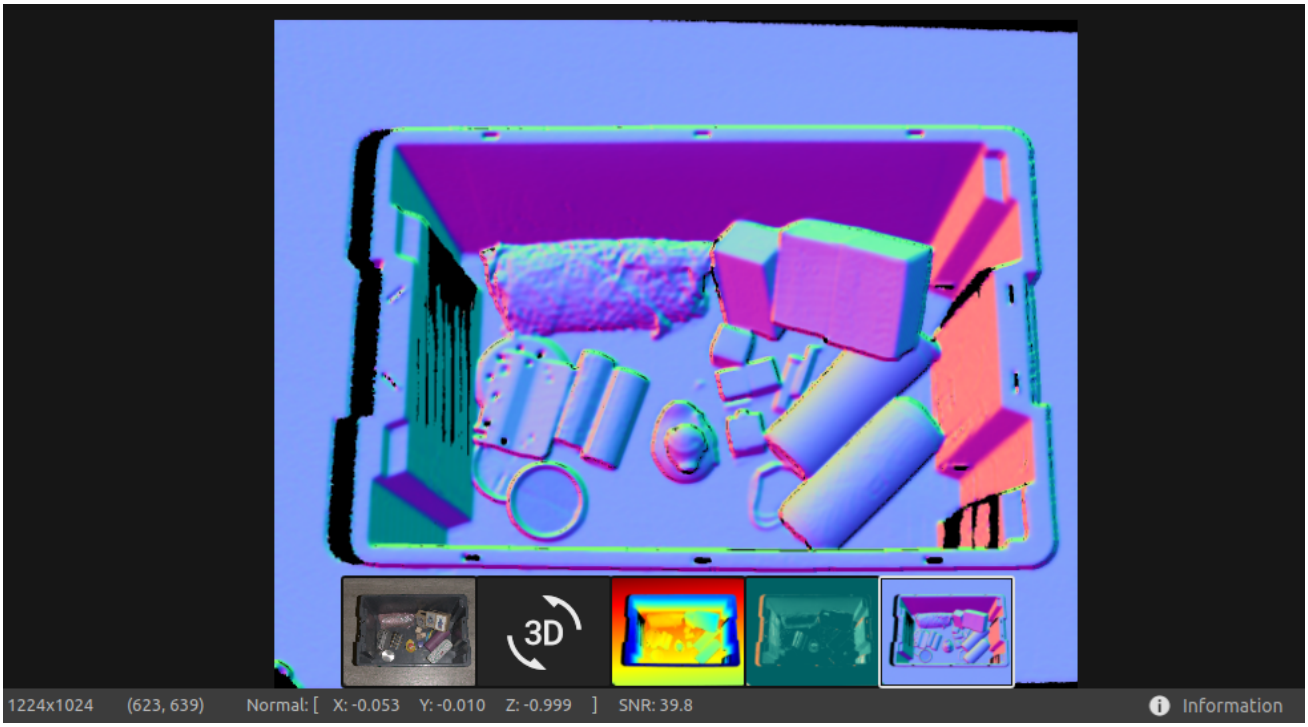
The color scale represents the variation in the SNR values. A pixel found at the higher end of the color scale represents a point associated with strong signal quality. For a point associated with a pixel found at the lower end of the color scale the ratio is more influenced by noise. Hence, these points involve higher uncertainty.

3.5. Normals

This view displays the normal map of the scene after a capture or after loading a ZDF file.

- Position the mouse pointer over a pixel in the image to get image coordinates, normal coordinates, and SNR values. The pixel values are displayed in the status bar in the bottom left corner of the window.

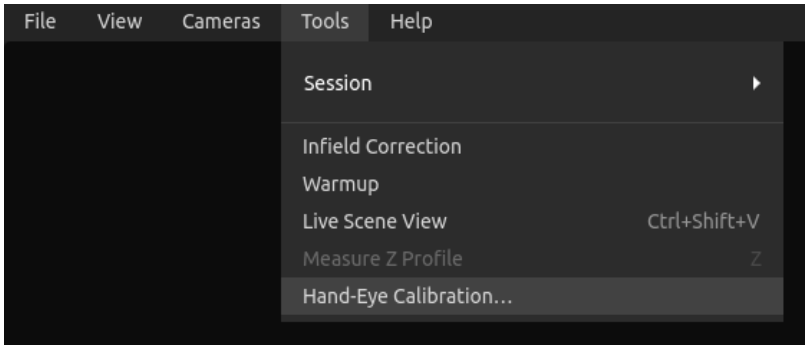
- Use zoom and pan features in the same way as described in the Color View.



The normal map provides a 2D representation of the surface normals of a scene where RGB color components describe the normal vectors. It is helpful in inspecting surface curvatures, surface textures, and transitions between objects as the color gradients describe these well.

4. Toolbar

The toolbar is located at the top of Zivid Studio. It consists of drop-down menus to handle files, control the GUI, configure cameras, use maintenance tools, and get information about the Zivid software.



4.1. File

Zivid Studio offers various saving options for point clouds, color images, and settings to disk.

Save/Export Point Cloud

To save the point cloud in file ZDF format:

- Click on **File** → **Save**.
- Navigate to the location where you want to save the point cloud.
- Write down the file name.
- Click Save.

> **Note**
>
> ZDF is the native Zivid file format that includes point cloud, color image, and depth image data. It's the preferred format when reporting an issue to the Zivid Customer Success Team.

To export to one of our supported point cloud formats, unordered or ordered Polygon (PLY), ASCII (XYZ), or Point Cloud Data (PCD) file format:

- Click on **File** → **Export**.
- Navigate to the location where you want to save the point cloud.
- Write down the file name.
- Select the file format type.
- Click Save.
- Choose Export options.

- Click Export.

Open Point Cloud / File Camera

Opening a point cloud in Zivid Studio is only supported for ZDF file format. A file camera can be opened in Zivid Studio in the ZFC file format.

- Click on **File** → **Open**.
- Navigate to the location of your ZDF / ZFC file.
- Click Open.

You can also drag and drop a ZDF / ZFC file into Zivid Studio, or double-click it.

To open or create a file camera from the Cameras panel, click the **⋯** menu and select one of:

- **Open ZDF file as file camera** - loads a ZDF file as a file camera. The file must have been captured with diagnostics enabled.
- **Use captured frame as file camera** - creates a file camera from the frame currently displayed in the viewer. The frame must have been captured with diagnostics enabled.

See File Camera for details.

Save 2D Image / Depth Map / SNR Map / Normal Map

You can save the 2D color image in one of our supported image formats, PNG, BMP and JPG. For all formats, you can choose between sRGB and linear RGB color space. The Depth Map, SNR Map and Normal Map can only be saved in PNG format.

- Click on **File** → **Save 2D Image** / **Save Depth Map** / **Save SNR Map** / **Save Normal Map**.
- Navigate to the location where you want to save the image.
- Write down the file name.
- Click Save.

Export Settings

It is possible to save all settings to disk.

- Click on **File** → **Export 2D + 3D Capture Settings**. The menu item is named after the current capture mode, for example **Export 2D Capture Settings**.
- Navigate to the location where you want to save the settings.
- Write down the file name.
- Click Save.

Import Settings

To import the settings in Zivid Studio:

- Click on **File** → **Import Capture Settings**.
- Navigate to the location of your settings file.

- Click Open.

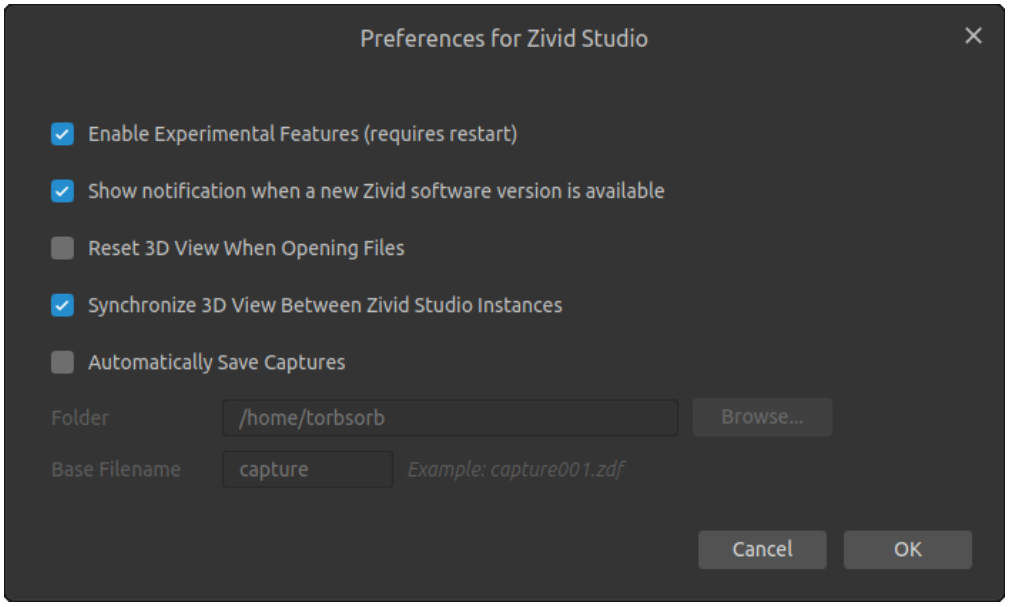
You can also drag and drop a YML file into Zivid Studio to import the settings.

Preferences

To open and modify Zivid Studio preferences:

- Click on **File** → **Preferences**.
- Check the boxes to enable the desired preferences.
- Click **OK** to apply your changes, or **Cancel** to discard them.

The **Reset 3D View When Opening Files** preference is the same setting as the one in the View menu.



Experimental Features

Some Zivid Studio tools are experimental and off by default. Enabling experimental features unlocks the Hand-Eye Calibration and Warmup tools and the session manager, and adds the latest improvements to Infield Correction (the Infield Correction tool itself is always available).

To enable them:

- Go to **File** → **Preferences**.
- Tick **Enable Experimental Features (requires restart)**.
- Click **OK**, then restart Zivid Studio.

After the restart, the experimental tools appear in the **Tools** menu.

Experimental Studio tools do their job, but their design is still being refined, so what changes is the interface, not the reliability:

- The interface and workflow may change between releases.
- Their options may change, and a tool may be removed.

They are off by default so you choose when to try them, not because they are untested.

Software Update Notification

Enable **Show notification when a new Zivid software version is available** to get a notification in Studio when a newer version of the Zivid software is released.

Synchronize 3D View Between Zivid Studio Instances

Enable **Synchronize 3D View Between Zivid Studio Instances** to make the 3D view follow when you rotate, pan, or zoom in another open Zivid Studio window, so you can compare point clouds side by side.

Automatically Save Captures

Enable **Automatically Save Captures** in Preferences to save every capture as a ZDF file automatically, without clicking **File** → **Save**, typing a filename, and clicking **Save** again after each one. Set the target folder and a base filename; each capture is then saved under an incrementing filename in that folder, for example `capture001.zdf`, `capture002.zdf`, and so on.

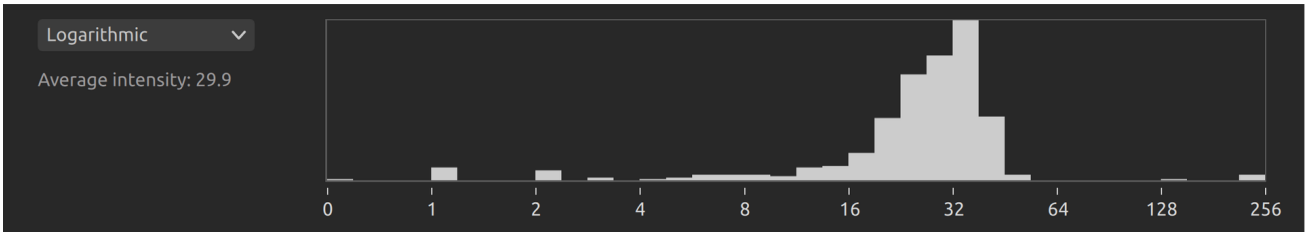
Automatically Save Captures only saves discrete captures. It does not save frames streamed in Live mode, and it does not save a frame again when you reprocess it.

4.2. View

2D Color Image Histogram

To show the 2D image histogram:

- Click on **View** → **2D Color Image Histogram**.
- Swap between **Linear** and **Logarithmic** to change scales.



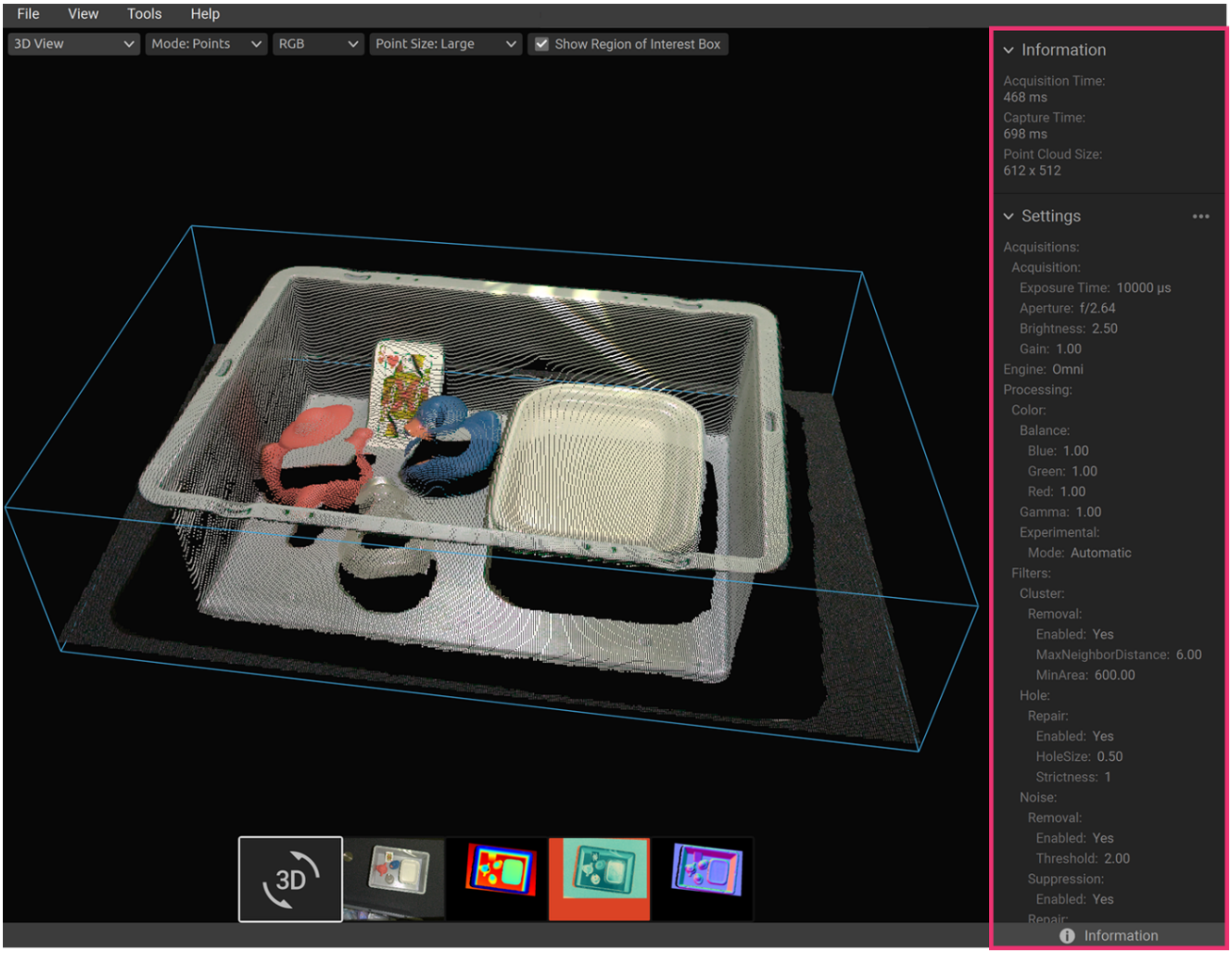
Information

To open the information panel:

