METROLOGY

Transforming the **World of Metrology**
One **Device** at a Time

1

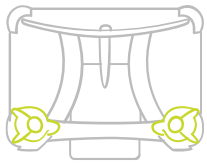
METROLOGY

HYPERLINK enabled by CLICKING TO LOGO////
Company Presentation

Company Presentation

2

EZ3D



Compact 3D Analysis Tool
Fast and Accurate Part Evaluation

3

Training Agenda

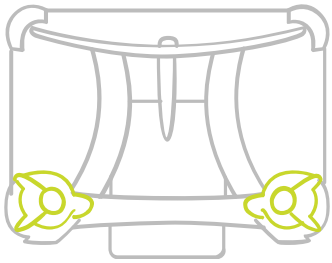
Day 1

- Introduction of the EZ3D
- Measurement process
- Features
- Applications

Day 2

- Onsite measurements
- Tune-up training

4



1. INTRODUCTION

5

1. INTRODUCTION

Concept

A mobile, tablet based, 3D measurement system that determines deformation or displacement of points. The main focus of EZ3D is its ease of use and speed of operation.

Application

Measure, using single snapshots, evolutions or change of

- Gap & flush
- Part alignment
- Lateral shifting of surface
- Deformation under climate, load or pressure
- Elongation/Shrinking effects

Technology

The compact, light, high resolution stereo vision system is combined with adhesive optical targets to measure accurately their relative positions with respect to a local reference. EZ3D is designed for static applications.

6

1.1 Specifications

Accuracy	0.1mm
Size	215x280x125mm
Average Standoff	300mm
Field Of view Approximate	300 x 200mm
Weight	2.0 kg
Operating Temperature Range	-40 to 60C
Optional external battery pack	14VDC

7

1.2 Safety

HAZARD WARNING!!! Laser Radiation: Do not stare into beam or view directly with optical instruments. Class 2M laser product.

CAUTION!!! Playing with the lasers or pointing them in unknown direction can cause distraction and may result in injury of personnel.

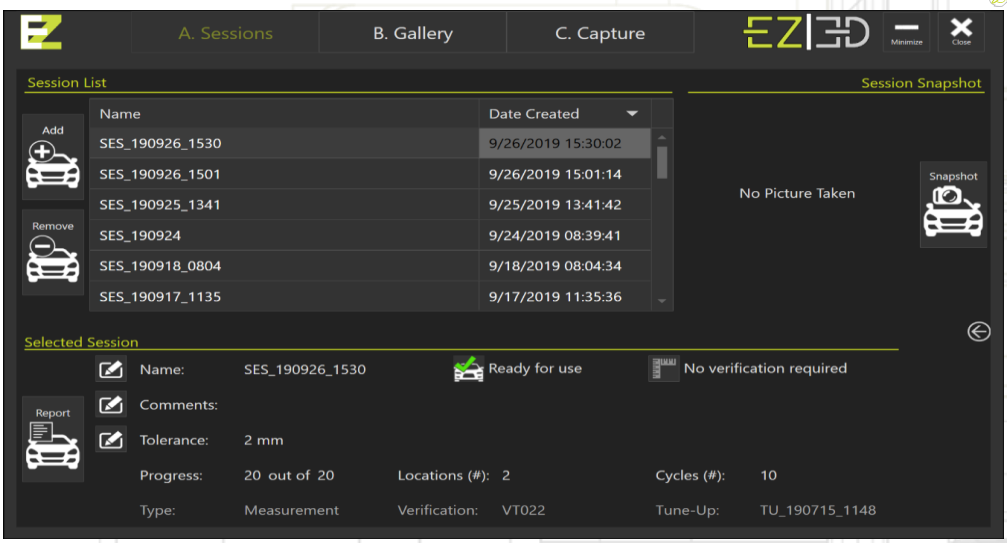
8

1.3 Glossary

Session	**A collection of measurements on inside/outside of the car taken with EZ3D.**
Tolerance	**To make the analysis easier, tolerance can be set in a desired range. If the displacement is over the tolerance the measurement will be highlighted in red.**
Verification	**To verify the accuracy in each session verification image can be taken by using the verification plate.**
Template	**consecutive measurements a template can be created in a desired sorting. The default Locations will be in number sorting and the cycles will be initial, cycle02, cycle03...sorting**
Location	**Each reference and target group is called a location.**
Cycle	**The measurement taken in the location is called a cycle.**
Tune-up	**A general adjustment to ensure operation at peak efficiency.**

