Vision Measuring Software
RationalVue Features

The composite solution of for Touch probe

and non-contact probe for Image/ Lase scan/White light

Sinowon Innovation Metrology Manufacture Limited.

RationalVue fully inherited the features of CAD, with seamless link, 100% graphical display, fast drag-and-drop operation, real-time d/a ratio, multiple graphic report , advanced algorithm. So as to make it operate simply and functional, as well as to ensures the advanced nature and

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reliability of the algorithm.

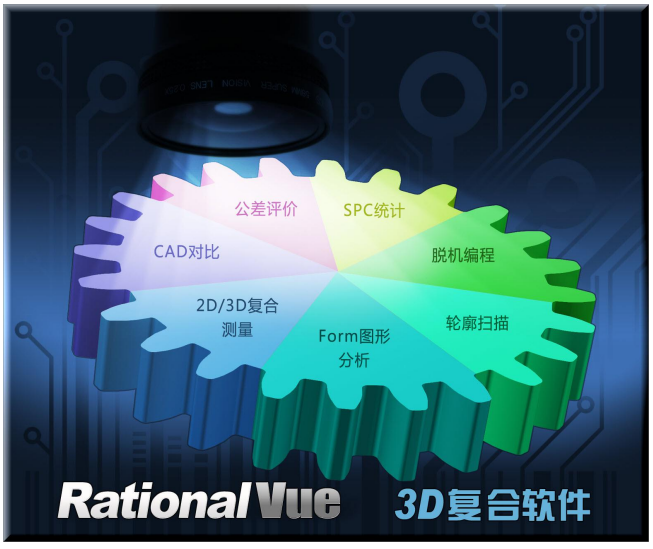
RationalVue is a kind of authentic 3D composite measuring software, leading vision measuring into 3D era, which has greatly expanded the applications of vision measuring machine, so as to make it authentically widely used in: Hardware, Mould, Machining, Precision Manufacturing, Automotive Parts, Stampings, Aerospace Components, Plastic & Rubber Products, Mobile Phone Industry, PCB Boards, Electronic Components, Semiconductor Components, Flat Glass (Touch Panels & LCD Panels), Medical Devices , tools and other fields.

Key features:

Support Win7, Win10 Systems

- Support Win7,Win10 system, the interface is fully in line with contemporary graphic designed style.
- Modular design, drag-and-drop operation. It completely avoids the problems in traditional software, with popping up complex windows, intricate operation steps, and interface stacking redundancy. Most of the functional implementation requires only 1-2 drags of the mouse.

One software, one complete solution



RationalVue broke trough past "image and probe functions need to be equipped and switch different software". With it, users can completely operate in one software interface and easily and accurately achieve the unified coordinate system!

1 set of RationalVue= 2D inspection comparison software + 3D inspection comparison software+ CAD reverse software + form analysis software + contour scanning software + SPC statistical analysis software + offline programming software + Geometric tolerance evaluation software

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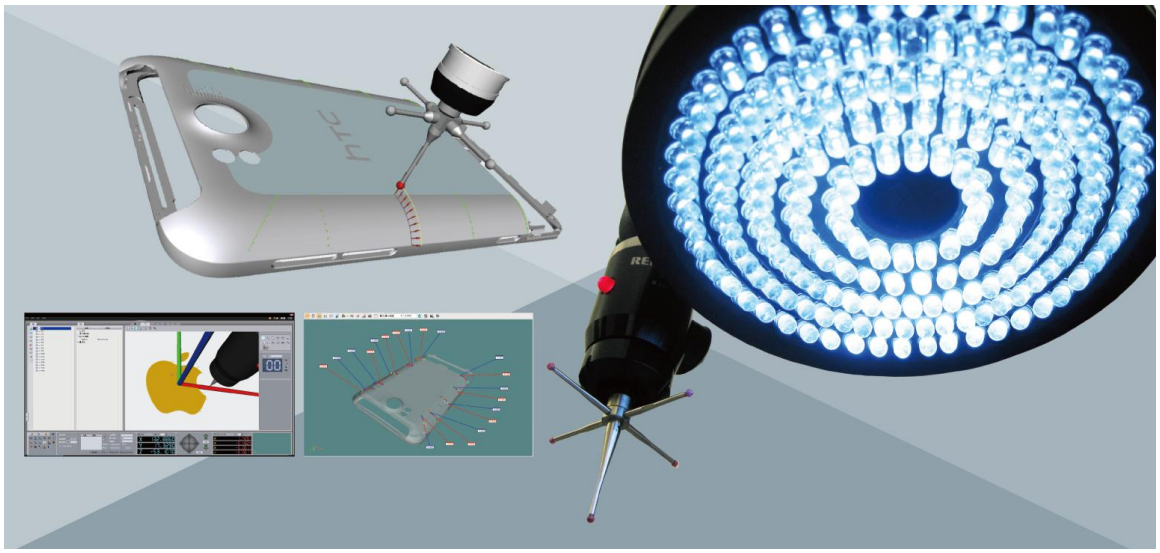
Fast operation, high efficiency

- Drag-and-drop operation: "1 mouse click" + "1 mouse drag" = powerful function
- Based on CAD, fast comparison
  - Iges 3D image file, DXF format and CAD profile can be imported
  - CAD directly used to guide measuring and complete the comparison between the actual and theoretical functions. Makes measurement efficiency improved by 2-3 times.
  - Can finish the Measurement of positional tolerances, profile contours, profile contours, and other ISO tolerances.



- Automatic Program
  - Image, probe measurement, coordinate system, autofocus, magnification, light brightness adjustment, CAD theory element identification, automatic comparison measurement, element construction, tolerance calculation, and output can all be added to one program at the same time and run automatically. And can freely change the detection order.
  - The procedure is easy and quick to modify. Can quickly modify the program's lighting, magnification, height, and modify the program's measurement sequence
  - With the same elements under one screen, the machine can automatically finish the measuring at a time without move.
  - Automatically judging NG/OK of products and will highlight the error.

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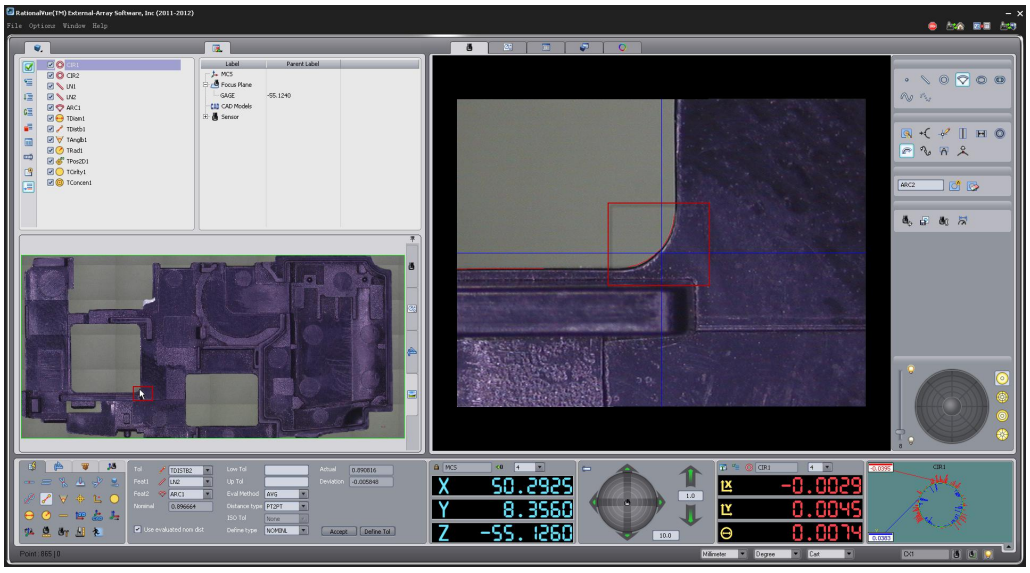
- Support offline programming & virtual measurement
  - Offline programming: Iges and DXF image file can be imported, based on CAD to make programming as well as writing data output and check programs.
  - Virtual measurement: The entire image of the specimen can be spliced into a complete graphic. In disconnect from machines and absence of specimen, do demonstration and teaching to the customer.