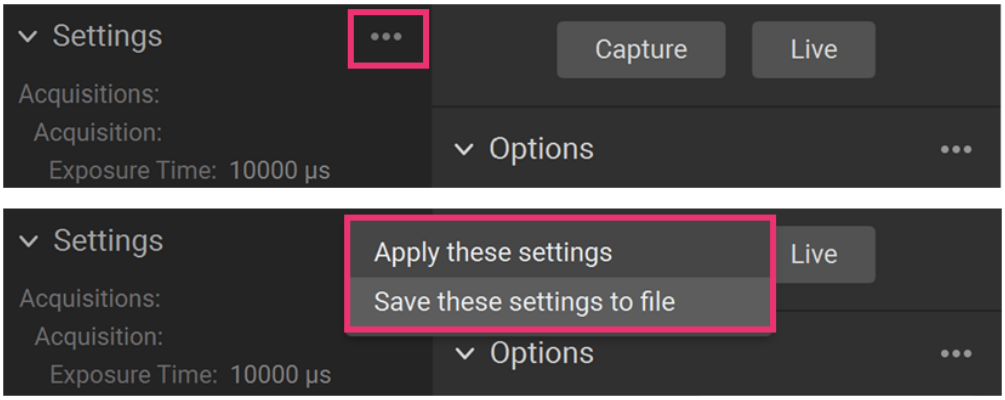
- Click **View** → **Information** or **Information** in the bottom right corner.

It is available only after you load a point cloud from a ZDF file or capture a point cloud or a color image.

The top part of the Information panel shows Acquisition Time, Capture Time, and Point Cloud / Color Image Size.



The bottom part shows the settings that were used in the capture. It is possible to save these settings to a file or apply them for use in the next capture.

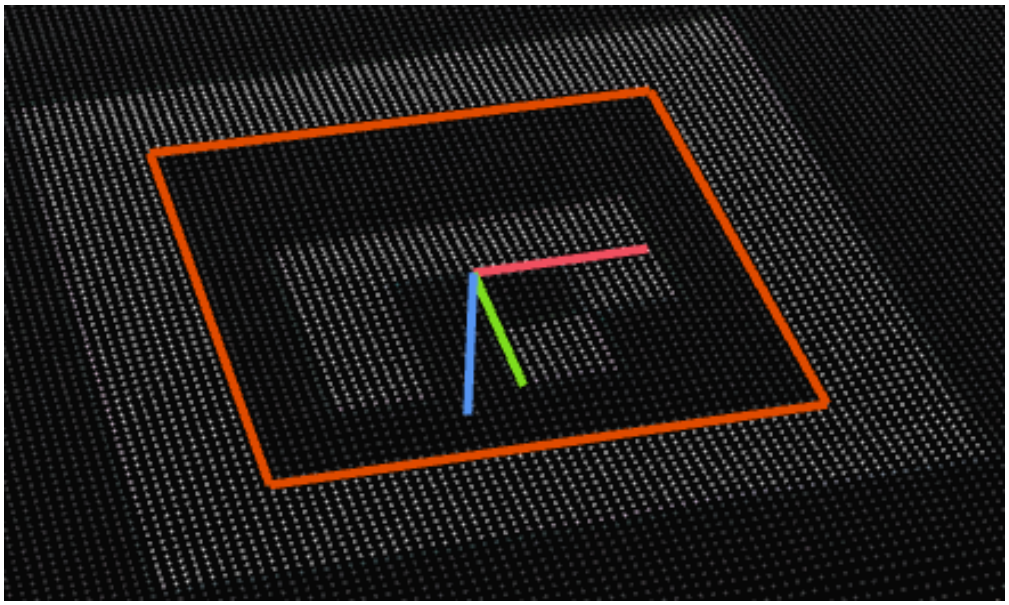


3D Axis Indicator

A 3D axis indicator is displayed in the bottom left corner of the point cloud view. To disable/enable it, click on **View** → **3D Axis Indicator**.

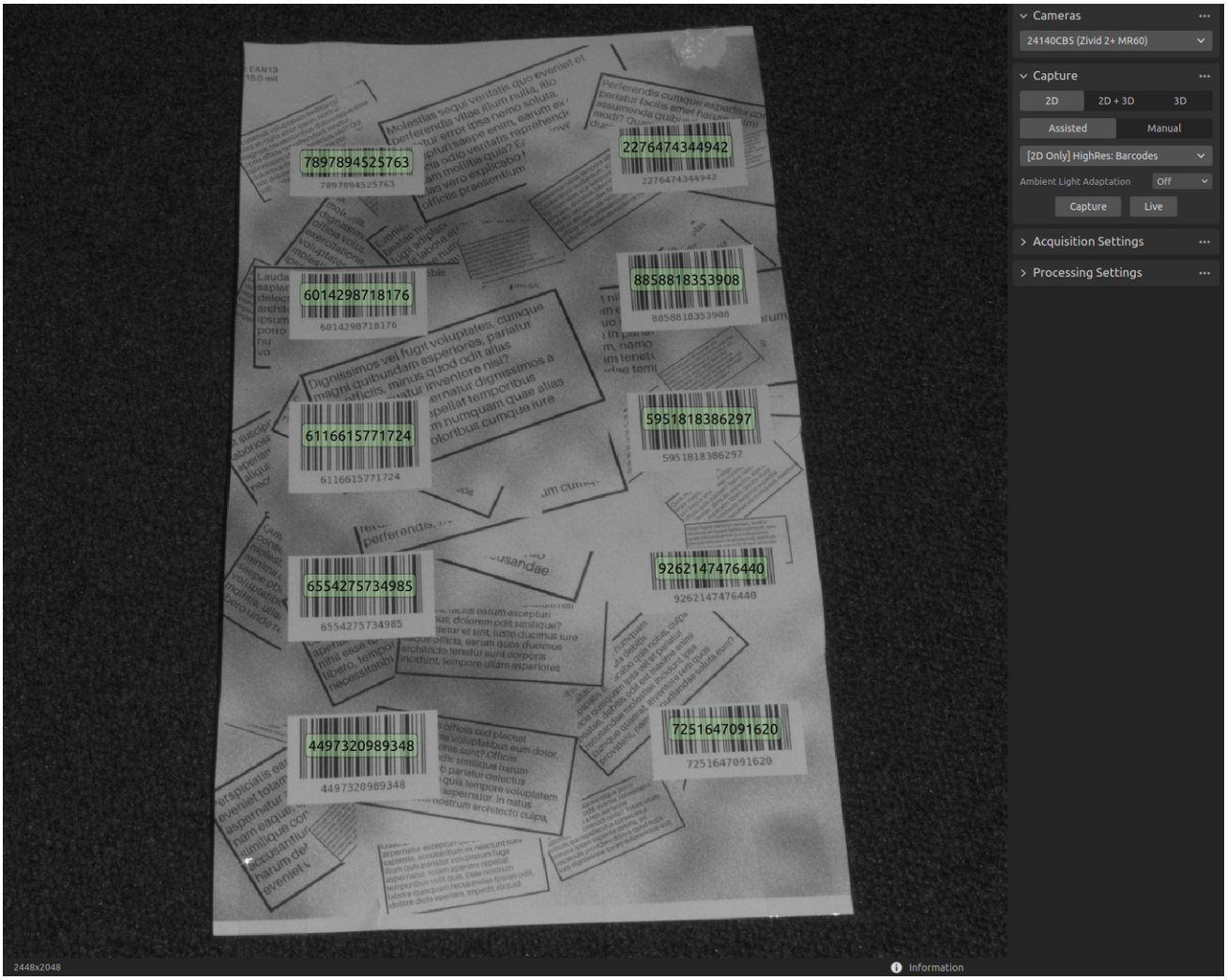
Show 4x4 Aruco Markers

To highlight any 4x4 Aruco markers in the point cloud, click on **View** → **Show 4x4 Aruco Markers**.



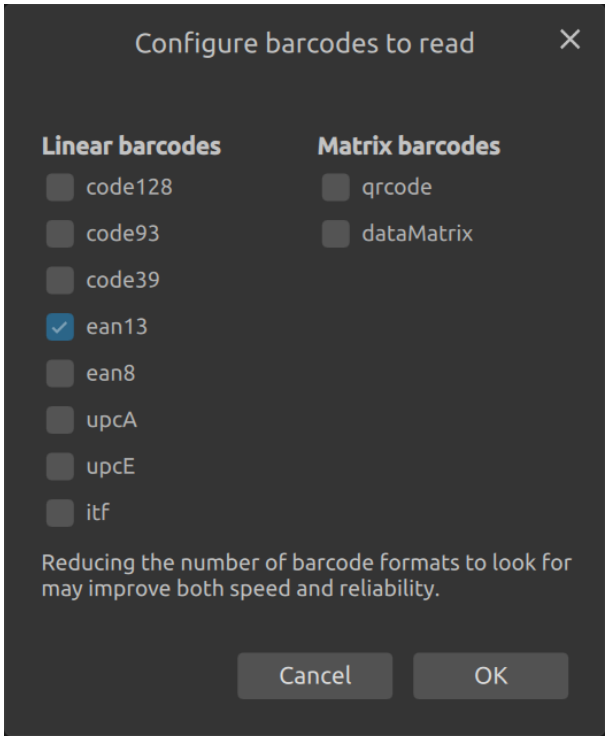
Show barcodes

To show barcodes detected and decoded in the 2D image, click on **View** → **Show barcodes**.



Configure barcodes to read

To configure which barcodes to detect and decode in the 2D image, click on **View** → **Configure barcodes to read**.



Reset 3D View When Opening Files

To control whether the 3D view is reset to the default view each time you open a file, click **View** → **Reset 3D View When Opening Files**. Leave it disabled to keep the current viewpoint, for example to compare several files from the same angle. The same setting is also in **File** → **Preferences**.

Reset View

To reset the point cloud, color image, and depth image view back to the default view, click **View** → **Reset View**, or press `Backspace`.

Reset UI Layout

To restore the Zivid Studio window to its default layout, click **View** → **Reset UI Layout**.

Full Screen Mode

To toggle between full screen and regular screen mode, click **View** → **Enter Full Screen Mode** / **Exit Full Screen Mode**, or press `F11`.

4.3. Cameras

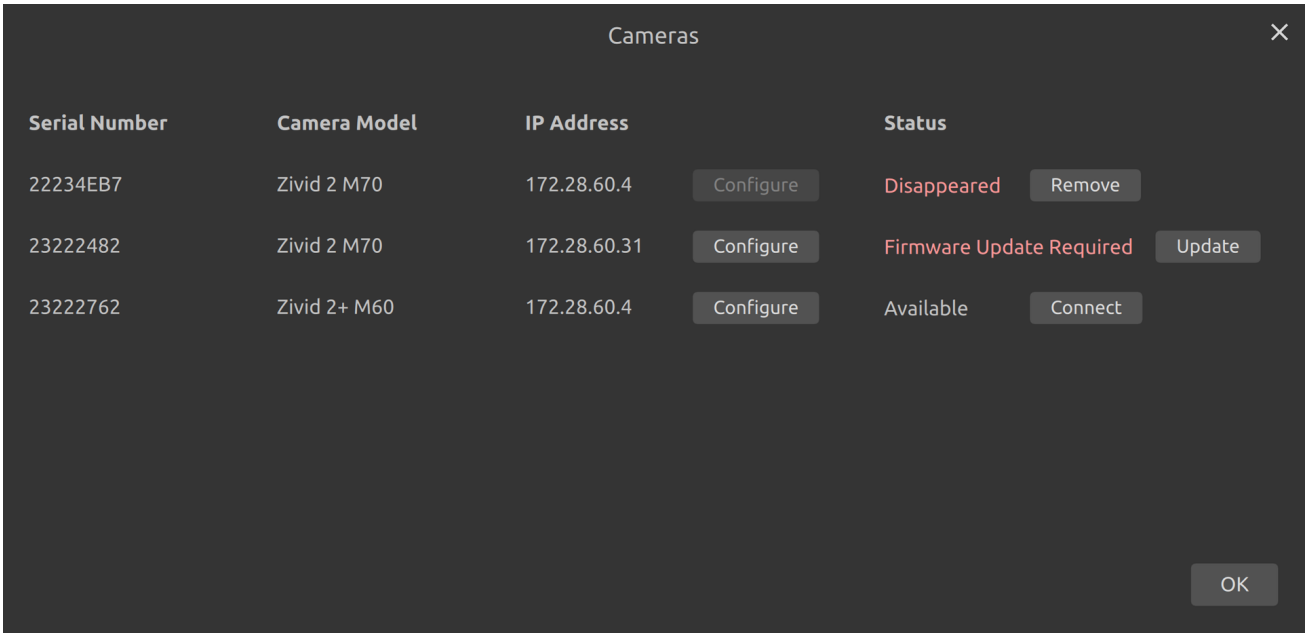
The **Cameras** menu lists the discovered cameras and lets you connect, configure, and health-check them.

All Cameras

To open the Cameras menu:

- Click on **Cameras** → **All Cameras**.

