

Zivid

Defining the future of 3D machine vision

zivid.com



Agenda

Zivid Workshop



Zivid Company Introduction (30min)

A few stories to associate Zivid with...



Zivid Technical Introduction (1h)

Tehcnology Primer - How does Zivid 3D camera work

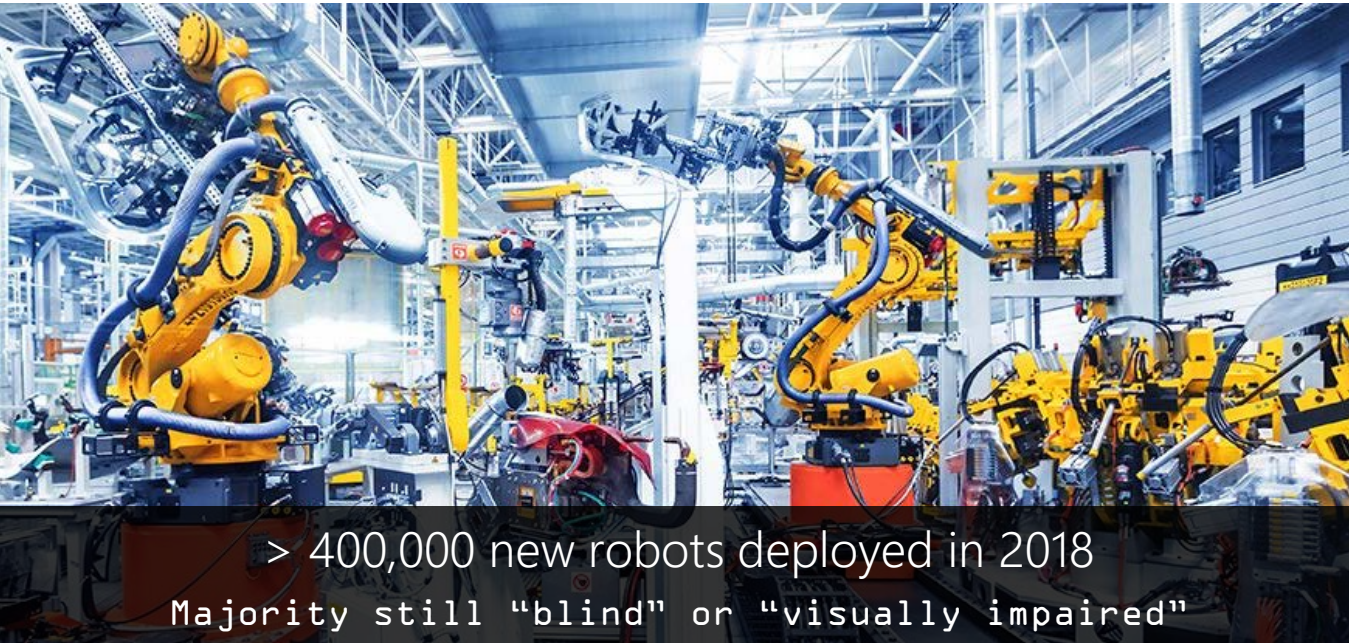


Zivid Imaging Primer (3h)

How to capture good 3D images with Zivid camera, including hands-on workshop.