Adopt world advanced algorithms to improve performance and accuracy

- Complete machine compensation algorithm
  - Support 21 kinds of error compensation: linearity, straightness, angle pendulum, verticality...
  - Support Z-axis rotation compensation, Z-axis verticality compensation, Z-axis probe compensation (with probe), lens XY proportional distortion correction

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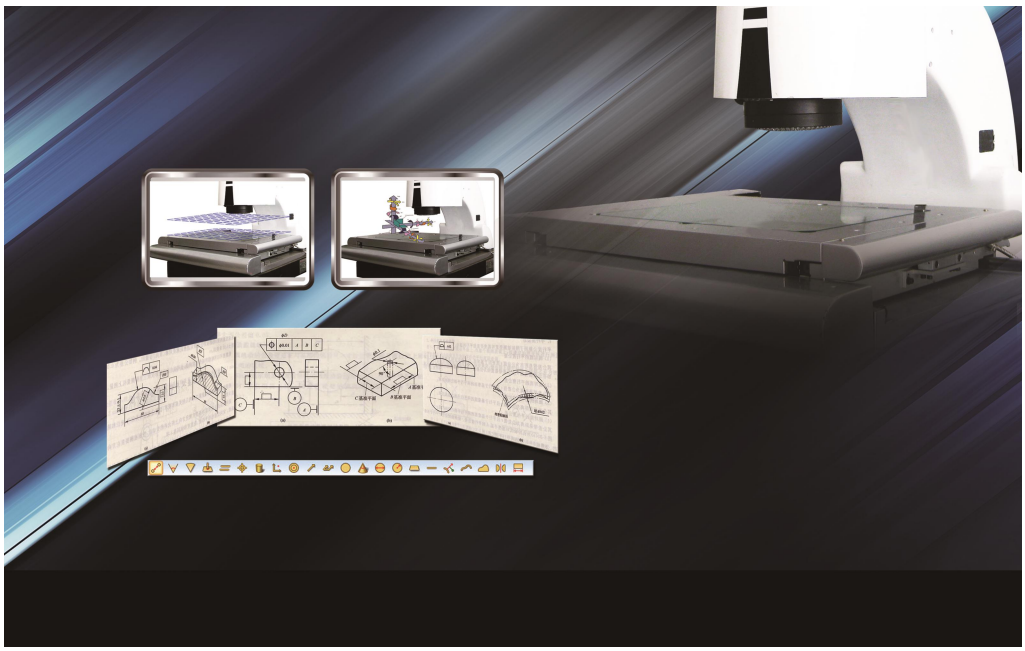
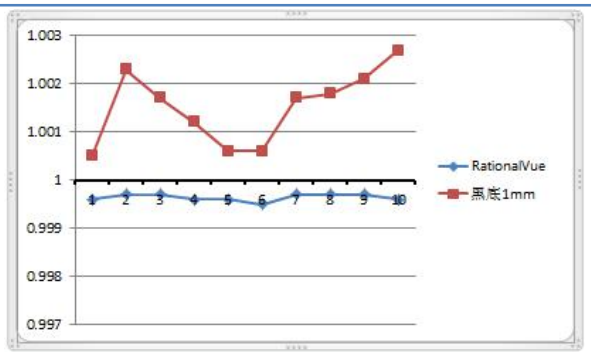
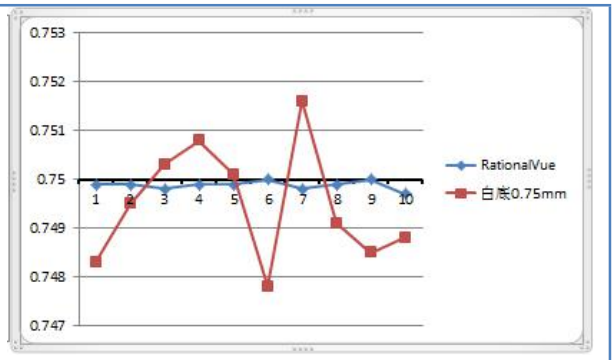
- Support OEM compensation encryption
- Support multi-layer space patching to maximize the measurement accuracy of the machine



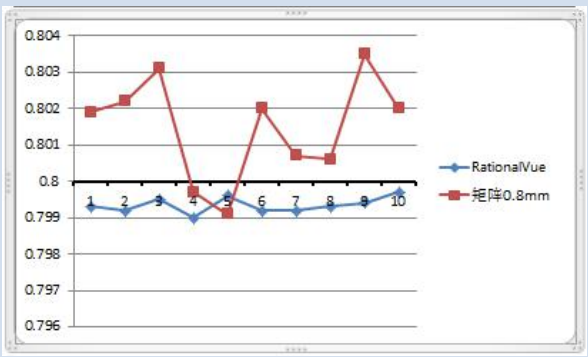
■ By comparison, the measuring accuracy and repeatability result measured by RationalVue (blue line) have improved greatly：

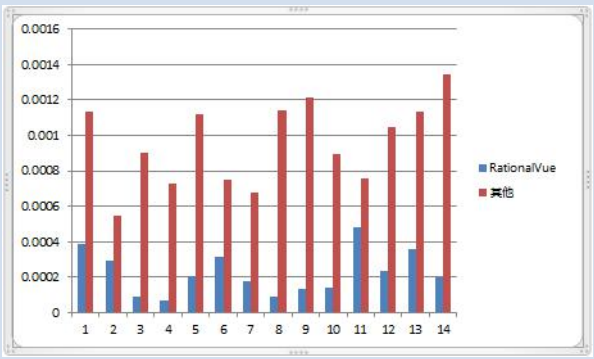


Black border, 1mm hole



White border, 0.75mm hole





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0.8mm Matrix shaped porous	Repeatability

- Pixel Algorithm

The use of the world's most advanced sub-pixel algorithm, greatly reduces the impact of software algorithms on measurement accuracy in optical measurement.

Maximize promote repeatability and measurement accuracy.

- Multiple element calculation algorithm to adapt to different measurement requirements

Circle: Least Square Method, Minimum Coverage Circle, Maximum Empty Circle, Minimum Radius Difference.

Arc: least square method, minimum radius difference.

Surface: Least Square Method, Minimum Plane Distance, Slice Plane Method.

Cylindrical: least squares, smallest covered cylinder, largest aperture cylinder.

Full-featured and powerful

- The most complete geometric measurement

2D element : points, lines, circles, arcs, curves, keyways, rectangles, ellipses	
3D element: Plane, sphere, cone, cylinder, ring, surface	

- Complete and diverse element measurement tools
  - Automatic measurement tools make it easy to automatically determine measurement circles, lines, and arcs.
  - Extremum measurement tool, which can measure the position of the protrusion, similar to the gold finger product, it needs this function to complete.
  - Rectangle, slot, and ellipse tools make it easy to measure the corresponding product.