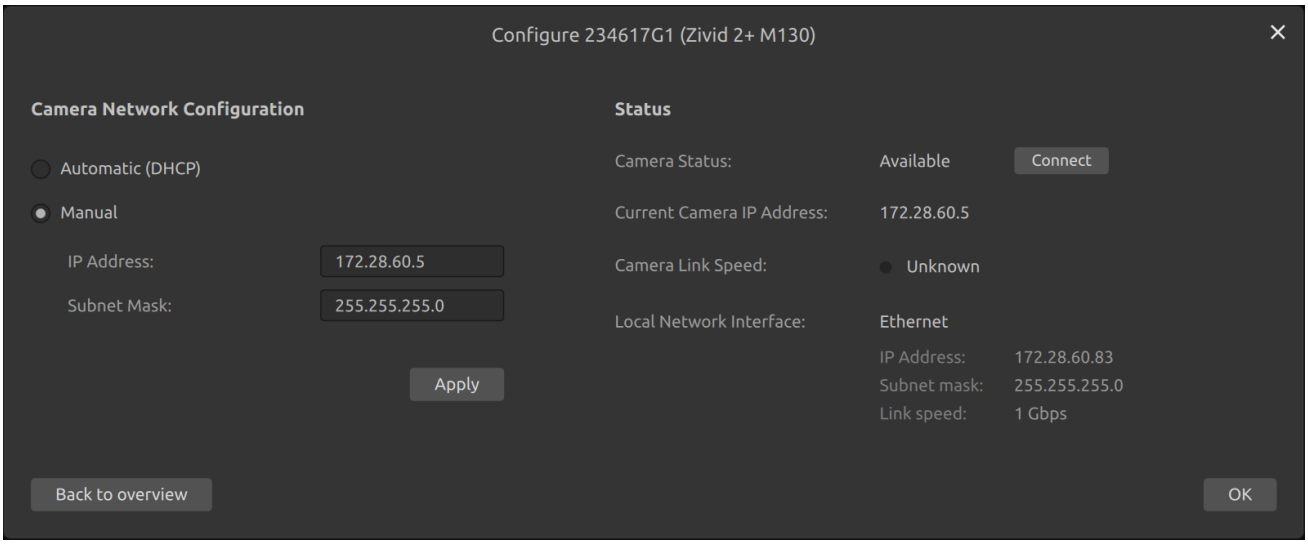
This will list all discovered cameras and their serial numbers, models, IP addresses and statuses.



The status-field allows the following actions:

- **Connect** to connect to the camera if it is available.
- **Disconnect** to disconnect from the camera if it is connected.
- **Update** to update the firmware of the camera if it is available but needs a firmware update.
- **Remove** to remove the camera from the list if it is no longer found.

You can change the network configuration of any discovered camera by clicking **Configure**. This will open the camera network configuration.

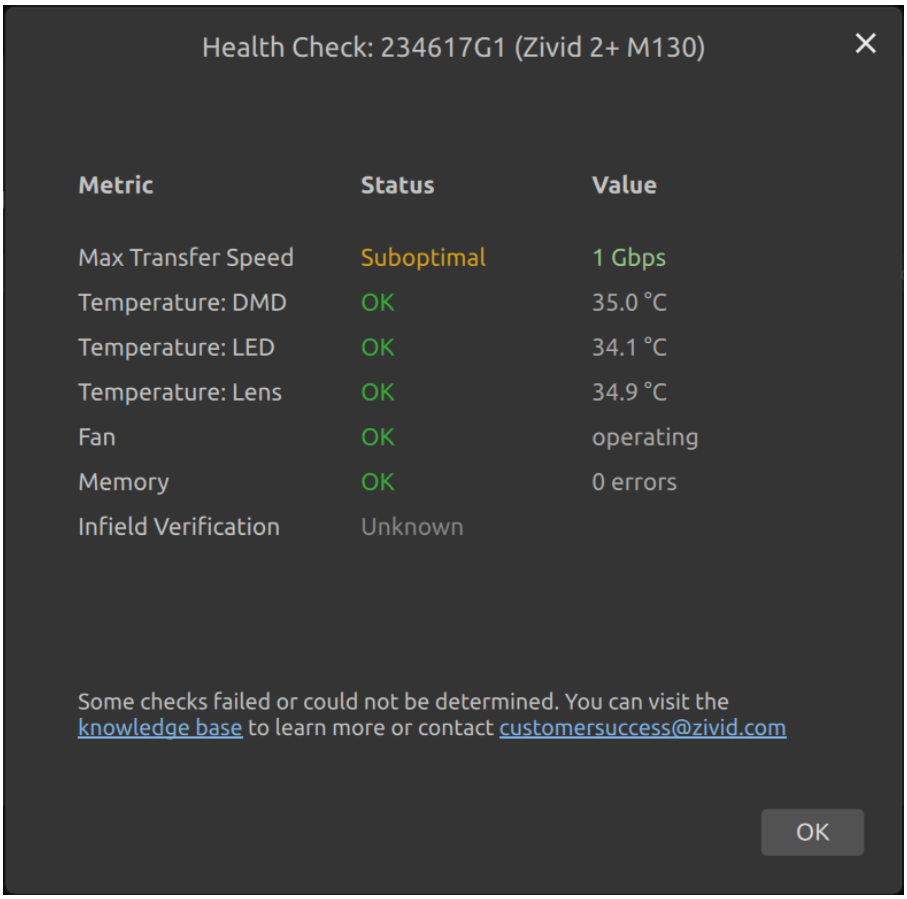


Here you can set the camera to use DHCP or a specific static IP address, and apply the configuration to the camera by clicking **Apply**. The status of the camera can change after applying the network configuration.

Health Check

The Health Check reports the status of a connected camera, aggregating several individual checks (such as temperatures, fan, memory, and transfer speed) into an overall status. This gives a quick overview of whether the camera is operating within its specified range.

To run a health check, open the Cameras menu (**Cameras** → **All Cameras**) and click **Check** on the row of a connected camera. The **Check** button becomes active once the camera is connected.



To read the same health check status programmatically, see Camera Health Check.

4.4. Tools

The **Tools** menu gives access to Zivid Studio's maintenance and calibration tools. Some are experimental and off by default (Warmup, Hand-Eye Calibration and the session manager); see how to enable experimental features.

Warmup

Zivid Studio can warm up the camera and track its progress in a side panel, so the camera reaches thermal equilibrium before you capture or calibrate. A Zivid camera heats up while it is used, and the small mechanical changes this causes reduce 3D accuracy until then.

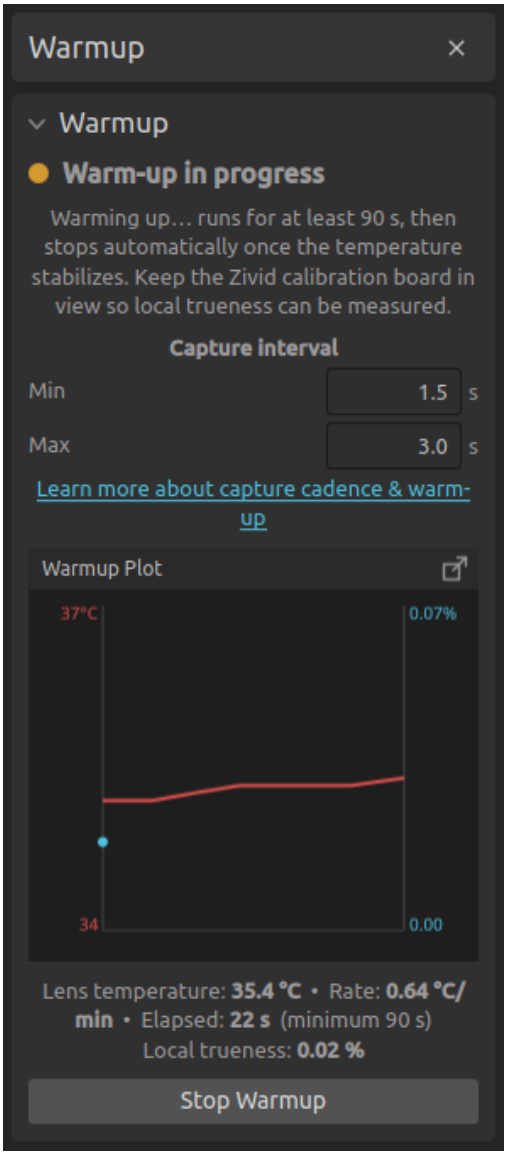
This page describes the Studio interface. For more on why warmup matters and how long to warm up, see the warmup tutorial.

Prerequisites

- Install Zivid Software.
- Enable experimental features in Studio.
- A connected Zivid camera.
- Optional, but recommended: a Zivid calibration board, to also track local trueness during warmup.

Opening the Warmup panel

Go to **Tools** → **Warmup** with a camera connected. The Warmup panel replaces the capture controls on the right. Select **Tools** → **Exit Warmup** to close it. Close the Hand-Eye Calibration window first, because the two cannot be open at the same time (see Using several tools in one session).



Running a warmup

- Place the Zivid calibration board in the camera's view (optional, but recommended; use Live Scene View to check the placement).
- Set the **Capture interval** to match your application's capture cycle.
- Click **Start Warmup**.

Studio captures repeatedly using the current capture settings, and plots the lens temperature and the local trueness error over time. The warmup stops automatically once the lens temperature stops changing, which means the camera has reached thermal equilibrium. You can stop it early with **Stop Warmup**.

Capture interval

The **Min** and **Max** values set how often Studio captures while warming up, in seconds. Match them to the capture cadence of your application, because a camera warmed with a different cadence settles at a different temperature. A fast, continuous cycle warms the camera quickly, while a slow or intermittent cycle lets it cool between captures.

Warmup Plot

The plot shows the lens temperature on the left axis and the local trueness error on the right axis as the warmup progresses. A live readout below the plot shows the current lens temperature, its rate of change, the elapsed time, and the local trueness error. Use the detach button, or drag the plot's header out of the window, to follow the plot in a separate window while you work.

Local trueness is measured only while the Zivid calibration board is in view. Without the board, the warmup still runs and stops the same way, but the plot shows only the temperature. Keeping the board in view is better, because the trueness curve shows when the 3D accuracy has settled.

Next steps

- Infield Correction to verify and correct the camera's dimension trueness once it is warm.
- Warmup for the concepts behind camera warmup.

Infield Correction

Zivid Studio can verify and correct the dimension trueness of a camera through the Infield Correction side panel, without writing any code.

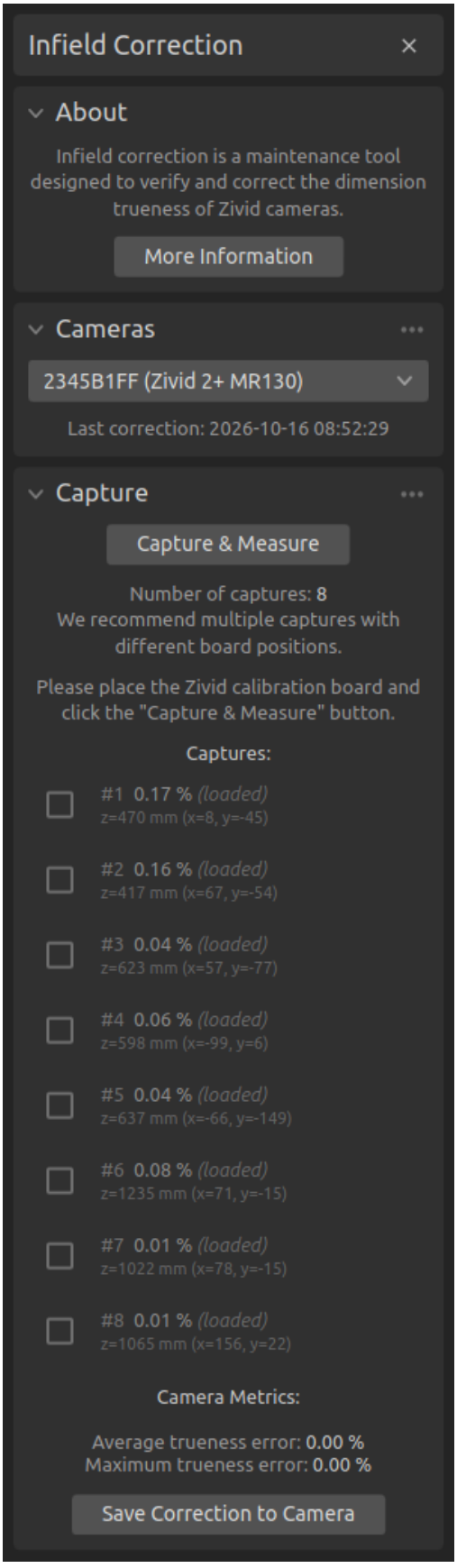
This page describes the Studio interface. For what infield correction is, which calibration boards to use, and how to place the board, see the infield correction tutorial and Guidelines For Performing Infield Correction.

Prerequisites

- Install Zivid Software.
- Optional: Enable experimental features in Studio to exclude individual captures from the correction.
- A connected Zivid camera.
- A Zivid calibration board.

Opening the Infield Correction panel

Go to **Tools** → **Infield Correction** with a camera connected. The panel replaces the capture controls on the right. Select **Tools** → **Exit Infield Correction** to close it.


Infield Correction
About
Infield correction is a maintenance tool designed to verify and correct the dimension trueness of Zivid cameras.
More Information
Cameras
2345B1FF (Zivid 2+ MR130)
Last correction: 2026-10-16 08:52:29
Capture
Capture & Measure
Number of captures: 8
We recommend multiple captures with different board positions.
Please place the Zivid calibration board and click the "Capture & Measure" button.
Captures:
#1 0.17 % (loaded)
z=470 mm (x=8, y=-45)
#2 0.16 % (loaded)
z=417 mm (x=67, y=-54)
#3 0.04 % (loaded)
z=623 mm (x=57, y=-77)
#4 0.06 % (loaded)
z=598 mm (x=-99, y=6)
#5 0.04 % (loaded)
z=637 mm (x=-66, y=-149)
#6 0.08 % (loaded)
z=1235 mm (x=71, y=-15)
#7 0.01 % (loaded)
z=1022 mm (x=78, y=-15)
#8 0.01 % (loaded)
z=1065 mm (x=156, y=22)
Camera Metrics:
Average trueness error: 0.00 %
Maximum trueness error: 0.00 %
Save Correction to Camera

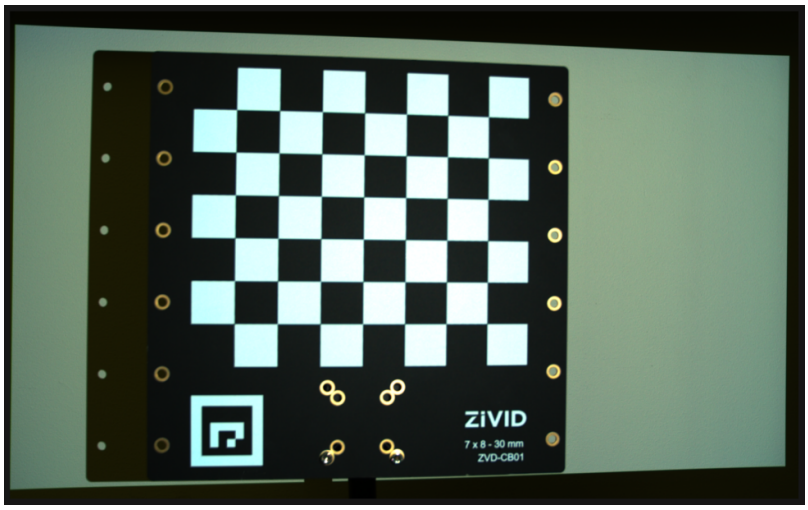
Close the Hand-Eye Calibration window first, because the two cannot be open at the same time. If the current session already holds hand-eye pose pairs, Studio offers to start a new session, because Infield Correction changes the camera's correction (see Using several tools in one session).