Industry 4.0 robotics

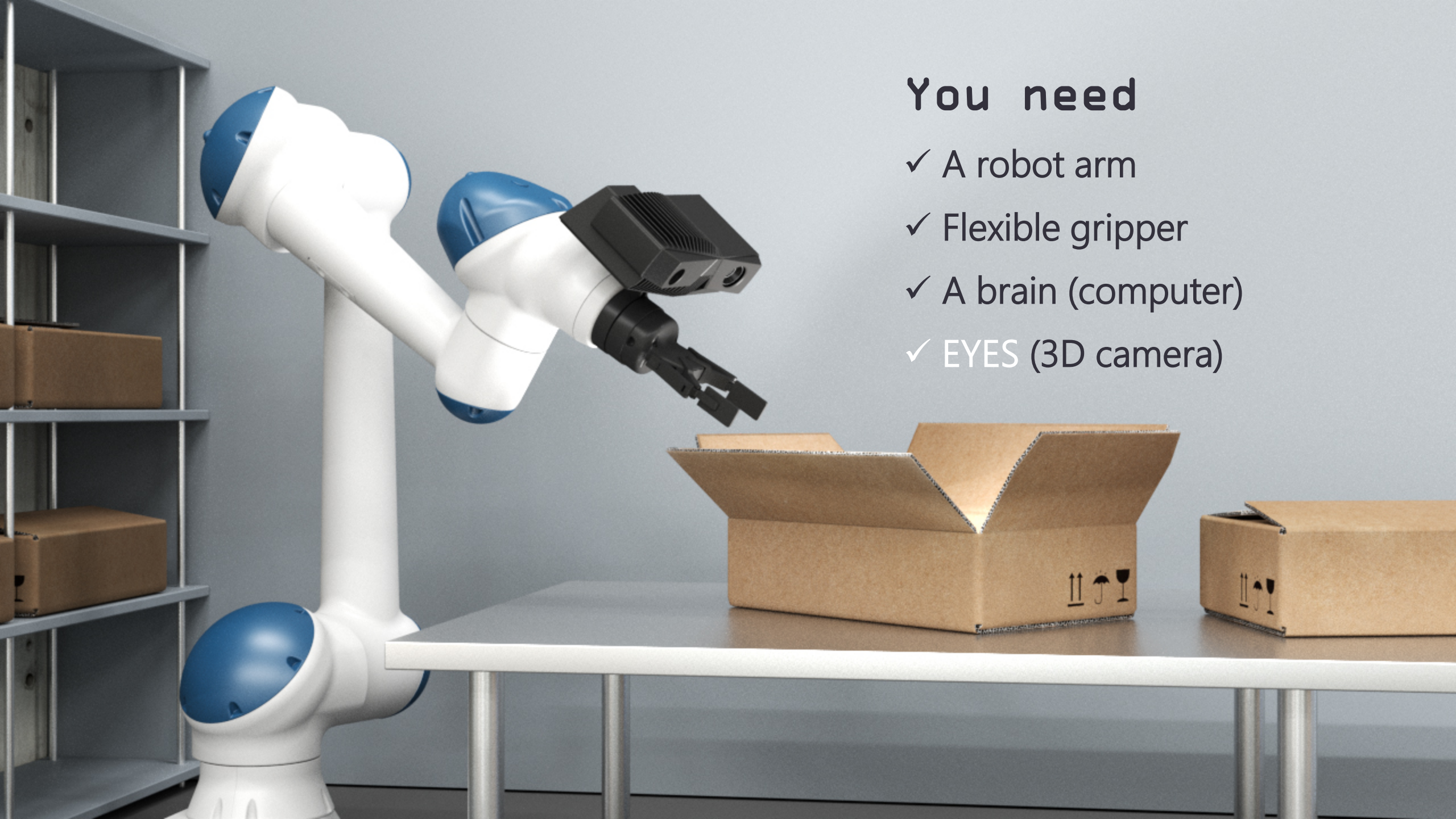


Advancements in machine vision to drive productivity and growth

Speed, precision and reliability for existing applications

Enabling new applications

Ease of deployment and flexibility



You need

- ✓ A robot arm
- ✓ Flexible gripper
- ✓ A brain (computer)
- ✓ EYES (3D camera)





Zivid designs **the world's most accurate real-time 3D color cameras**



ZiVID

Founded in 2015.
Headquarters in Oslo, Norway.
40+ employees.

Capital Structure

Privately funded. Investors and employees

*Photo:
Zivid HQ in historic factory building from 1845
Industry 1 meets Industry 4*

3D Vision Experts

Focused on 3D color vision for industrial automation, robotics, warehousing and smart factories

In-house optics, 3D hardware and 3D software expertise

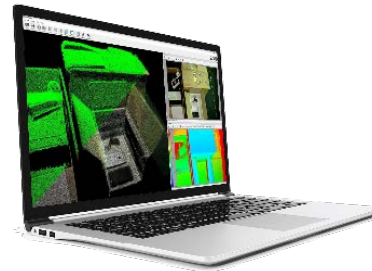
15 years of R&D

The Zivid One+ solution



Zivid One+

3D camera line-up
S / M / L models



Zivid Studio

Application for point cloud capture, visualization and exploration.