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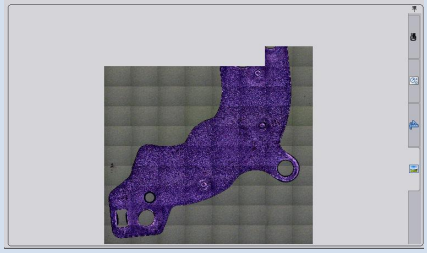
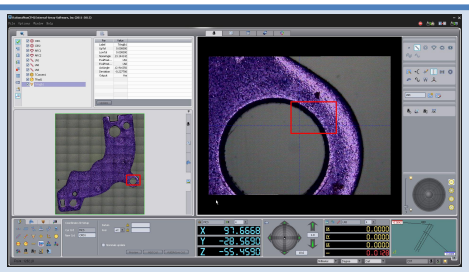
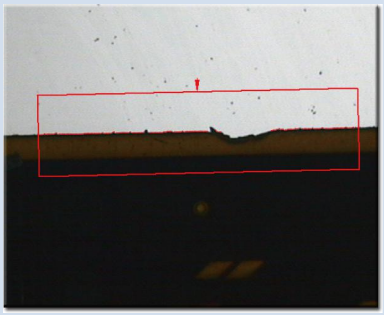
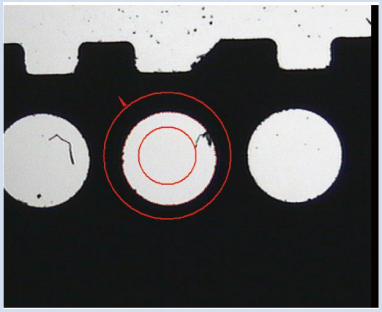
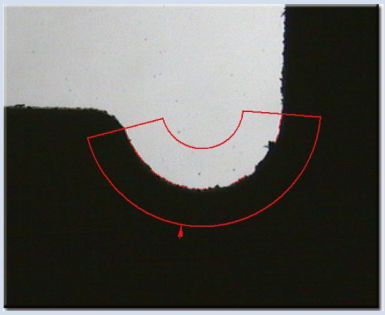
■ Workpiece Jigsaw & Navigation

● Complete image of specimen is stitched in actual time. The following figure shows the real-time process ● The jigsaw algorithm has been optimized, the seams are very small, can be used for product observation, or other software image measurement	The panoramic image of specimen can be scanned out and used directly for GPS navigation to quickly find the position to be measured. The measurement process is no longer lost.
	

■ Special edge measurement

Burr Filtering

Filtration performed on the specimen, removing the protuberance or recess, measuring the complete parts, which greatly improve the accuracy of the measurement

Strong Edge Function

Self-developed world-leading strong edge feature that can easily pick up the blurry edges and other matte edges,

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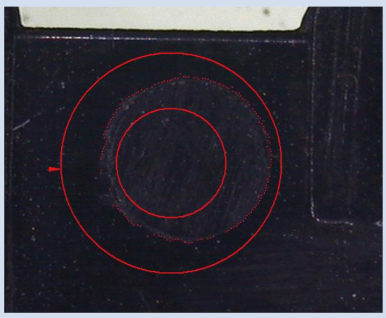
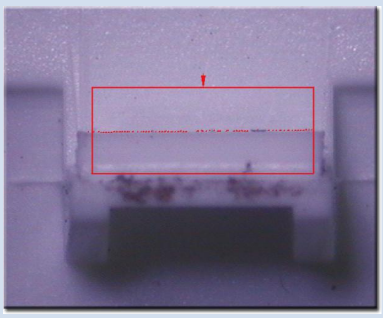
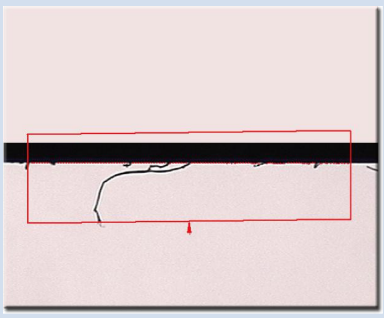
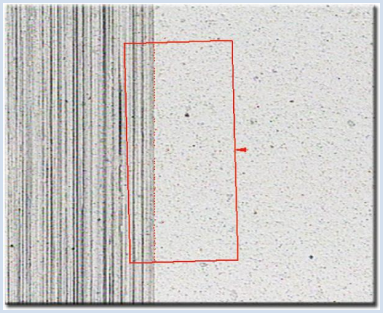
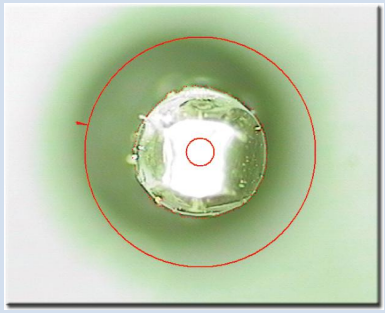
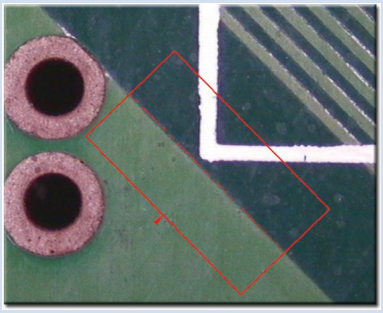
truly achieve automated measurement

Special Edge Processing

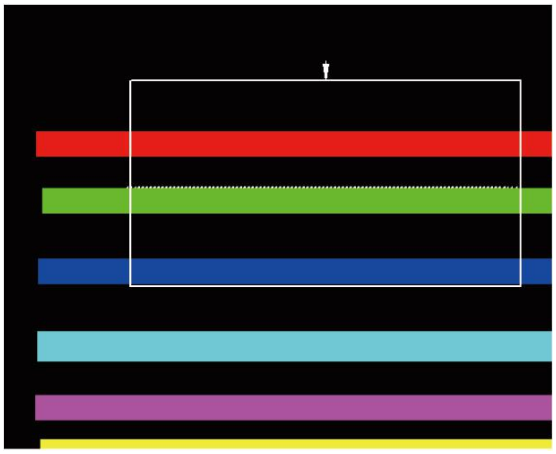
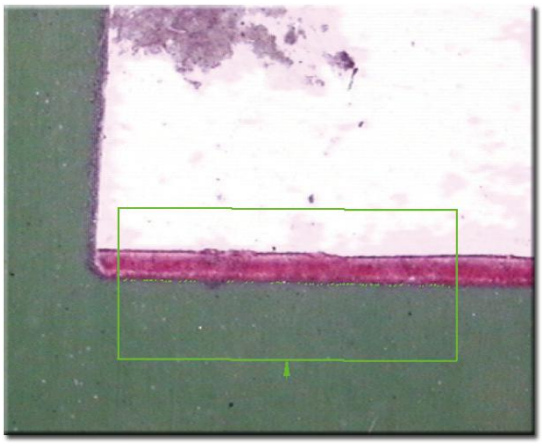
RationalVue lots of measuring settings, which can be set according to the actual situation to meet different measurement environments and complete the specimen CNC testing.

Remove impact of edge impurities	Remove impact of the edge shadow	Remove impact of edge white bright

Color Filter

Gray Filter

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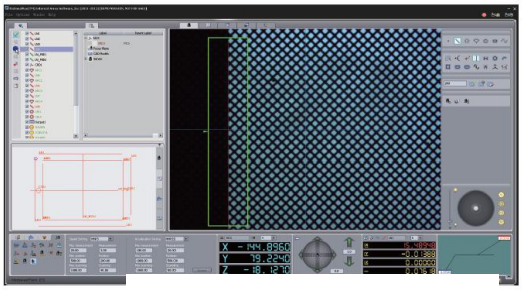
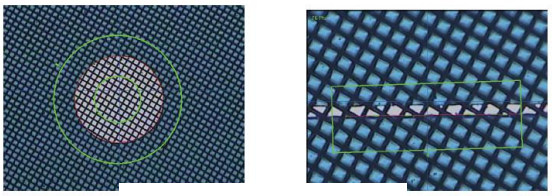
Setting the color to be measured, can remove the effect of color not to be measured	Set the filtered edges that don't need measuring to achieve measurements of relatively weak edge not effected by strong edge

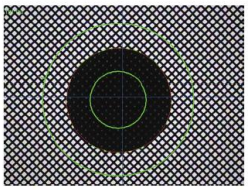
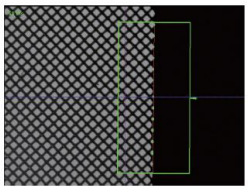
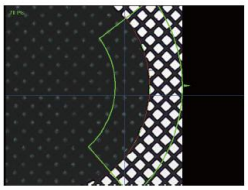
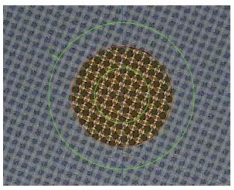
Silk Screen Measurement



Ipad Screen Measuring



Surface Light Measuring

As the professional measurement tool for the screen, it can easily finish the linear measuring. Applied in screen printing measurement of solar energy, television, mobile phone and other industries

The surface light can also easily remove the influence of the outer edge, to measure the edge of the product conveniently and quickly .

