ZEISS

Seeing beyond

l = 1,19 mm
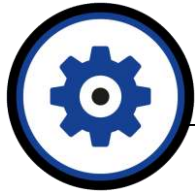
Ø = 2,35 mm

l = 2,12 mm

Easily capture things that are better left untouched

ZEISS O-DETECT

Fields of Applications
By industry, material, process and part

Industry

- Electronics
- Medical/Pharmaceutical
- Automotive
- Plastics industry
- Watch manufacturing (precision)
- Aerospace
- Manufacturing Steel

Material

- Metals
- Ceramics
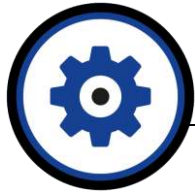- Composites
- Plastics/rubber
- Glass

Process

- Stamping
- Cutting
- Milling
- Etching
- Extruding
- Sintering
- Casting

Part

- Small parts
- 3D workpiece (one side)
- Dark/bright parts
- Flat parts

Industry
Applications

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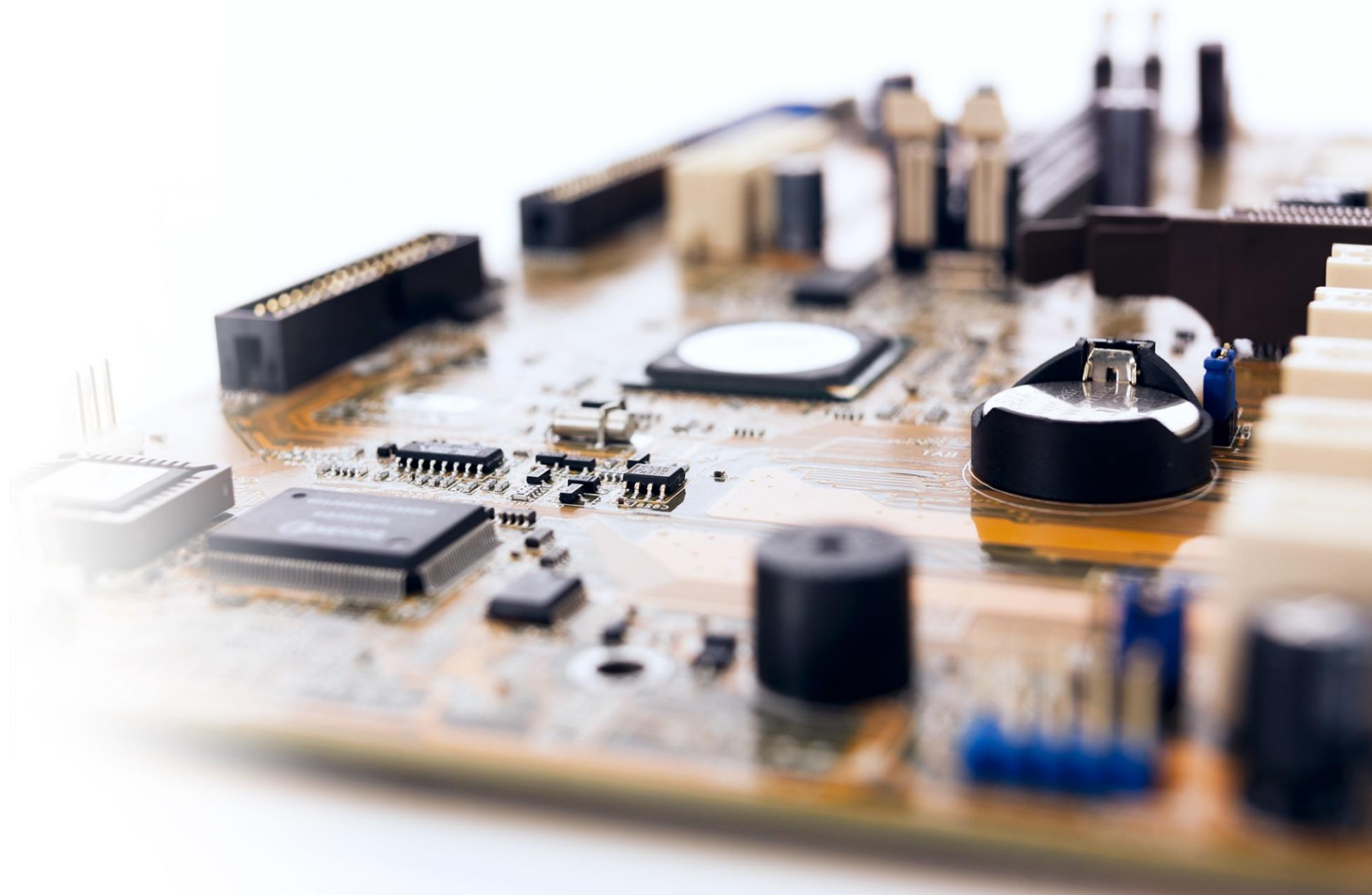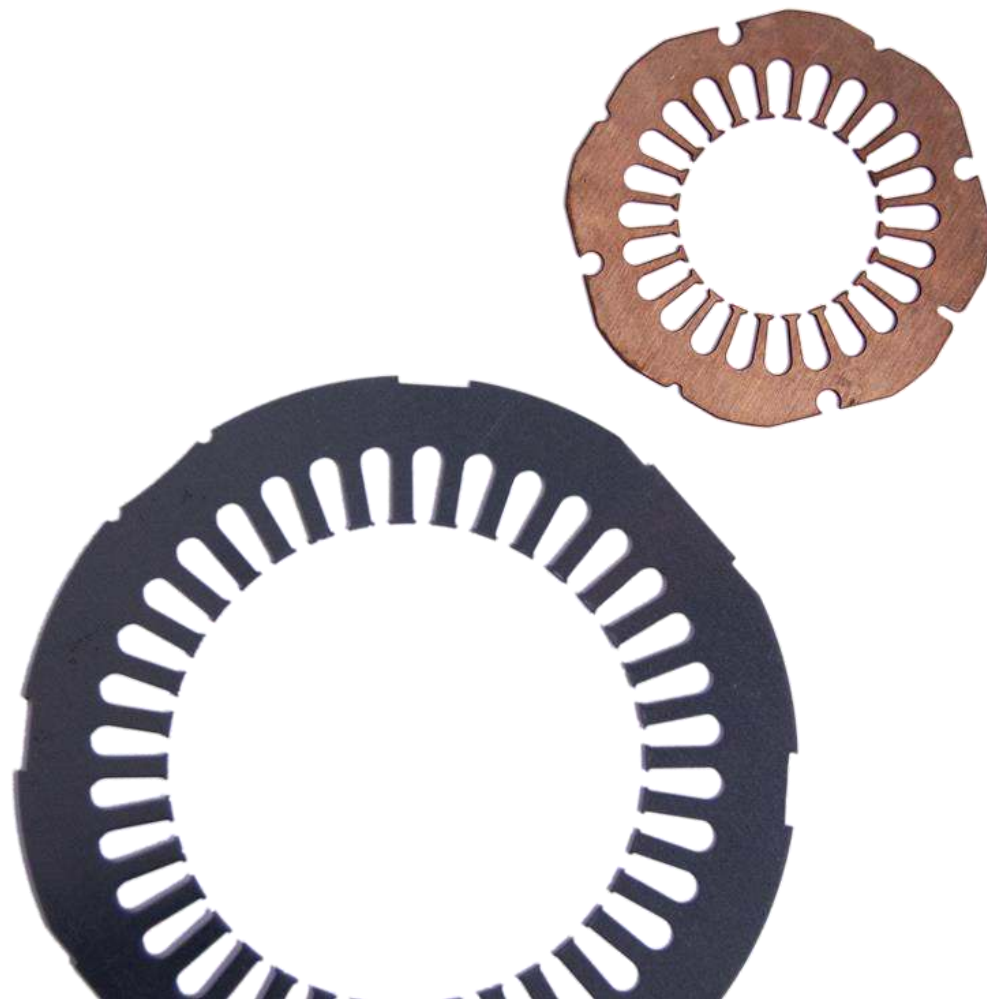- Etching
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- Casting