Zivid SDK

The essential tool suite for machine vision software development

Zivid One+

Time coded structured light

3D camera



See accurately

Z0+ Small: 25 μ m point precision

Z0+ Medium: 60 μ m point precision

Z0+ Large: 225 μ m point precision

Up to 13 FPS burst

Down to 80 ms acquisition time

See everything

2.3 Megapixels

1920 x 1200 resolution

Native 3D RGB

HDR - Extended dynamic range

Multi-frame 3D HDR merge



Zivid One+

3D camera line-up



Model	S	M	L
Max distance	1.0 m	2.0 m	3.0 m
Optimal working distance	0.3 to 0.8 m	0.6 to 1.6 m	1.2 to 2.6 m
Key applications	Tiny to small objects Trays and boxes	Small to medium objects Totes and bins	Medium to large objects Standard EU/US pallets

3DIQ – Imaging Quality in 3D

True-to-life Accuracy

See shapes and details with 0.1 mm Depth Resolution
Absolute Accuracy in the whole scene.

Data on Any Material

Works on Shiny / Reflective /
Translucent / Dark + Absorbing (*)

Minimizing False Data

Smart Patterns and Filters eliminates noise and
false data due to reflections and scattering

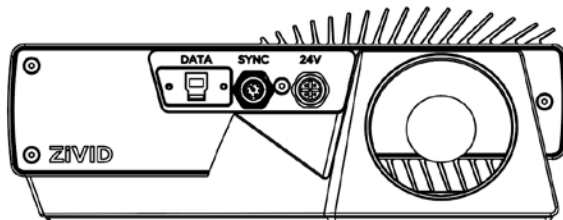
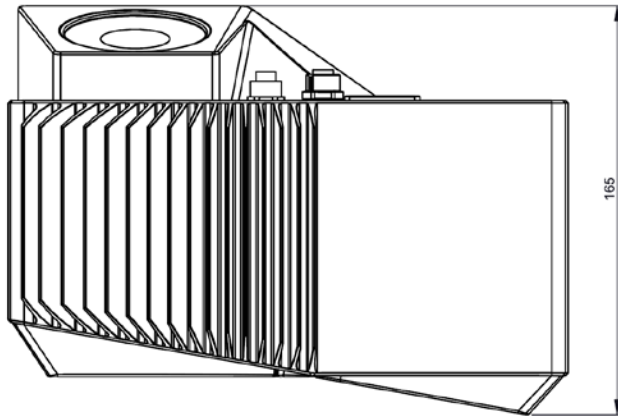
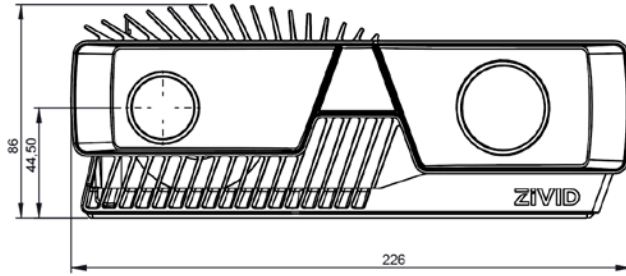
Pixel Level Accuracy

No need for analyzing spatial neighborhood.
Eliminates block averaging.

(*) Exceptions: Transparent/Glass/Mirror like



Industry Ready



Calibration

Pre-calibrated. Ready to use

Rugged

Aluminum Body

IP65 Housing

Dust Tight
Water Protected

EMC / Safety

CE
FCC Class A
IEC62471 Risk 2. White light, no laser.