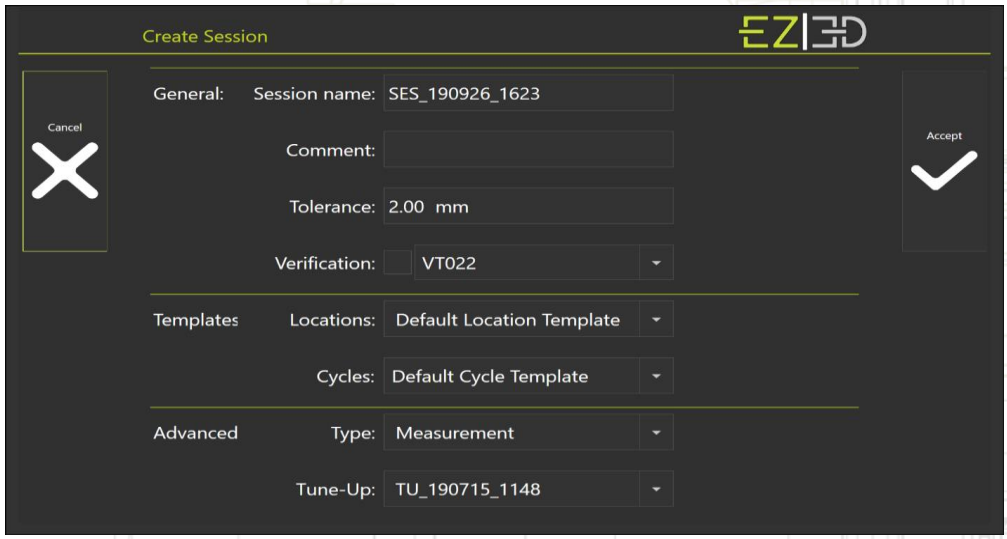
9

1.3.1 GLOSSARY

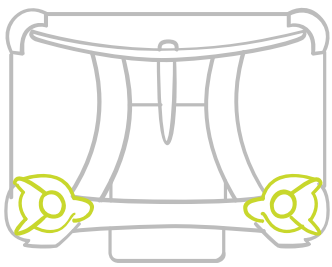


10

1.3.1 GLOSSARY



11



2. PROCESS

12

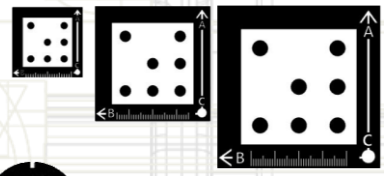
2. PROCESS

A. Step 1: Targets and References

Install Reference and Targets

Place the adhesive targets and references on the parts or assemblies.

- Coded references labels are placed on the parts to establish a local reference
- Compact single point target labels are placed on the part of interest.



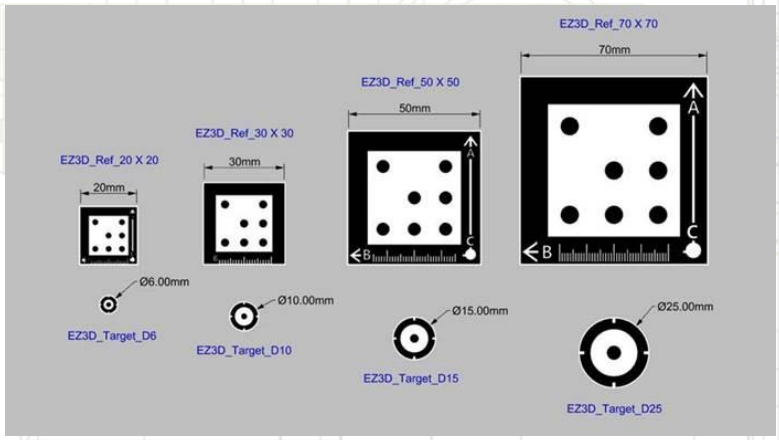
13

2. PROCESS

A. Step 1: Targets and References

Sticker Sizes

If you are running out of stock contact e-mail support@ezmetrology.com



14

2. PROCESS

A. Step 2: Running the tablet

Push Power button for EZ3D first.

15

2. PROCESS

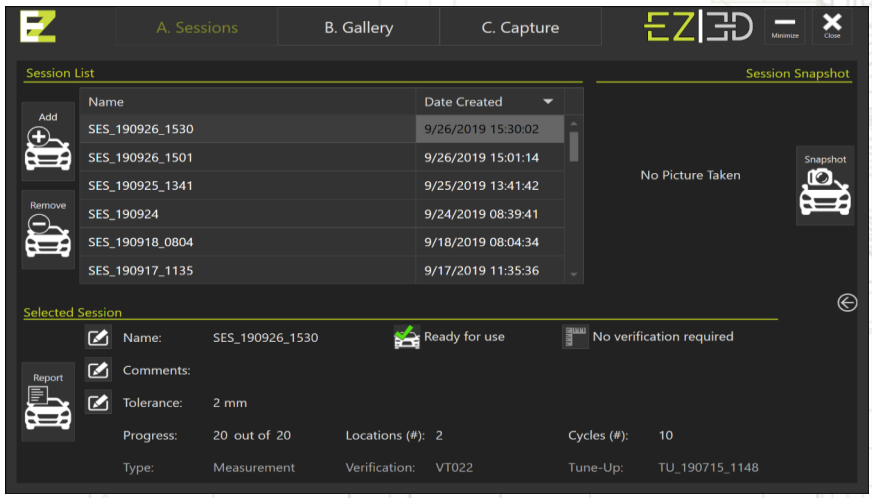
A. Step 3: Running the Software

Click on EZ3D button on desktop.