Part
Applications

Part

- Small parts
- 3D workpiece (one side)
- Dark/bright parts
- Flat parts

ZEISS O-DETECT
Reasons to buy…

ZEISS O-DETECT
Video

Please click to play.

ZEISS O-DETECT
Key Characteristics

Excellent optics
ZEISS Digital Zoom provides a large field-of-view at high resolution – increasing efficiency and capturing more details.

Simple part navigation and visualization
The integrated 5-megapixel overview color camera locates the part quicker to start measurements. Controlled by the software, it reduces the need to use the joystick.

Versatile and easy-to-upgrade
The new exchangeable accessory platform enables users to install, remove or exchange accessories like toplights without the need for service. The software automatically understands which accessory is attached or informs the user if a required accessory is missing.

Accuracy and precision
ZEISS O-DETECT provides both 2D and 3D accuracy specifications - a first for this segment. Thanks to calibration in compliance with ISO 10360-7, ZEISS O-DETECT is comparable worldwide and can be trusted to provide consistent and reliable measurement results.

Intuitive and user-friendly software
Entering the world of optical metrology. With focus on the user, the handling of the optical measuring system ZEISS O-DETECT is easy to use with ZEISS CALYPSO express.

Professional and actionable reports
ZEISS PiWeb reporting offers one-click documentation and visualization of your measurement data, giving you useful insights into your parts and processes.

ZEISS O-DETECT 3/2/2
Measuring range: 300 x 200 x 200 mm
MPE E(2D)=1.9+L/150 µm
MPE E(3D) = 2.4+L/150 µm

ZEISS O-DETECT 5/4/3
Measuring range: 500 x 400 x 300 mm
MPE E(2D)=1.9+L/150 µm
MPE E(3D) = 2.4+L/150 µm

#1 The right size for every application

#1. The right size for every field of application
ZEISS O-DETECT 3/2/2

Measuring Volume: 12 dm³
Measuring Range: 300 x 200 x 200 mm
MPE E(2D) = 1.9+L / 150 µm
MPE E(3D) = 2.4+L / 150 µm

Key Features:

- High-resolution 5 MP measuring camera
- 1,0x telecentric optical system with continuous digital zoom
- Overview camera for navigation
- All specifications according to ISO 10360 (1D, 2D, 3D) - 3D specification is unique in optical metrology
- Backlight and coaxial bright field light as a standard
- Illuminations options (blue/white; diffuse)
- ZEISS CALYPSO Software
- Integrated pallet receiving system
- Choose between standard base or shopfloor base
- Workpieces up to 20kg

# #1. The right size for every field of application
ZEISS O-DETECT 5/4/3

Measuring Volume: 60 dm³
Measuring Range: 500 x 400 x 300 mm
MPE E(2D)= 1.9 + L/150 µm
MPE E(3D) = 2.4 + L /150 µm

Key Features:

§   High-resolution 5 MP measuring camera
§   1,0x telecentric optical system with continuous digital zoom
§   Overview camera for navigation
§   All specifications according to ISO 10360 (1D, 2D, 3D) -
     3D specification is unique in optical metrology
§   Backlight and coaxial bright field light as a standard
§   Illuminations options (blue/white; diffuse)
§   ZEISS CALYPSO Software
§   Integrated pallet receiving system
§   Workpieces up to 25kg

#2
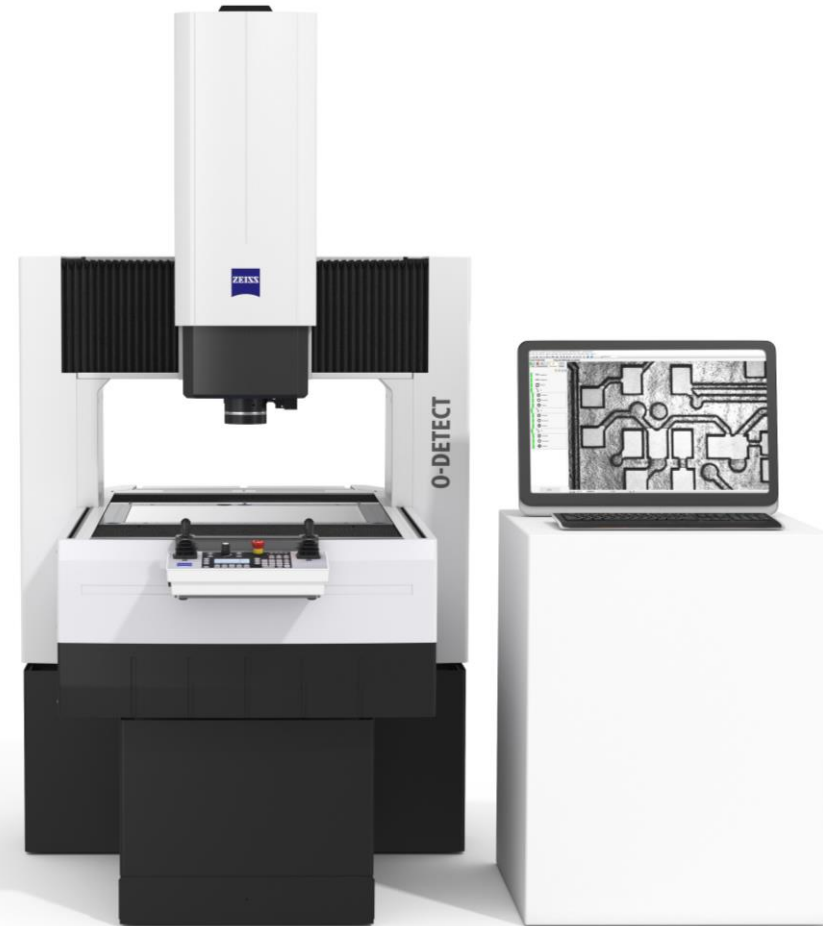
Excellent optics

Measuring Camera and Overview Camera

Measuring Camera:

- 5 Megapixel Camera
- Resolution (H x V) [px]: 2448 x 2048
- Sensor: CMOS
- Type: monochromatic
- Field-of-view: 8.0 x 7.4 mm²
- Pixel resolution: 3.4 µm
- Depth of field: ~100 µm

Used for measuring the features and toleranced characteristics.