Panel overview

- **Last correction** shows the date and time an infield correction was last written to the camera.
- **Capture & Measure** (`F5`) captures the Zivid calibration board and measures the local dimension trueness error of the point cloud where the board is placed.
- **Captures** lists each capture with the board position (z is the distance from the camera) and its local dimension trueness error. Uncheck a capture to exclude it from the correction. This list is shown only with experimental features enabled.
- **Camera Metrics** shows the **Current trueness error**, the local dimension trueness error for the last capture, and once there are several captures, the **Average trueness error** and **Maximum trueness error** over all of them.
- **Expected Post-Correction Metrics** shows the estimated dimension trueness error after correction, within 1σ statistical uncertainty, and the **Optimized workspace (depth)**, the range of working distances the captures were taken at.
- **Save Correction to Camera** writes to the camera the correction parameters computed from the captures.
- **Reset Camera Correction**, in the menu of the **Cameras** section, removes any infield correction written to the camera earlier. It is not necessary to reset a correction before verifying or applying a new one.

Verifying the camera

Place the Zivid calibration board in the desired location. We recommend using Live Scene View to help align the board correctly. Place the board at the closest distance you want to capture for the first capture in your infield correction dataset. Try to have the board as parallel as possible to the camera's coordinate system, and make sure the entire board is visible in the camera frame. For more guidance, see Guidelines For Performing Infield Correction.



Click **Capture & Measure** to verify the local dimension trueness error of the connected camera. The result shows under **Camera Metrics** as the **Current trueness error**.

Potential Issues

If the board is too far out of the orientation or the capture is of poor quality to provide sufficient data, you will be informed of the potential setup issue:

- Board is too tilted in X, Y, or Z planes.
- Not all of the feature points are detectable.
- The fiducial marker is not visible.
- The image of the board is of too poor quality to provide sufficient data.

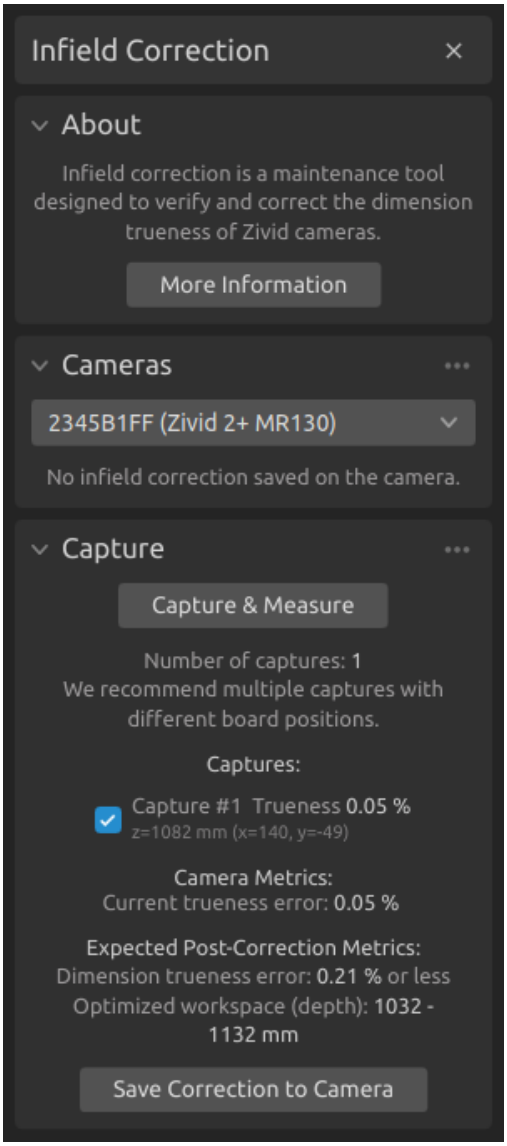
Correcting the camera

To perform infield correction on a camera, gather data by clicking **Capture & Measure** with the board at different distances and at different locations in the FOV, as described in Guidelines For Performing Infield Correction.

As you take captures, **Expected Post-Correction Metrics** shows what you would get if you applied the correction now:

- The estimated new maximum dimension trueness error for the majority of the FOV.

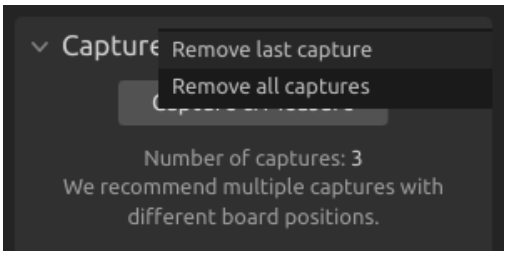
- The **Optimized workspace (depth)**, the range at which this error is expected, which depends on the distances the captures were taken at.



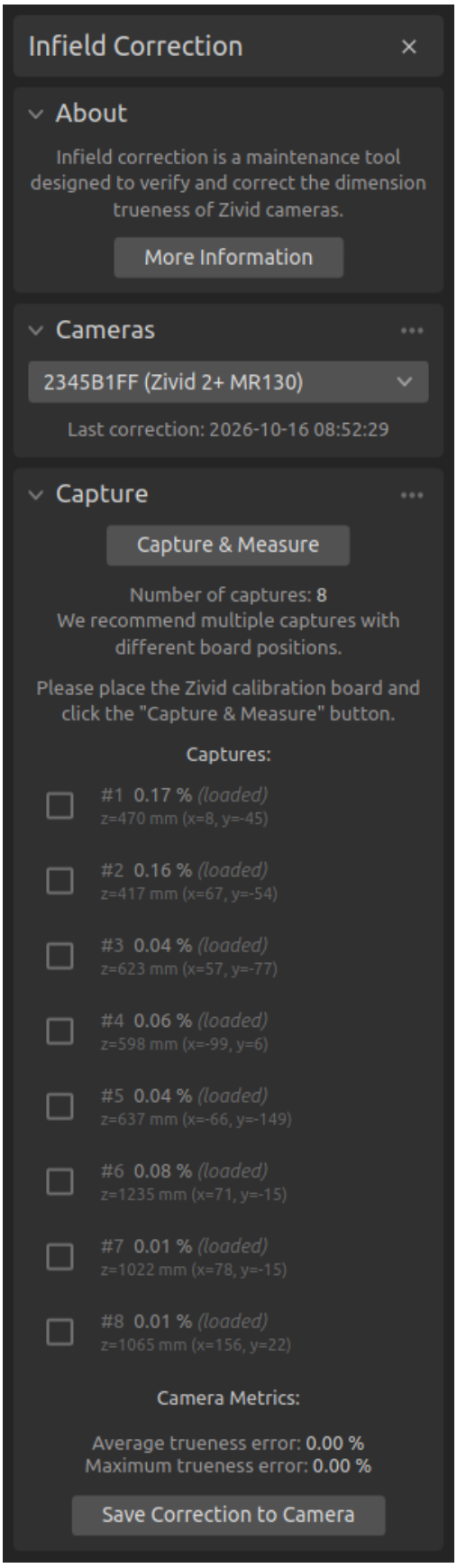
Note

It is not unexpected to get larger values for the **Expected Post-Correction Metrics** than the values under **Camera Metrics**. This is because the **Expected Post-Correction Metrics** are given for the majority of the FOV and the distance range that was used in the infield correction dataset. On the other hand, the **Camera Metrics** are local dimension trueness errors calculated for a capture for the FOV covered by the calibration board and at the distance to the board.

To start over, click the three dots in the **Capture** section, then **Remove last capture** or **Remove all captures**.



With experimental features enabled, you can also uncheck individual captures in the **Captures** list to exclude them from the correction.



If you are satisfied with the expected result, apply the correction to the camera by clicking **Save Correction to Camera**. The correction is persisted on the camera and applied to all future captures.



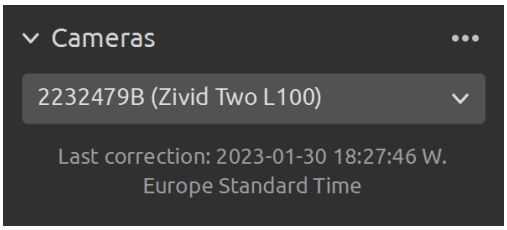
After saving, click **Restart Tool** to measure again and confirm the written correction, or **Close** to finish.

With experimental features enabled, Studio stores the infield captures in the current session.

The same setup issues as when verifying can be reported while you capture (see Potential Issues under Verifying the camera).

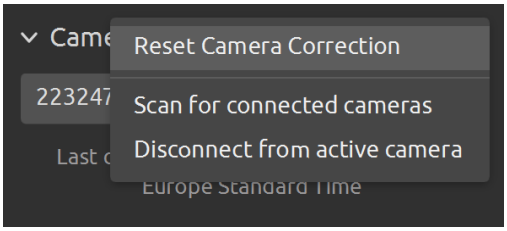
Reading the last correction

The **Cameras** section always shows when the last correction was applied to the camera.



Resetting a correction

In the **Cameras** section, click the three dots, then click **Reset Camera Correction**. It is not necessary to reset a correction before applying a new one.



Hand-Eye Calibration

Zivid Studio can perform the full hand-eye calibration workflow through a graphical interface: capture pose pairs, calibrate, and verify the result. It uses the same calibration as the SDK, so you can calibrate a robot cell without writing code.

This page describes the Studio interface. For other ways to calibrate (Python samples, RoboDK, HALCON, ROS), see Hand Eye Calibration Tools. For the concepts, getting a good dataset, and troubleshooting, see the hand-eye calibration tutorial, and for the API, see Hand-Eye Calibration.

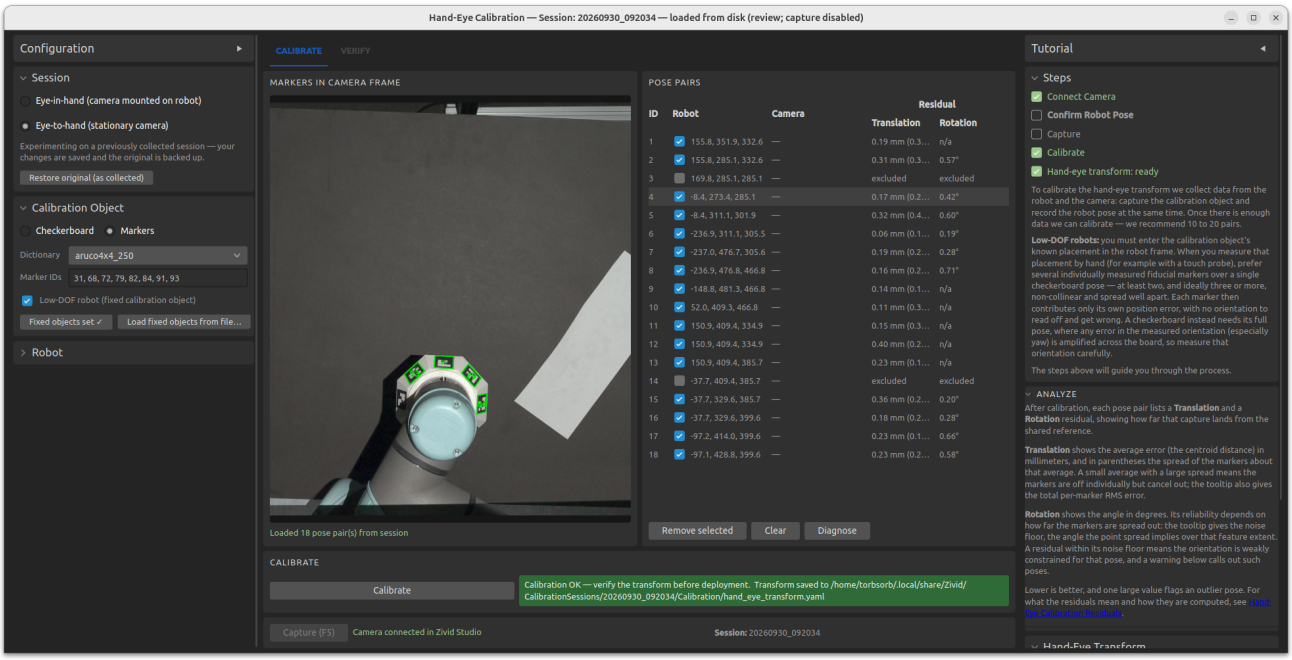
Prerequisites

- Install Zivid Software.
- Enable experimental features in Studio.
- A Zivid calibration board or a set of ArUco markers.
- Optional: a Universal Robots robot reachable over the network, for live robot poses and robot motion.
- Recommended: warm up the camera and run infield correction before you capture pose pairs.

Opening the Hand-Eye Calibration window

Go to **Tools** → **Hand-Eye Calibration...**. The window opens as a standalone window and does not require a connected camera or robot to open. Close Infield Correction and Warmup first, because Hand-Eye Calibration cannot be open at the same time as either (see Using several tools in one session).

The window has a **Configuration** panel on the left, the capture and pose-pair area in the center, and a **Tutorial** panel on the right that guides you through the workflow.



Configuration

Mounting

Select how the camera is mounted:

- **Eye-in-hand**: the camera is mounted on the robot.
- **Eye-to-hand**: the camera is stationary and observes the robot.

Session

The **Session** section shows the current session. Click **Sessions...** to open, create, or switch sessions without leaving the Hand-Eye Calibration window.

Calibration object

Select **Checkerboard** or **Markers**. For markers, choose the ArUco dictionary and enter the marker IDs to use. For the supported calibration objects and ArUco dictionaries, see Calibration Object. The marker IDs field accepts comma-separated integers and inclusive ranges, for example `1, 2, 5-8`. Valid IDs depend on the chosen dictionary: the number in its name is the dictionary size, so the IDs run from 0 to one less than that. For example, `aruco4x4_50` allows 0 to 49, and `aruco7x7_1000` allows 0 to 999.