16

2. PROCESS

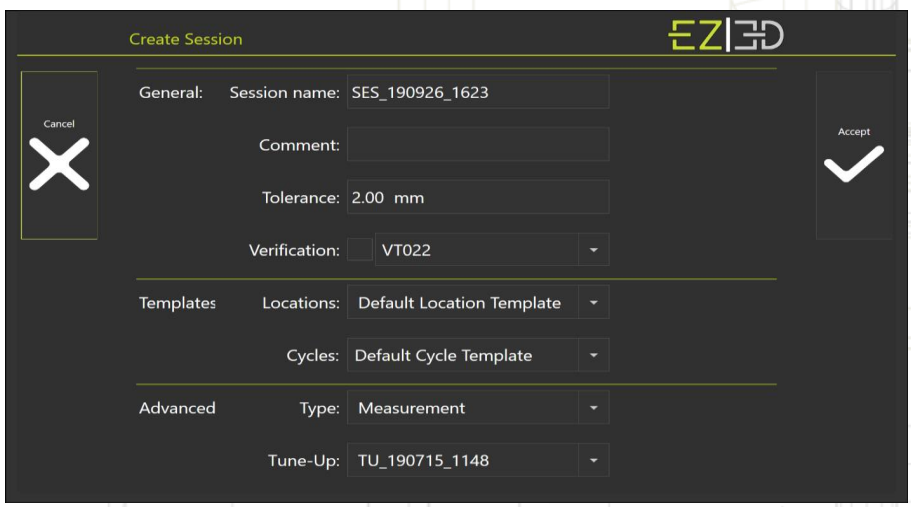
B. EZ3D MAIN WINDOW



17

2. PROCESS

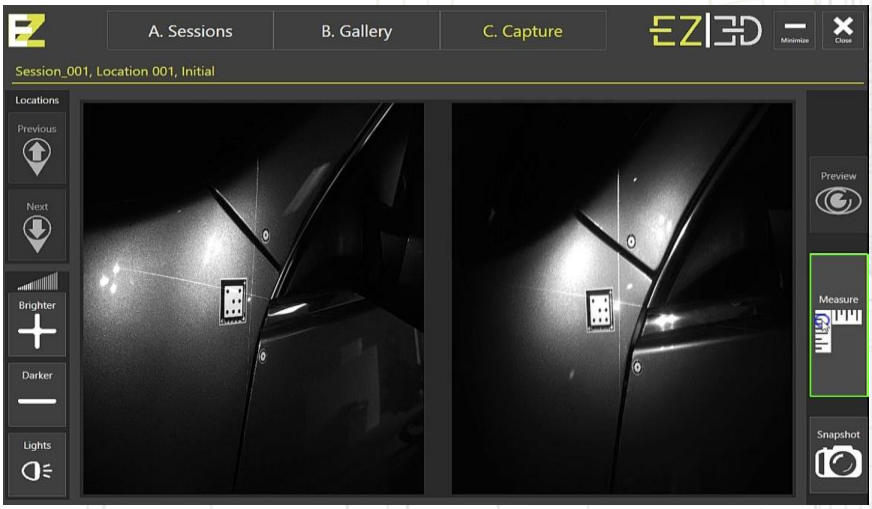
B. EZ3D MAIN WINDOW



18

2. PROCESS

B. EZ3D MAIN WINDOW



19

2. PROCESS

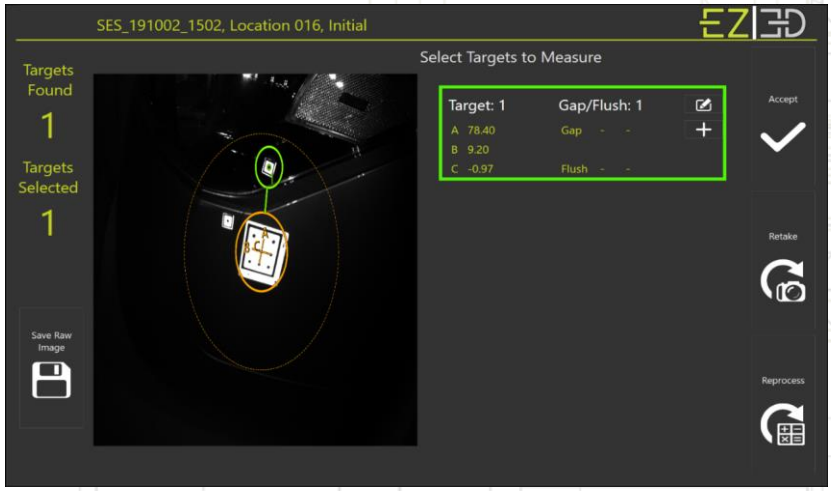
USEFUL HINTS

The lighting conditions take important effect on the image quality. Make sure that all the targets are visible and none of the images are blurry or low lighted. To make the image brighter use the light adjustment buttons.