Judgement of black and white edge

The software can judge and record the measuring position is from black to white or white to black, so as to get the position which is about to be measured, at the same

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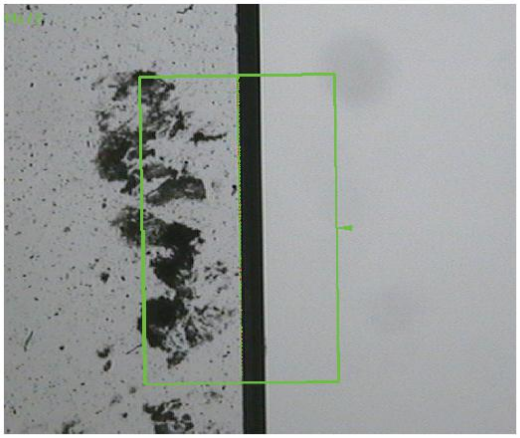
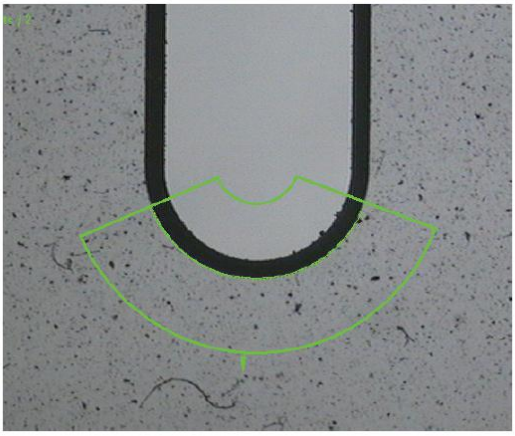
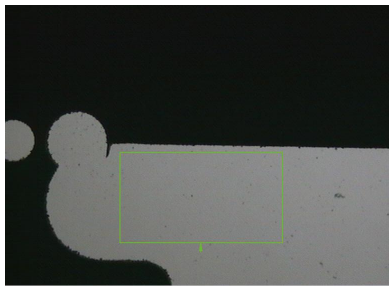
time, it will record into the measuring program to ensure the accuracy next time.

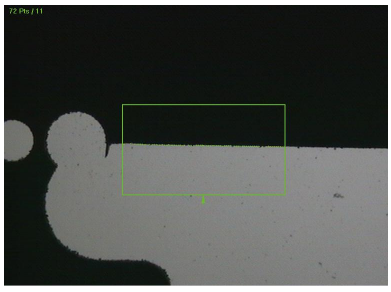




Automatic Tracing-edge

For the soft specimen or the ones processed with big error, the tool box may fail to find the product edges. This will make the program can't finish autoexec.
However, RationalVue, that has uncomparable relocation and automatic tracing-edge function which could locate the position to be measured fast and accurately.





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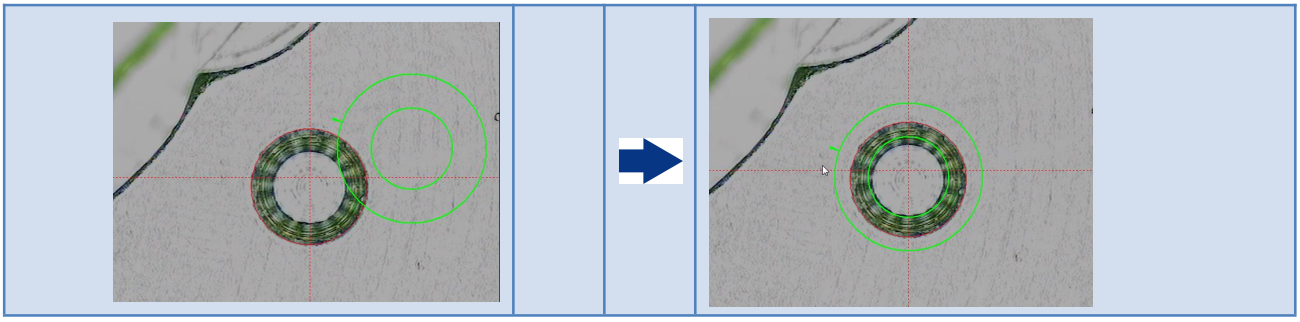

By contrast, when come to the special edges, traditional and other software will be helpless or simply by the step of reducing border distance or by manually catching. There will be 3 disadvantages of them:

1. Inaccurate (matte, color, grayscale, highlight, corona, etc. are not removed).
2. Automatic operation cannot be ensured (because the specimen cannot be the same, nor can it be placed in the same position completely), if the position is slightly deviated and the automatic program will be forced to stop.
3. poor repeatability (The human eye can only be subdivided into 1 pixel. Manual re-crawling can not eliminate interference.).

RationalVue can solve the above 3 problems easily!

- Relocation

For small products, or products with large machining errors or products whose measuring position cannot increase the measuring tool frame, we can use the relocation function to help find the correct position of the tested product.

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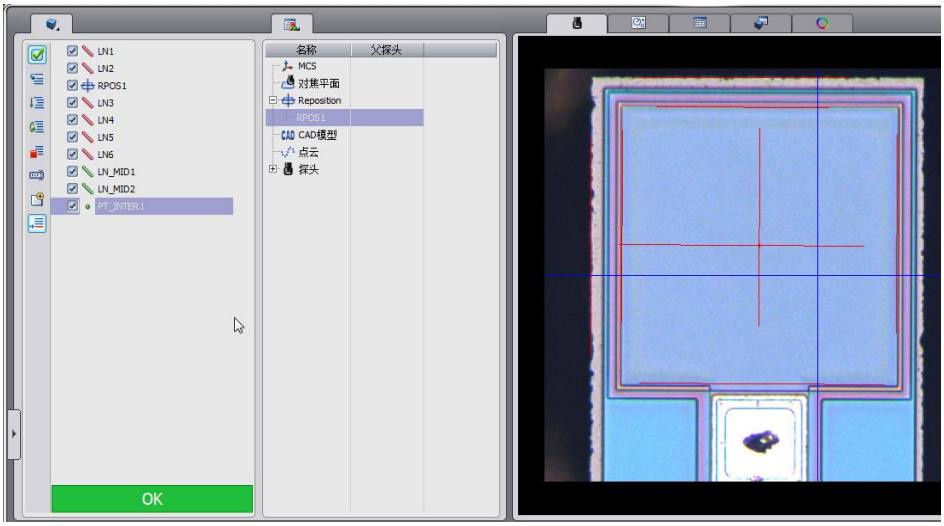
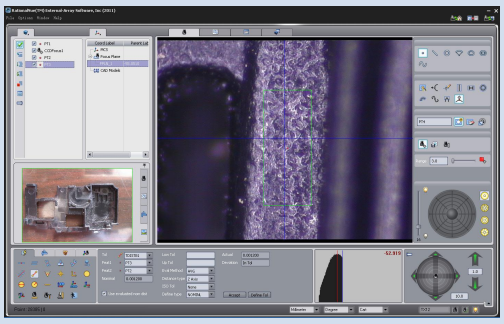
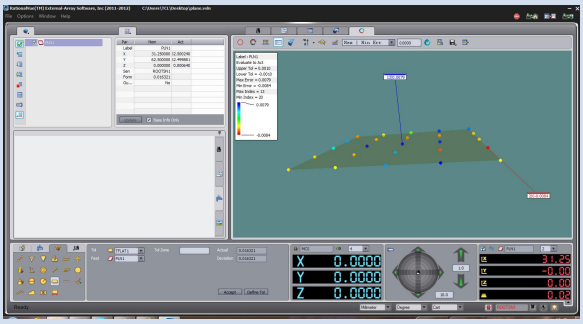


■ Focus measurement height, flatness

The independent focusing algorithm developed by RationalVue can quickly and accurately complete the focusing of the specimen and complete the fast focusing within 2-3 seconds. The repetitive focusing accuracy can reach 0.003mm. It can be used for the measurement of tolerances such as height and flatness.