Low-DOF calibration

For robots with fewer than six degrees of freedom, enable **Low-DOF** and define the fixed placement of the calibration object with **Set fixed objects...**, or load it from a file with **Load fixed objects from file...**. Positions are given in the robot base frame for eye-in-hand, or the end-effector frame for eye-to-hand. See Hand Eye Calibration Low Dof for when this is required and how to measure the fixed placement.

Robot connection

Choose the robot type:

- **None**: enter each robot pose manually and confirm it before capturing.
- **Universal Robots (read-only)**: stream the live robot pose, with no robot motion.
- **Universal Robots (read/write)**: stream the live pose and command the robot (**MoveL**, **MoveJ**, and the touch move used in verification).

For the Universal Robots modes, enter the robot IP or hostname and click **Connect**. For Studio to move the robot, the teach pendant must be in **Remote Control**; in local control, Studio shows a warning and the robot does not move.

Capturing pose pairs

Each capture pairs the current robot pose with the camera's detection of the calibration object. Before you capture, choose capture settings in the **Capture** panel of the main Studio window: a preset, or **Manual** mode. For pose pairs and for verification by projection, only the vision engine and pixel sampling of those settings are used. The Hand-Eye Calibration tool sets the other capture settings itself, so changing exposure, color, or filter settings has no effect on the pose pairs. Verification by stitching and by touch captures with your chosen settings unchanged, so choose the settings your application uses.

- Move the robot to a new pose and make sure the calibration object is visible.
- Confirm the robot pose. When Studio streams the live pose from a Universal Robots robot, this is automatic; otherwise enter the pose and toggle **Confirm**.
- Click **Capture** or press `F5`.

Each successful capture adds a row to the pose-pair table. Studio saves each pose pair, including its point cloud, in the current session, so the pose pairs take up disk space. Capture 10 to 20 poses that span a range of orientations and positions for a well-constrained calibration. For pose coverage and data-quality guidance, see Hand Eye Calibration Getting Good Dataset.

> **Tip**
>
> Uncheck a pose pair in the table to exclude it from the calibration without deleting it, so you can experiment with which poses to use.

To remove a pose pair permanently, click its delete button in the table and confirm. This deletes the pose pair's capture and robot pose files from the session. The delete button is not available when you review a saved session.

Calibrating

Click **Calibrate**. It becomes available once enough pose pairs are selected: at least four for a checkerboard, or six for markers. Studio runs the calibration that matches your configuration (eye-in-hand or eye-to-hand, standard or low-DOF) and shows the resulting transform, the per-pose residuals in the table, and a status banner. Use **Diagnose** for an analysis of the selected poses, including suspected outliers and alternative interpretations, without changing the result.

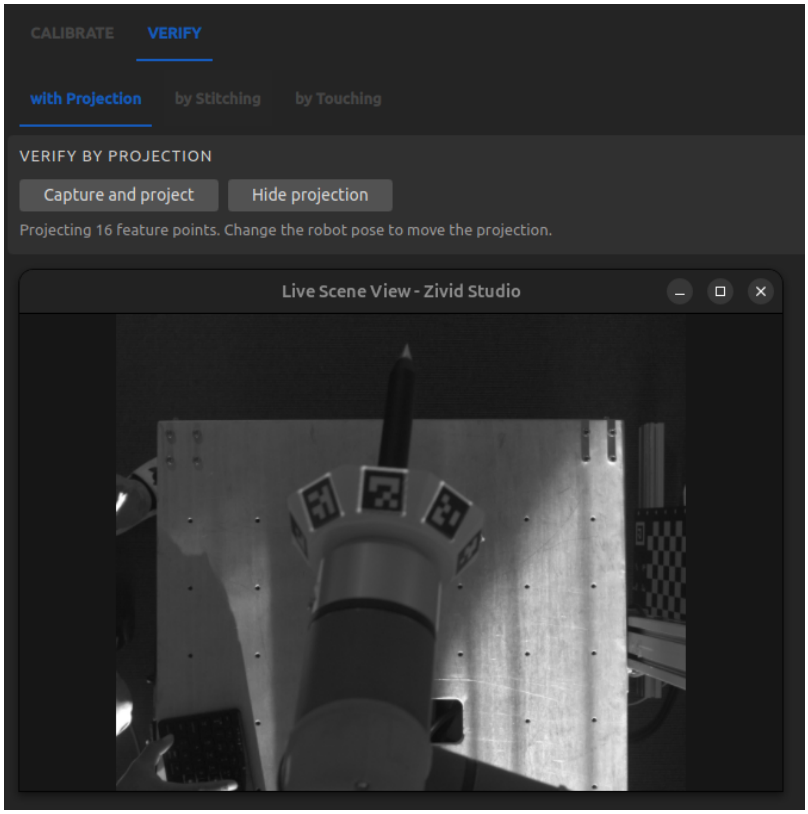
The calibrated transform is saved with the session, in `Calibration/hand_eye_transform.yaml` inside the session folder. This is the file to load in your robot application; the per-pose residuals are in `Calibration/hand_eye_residuals.yaml` next to it.

Verifying the result

The **Verify** tab offers three ways to check a calibration. Verification captures also work on a saved session that you opened for review. For how to choose a verification method and interpret it, see Hand Eye Calibration Verification.

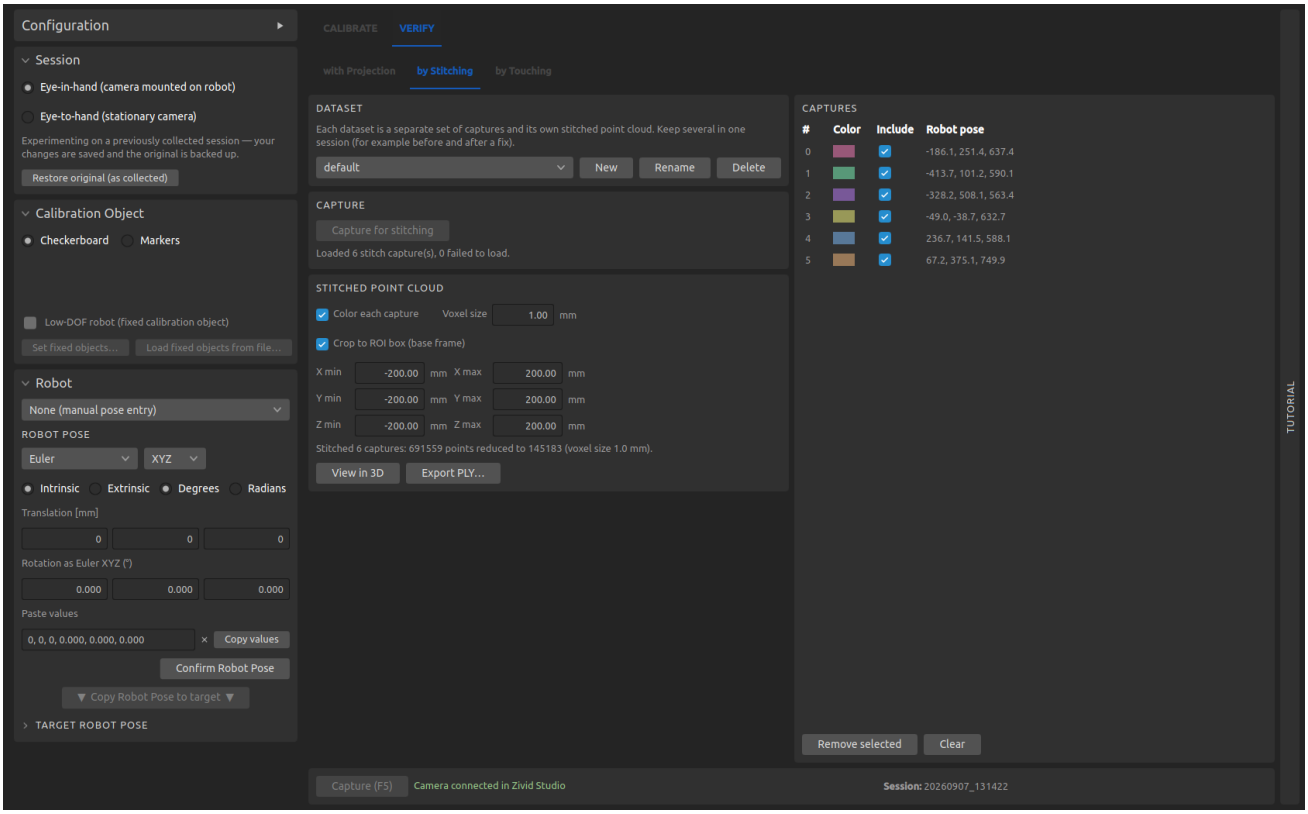
By projection

Projects the detected feature points back into the scene using the calibrated transform, so you can see how well they line up with the physical object. Editing the robot pose re-projects live.



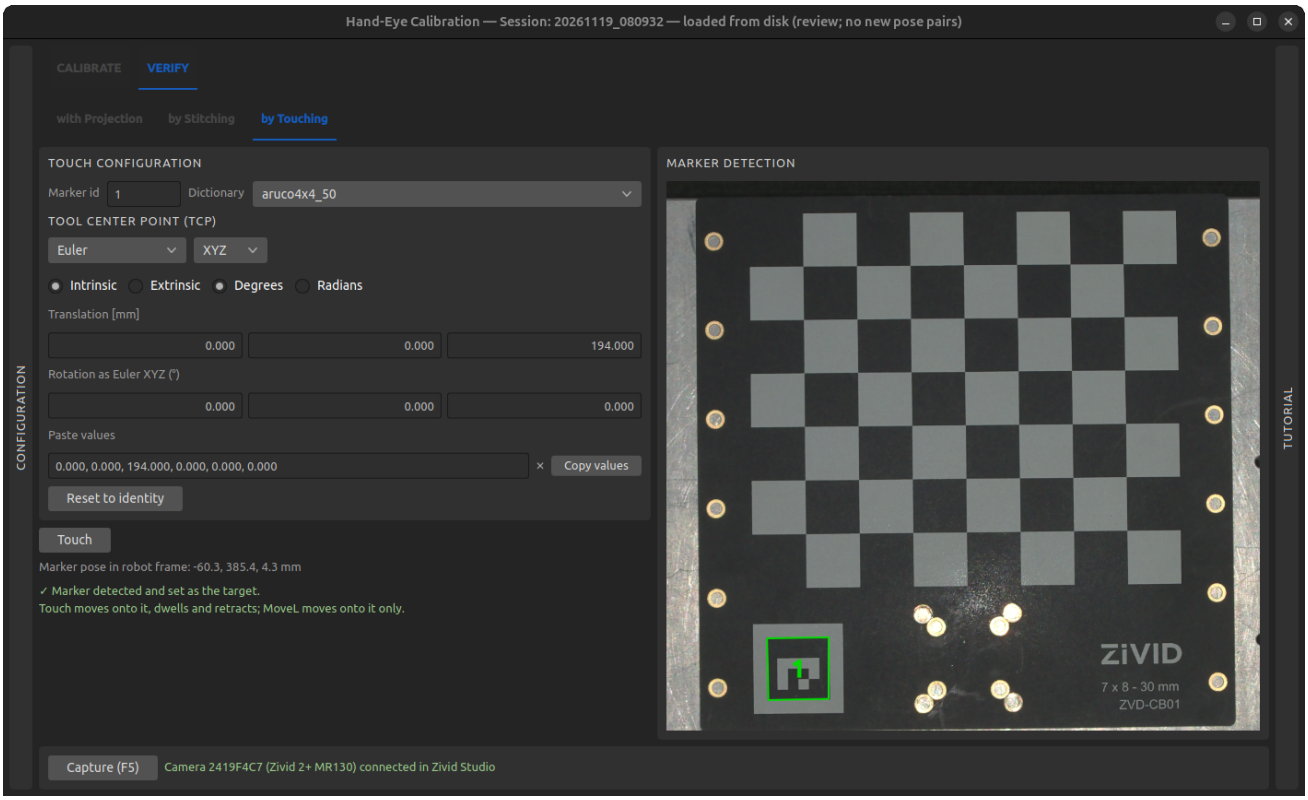
By stitching

Captures from several poses and stitches the point clouds into one using the calibration. Misaligned clouds indicate a poor calibration. A session can hold several named stitch datasets, each with its own captures and settings, and the result can be exported to a PLY file.



By touching

Detects a marker and commands the robot to touch it, so you can confirm the calibration against the physical world. The touch point is defined by a full tool center point (TCP) pose. The touch test needs a pointed verification tool mounted on the robot, so its tip can reach the marker. Zivid provides the Pointed Hand-Eye Verification Tool, with CAD files for 3D printing and its tool center point transform. Before you run the touch test in Studio, read the Introduction and the Pointed Hand-Eye Verification Tool section of the touch test tutorial; the rest of that tutorial is specific to RoboDK. The **Touch** button moves the robot only for Universal Robots in read/write mode. With other robots, Studio still shows the detected marker pose in the robot base frame, and you can move the robot to it from the robot controller. To run the touch test with any RoboDK-supported robot, use the Hand-Eye GUI with RoboDK and follow the touch test tutorial. See also the touch-test section of hand-eye calibration verification.



⚠ Warning

Touching commands a real robot move. Keep the path clear, make sure the target is reachable, and keep the emergency stop within reach.