20

2. PROCESS

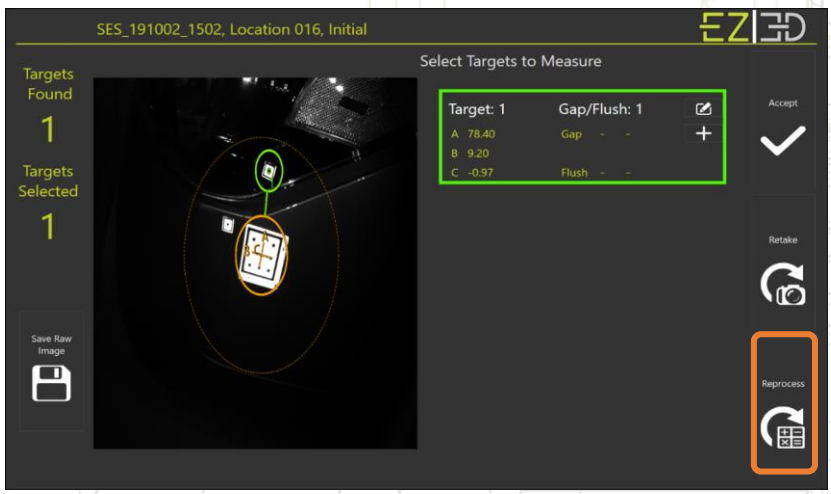
B. EZ3D TAKING MEASUREMENT



21

2. PROCESS

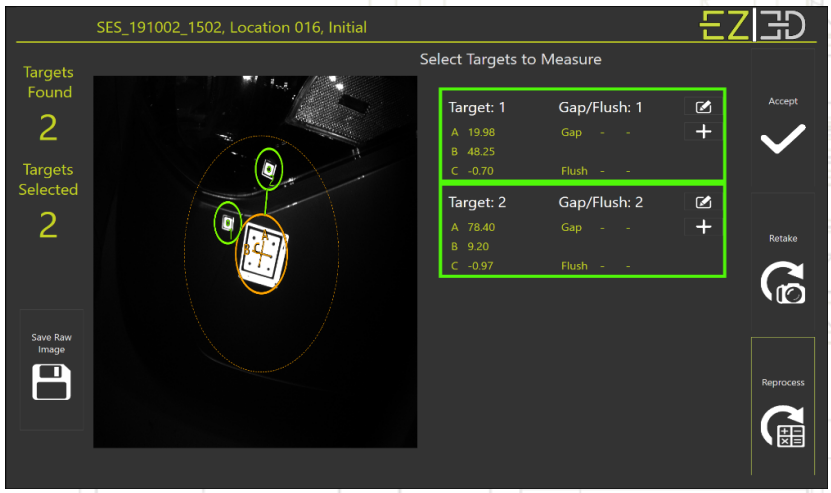
B. EZ3D TAKING MEASUREMENT



22

2. PROCESS

B. EZ3D TAKING MEASUREMENT



2. PROCESS

USEFUL HINTS

2. PROCESS

C . Record Consecutive Cycles

Consecutive Cycles

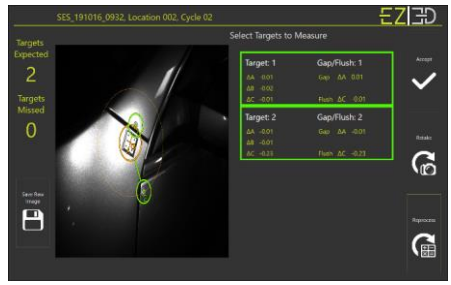
Following the initial cycle, unlimited number of variations can be recorded. Variations can be

- Temperature
- Load

When a measurement cycle is repeated, the new XYZ values or the delta values of the point will be calculated and immediately displayed.

In case the point was initially set up as a flush and gap point, these values will be updated as well.

A ghost image guides the operator over all measurement points and ensures that the right initial location is paired with the current situation.



2. PROCESS

D . Gap/Flush

Initial Cycle:

During the initial cycle, a 3D point measurement can be converted into a flush and gap pair.

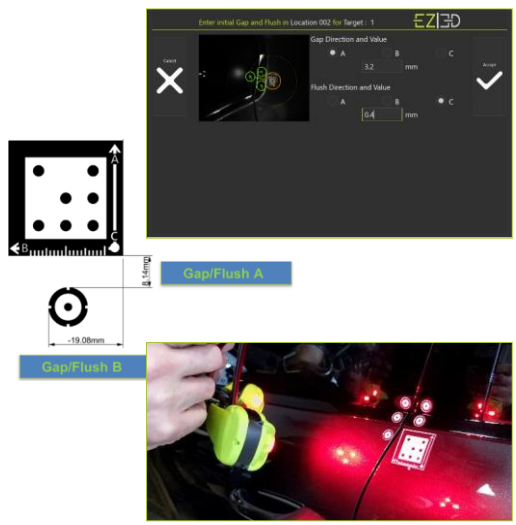
The initial flush and gap values can be based on

a) the physical gap between the labels. In this method the application of the labels will need to be representative for the actual visual gap.

b) a 3rd party gauge measurement (feeler gauges or calipers) and entered manually.