Auto-focusing



Flatness Calculation

■ Curve Contour Scanning.

- The software can automatically scan the entire closed curve and compare it with the imported CAD theoretical curve, and output the FormError report.
- Calculate the perimeter of the curve, measure the perimeter and diameter of seals, O-rings, acoustic covers, etc., and calculate the highest point of the curve. Example: Measuring the distance from a Samsung mobile phone's curved glass.

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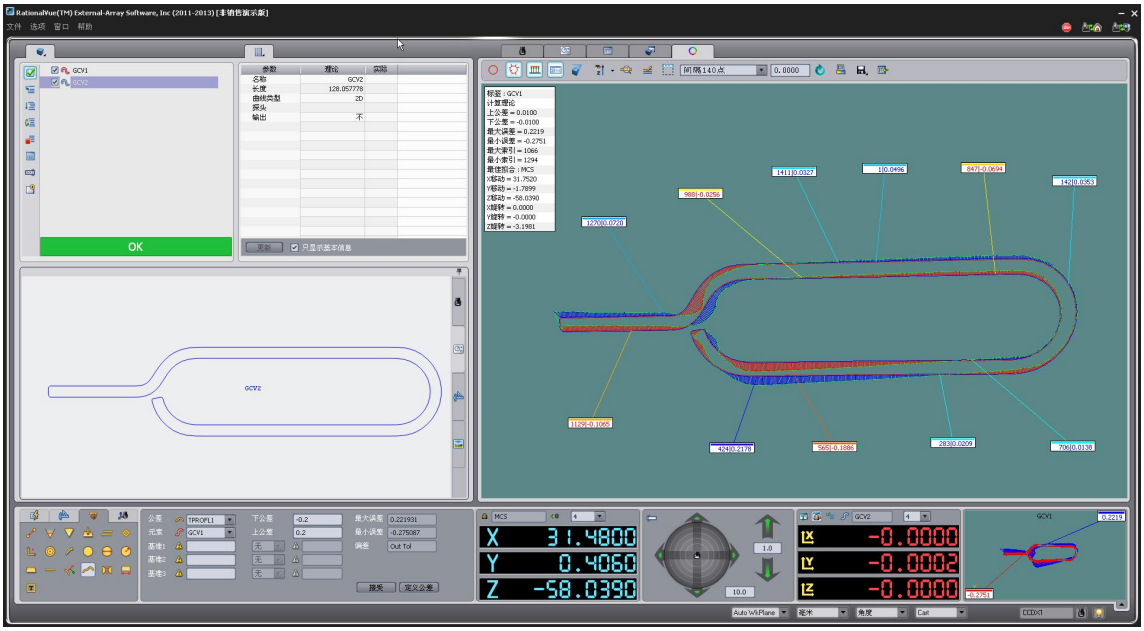

- Probe/image composite measuring
  - Real CAD 3D view.
  - CAD element points, lines, circles, arcs, planes, cylinders, cones, spheres, curves, surfaces automatically identified (without manual input theory).
  - Image and probe coordinate system are merged, and the measured elements are automatically unified.
  - Image and probe programs can be interspersed throughout the same program.

- The most complete calculation of dimensional tolerances (including: 2D and 3D

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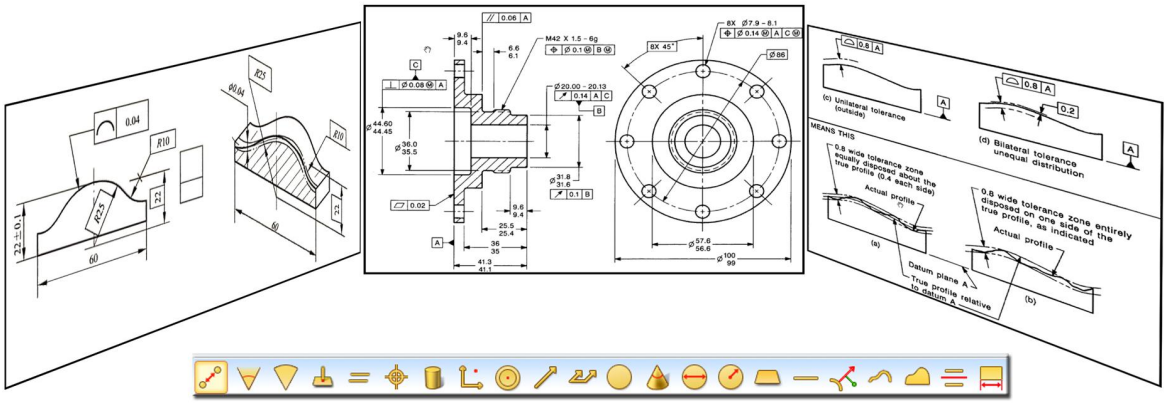
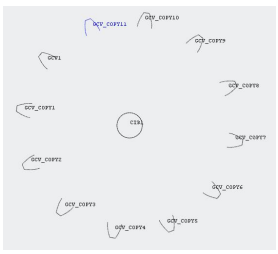
dimensional tolerances, shape tolerances, position tolerances). Strictly follow the international GD&T evaluation standards, in line with ISO (including German DIN standards) and the United States Y14.5M and GB and other standards.

- Distance (maximum distance, minimum distance, average distance, space distance), angle, diameter, radius, cone angle.
- Straightness, flatness, roundness, cylindricity.
- Verticality, tilt, parallelism, symmetry, concentricity, concentricity, positional degree (2D & 3D), point contour, curve contour, surface contour, round runout, full jump...

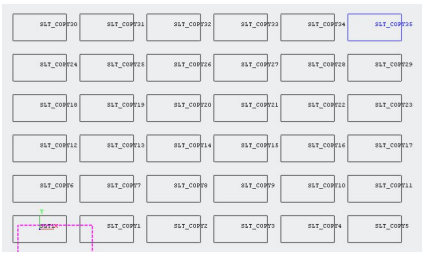


- Complete Graphic Construction

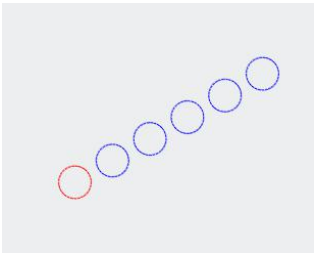
Can complete arrays, intermediate points, symmetry, projections, fittings, intersections, tangents, extreme values, etc.