Overview Camera:

- 5 Megapixel Camera
- Resolution (H x V) [px]: 2592 x 1944
- Sensor: CMOS
- Type: color
- Field-of-view: complete measurement volume

Used for navigating the measuring camera in the measurement volume

With ZEISS Digital Zoom

One image from ZEISS O-DETECT using digital zoom can successfully measure features of different sizes. Traditional mechanical zoom lenses need different magnifications and thus need several images for the same results.

ZEISS O-DETECT, Digital zoom

1st image, 1.0x magnification

Mechanical zoom

1st image, small magnification

How you benefit

- Better efficiency
- Large field-of-view to capture big features
- High resolution images to capture tiny features
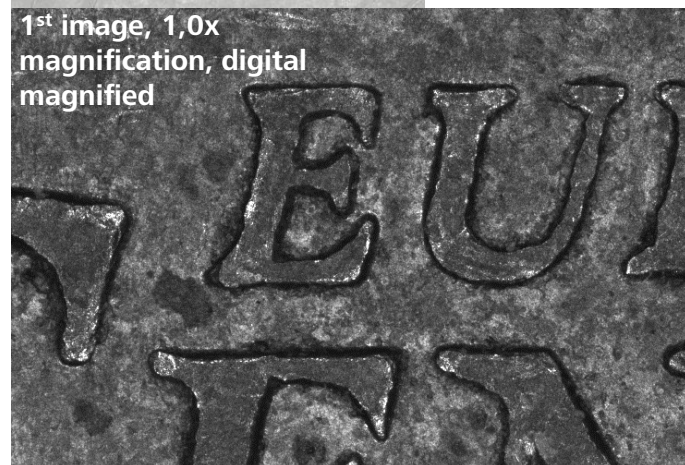- 5 MP camera delivers a lot of information per image

With ZEISS Digital Zoom

One image from ZEISS O-DETECT using digital zoom maintains the same quality as a magnified mechanical zoom image.

ZEISS O-DETECT, Digital zoom

1st image, 1.0x magnification

1st image, 1,0x magnification, digital magnified

Mechanical zoom

1st image, small magnification

2nd image, high magnification, mechanical magnified

How you benefit

- Better efficiency
- Large field-of-view to capture big features
- High resolution images to capture tiny features
- 5 MP camera delivers a lot of information per image

#2. Excellent optics
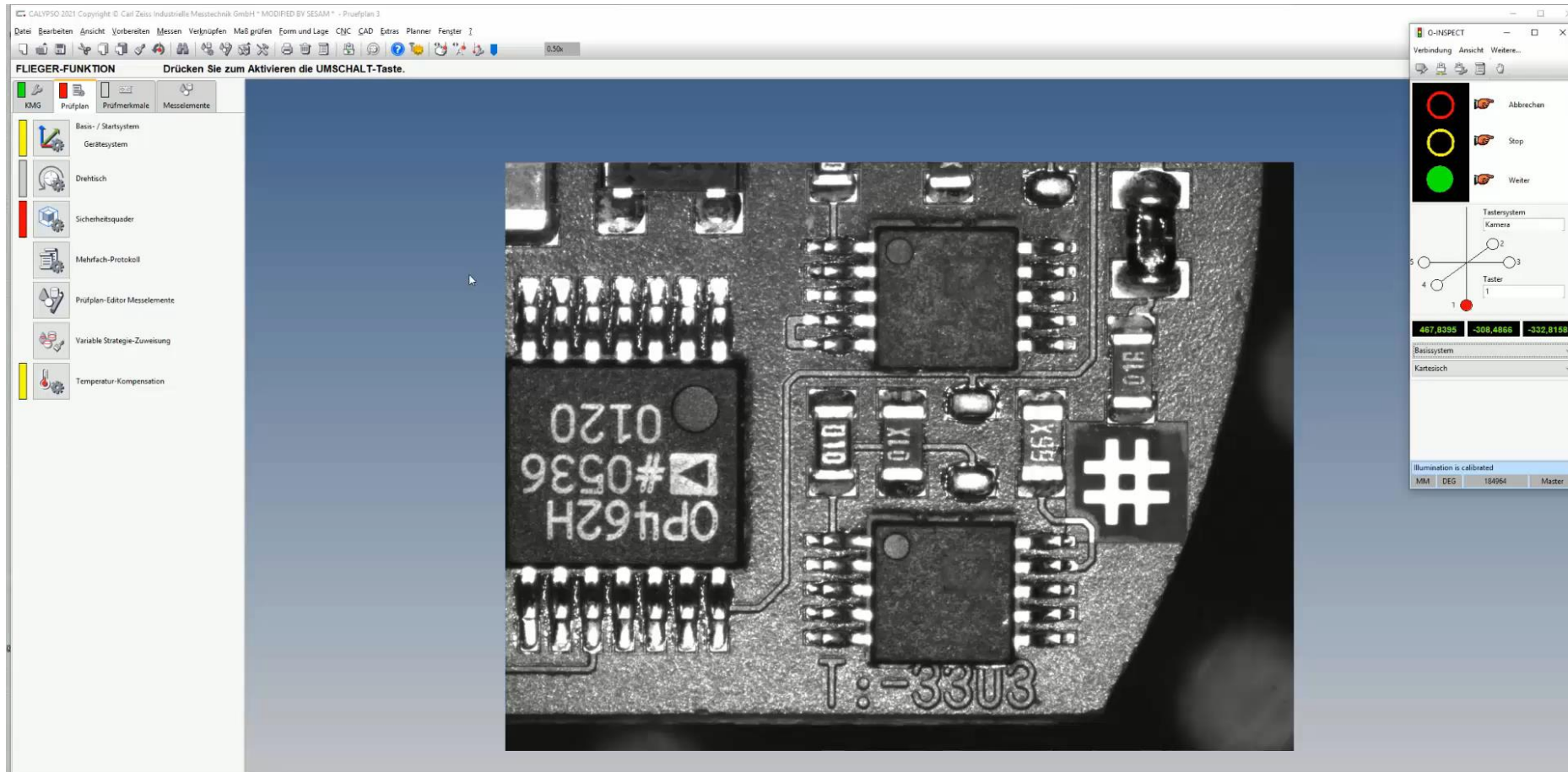## Comparison of different Optics