Next steps

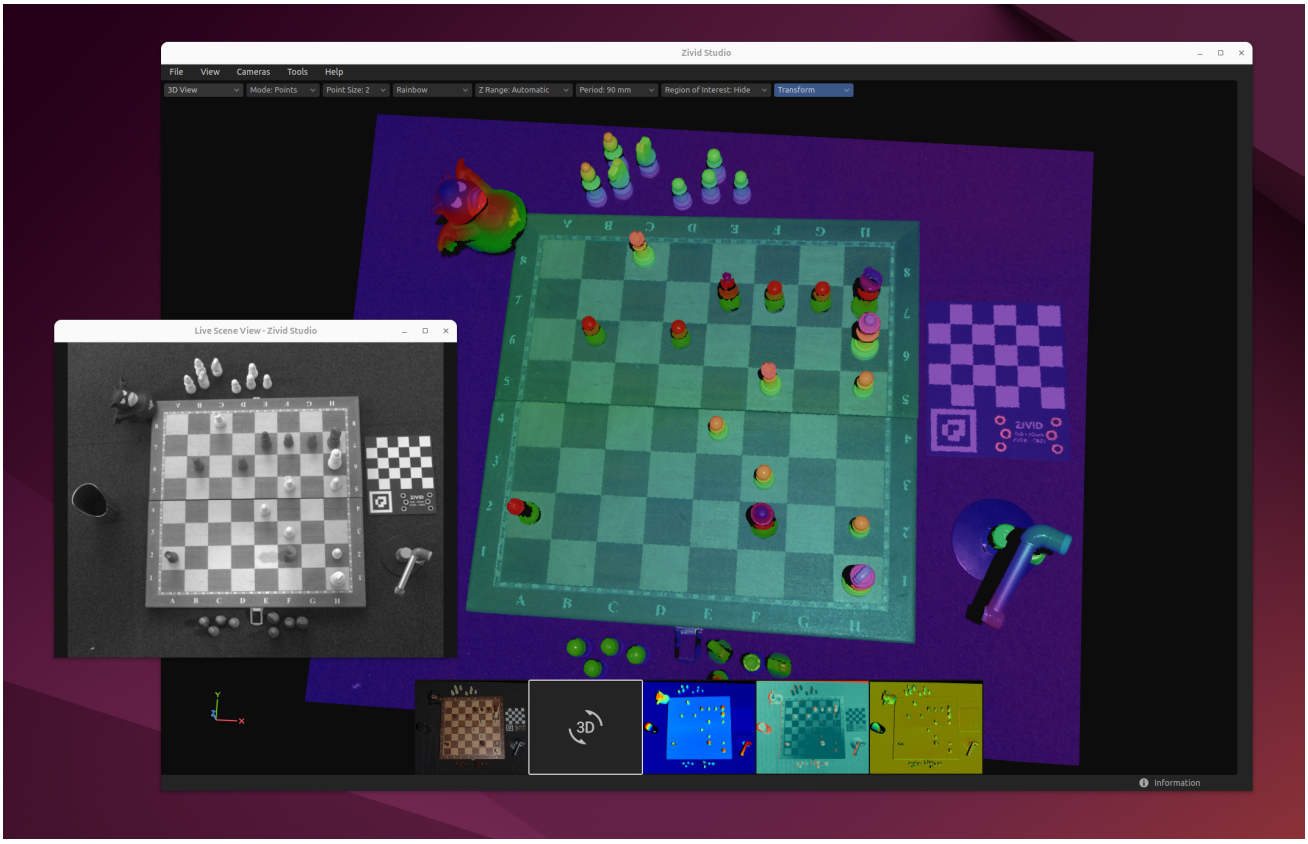
- How To Use The Result Of Hand Eye Calibration to apply the transform in a robot application.
- Hand Eye Calibration Troubleshooting if the residuals are high or the result looks wrong.

Live Scene View

Live Scene View is a continuously updating 2D image of the scene, used to frame the scene and check the view before capturing. It runs in the background without interfering with the foreground capture pipeline, and it always opens in its own window, so it stays visible while you work in Studio.

Opening Live Scene View

Go to **Tools** → **Live Scene View** with a camera connected, or press `Ctrl` + `Shift` + `V`. It opens in its own window and streams a live 2D image, keeping it updated as the scene or the camera moves. Because it is a separate window, it stays visible while you work in the rest of Studio, for example while moving the robot between poses during hand-eye calibration. Close the window to stop the stream.



How it behaves

Live Scene View is a background stream that is deliberately independent of the **Capture** panel:

- It captures only while the camera is otherwise idle and yields to any foreground capture, so it never changes or interrupts what the Capture panel shows. It resumes automatically once the foreground capture finishes.

- It keeps the projector off and uses its own automatic exposure, independent of your capture settings, so the live image stays bright without the projector firing continuously.
- When the camera disconnects, the stream stops and the window shows Camera disconnected until the camera is connected again.

The hand-eye calibration workflow uses Live Scene View to frame the calibration object while moving the robot between poses. See Hand-Eye Calibration.

Sessions

A Zivid Studio session is the shared on-disk workspace for the Hand-Eye Calibration, Warmup, and Infield Correction tools, and the session manager creates and opens them.

Each tool reads and writes the current session, so the captures, calibration result, and verification data for one camera and robot setup stay together. Studio saves a session automatically, so there is no **Save** or **Save As** action.

Prerequisites

- Install Zivid Software.
- Enable experimental features in Studio.

What a session contains

A session is a folder on disk, not a single file. Studio creates each session in the session root folder and names it with a timestamp, for example `20261110_143005`. By default, the root folder is `%LOCALAPPDATA%\Zivid\CalibrationSessions` on Windows and `~/.local/share/Zivid/CalibrationSessions` on Linux. To use another folder, click **Browse...** next to **Root folder** in the session manager. Studio remembers the root folder you last used. A `session.yml` file inside the folder marks it as a session and holds its settings: the mounting (eye-in-hand or eye-to-hand), whether low-DOF is used, the calibration object, the marker configuration, and the default robot-pose rotation format. Studio can also open a session saved by the Hand-Eye GUI with RoboDK, which has a `session_info.json` file instead, and takes the mounting, the calibration object, and the markers from it.

The captured data lives in subfolders of the session:

- **Warmup**: the warmup captures.
- **Infield**: the infield correction data.
- **Calibration**: the hand-eye pose pairs and the resulting transform.
- **Calibration/Verification-Projection**, **Calibration/Verification-Stitching**, and **Calibration/Verification-Touch**: the verification datasets.

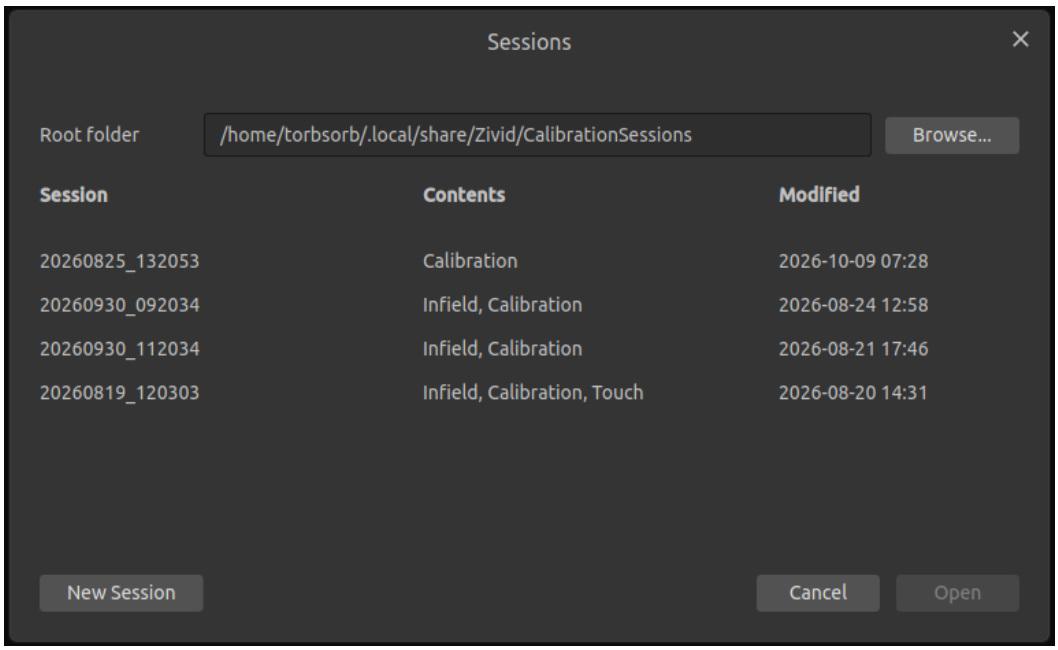
Disk usage

Sessions take up disk space, because Studio saves the captured point clouds in them without asking. With experimental features enabled, Studio saves a full point cloud (ZDF file) for every hand-eye pose pair, every Infield Correction capture, and every stitching verification capture. Warmup saves only a small CSV file with the temperature and trueness readings.

Studio does not delete sessions that contain data (it removes only an empty session when it starts). To free disk space, delete the session folders you no longer need from the root folder shown in the session manager.

Opening the session manager

Go to **Tools** → **Session** → **Sessions...**, or click **Sessions...** in the **Configuration** panel of the Hand-Eye Calibration window. The **Session** submenu also shows the current session name, or **No session open**.



The dialog lists the sessions found in the root folder, newest first. Each row shows the session name, which tools already have data in it, and when it was last modified.

Creating and opening sessions

- Click **New Session** to start an empty session in the current root folder.
- Select a session and click **Open**, or double-click it, to switch to it.
- Click **Browse...** next to **Root folder** to choose the folder that Studio scans for sessions.

Studio reopens your last session on startup. If that session is empty, Studio starts a fresh one instead.

Reviewing a saved session

Opening a session that already contains hand-eye pose pairs loads them for review: you cannot capture new pose pairs or delete existing ones. You can still change the configuration, recalibrate, and run verification captures. Studio saves these changes in the session, and backs up the original files the first time you change anything. To return to the session as it was collected, click **Restore original (as collected)** in the **Configuration** panel. To capture new pose pairs, click **Start new session**.

Using several tools in one session

Hand-Eye Calibration cannot be open at the same time as Infield Correction or Warmup, because they use the same camera and robot. If you open one while the other is open, Studio asks you to close the other first.

Infield Correction changes the camera's correction, so a hand-eye calibration made before it no longer matches the camera. If the session already holds hand-eye pose pairs, opening Infield Correction offers to start a new session, so each hand-eye calibration stays with the correction it was made with. To use one session for all three tools, run Warmup and Infield Correction before you capture hand-eye pose pairs.

Next steps

- Warmup to warm the camera, storing the captures in the session.
- Infield Correction to verify and correct dimension trueness, storing the data in the session.
- Hand-Eye Calibration to capture pose pairs and calibrate within a session.

Depth Profile

Depth Profile is a Zivid Studio tool that plots the point cloud Z values along a line between two points, giving a cross-section of the surface along that line. You pick the points in any 2D view, not in the 3D View. The graph header shows the depth difference, which is the highest minus the lowest Z value along the line. Use it to check small height differences that are hard to judge in the 3D View, such as the depth of a hole, the height of a step, or the profile of a weld seam or a gasket.

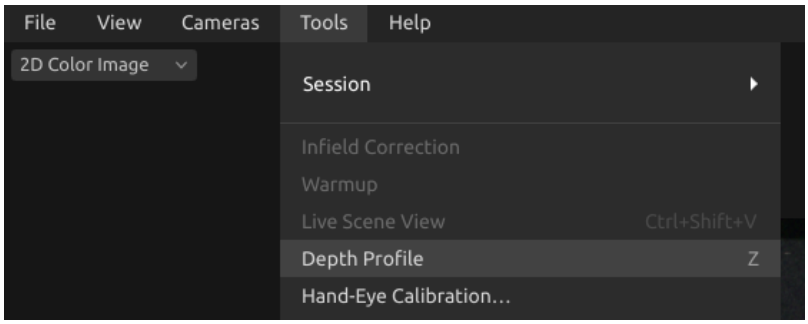
Note

Depth Profile is only available in Zivid Studio. The Zivid SDK API has no equivalent function.

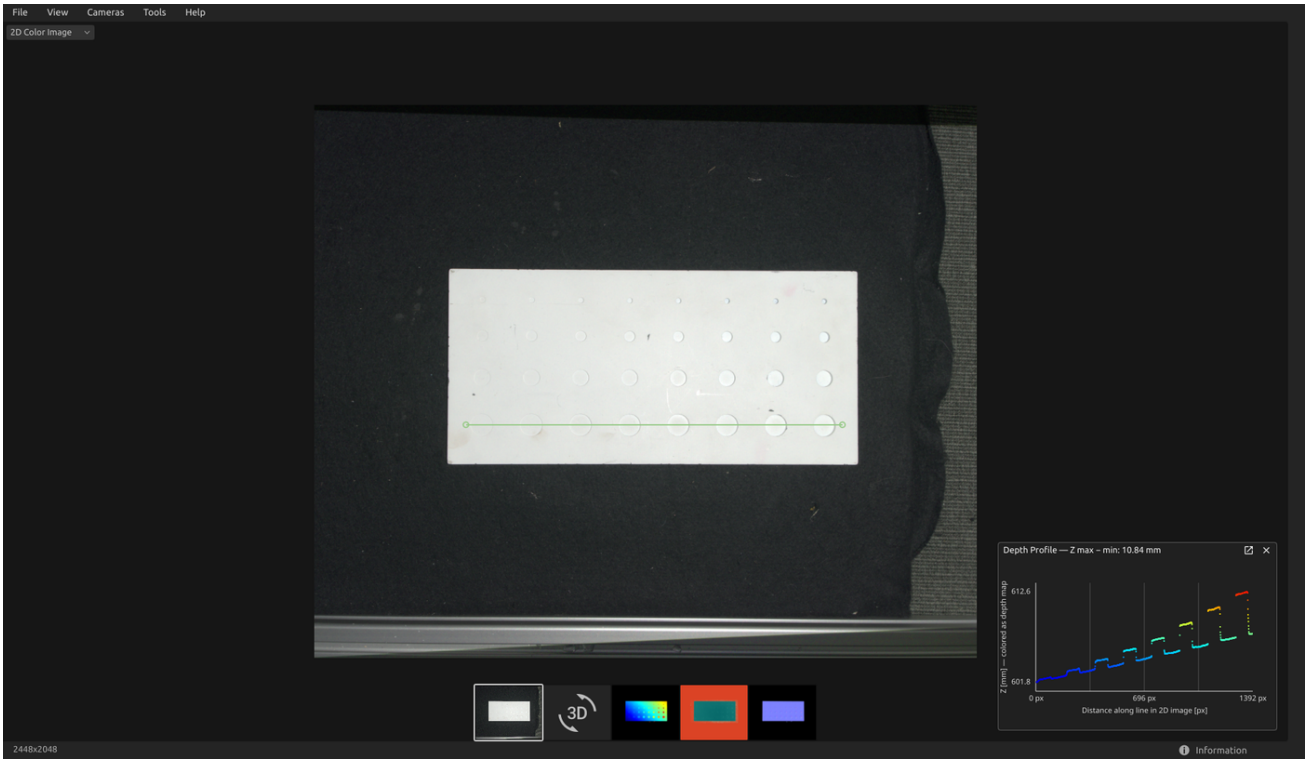
Picking the profile line

To pick the line for a depth profile:

- Capture a point cloud or open a ZDF file.
- Click **Tools** → **Depth Profile**, or press `Z`. While you pick, the menu item reads **Cancel Depth Profile**.