Vibration

5G Sinus
25G Shock

Mounting Options

Dynamic / Robot
Static

Weight

2 kg
Minimal robot payload reduction

White light 3D

Inherently safe for collaborative use

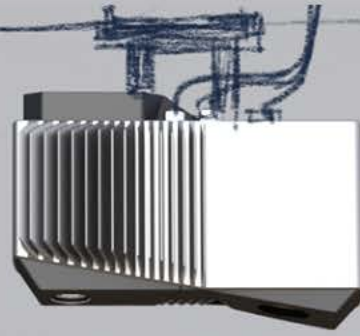
- Non laser based visible white light source
- Eye safe and less annoying
- No dangerous direct reflections from shiny objects (e.g. in machine tending)

Usability - "The best of both worlds"

- White light has native color and broad material coverage
- Functional diversity and repurpose - "One camera fits all"
- Robot mounting to get closer, avoiding the inherent drawbacks of white light vs. mono/laser with regards to ambient light sensitivity



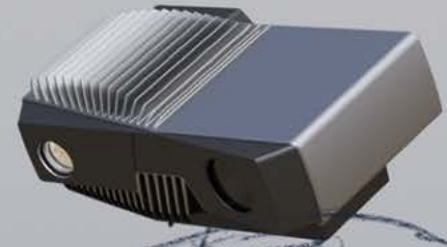
Flexible Mounting



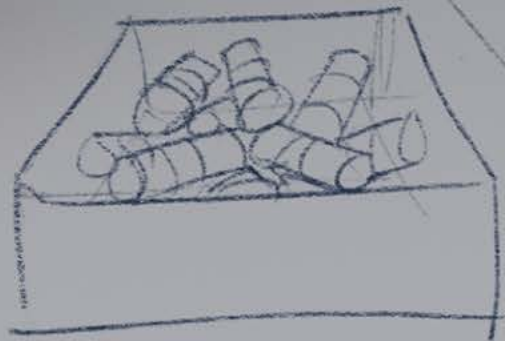
CEILING MOUNT



WALL MOUNT



ROBOT MOUNT



Datasheet specifications

Specifications

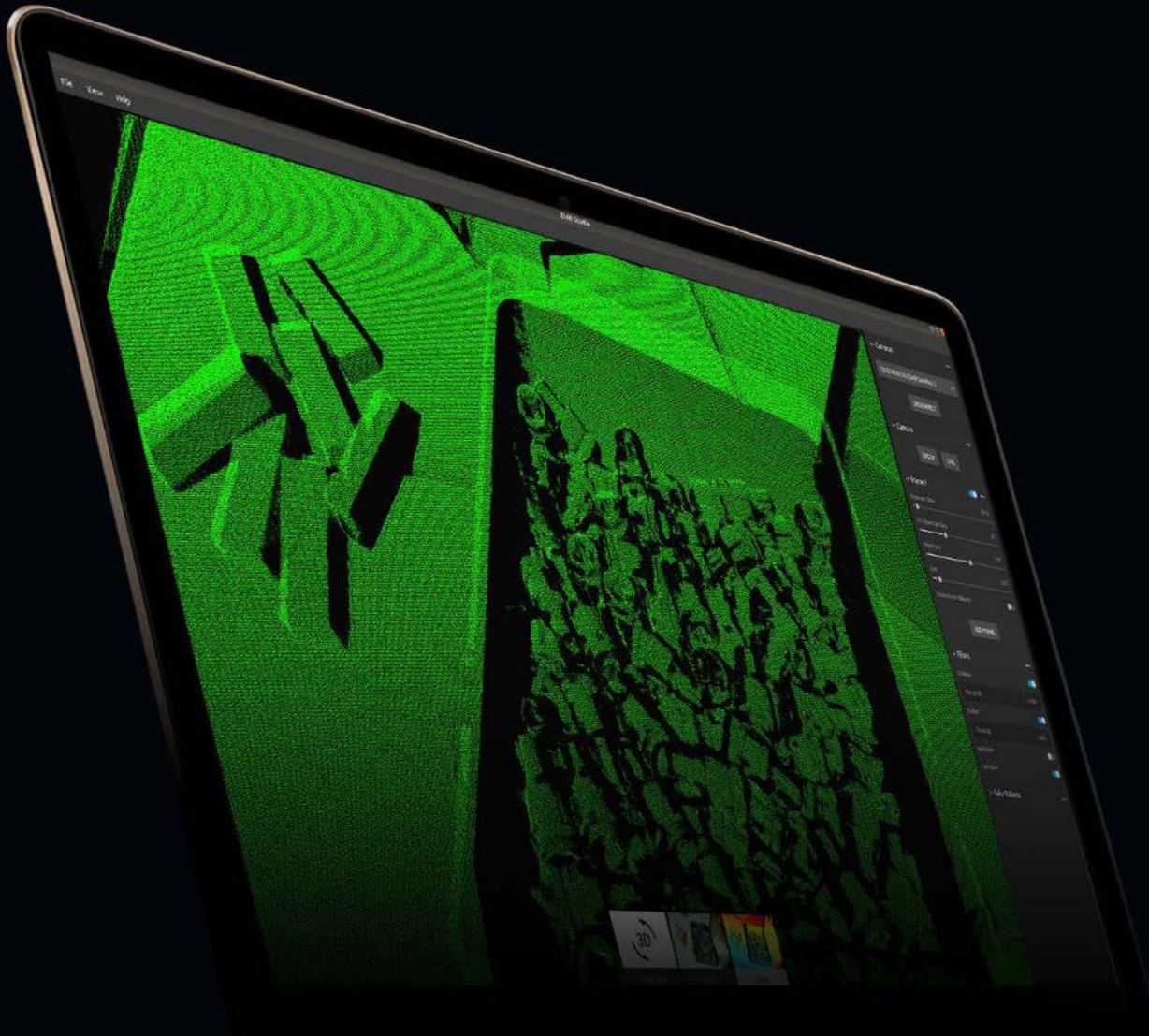
- Point precision
- Local planarity precision
- Global planarity trueness and accuracy
- Dimension precision, trueness and accuracy