x0.5

x1.61

x6.3
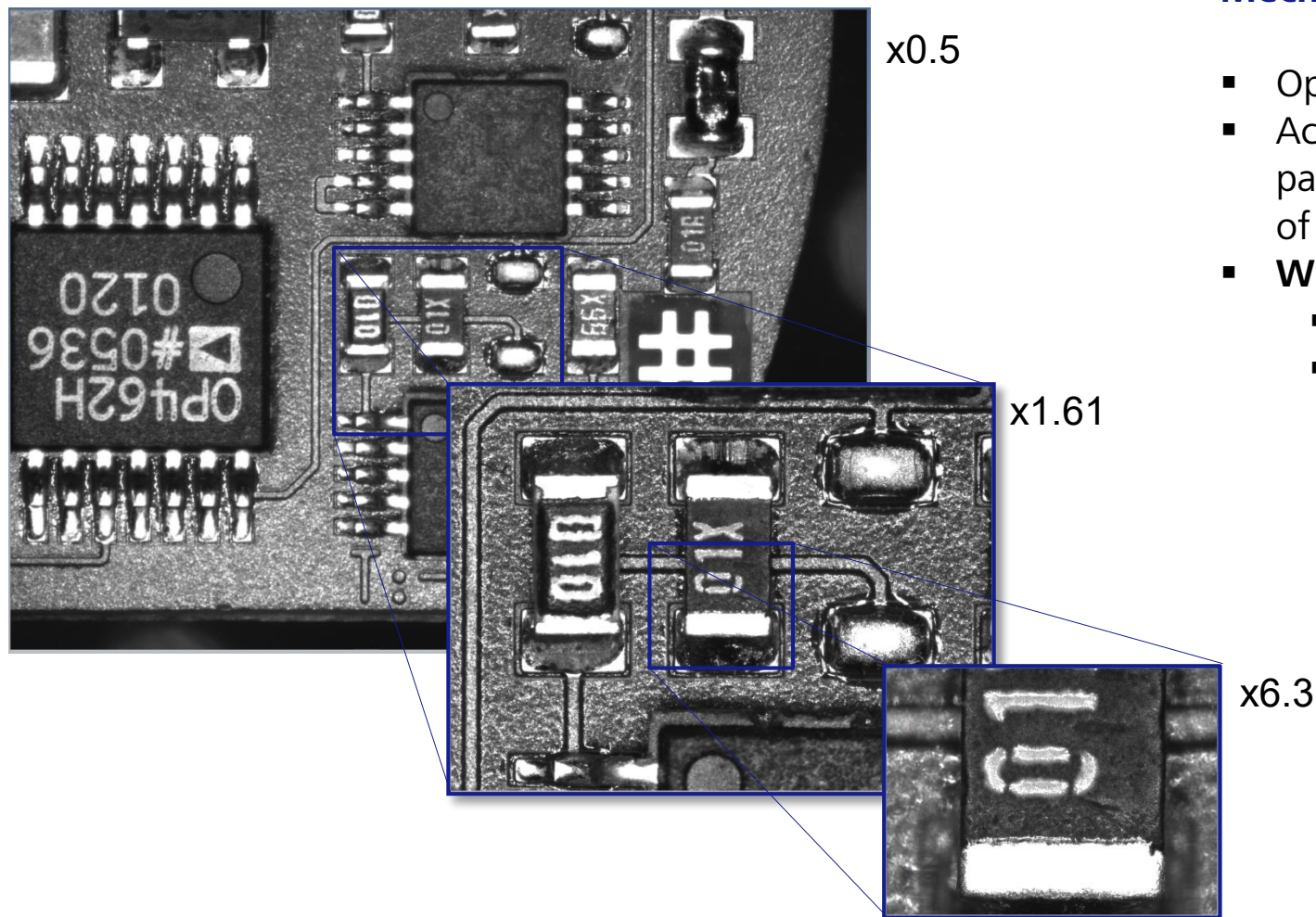
Mechanical Zoom Optic

- Optical system is based on several lenses.
- According to the magnification some lens packages have to move along the optical axis of the system and a new picture is acquired.
- **With increasing the magnification:**
    - **the resolution gets higher**
    - **the field-of-view gets smaller**
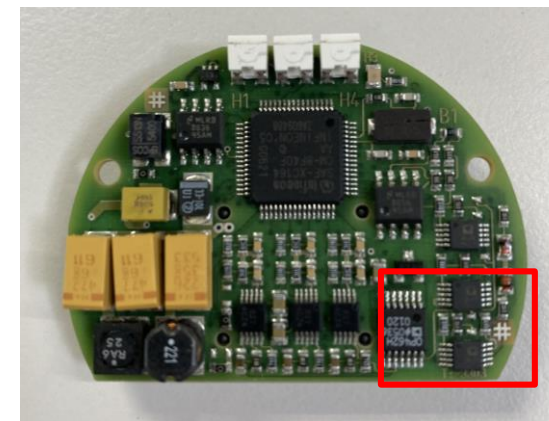
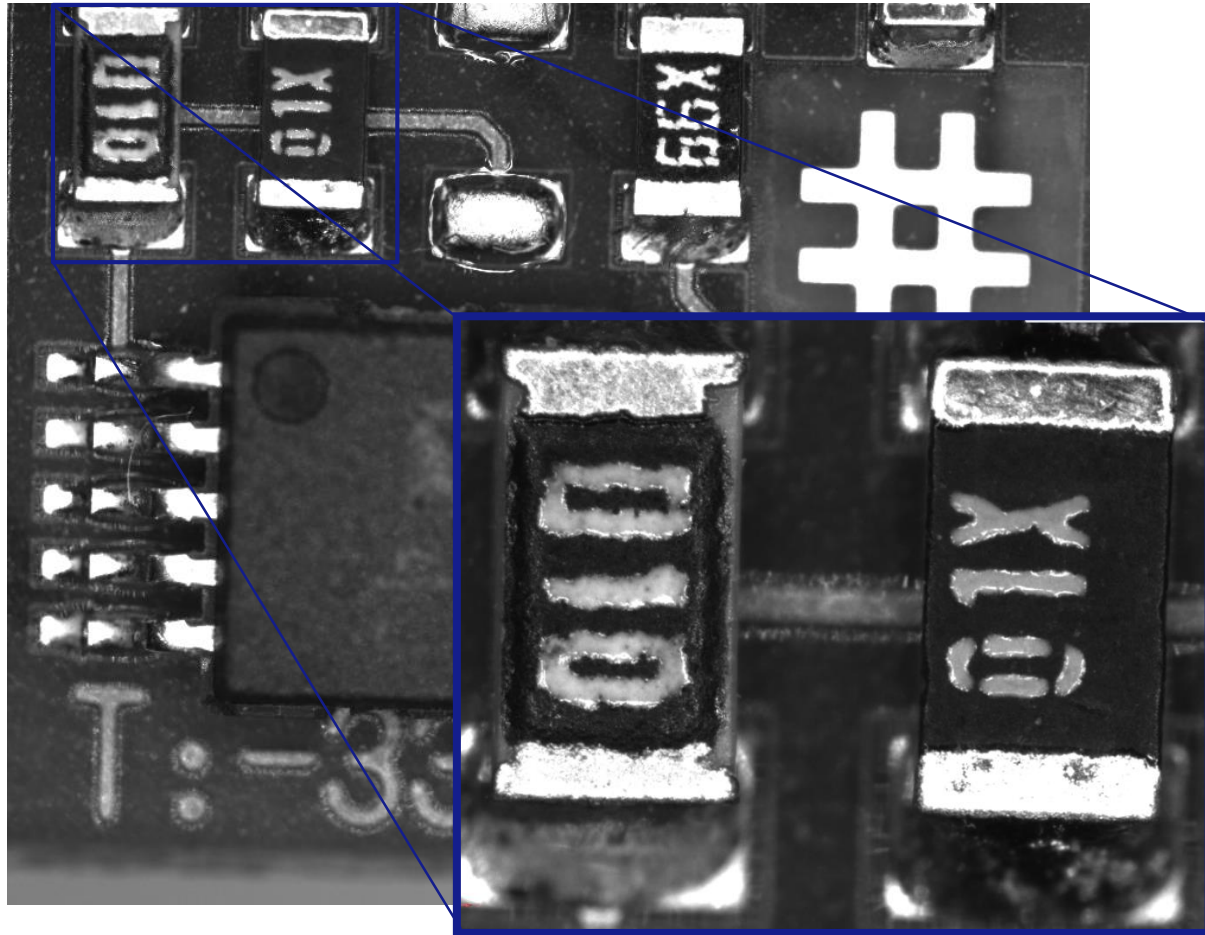# #2. Excellent optics
Mechanical Zoom Optic of ZEISS O-INSPECT