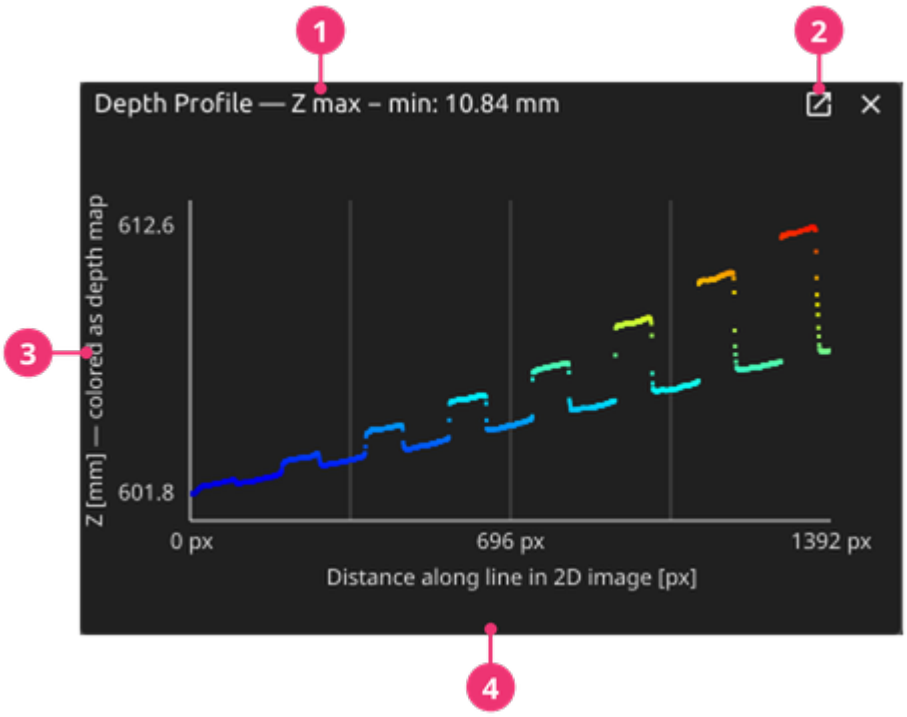
- Click the start and the end point of the line.



To adjust the depth profile:

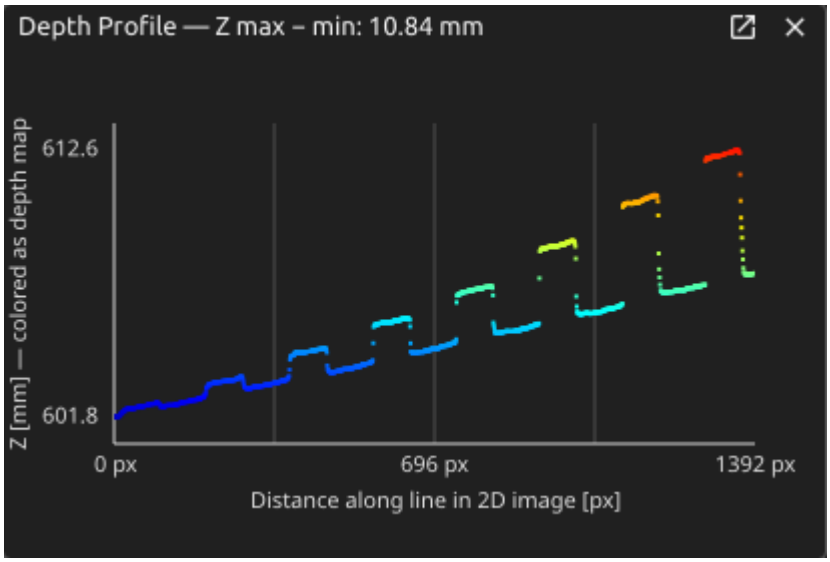
- Drag either endpoint of the line to move it. The depth profile updates while you drag.
- Press `Z` again and pick two new points to measure along a new line.
- Capture again or change the transform to update the depth profile for the same line.

Reading the profile graph



- The graph header shows **Z max – min**, the depth difference along the line, which is the maximum Z value minus the minimum Z value.
- The detach button opens the graph in a separate, resizable **Depth Profile** window, where small details are easier to see. Click it again to move the graph back into the main window, or close the window to remove the depth profile. In the main window, the × button next to it removes the depth profile.
- The vertical axis is the Z value of each point along the line. Only the minimum and maximum Z values are labeled. Each point has the color of its Z value in the Depth view. Points outside the Z range of the Depth view are not drawn, but they still count in the depth difference.
- The horizontal axis is the distance along the line in the 2D image, in pixels.

Points without valid data are left out of the graph. A line that crosses missing data, for example in the shadow next to an object edge, shows a gap instead of a slope that was never measured.

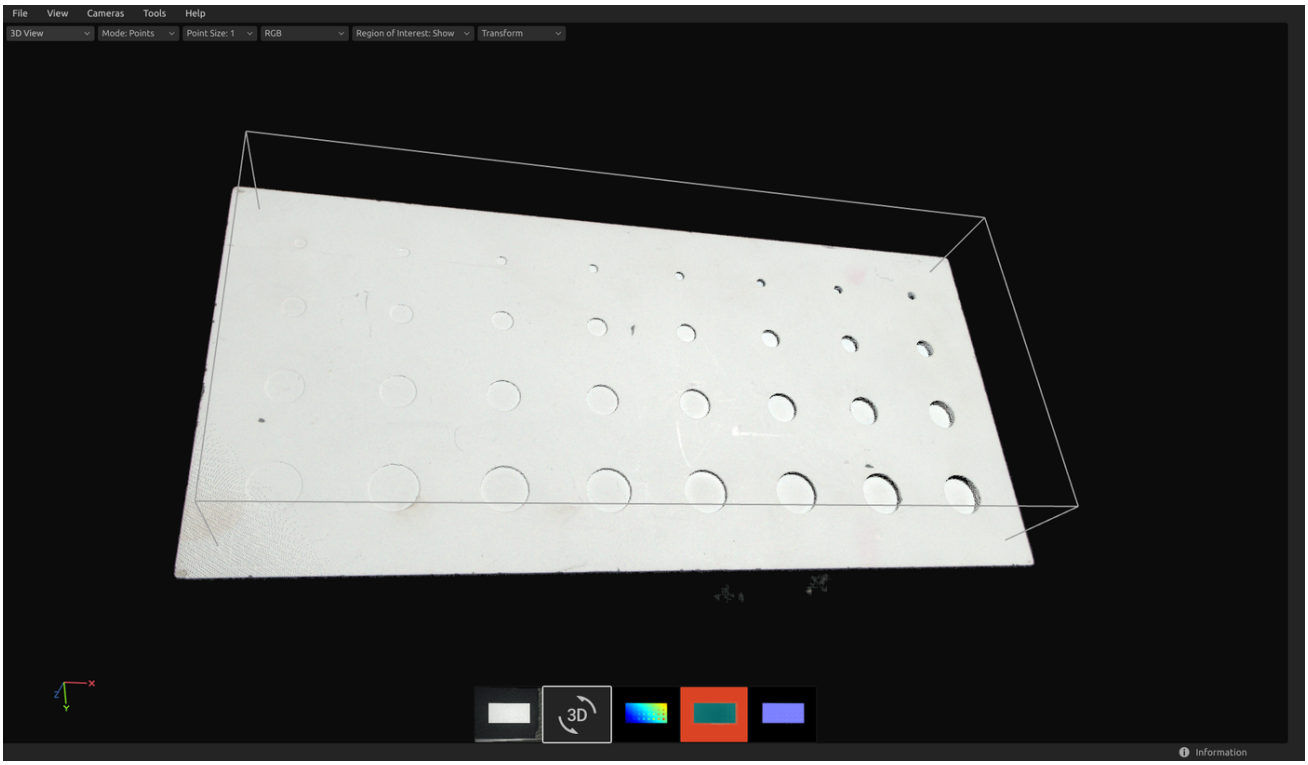


In this example, the line crosses a row of holes in a plate that is tilted slightly relative to the camera. The Z values rise from about 602 mm to 613 mm along the line, so the depth difference of 10.84 mm mixes the tilt with the depth of the holes. Measuring heights above a surface shows how to measure the holes relative to the plate instead.

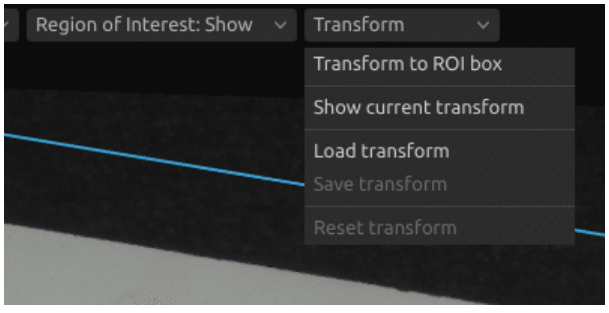
Measuring heights above a surface

Without a transform, Z values are distances from the camera. To measure heights relative to a surface, such as the depth of a hole below a plate, transform the point cloud to that surface with the Region of Interest box:

- Place the Region of Interest box so that `PointO`, `PointA` and `PointB` are on the surface.

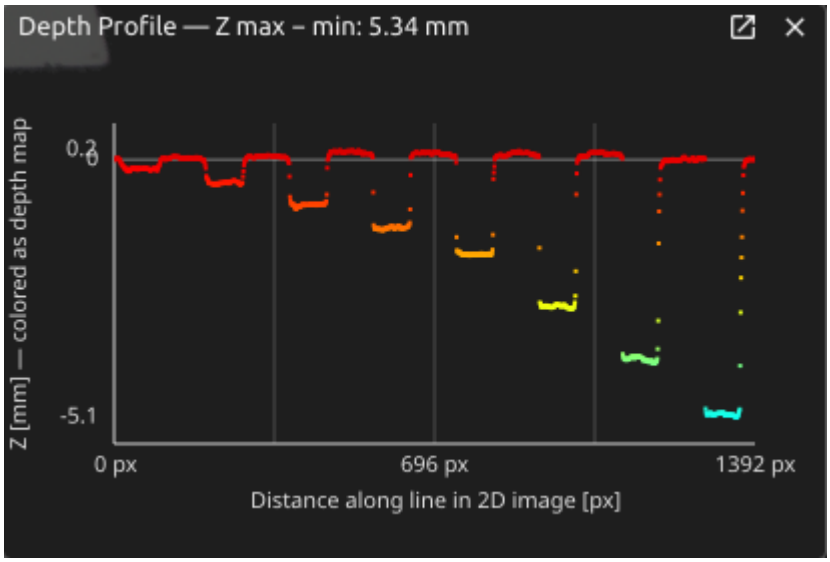


- Click **Transform** → **Transform to ROI box**. This needs a connected camera with the Region of Interest box enabled in its settings.



If you only have a ZDF file and no camera, click **Transform** → **Load transform** instead and load a transformation matrix that you computed for the surface.

With this transform, Z values are heights above the surface, and points below the surface have negative Z values. The depth profile updates for the same line.



In this example, the plate is now flat at Z = 0, and each hole shows as a dip below the plate. The holes get deeper along the row, and the depth difference of 5.34 mm is the depth of the deepest hole.

Tip

The depth difference comes from single points, so if one is noisy, it can change the depth value. For a more robust measurement, average the Z values over each surface, for example the bottom of the hole and the plate around it, and take the difference. Depth Profile can't do this, but you can do it in your own code with the Zivid SDK.

4.5. Help

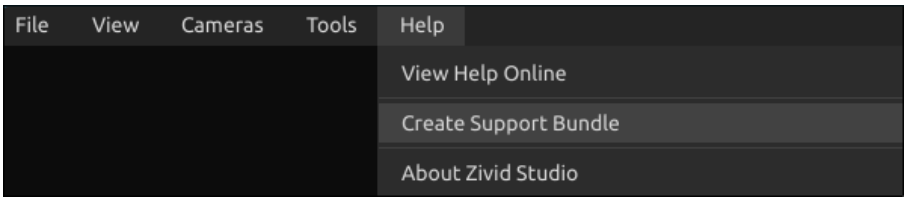
View Help Online

To open the Zivid Knowledge Base in your browser, click **Help** → **View Help Online**.

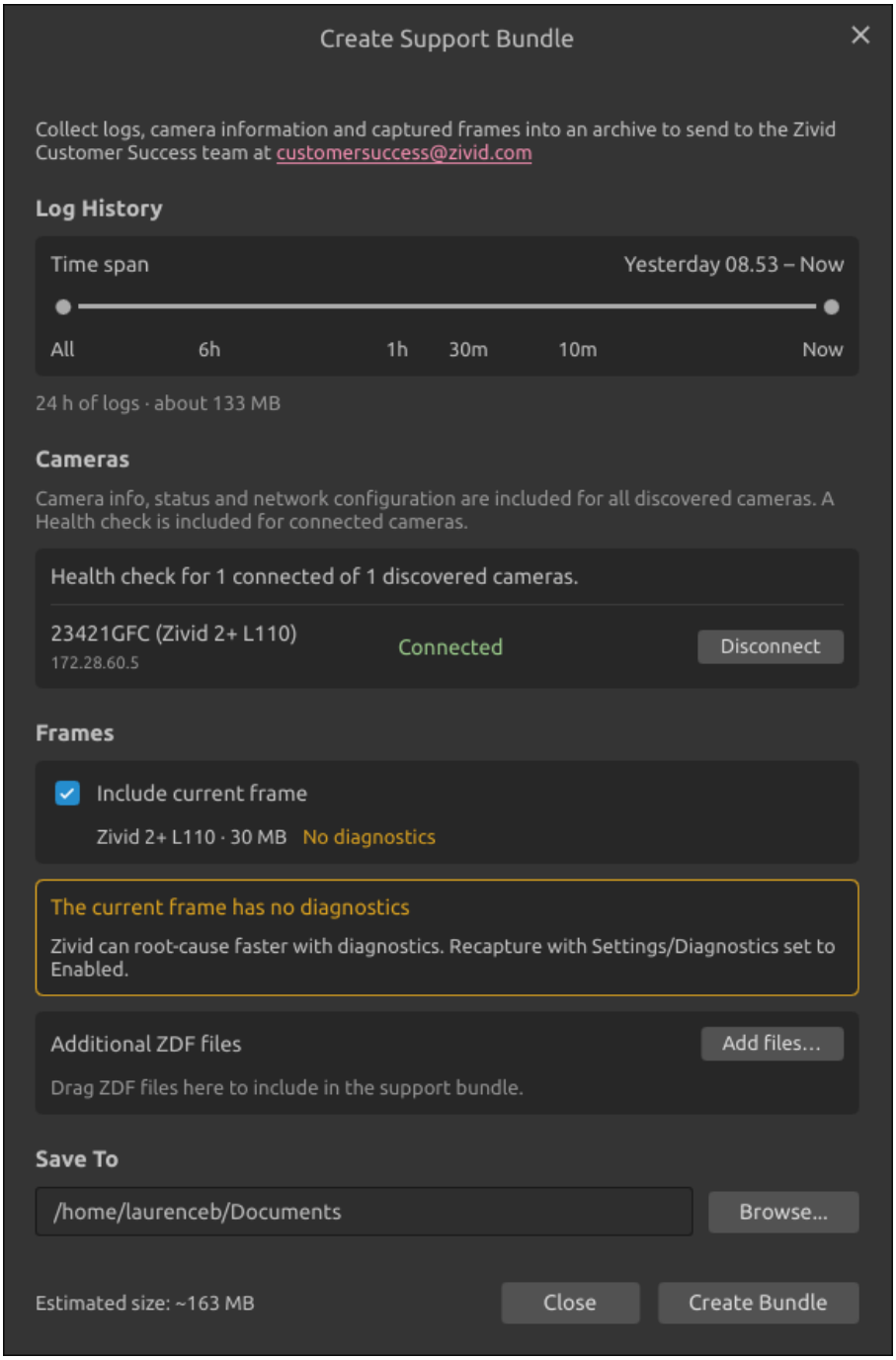
Create Support Bundle

Collect SDK logs, frames, and camera information into a single archive to share with Zivid customer support.

