

BACKEND LINE

AOI

AOI CAM READY TO INTEGRATE



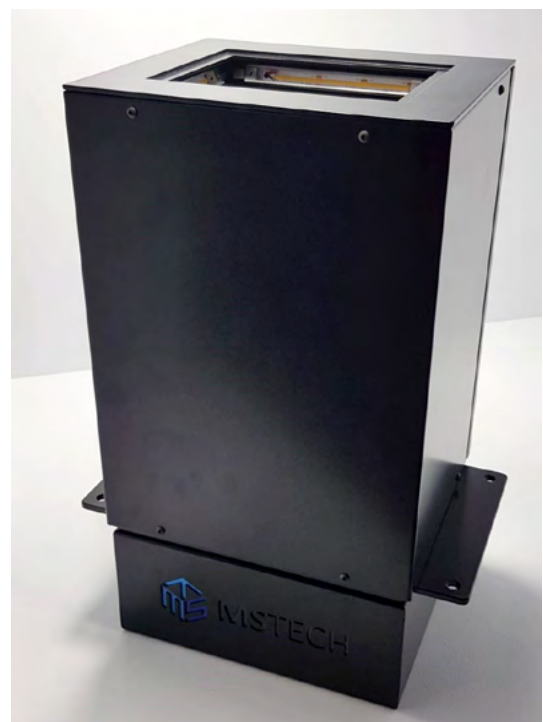
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MEASURE OF PRESENCE, POSITION
AND SIZE (AREA) FOR GLUE INSPECTION

AOI Top Bottom ready to integrate in any inline/offline equipment

Single system for inspection of objects

- Combination of diverse application tasks in the THT area which take place before a wave soldering or selective soldering oven
- Typical tests include confirmation of the mechanical assembly, presence, placement and orientation of plugs, stickers, fixings, reading of barcodes and data matrix codes
- Inspection of workers process flow
- Glue and coating inspection



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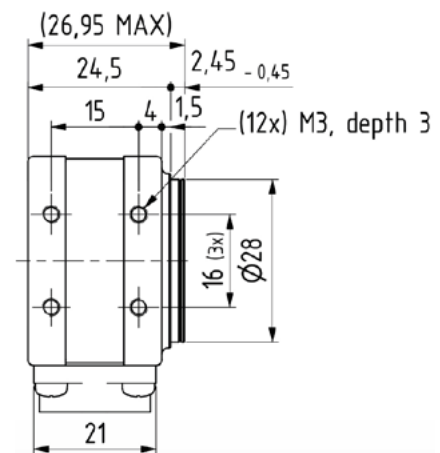
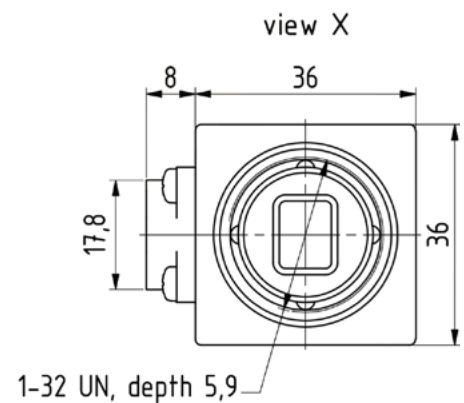
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TECHNICAL SPECIFICATIONS