Conditions

- Working distance
- Ambient temperature
- Ambient light
- Aperture
- Imager Gain
- Projector brightness

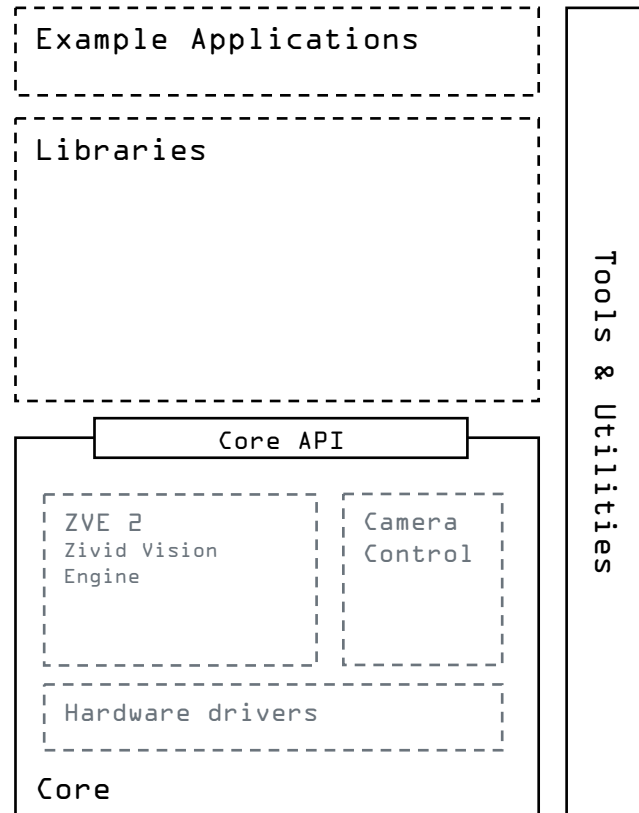


Zivid Studio



- Powerful for quickly finding parameters
- Capture
 - Snapshot
 - Live
 - HDR (min. 2 aperture settings required)
- View and evaluate
 - Color Point Cloud
 - Depth Map
 - 2D Color Image
- Optimize settings
 - Camera Exposure
 - Filters
 - Modes

Zivid SDK



Simplified block diagram

The essential tool suite for
developing machine vision software
with Zivid 3D cameras

Cross platform

x86-64

Linux and Windows



Language & wrappers

Native: C++ / .NET / Python



Zivid Vision Engine

GPU accelerated point cloud
computations

Wrappers: Genicam, ROS