In Zivid Studio, click **Help** → **Create Support Bundle**.



The **Create Support Bundle** dialog opens:



- In **Log History**, move the slider to select how much of the log history to include. Include the time when the problem occurred.

- In **Cameras**, click **Connect** for each camera that you want a health check for.
- In **Frames**, select **Include current frame** to include the frame that shows the problem. To include frames that you saved earlier, click **Add files...** or drag ZDF files into the dialog.
- In **Save To**, select the folder where you want to save the bundle.
- Click **Create Bundle**.

If the frame has no diagnostics data, the dialog shows a warning. With diagnostics data, Zivid customer support can find the cause of the problem faster. To get diagnostics data, capture again with Diagnostics enabled.

For more information, see Support Bundle.

About Zivid Studio

To view detailed information about Zivid, third-party software licenses, and system info, click **Help** → **About Zivid Studio**.

4.6. Dropdown Menus

File	Shortcut	Function
Open	`Ctrl` + `O`	Load a point cloud from a ZDF file, or a file camera from a ZFC file.
Save	`Ctrl` + `S`	Save a point cloud, color image, and depth image data to a ZDF file, the native Zivid file format.
Export	`Ctrl` + `E`	Export a point cloud data to a file in unordered or ordered Polygon (PLY), ASCII (XYZ), or Point Cloud Data (PCD) file format.
Save 2D Image	N/A	Save a color image to a file in PNG, BMP, or JPG file format.
Save Depth Map	N/A	Save a colored depth map to a file in PNG file format.
Save SNR Map	N/A	Save a colored SNR map to a file in PNG file format.
Save Normal Map	N/A	Save a colored normal map to a file in PNG file format.
Import Capture Settings	`Ctrl` + `Shift` + `I`	Load saved capture settings from a file in YML into Zivid Studio.
Export 2D + 3D Capture Settings	`Ctrl` + `Shift` + `E`	Save current capture settings from Zivid Studio into a file in YML.
Preferences	N/A	Open the Preferences menu to configure Zivid Studio settings.
Exit	`Alt` + `F4`	Exit Zivid Studio.

View	Shortcut	Function
2D Color Image Histogram	`H`	Open the Histogram, a tool for analyzing pixel intensity distribution on an image.
Information	`Shift` + `I`	Open the Information panel to display capture information such as camera model, acquisition time, capture time and settings used. Provides ability to apply or save settings from previous captured point cloud.
3D Axis Indicator	`Ctrl` + `Shift` + `A`	Show or hide the 3D axis indicator in the 3D view.
Show 4x4 Aruco Markers	`Ctrl` + `M`	Highlight 4x4 Aruco markers in the point cloud.
Show barcodes	N/A	Highlight barcodes detected and decoded in the 2D image.
Configure barcodes to read	N/A	Select specific types of linear and matrix barcodes to detect and decode.
Reset 3D view when opening files	N/A	Enable/disable 3D view reset when opening files.
Reset View	`Backspace`	Reset the point cloud, color image, and depth image view back to the default view.
Reset UI Layout	N/A	Reset the layout of the Zivid Studio window.
Enter/Exit Full Screen Mode	`F11`	Toggle between full and regular screen mode.

Cameras	Shortcut	Function
All Cameras	`Ctrl` + `Shift` + `C`	Open the Cameras menu to list and configure all discovered cameras. Each connected camera row has a **Check** button that runs a health check on that camera.

Tools	Function
Infield Correction	Open Infield Correction, a maintenance tool to verify and correct the camera's dimension trueness.
Warmup	Open Warmup, which warms the camera to a stable temperature and tracks the progress.
Live Scene View	Open Live Scene View, a continuously updating 2D image to frame the scene before capturing.
Hand-Eye Calibration…	Open Hand-Eye Calibration, which runs the full calibrate-and-verify workflow.
Session → Sessions…	Open Sessions, the session manager for the shared on-disk workspace of the calibration tools.
Depth Profile	Open Depth Profile, a tool that plots Z values along a line between two points to measure height differences.

Help	Function
View Help Online	URL to the Zivid Knowledge Base.
Create Support Bundle	Collect SDK logs, frames, and camera information into a Support Bundle to share with Zivid customer support.
About Zivid Studio	Detailed information about Zivid, third-party software licenses and system info.

5. Quick Reference Index

This page lists every menu option, keyboard shortcut, and control panel setting in Zivid Studio, grouped by menu and panel.

5.1. Toolbar Menus

File	Shortcut	Function
Open	`Ctrl` + `O`	Load a point cloud from a ZDF file, or a file camera from a ZFC file.
Save	`Ctrl` + `S`	Save a point cloud, color image, and depth image data to a ZDF file, the native Zivid file format.
Export	`Ctrl` + `E`	Export a point cloud data to a file in unordered or ordered Polygon (PLY), ASCII (XYZ), or Point Cloud Data (PCD) file format.
Save 2D Image	N/A	Save a color image to a file in PNG, BMP, or JPG file format.
Save Depth Map	N/A	Save a colored depth map to a file in PNG file format.
Save SNR Map	N/A	Save a colored SNR map to a file in PNG file format.
Save Normal Map	N/A	Save a colored normal map to a file in PNG file format.
Import Capture Settings	`Ctrl` + `Shift` + `I`	Load saved capture settings from a file in YML into Zivid Studio.
Export 2D + 3D Capture Settings	`Ctrl` + `Shift` + `E`	Save current capture settings from Zivid Studio into a file in YML.
Preferences	N/A	Open the Preferences menu to configure Zivid Studio settings.
Exit	`Alt` + `F4`	Exit Zivid Studio.

View	Shortcut	Function
2D Color Image Histogram	`H`	Open the Histogram, a tool for analyzing pixel intensity distribution on an image.
Information	`Shift` + `I`	Open the Information panel to display capture information such as camera model, acquisition time, capture time and settings used. Provides ability to apply or save settings from previous captured point cloud.
3D Axis Indicator	`Ctrl` + `Shift` + `A`	Show or hide the 3D axis indicator in the 3D view.
Show 4x4 Aruco Markers	`Ctrl` + `M`	Highlight 4x4 Aruco markers in the point cloud.
Show barcodes	N/A	Highlight barcodes detected and decoded in the 2D image.
Configure barcodes to read	N/A	Select specific types of linear and matrix barcodes to detect and decode.
Reset 3D view when opening files	N/A	Enable/disable 3D view reset when opening files.
Reset View	`Backspace`	Reset the point cloud, color image, and depth image view back to the default view.
Reset UI Layout	N/A	Reset the layout of the Zivid Studio window.
Enter/Exit Full Screen Mode	`F11`	Toggle between full and regular screen mode.

Cameras	Shortcut	Function
All Cameras	`Ctrl` + `Shift` + `C`	Open the Cameras menu to list and configure all discovered cameras. Each connected camera row has a **Check** button that runs a health check on that camera.

Tools	Function
Infield Correction	Open Infield Correction, a maintenance tool to verify and correct the camera’s dimension trueness.
Warmup	Open Warmup, which warms the camera to a stable temperature and tracks the progress.
Live Scene View	Open Live Scene View, a continuously updating 2D image to frame the scene before capturing.
Hand-Eye Calibration…	Open Hand-Eye Calibration, which runs the full calibrate-and-verify workflow.
Session → Sessions…	Open Sessions, the session manager for the shared on-disk workspace of the calibration tools.
Depth Profile	Open Depth Profile, a tool that plots Z values along a line between two points to measure height differences.

Help	Function
View Help Online	URL to the Zivid Knowledge Base.
Create Support Bundle	Collect SDK logs, frames, and camera information into a Support Bundle to share with Zivid customer support.
About Zivid Studio	Detailed information about Zivid, third-party software licenses and system info.

5.2. Keyboard Shortcuts

Function	Shortcut
Navigate to 2D Color Image	`1`
Navigate to 3D View	`2`
Navigate to Depth Map	`3`
Navigate to SNR Map	`4`
Navigate to Normal Map	`5`
Enable/disable Monochrome (Green) point cloud color	`C`
Enable/disable Depth Map point cloud color	`D`
Enable/disable Rainbow point cloud color	`R`
Enable/disable SNR point cloud color	`S`
Enable/disable Normal Map point cloud color	`N`
Enable/disable Mesh in point cloud	`M`
Start Depth Profile	`Z`
Increase point size	`Ctrl` + `Alt` + `+`
Decrease point size	`Ctrl` + `Alt` + `-`

5.3. Control Panel Options

Cameras	Function
Reset camera correction	Remove the infield correction saved on the connected camera. Available when the active camera has a saved correction.
List all cameras	Open the Cameras menu and list all cameras.
Scan for connected cameras	Show all cameras plugged into the PC and list them by model and serial number.
Use captured frame as file camera	Create a file camera from the 3D frame currently displayed in the viewer. The frame must have been captured with diagnostics enabled. See File Camera.
Open ZDF file as file camera	Open a file dialog to select a ZDF file and load it as a file camera. The file must have been captured with diagnostics enabled. See File Camera.
Configure this camera	Configure the IP, subnet mask and mode of the active camera.
Disconnect from active camera	Disconnect from the active camera.

Capture	Shortcut	Function
Measure scene lighting conditions	N/A	Measure the ambient light frequency.
Reset to file camera settings	N/A	Restore all settings to the values stored in the active file camera. Only available when a file camera is connected.
Reset all settings to default	N/A	Reset all settings to default values.
2D	`Shift` + `1`	Switch to 2D capture mode.
2D+3D	`Shift` + `2`	Switch to 2D+3D capture mode.
3D	`Shift` + `3`	Switch to 3D capture mode.
Assisted / Manual Mode	`Shift` + `M`	Switch between Assisted and Manual Mode.
Please select a preset...	N/A	Opens a list of predefined settings.
Ambient Light Adaptation	N/A	Specify if and to what ambient light frequency the assisted capture is to adapt.
Capture	`F5`	Trigger a single capture with the specified settings.
Live	`Shift` + `F5`	Trigger a continuous capture that allows viewing the scene in real-time.
Stop (Live)	`Esc`	Stops the continuous capture that allows viewing the scene in real-time.
Expand all acquisitions	N/A	Expand the settings on all acquisitions.
Collapse all acquisitions	N/A	Collapse the settings on all acquisitions.
Reset to default	N/A	Reset the control panel to the default state.

5.4. Settings

Setting	Function
Engine	Choose between different pattern projections.
Reset to default	Reset the Engine to the default value.

Setting	Function
Sampling Color	Choose how to sample colors for the 2D image.
Sampling Pixel (2D) / Pixel (3D)	Choose the subsampling factor to downscale 2D image or point cloud.
Reset to default	Reset the Sampling to the default value.

Setting	Function
Exposure Time (2D) / Exposure Time (3D)	The duration a single camera image is exposed to light.
Aperture (2D) / Aperture (3D)	The opening that controls the amount of light to the camera sensor through the lens.
Brightness (2D) / Brightness (3D)	The output power (the amount of light) emitted by the LED projector.
Gain (2D) / Gain (3D)	The amplification of the signal from the camera sensor.
Checkbox	Enable/disable the selected acquisition.
Clone acquisition	Add a new frame resembling the setting of the selected acquisition.
Delete acquisition	Delete the selected acquisition.
Add acquisition	Add a new frame resembling the setting of the last acquisition.
Reset to default	Reset the selected acquisition settings to default values.

Setting	Function
Box	Create and configure a box in 3D and remove the points outside the box.
Depth	Remove points outside a user-defined depth range.
Reset to default	Reset the Region of Interest to the default values.

Setting	Function
Diagnostics	Collect extra diagnostic data from a capture that can be saved in the ZDF file. Required to enable re-processing.

Setting	Function
Re-processing	Reprocess a capture with different processing settings without re-capturing. Requires diagnostics to be enabled during capture.

Setting	Function
Cluster Filter	Remove floating points and isolated clusters from the point cloud.
Hole Repair	Fill in removed points by interpolating remaining surrounding points.
Noise Filter	Remove or correct points where the projected pattern signal-to-noise-ratio is low.
Outlier Filter	Remove points if the distance to their neighboring pixels within the small local region is larger than the threshold specified in mm.
Reflection Filter	Remove points impacted by reflections and thus erroneous.
Gaussian Smoothing	Perform Gaussian smoothing on the point cloud.
Contrast Distortion	Correct or remove points affected by blurring in the camera lens, or both.
Reset to default	Reset the filters to the default state.

Color	Function
Blue color balance	The color temperature of ambient light affects the appearance of the color image. Setting white balance by adjusting blue color balance makes the color image look natural. The blue color balance parameter ranges between 1.0 and 8.0.
Green color balance	The color temperature of ambient light affects the appearance of the color image. Setting white balance by adjusting green color balance makes the color image look natural. The green color balance parameter ranges between 1.0 and 8.0.
Red color balance	The color temperature of ambient light affects the appearance of the color image. Setting white balance by adjusting red color balance makes the color image look natural. The red color balance parameter ranges between 1.0 and 8.0.
Gamma	The output color image can appear too dark. Adjust the brightness of the image.
Color Mode	Control how the color image is computed. The options are Automatic and ToneMapping.
Highlight Suppression	Remove bright spots that the projector causes in the color image.
Reset to default	Resets blue, green, and red color balance to default values.

Setting	Function
Resampling Mode	Upsample or downsample the point cloud based on the selected resampling mode.
Reset to default	Reset the Resampling to the default value.

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. 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 3, 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:

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