Camera Unit C42	Resolution 42 megapixels (7716 x 5364 pixels) Aspect ratio 3:2, pixel size (on object) depending on focal length and working distance RGB-color filter on CMOS sensor Color depth 24 bit
Light Source	White light in combination of some filters depending on application. Automatic white balance and auto-exposure ensure stable tests
Lens	Typical 12, 16, 25 mm, other lenses optionally (C-mount)
Inspection area with standard lens	Operation range up to 420mm x 530mm (16.52 in x 20.80 in) Minimum distance of camera 280 mm (11.02 in)
Test Speed	Image acquisition including analysis: typically 2-4 seconds
System PC	Intel i5/i7/i9, 16GB DDR3-RAM, 2 x 1Gb/s Network interface, 1 x 240GB SSD mSATA 1 x 1TB HDD SATA, Windows 10 Professional/ LTSB 64Bit, Acronis Backup Software, Keyboard, Mouse, Operator Keyboard, 24" Full-HD IPS 16:9 Monitor
Dimensions and Weight	Camera unit (LxWxH): 36mm x 36 mm x 21 mm (1.41 in x 1.41 in x 0.83 in), weight ca. 300 g (0.66 lbs)
Connection values	230 V / 50 Hz P1 or 110 V / 60 Hz power consumption PC: 300 W power consumption monitor: 120 W



TOP AND BOTTOM INSPECTION



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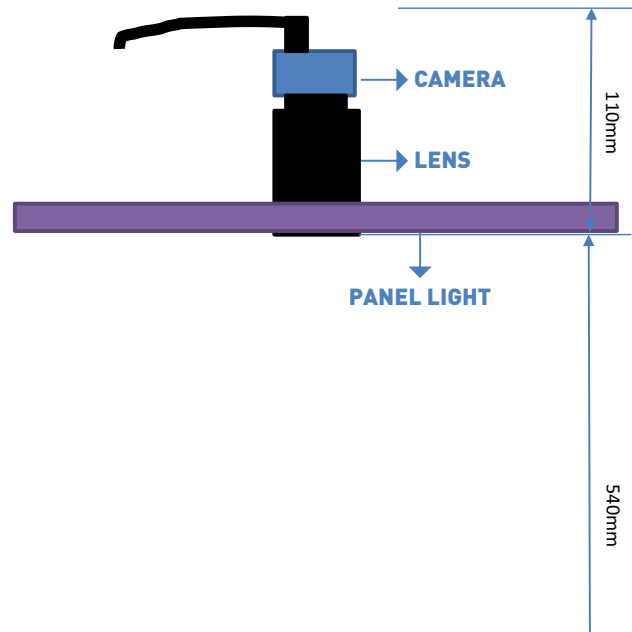
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EXAMPLE OF STRUCTURE

STRUCTURE TO BE INTEGRATED ON SL940

- 1 Camera System
Max FOV size 300*200mm
Distance from Lens to Object 540mm
Resolution 649dpi=39µm
- Calibrated System
 - » Lens correction
 - » Light homogenic calibration



SAMPLE USED

- Inspection time= 1.6s
- 16 PCB
- 32 Fiducials
- 3 dots by PCB
- 2 test per dot



OTHER SIZES FOV INFORMATION

For 20-40µm resolution configuration

XS 1 camera	FOV 160x110mm
S 1 camera	FOV 200x160mm
M 4 cameras	FOV 300x200mm
L 1 camera	FOV 300x200mm
LL 1 camera	FOV 400x300mm
XL 4 cameras	FOV 600x400mm

- Option for camera XS - S - L - LL - XL: Calibration kit (3 units)