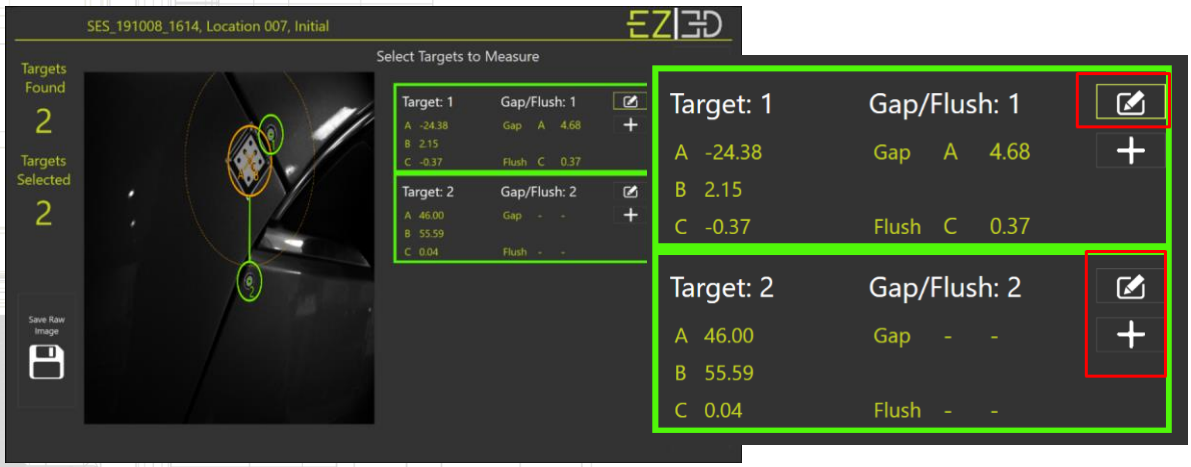
From this point forward this target point and the drift of the system measured will be reported as changes in Flush and Gap.

Enter initial Flush and Gap Values to track absolute value evolution.