Starting in lowest magnification x0.5 [FOV 16.1mm x 12.0mm]
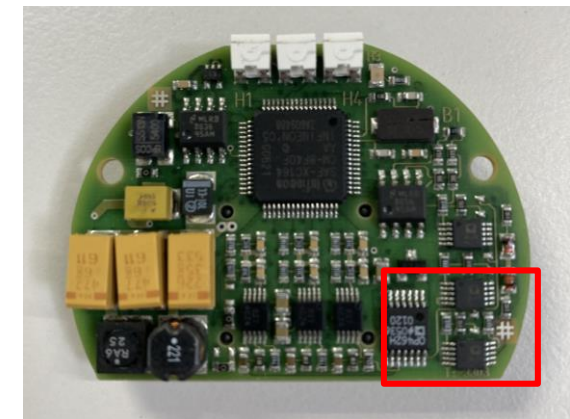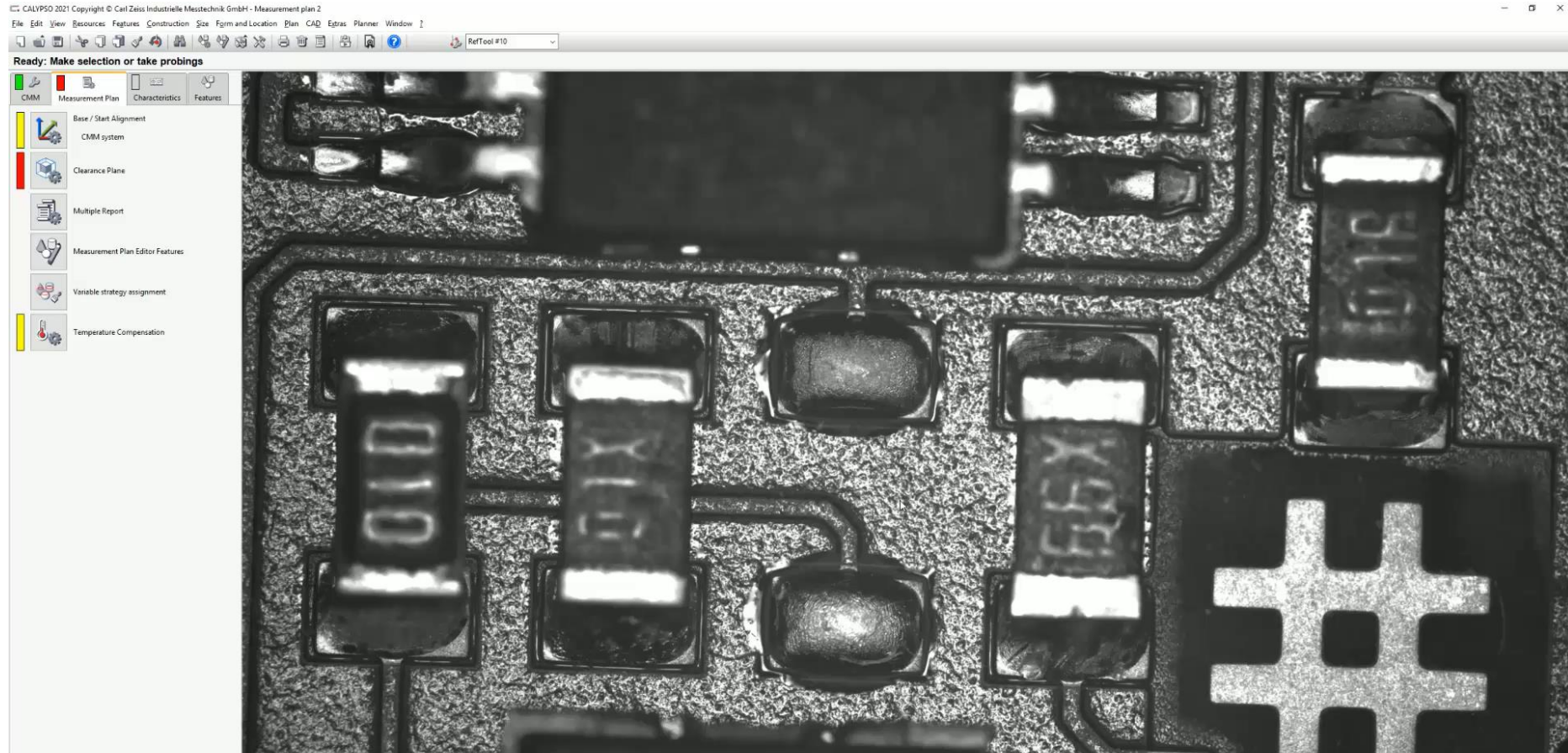
Please click to play.

Digital Zoom Optic

- One fixed lens system with a high-resolution camera has no mechanical movement inside the lens system.
- Enables the operator to zoom in on the already existing picture by a scrolling of the mouse wheel.
- **With digital magnification:**
    - **the resolution stays the same**
    - **the field-of-view stays the same**

#2. Excellent optics
Digital Zoom Optic of ZEISS O-DETECT

Fixed lens system with one high resoluted image

Please click to play.

ZEISS

With ZEISS Digital Zoom

Measuring Camera:

- 5 Megapixel Camera
- Resolution (H x V) [px]: 2448 x 2048
- Sensor: CMOS
- Sensor Size: 2/3"
- Type: monochromatic
- Pixel resolution: 3.4 µm smallest measurable circle: <70µm

Optics:

- Telecentric lens system
- Working distance: 65 mm
- FoV: 8.4 mm x 7.0 mm
- Depth of field: ~ 100 µm
- Magnification: 1.0x (for a 27-inch screen appr. 63 times magnification on screen)
- Magnification by Digital Zoom

How you benefit

- High resolution camera guarantees very sharp and detailed images
- Better efficiency
- Large field-of-view to capture big features
- High resolution images to capture tiny features

#3 Simple part navigation and visualization

5 megapixel Overview Camera

ZEISS O-DETECT has a fully integrated overview camera to create a smoother user experience.

You control the camera around the stage via software wherever you are – reducing the tedious task of part navigation using the joystick.

Please click to play.