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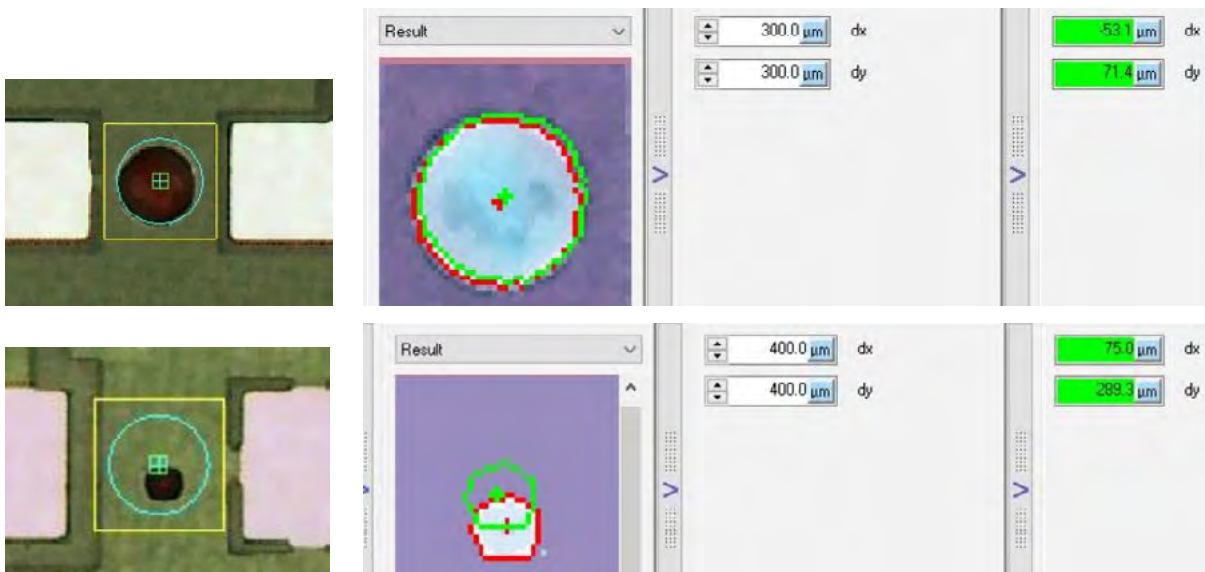
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POSITION INSPECTION

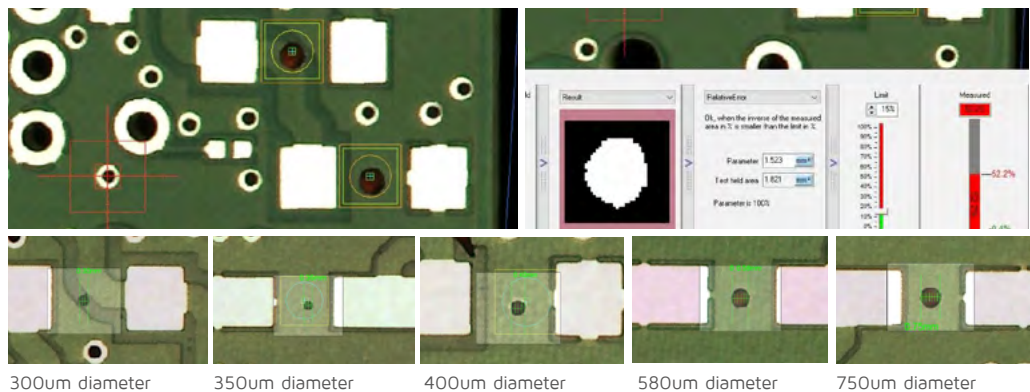
From the gravity center of the Glue deposit we calculate the X & Y deviation and setup a tolerance. Values can be always shown on inch, mil, um, pixels.



SIZE INSPECTION

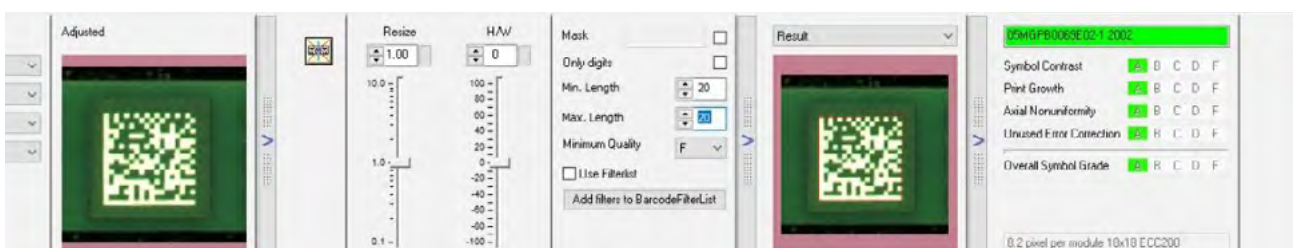
We can setup an area size and establish a tolerance around the nominal value in %