2. PROCESS

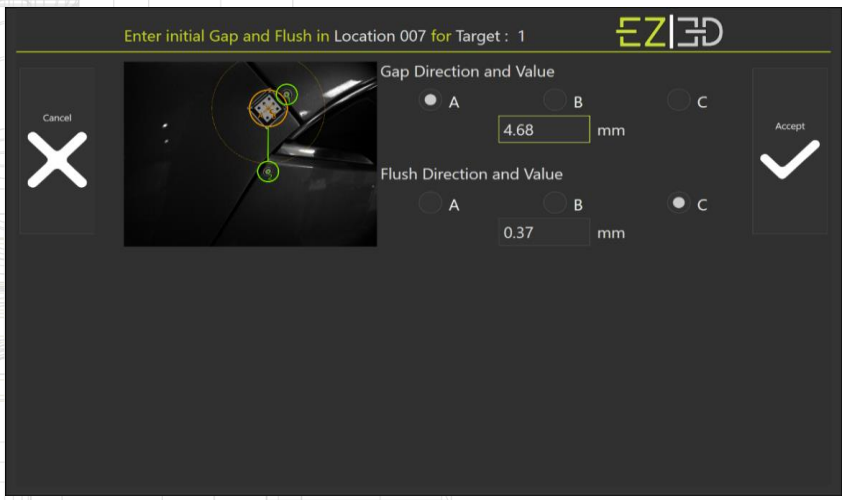
D. Gap/Flush



27

2. PROCESS

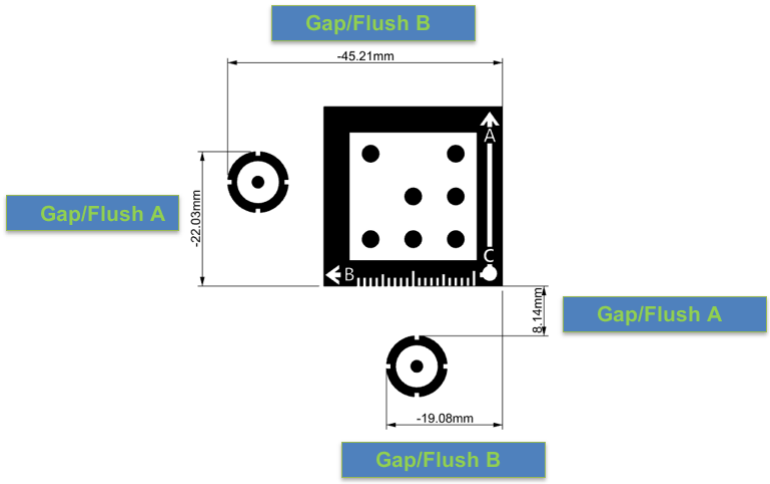
D. Gap/Flush



28

2. PROCESS

D. Gap/Flush



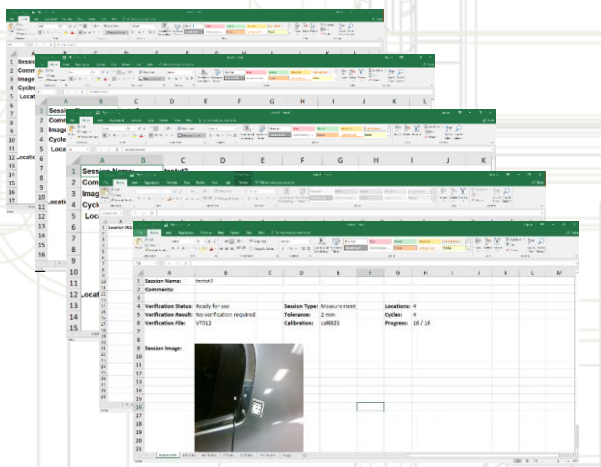
29

2. PROCESS

E. Reporting

Upon completion of the session; after n cycles and x positions, the software automatically generates an Excel report of all numerical values, complemented with images, header, verification information etc.

- Session Information header
- Data Points
- Deltas
- Flush and Gap Values
- Flush and Gap Delta Values
- Session Location and Cycle Comments
- Session Snapshots
- Verification Results
- Images with markings



30

2. PROCESS

E . Reporting

Upon completion of the session; after n cycles and x positions, the software automatically generates an excel report of all numerical values, complemented with images, header, verification information etc.

- Session Information header
- Axis/Cycle data
- Deltas
- Flush and Gap Values
- Flush and Gap Delta Values
- Session Location and Cycle Comments
- Session Snapshots
- Verification Results
- Images with markings

	A	B	C	D	E
1	Session Name:		SES_191008_1522		
2	Comments:				
3	Image:		*See "Images" for cycle point lo		
4	Cycles:			Initial	Cycle 02
5	Locations	Targets	Direction	mm	mm
6					
7			A	0.00	-0.01
8		Target 1	B	-30.00	-29.99
9			C	0.00	0.02
10					
11			A	30.00	30.00
12		Target 2	B	11.52	11.51
13			C	0.03	0.03
14					
15			A	-11.46	-11.48
16		Target 3	B	29.98	29.99
17			C	0.06	0.01
18					
19			A	-29.97	-29.97
20		Target 4	B	-0.02	-0.01
21			C	0.03	0.03
22					
23			A	11.48	11.49
24	Location 001	Target 5	B	-29.98	-30.00
25			C	-0.01	-0.01
26					
27			A	0.03	0.04
28		Target 6	B	29.97	29.98
29			C	0.01	-0.01
30					
31			A	-29.99	-30.01
32		Target 7	B	11.51	11.52
33			C	0.02	0.01

31

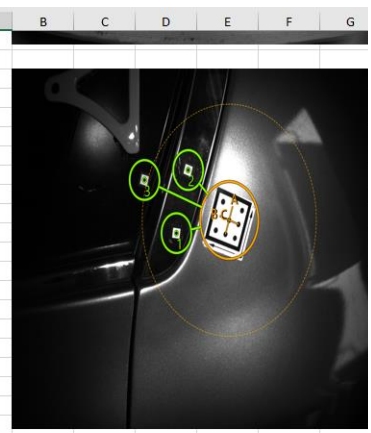
2. PROCESS

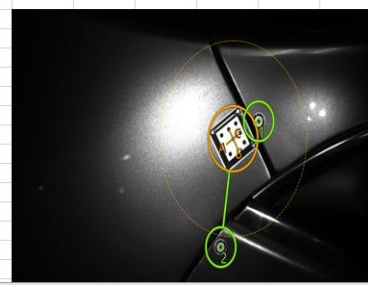
E . Reporting

Upon completion of the session; after n cycles and x positions, the software automatically generates an excel report of all numerical values, complemented with images, header, verification information etc.

- Session Information header
- Data Points
- Deltas
- Flush and Gap Values
- Flush and Gap Delta Values
- Session Location and Cycle Comments
- Session Snapshots
- Verification Results
- Images with markings

	A	B	C	D	E	F	G
19							
20							
21	Location 002:						
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41	Location 003:						
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							