Rotating array



Matrix array



Arrays in a straight line

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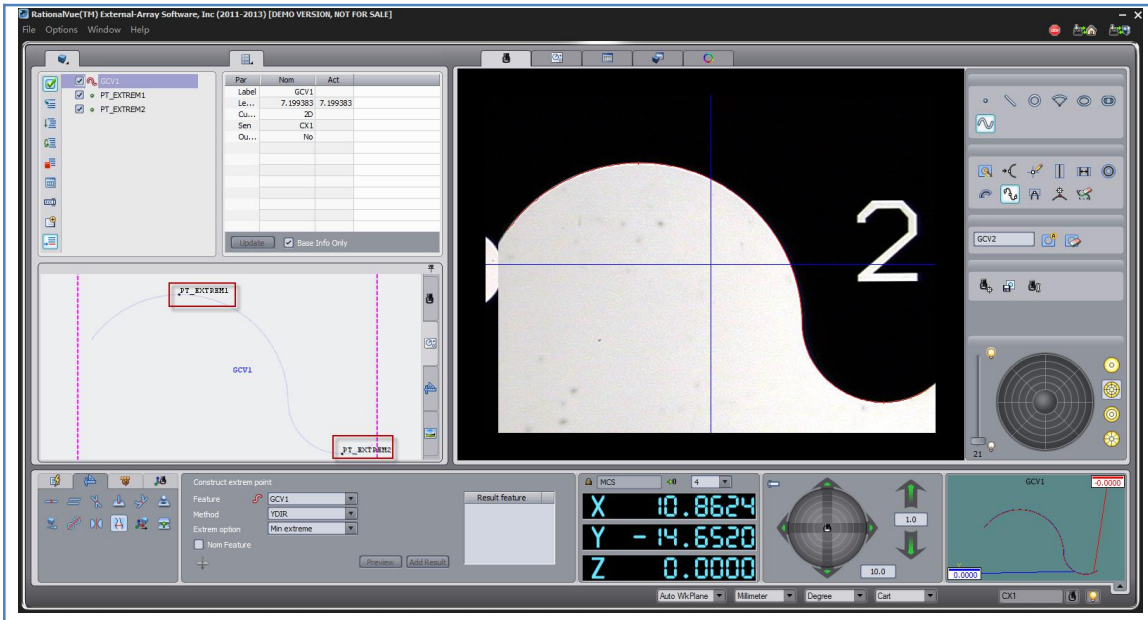
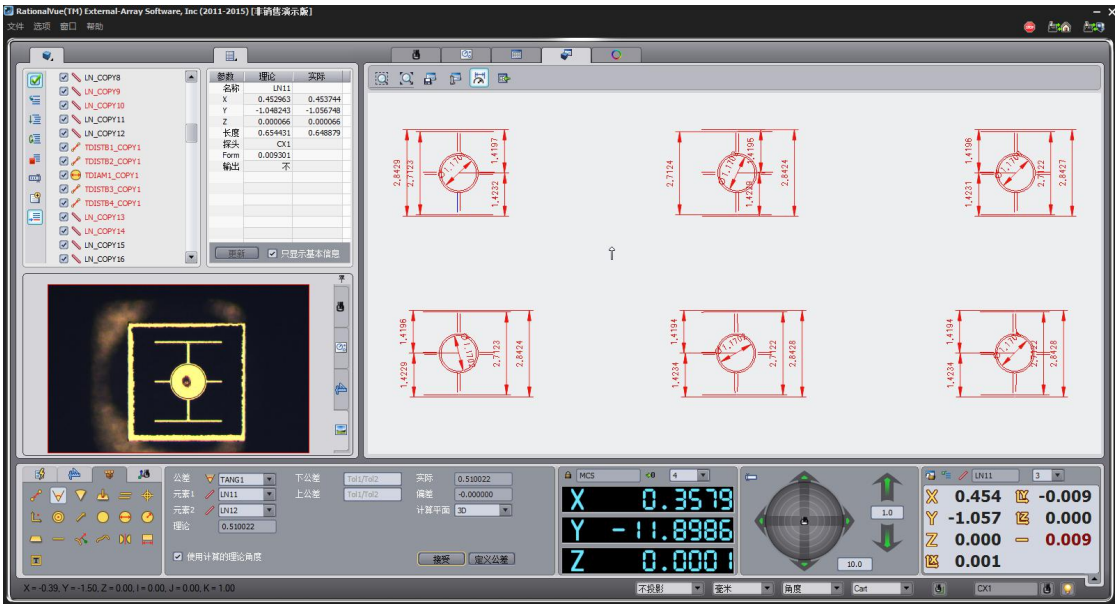


Extremum Calculation

■ Support program Copy

Can achieve coordinate level, measurement elements, and overall level of construction elements and tolerances Copy and Rotate Copy, greatly improving program editing efficiency.



■ Supports Program Mirroring

Symmetric products are very common in production, so the program image is essential, RationalVue can achieve program image function, improve program editing efficiency.

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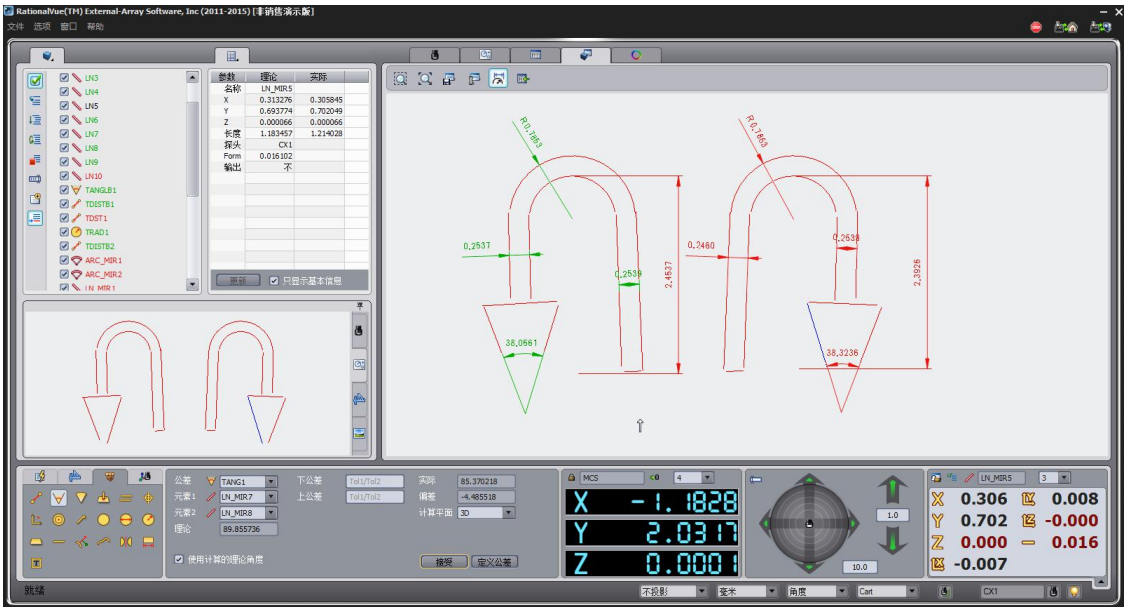
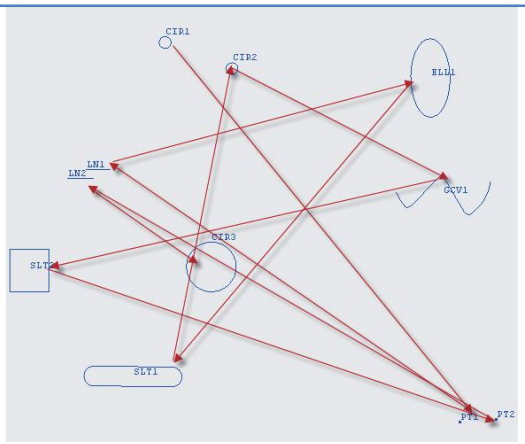


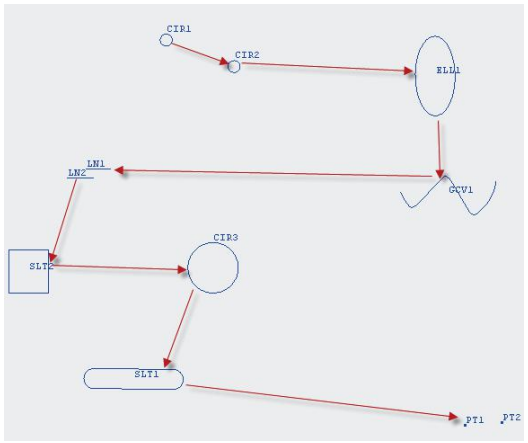
- Supports program measurement path optimization

  Optimize the measurement path to be the shortest, and all elements in the same screen that the measurement can be finied at a time without machine moving.