Example images for dots different sizes smaller calculated on trials



DATAMATRIX

Read capability with Classification of Quality Class A, B, C, D, F



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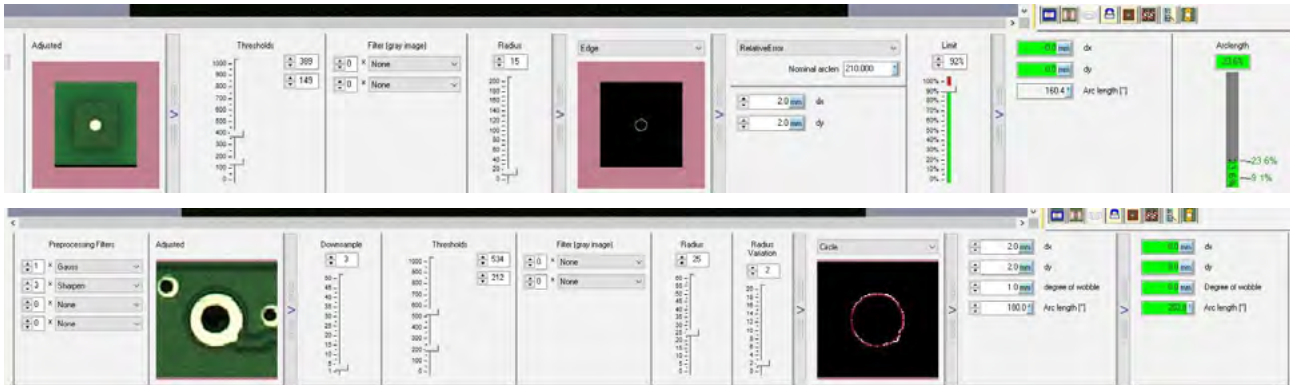
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FIDUCIAL

Different fiducial types detection using circle detection or match



SimpleBrightObject10	dx	dy
{300um1}_2#A11	0,14425	0,19193
{300um1}_2#A11	0,14571	0,19631
{300um1}_2#A11	0,14571	0,19631
{300um1}_2#A11	0,14296	0,19458
{300um1}_2#A11	0,1406	0,19704
{300um1}_2#A11	0,1406	0,19704
{300um1}_2#A11	0,1489	0,20052
{300um1}_2#A11	0,14335	0,1987
{300um1}_2#A11	0,14296	0,19904
{300um1}_2#A11	0,14571	0,19631
{300um1}_2#A11	0,14191	0,19439
{300um1}_2#A11	0,14191	0,19439
{300um1}_2#A11	0,14191	0,19439
{300um1}_2#A11	0,14936	0,19558
{300um1}_2#A11	0,14335	0,1987
{300um1}_2#A11	0,1406	0,19704
{300um1}_2#A11	0,1406	0,19704
{300um1}_2#A11	0,14191	0,19439
{300um1}_2#A11	0,14335	0,1987
{300um1}_2#A11	0,14335	0,1987
{300um1}_2#A11	0,14571	0,19631
{300um1}_2#A11	0,14694	0,19367
{300um1}_2#A11	0,14694	0,19367
{300um1}_2#A11	0,14459	0,19607
{300um1}_2#A11	0,14694	0,19367
{300um1}_2#A11	0,14425	0,19193
{300um1}_2#A11	0,14459	0,19607
{300um1}_2#A11	0,14191	0,19439
{300um1}_2#A11	0,1406	0,19704
{300um1}_2#A11	0,1406	0,19704
Mean	0,144	0,196
Sd	0,003	0,002
Low_Limit	-0,1	-0,1
High_Limit	0,1	0,1
Min	0,141	0,192
Max	0,149	0,201
DIF	0,009	0,009
R&R	8%	6%