How you benefit

- Improved ergonomics
- Faster part navigation
- Gives you an overview of all measured parts
- The overview camera captures the complete measurement volume – for ZEISS O-DETECT 3/2/2 and ZEISS O-DETECT 5/4/3

#3. Simple part navigation and visualization

5 megapixel Overview Camera

Technical Details:

- 5 Megapixel Camera

- Resolution (H x V) [px]:
  2592 x 1944

- Sensor: CMOS

- Type: color

- Field-of-view:
  O-DETECT 3/2/2: 300 x 200 mm²
  O-DETECT 5/4/3: 500 x 400 mm²

How you benefit

- Improved ergonomics

- Faster part navigation

- Gives you an overview of all measured parts

- The overview camera captures the complete measurement volume – for ZEISS O-DETECT 3/2/2 and ZEISS O-DETECT 5/4/3

#4 Versatile and easy-to-upgrade

#4. Versatile and easy-to-upgrade
Quick-change toplights

Illumination is the key for a stable optical measurement: Toplight options are needed to solve challenging measurement tasks. With blue and white toplight it is possible to create stable and comparable results for different materials and colors. A diffuse light source enables homogeneous images.
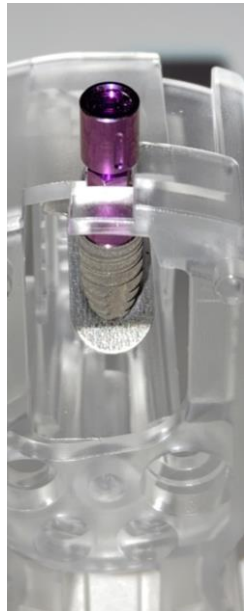

Please click to play.

How you benefit

- Easy manual exchange
- You can carry out optional upgrades without calling in for service, saving you service hours
- Purchase only the toplight for your current requirements
- 8-segment standard ring light (blue / white)
- Diffuse ring light
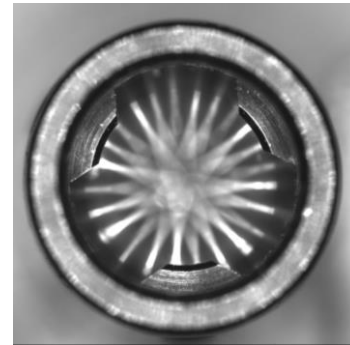- Darkfield illumination (coming soon)
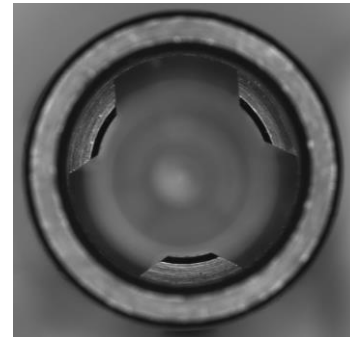
Different illumination options

Application: dental implant

Standard ring light illumination (blue/white)
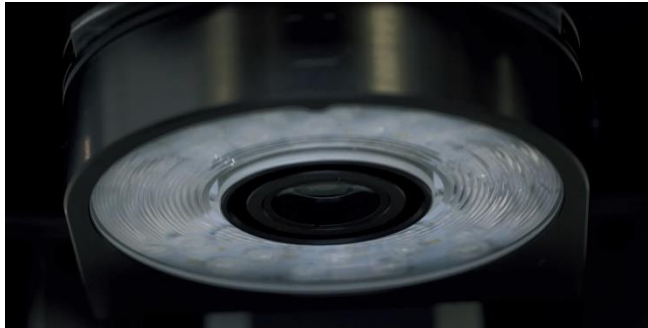
Diffuse ring light illumination

How you benefit

- Easy manual exchange of different ring light options
- You can use the illumination option that helps to solve your challenging measurement task
- Different illumination options enable more flexibility
- Standard ring light with 8 segments of blue and white LED ensure a flexible illumination
- Diffuse ring light to illuminate shiny surfaces and challenging edges

Different illumination options
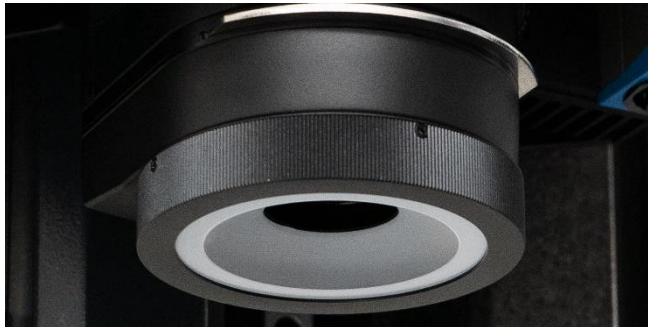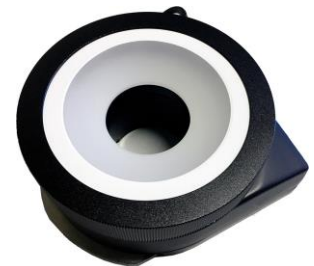

Standard ring light

Standard ring light off

8-segment Illumination blue

8-segment Illumination white

Diffuse ring light

Diffuse ring light off

Diffuse illumination blue

Option: Three-point pallet loading system with temperature interface

The optional pallet systems and fixtures save you time while ensuring greater reliability. After mounting, the temperature of the workpieces on the pallet can automatically captured by sensors to use it for temperature compensation.

How you benefit
- Shorter setup times – guaranteed
- No machine downtime
- Accurate results in a wide temperature range

This is our integrated 3-point pallet receiving system,

Please click to play.
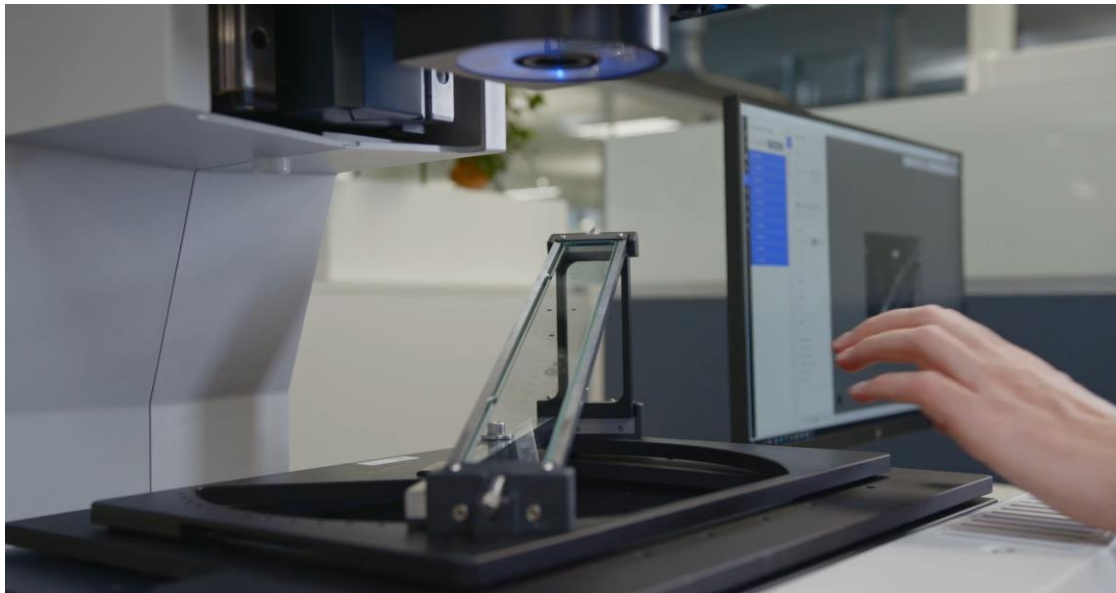
#5 Accuracy and precision

#5. Stable precision

Calibrated to MPE E(3D) per ISO 10360-7:2011

The optical sensor in ZEISS O-DETECT is calibrated to ISO 10360-7 which is a global and transparent standard.