  Minimize machine movement and shorten measurement time as much as possible to improve measurement efficiency and save time and cost for customers.



Before Optimization



After Optimization

Output Data

- Can output PDF, Excel, TXT, Html, DMO (DMIS standard format), pictures, etc, a variety of reports.
- Dimension & tolerance annotation: distance, Angle, radius, diameter, roundness, straightness, location, the reference element tag..., and show whether the

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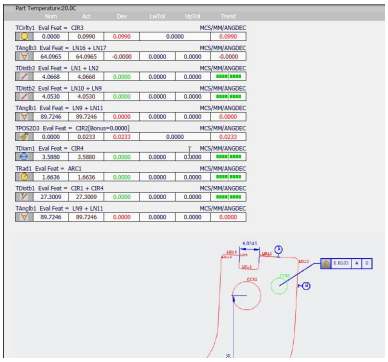
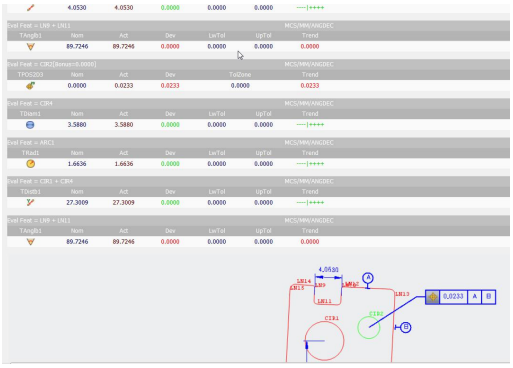
tolerance is overproof by color.

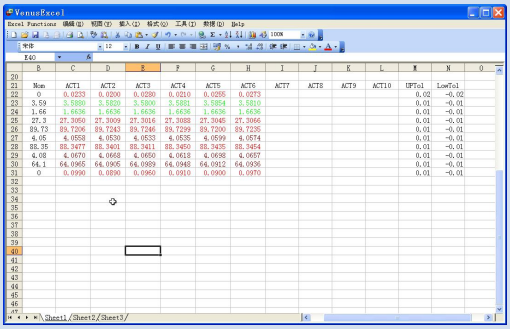
- FormError graphics: setting up tolerance zone, color display graphical trends, maximum minimum display, spacing error...



PDF format

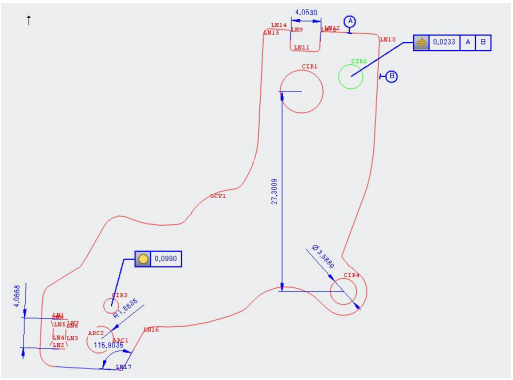


Html format

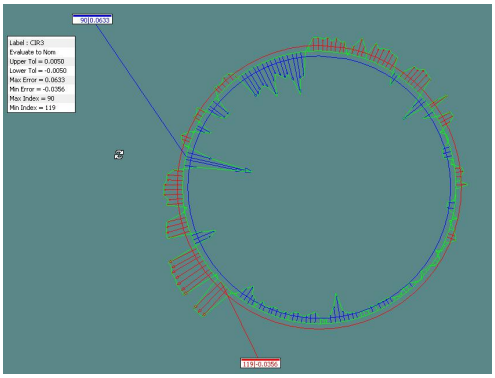


Excel Format

TXT Format



Dimensions and tolerances



Form Error

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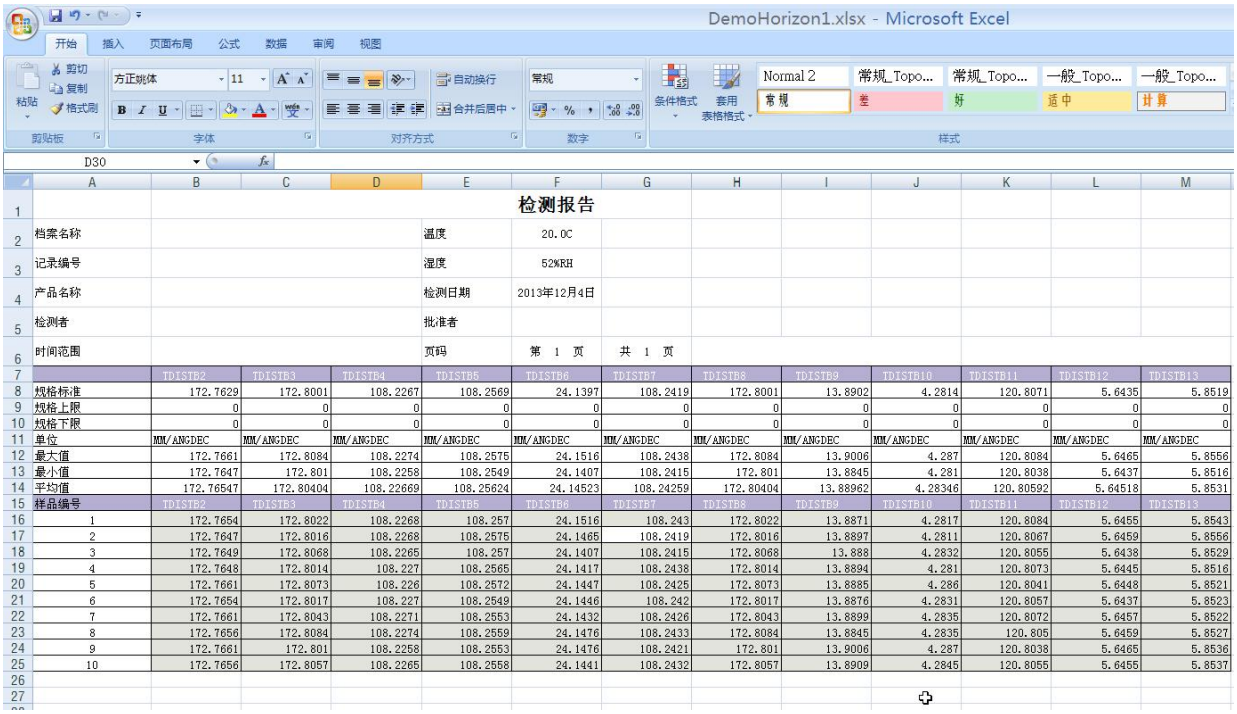
- **Customizable output Excel profile**



DemoHorizon1.xlsx - Microsoft Excel

检测报告

档案名称		温度	20.0C	
记录编号		湿度	52%RH	
产品名称		检测日期	2013年12月4日	
检测者		批准者		
时间范围		页码	第 1 页	共 1 页