SimpleBrightObject8	dx	dy
{700um1}_2#A1	0,053888	0,15753
{700um1}_2#A1	0,055578	0,15757
{700um1}_2#A1	0,054717	0,15638
{700um1}_2#A1	0,058047	0,16079
{700um1}_2#A1	0,055156	0,15917
{700um1}_2#A1	0,054277	0,15756
{700um1}_2#A1	0,054659	0,15663
{700um1}_2#A1	0,05706	0,15785
{700um1}_2#A1	0,05696	0,15585
{700um1}_2#A1	0,0546	0,15437
{700um1}_2#A1	0,057548	0,15614
{700um1}_2#A1	0,054308	0,15392
{700um1}_2#A1	0,051563	0,15439
{700um1}_2#A1	0,054308	0,15421
{700um1}_2#A1	0,054395	0,15459
{700um1}_2#A1	0,05454	0,15692
{700um1}_2#A1	0,05565	0,15614
{700um1}_2#A1	0,052649	0,15503
{700um1}_2#A1	0,05454	0,15313
{700um1}_2#A1	0,054945	0,15527
{700um1}_2#A1	0,056818	0,1557
{700um1}_2#A1	0,053583	0,15319
{700um1}_2#A1	0,053606	0,15439
{700um1}_2#A1	0,050974	0,15537
{700um1}_2#A1	0,052504	0,15575
{700um1}_2#A1	0,05597	0,15428
{700um1}_2#A1	0,050969	0,15662
{700um1}_2#A1	0,054281	0,15432
{700um1}_2#A1	0,051989	0,15537
{700um1}_2#A1	0,054367	0,15571
Mean	0,054	0,156
Sd	0,002	0,002
Low_Limit	-0,1	-0,1
High_Limit	0,1	0,1
Min	0,051	0,153
Max	0,058	0,161
DIF	0,007	0,008
R&R	5%	5%

EXTRACT OF R&R CALCULATION FOR SMALLER PADS

Read capability with
Classification of Quality Class
A, B, C, D, F

BACKEND LINE

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TRACEABILITY



PROCESS TRACKER:
**CONNECT TO FIS/MES
SYSTEM**



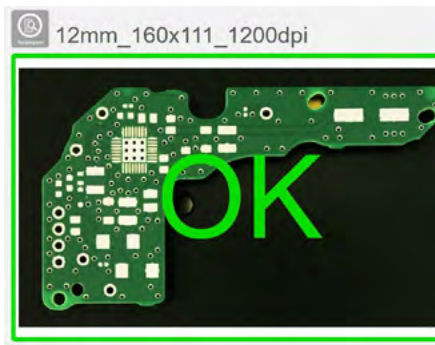
BAR CODE & DATA MATRIX
CODE READER SOFTWARE
CONNECTION



REAL TIME
MONITORING

INSPECTION APPLICATIONS

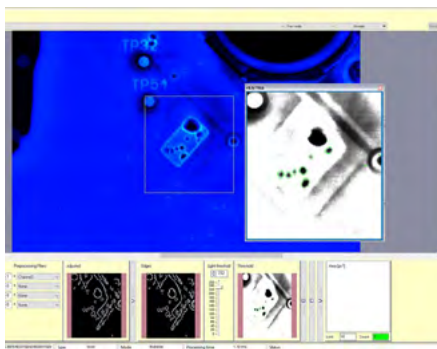
INSPECTION OF: Tray - Cutting - Glue - THT - Screw - Silicone - UV



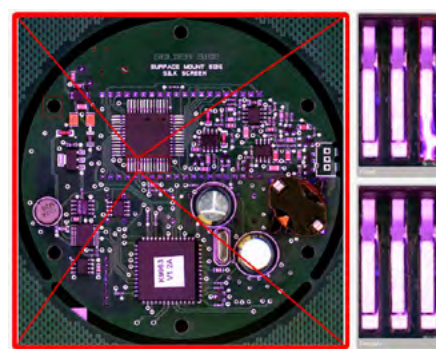
Cutting Inspection



Tray Inspection



UV Inspection



THT Inspection



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