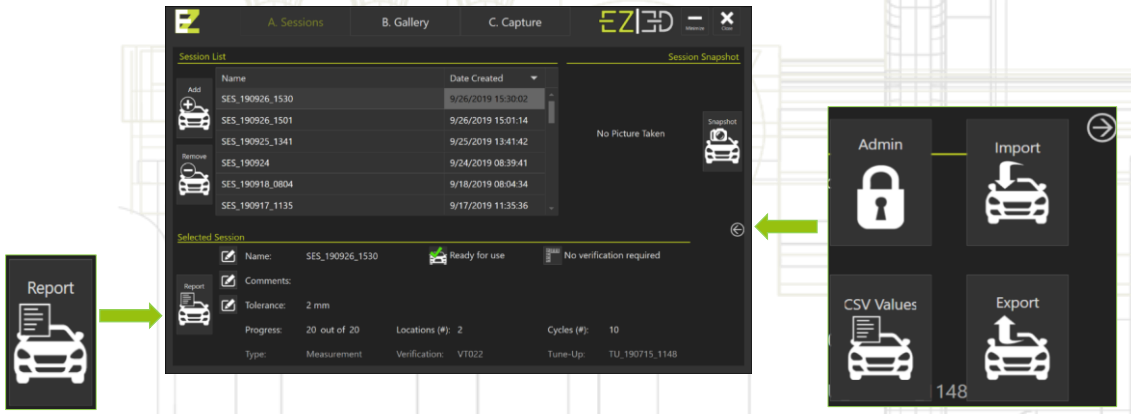




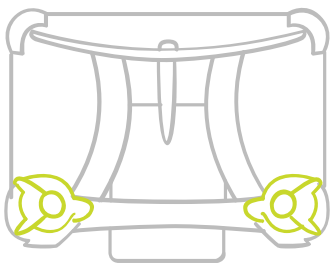
32

2. PROCESS

E . Reporting



33

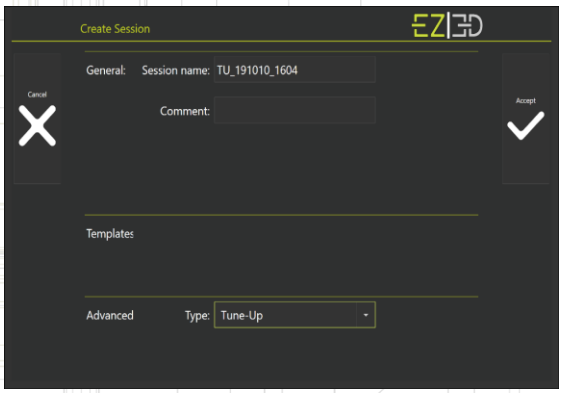


3. ADDITIONAL FEATURES

34

3. ADDITIONAL FEATURES

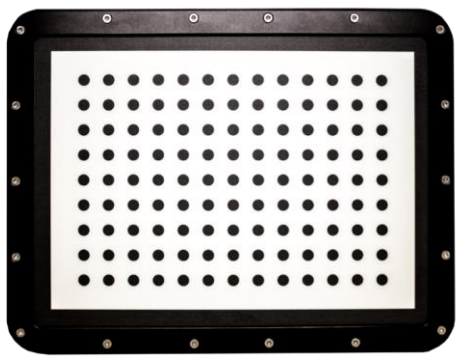
A. TUNE-UP



35

3. ADDITIONAL FEATURES

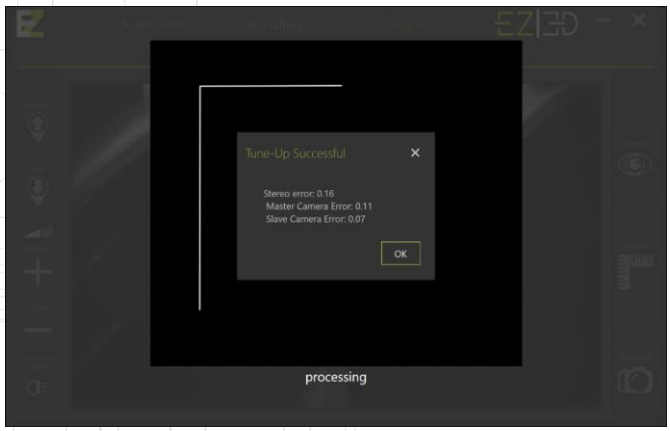
A. TUNE-UP



36

3. ADDITIONAL FEATURES

A. TUNE-UP



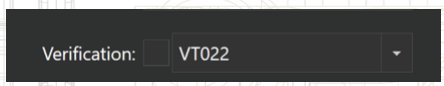
37

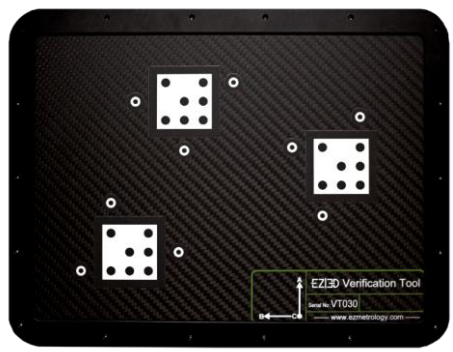
3. ADDITIONAL FEATURES

B. VERIFICATION PLATE

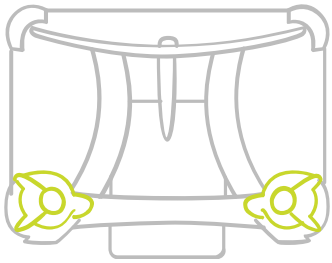
Easy System Validation

As EZ3D is exposed to wide temperature variations, potential drops or other accidental manipulations, the system comes with an artefact and build-in procedure to verify the performance over the course of the lifetime.