Additionally, it is calibrated to fully 3D accurate volume (MPE E(3D)) – a first for the entry class optical metrology market.

Please click to play.

How you benefit

- Confidence in your measurement results
- Accurate results on the glass plate as well as on a certain height
- Reliable 3D accuracy in high-compliance markets (e.g. medical, aerospace)
- Results you can trust – everywhere in the measurement volume

#6

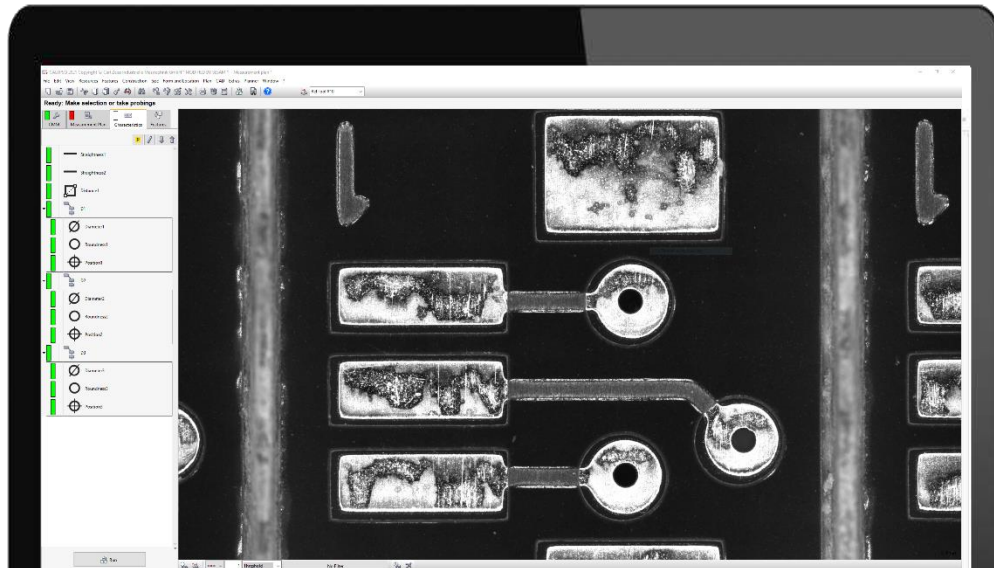**Intuitive and user-friendly software**

ZEISS CALYPSO and ZEISS PiWeb reporting

The metrology experience from many years has been combined in the universal metrology software ZEISS CALYPSO. No matter if you are measuring challenging parts or a simple inspection, ZEISS CALYPSO delivers the right solution to manage the task. ZEISS CALYPSO express has a simple programming environment to make it as easy as possible for you to get started.

How you benefit

- ZEISS CALYPSO express with its clear user interface and structured workflows allow easy programming and is simple to learn.

- Advanced users get access to more functionality and settings if necessary.

- ZEISS CALYPSO autorun for creating automation interfaces and pallet measurements.

- ZEISS CALYPSO curve for measuring 2D and 3D contours.

ZEISS CALYPSO and ZEISS PiWeb reporting

Please click to play

Application:
Printed circuit board (PCB)
on ZEISS O-DETECT 5/4/3

How you benefit

- Increase efficiency with automated features (ZEISS CALYPSO autorun and ZEISS PiWeb reporting)

- Software options can be added tailored to the requirements of specific industries

- User and rights management to log your measurement process
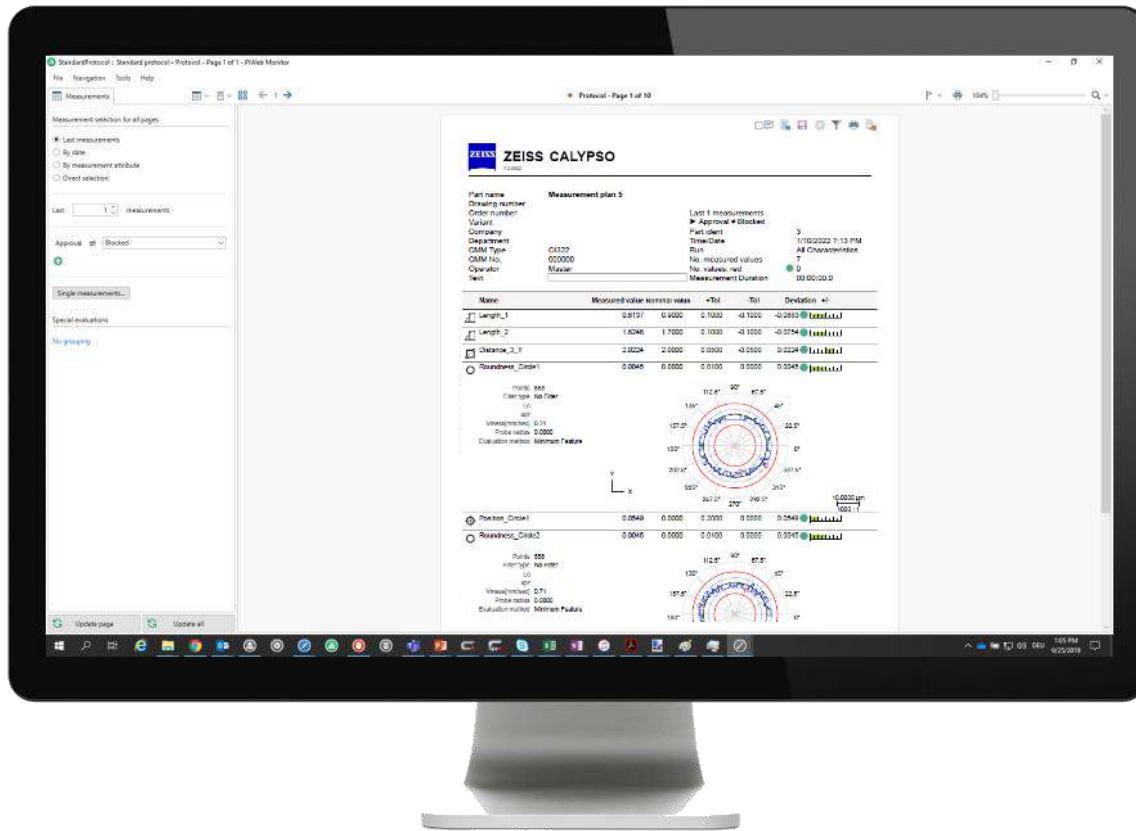
- Connectivity with ZEISS PiWeb reporting

#7 Professional and actionable reports

ZEISS PiWeb reporting software

Screenshot: ZEISS PiWeb reporting – Standard report

How you benefit

- Save time and costs

- Easy-to-understand visual reports you can customize to your application

- Visualize and compare your measurement results

- Future-proof: upgradeability to connect your measurement data from all systems

- Different options:

  - ZEISS PiWeb reporting plus (up to 1000 measurements)

  - Network solutions: ZEISS PiWeb sbs, ZEISS PiWeb enterprise

  - Cloud solution: ZEISS PiWeb cloud

#7. Professional and actionable reports

## Option: ZEISS PiWeb reporting plus software

ZEISS PiWeb reporting plus is an upgrade option to visualize results, create custom reports, interact with data via CAD models, images, form and statistic plots.