38



4. APPLICATIONS

39

4. APPLICATIONS

A. Chamber testing

Depending on the scope of the tests EZ3D can be used for the chamber tests. Increase in the temperature leads to an increase in the length, area and volume of the material.
Also, low temperatures can affect the tensile toughness of many commonly-used engineering materials. The loss of ductility can make the materials brittle.

40

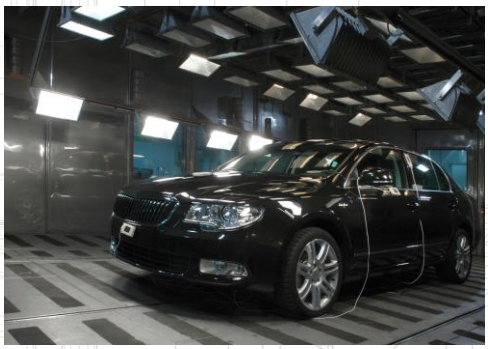
4. APPLICATIONS

A. Chamber testing

41

4. APPLICATIONS

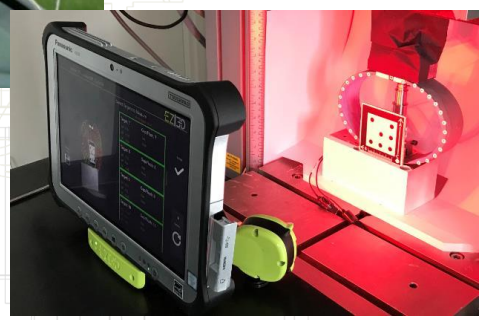
A. Chamber testing



42

4. APPLICATIONS

B. Load Testing



You can measure the current state of the parts before load on the force and then with the help of using a handheld force gage where the gage measures the pull force applied on a sample, product or component you can find the displacement over time.

43

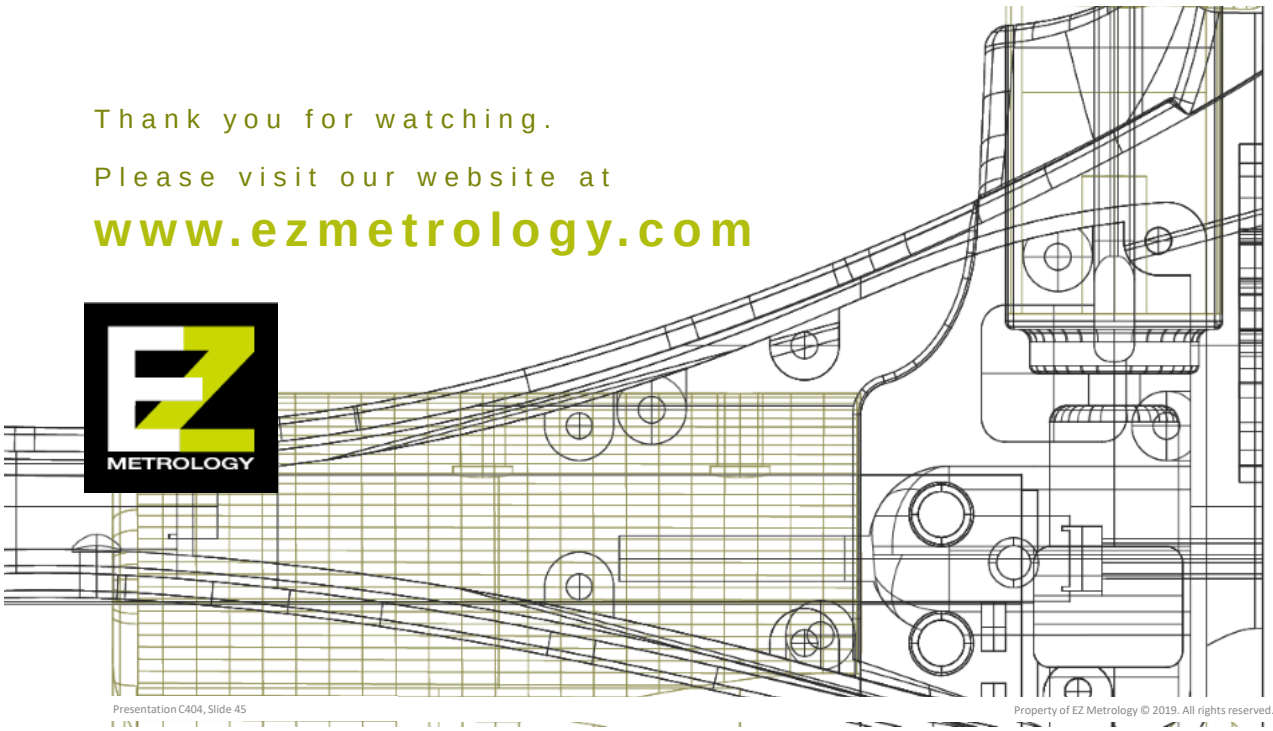
4. APPLICATIONS

44

Thank you for watching.

Please visit our website at

www.ezmetrology.com



45