- Store up to 1000 measurements per part program
- Customize reports for the specific application
- Visualize single part reports, gage repeatability & reproducibility and statistical process control reports
- Scalable to your growth and need for connected data (PiWeb sbs, enterprise, cloud)

How you benefit

- Save time and costs
- Easy-to-understand visual reports you can customize to your application
- Future-proof: upgradeability to connect your measurement data from all systems
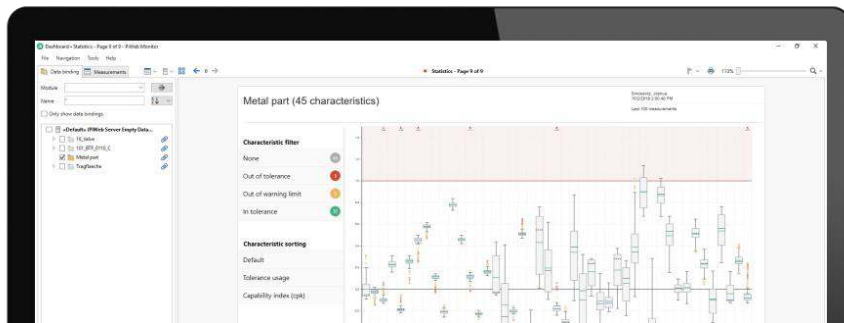
#8 Higher productivity with accessories

#**8. Higher productivity with accessories**
Accelerate set-up

ZEISS Omnifix

Universal clamping tools offer an optimal combination of accessibility and flexibility for a wide range of part geometries.

How you benefit

- Black anodized aluminum for fewer reflections and more stable optical measurements

- Optimum Z axis accessibility

- Vise can also be used as a center cradle thanks to special clamps available as accessories

ZEISS OMEGA pallets

Significantly increase the productivity of a measuring device and considerably shorten set-up time, thus minimizing downtime.

Please click to play.

How you benefit

- Fixturing of the workpiece apart from the machine - this saves valuable machine capacity for the actual measuring

- Change pallets in a twinkling - reduce downtime additionally

- The workpiece is easily positioned using the 3-point-bearing for a repeatable measurement

#9 Worldwide sales and service

#9. Worldwide sales and service
ZEISS as Global Partner – Close to you worldwide

32 sales & service organizations

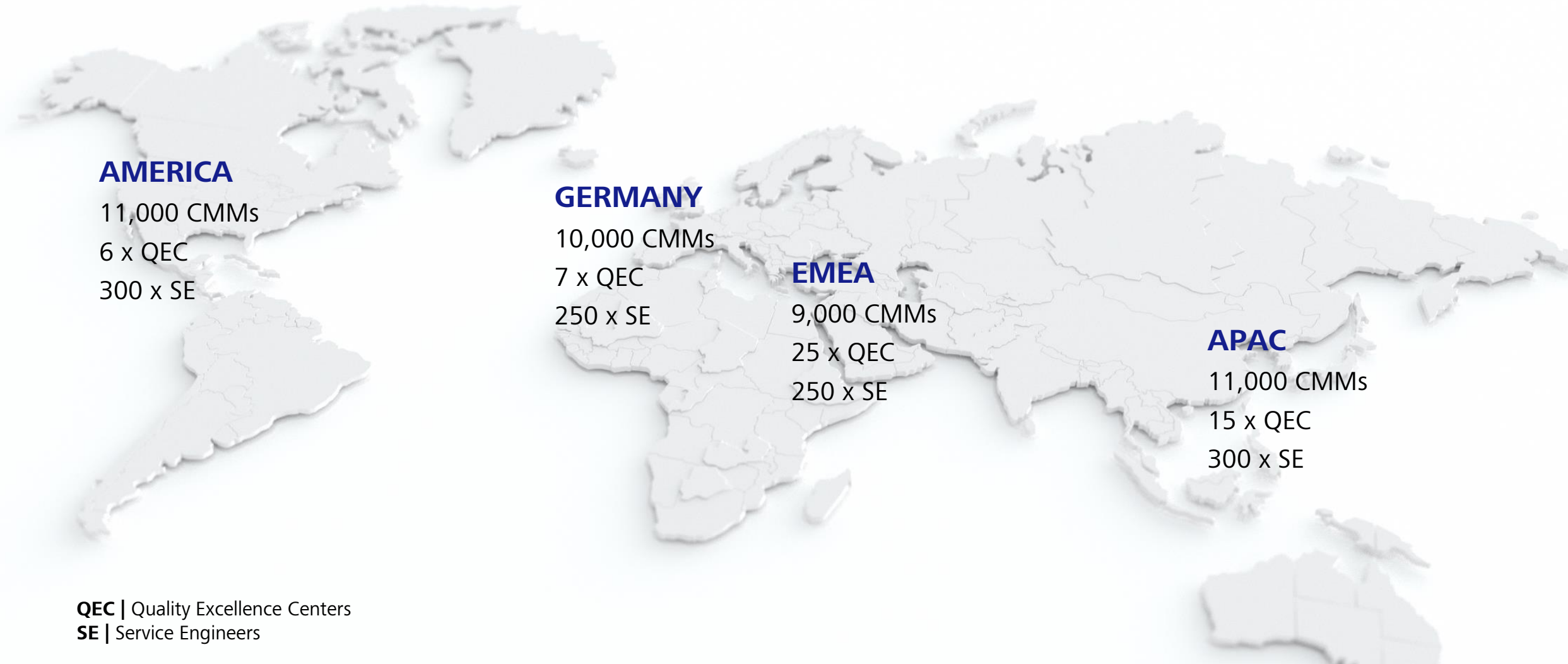**62** ZEISS Metrology Excellence Centers

10 production sites

100 business partners

**Headquarters:
Oberkochen, Germany**

Global support network: service and application structure

ZEISS

AMERICA

11,000 CMMs

6 x QEC

300 x SE

GERMANY

10,000 CMMs

7 x QEC

250 x SE

EMEA

9,000 CMMs

25 x QEC

250 x SE

APAC

11,000 CMMs

15 x QEC

300 x SE

QEC | Quality Excellence Centers
SE | Service Engineers

Easily capture things that are better left untouched.

ZEISS O-DETECT

ZEISS

Seeing beyond