	TDISTB2	TDISTB3	TDISTB4	TDISTB5	TDISTB6	TDISTB7	TDISTB8	TDISTB9	TDISTB10	TDISTB11	TDISTB12	TDISTB13
规格标准	172.7629	172.8001	108.2267	108.2569	24.1397	108.2419	172.8001	13.8902	4.2814	120.8071	5.6435	5.8519
规格上限	0	0	0	0	0	0	0	0	0	0	0	0
规格下限	0	0	0	0	0	0	0	0	0	0	0	0
单位	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC	MM/ANGDEC
最大值	172.7661	172.8084	108.2274	108.2575	24.1516	108.2438	172.8084	13.9006	4.287	120.8084	5.6465	5.8556
最小值	172.7647	172.801	108.2258	108.2549	24.1407	108.2415	172.801	13.8845	4.281	120.8038	5.6437	5.8516
平均值	172.76547	172.80404	108.22669	108.25624	24.14523	108.24259	172.80404	13.88962	4.28346	120.80592	5.64518	5.8531
样品编号	TDISTB2	TDISTB3	TDISTB4	TDISTB5	TDISTB6	TDISTB7	TDISTB8	TDISTB9	TDISTB10	TDISTB11	TDISTB12	TDISTB13
1	172.7654	172.8022	108.2268	108.257	24.1516	108.243	172.8022	13.8871	4.2817	120.8084	5.6455	5.8543
2	172.7647	172.8016	108.2268	108.2575	24.1465	108.2419	172.8016	13.8897	4.2811	120.8067	5.6459	5.8556
3	172.7649	172.8068	108.2265	108.257	24.1407	108.2415	172.8068	13.888	4.2832	120.8055	5.6438	5.8529
4	172.7648	172.8014	108.227	108.2565	24.1417	108.2438	172.8014	13.8894	4.281	120.8073	5.6445	5.8516
5	172.7661	172.8073	108.226	108.2572	24.1447	108.2425	172.8073	13.8885	4.286	120.8041	5.6448	5.8521
6	172.7654	172.8017	108.227	108.2549	24.1446	108.242	172.8017	13.8876	4.2831	120.8057	5.6437	5.8523
7	172.7661	172.8043	108.2271	108.2553	24.1432	108.2426	172.8043	13.8899	4.2835	120.8072	5.6457	5.8522
8	172.7656	172.8084	108.2274	108.2559	24.1476	108.2433	172.8084	13.8845	4.2835	120.805	5.6459	5.8527
9	172.7661	172.801	108.2258	108.2553	24.1476	108.2421	172.801	13.9006	4.287	120.8038	5.6465	5.8536
10	172.7656	172.8057	108.2265	108.2558	24.1441	108.2432	172.8057	13.8909	4.2845	120.8055	5.6455	5.8537

- Supports thirteen major languages in English, simplified/traditional Chinese, German, French, Spanish, Italian, Russian, Dutch, Czech, Polish, Korean, Japanese, Hungarian, etc.

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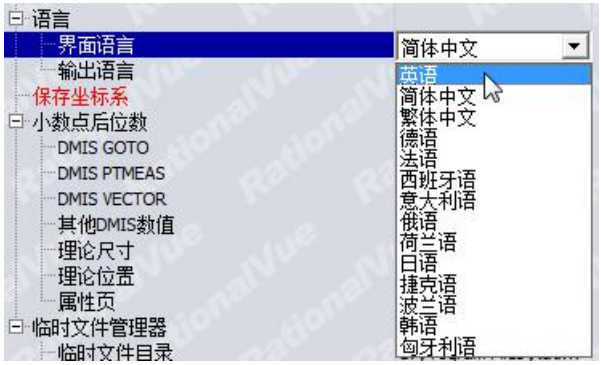


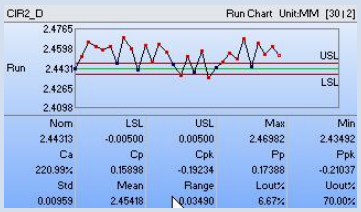
■ SPC Statistics

The built-in SPC statistical analysis module of RationalVue provides a complete set of control charts, such as: XBar-S (mean and standard deviation maps), XBar-R (mean and polar maps), XBar-Rm (single-valued and mobile polar maps), Histogram (histogram) , Capability (normal distribution)...

Real-time calculation of relevant parameters: Ca, Cp, Cpk, Pp, PpK, Std, Max, Min, Range, Lout%, Uout%...

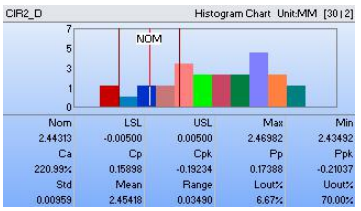
XBar-S

XBar-R

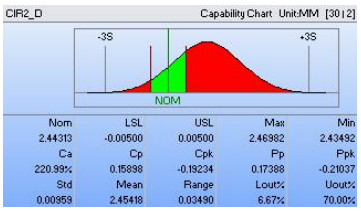


Run-Chart

XBar-Rm



Histogram



Capability

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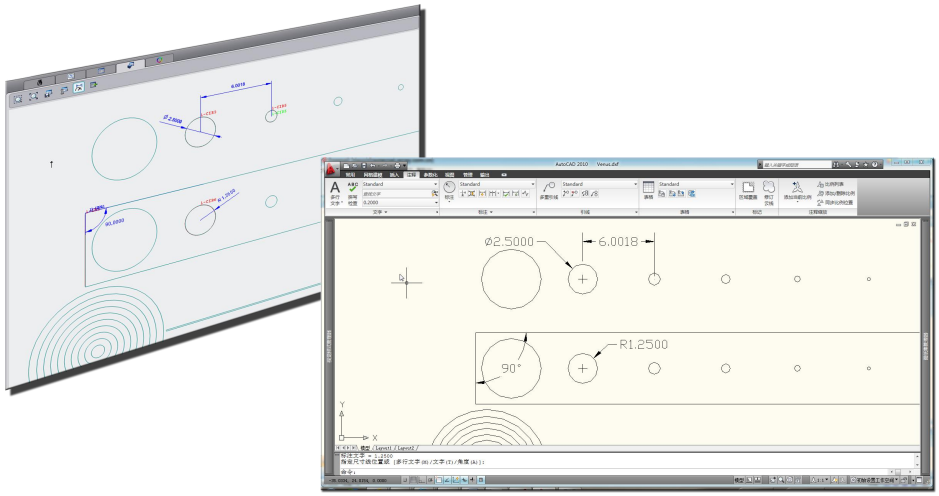
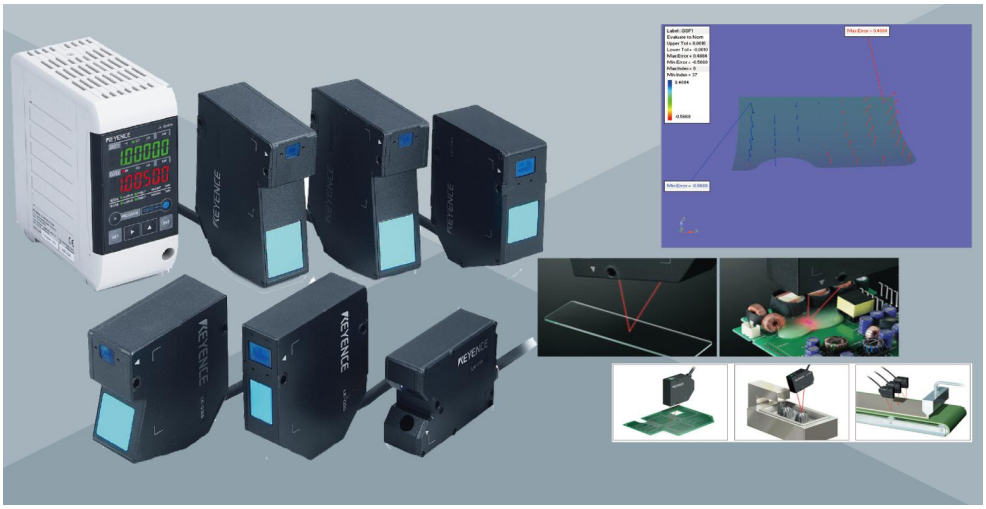
Reverse Engineering

- RationalVue can export measurement products as DXF and 3D Iges format data to achieve reverse engineering.
- Output product point cloud data as Iges, DXF or TXT.



Support laser Measurement

- Supports KEYENCE and Panasonic laser scanning probes.
- Professional laser measurement function, can finish automatically non-contact measurement, and complete the calculation of specimen's height, flatness, contour profile.
- The flatness of the plane can be quickly measured by scanning and the measurement efficiency can be improved by 3~10 times.



Support white light measurement

Support Precitec white light measurement

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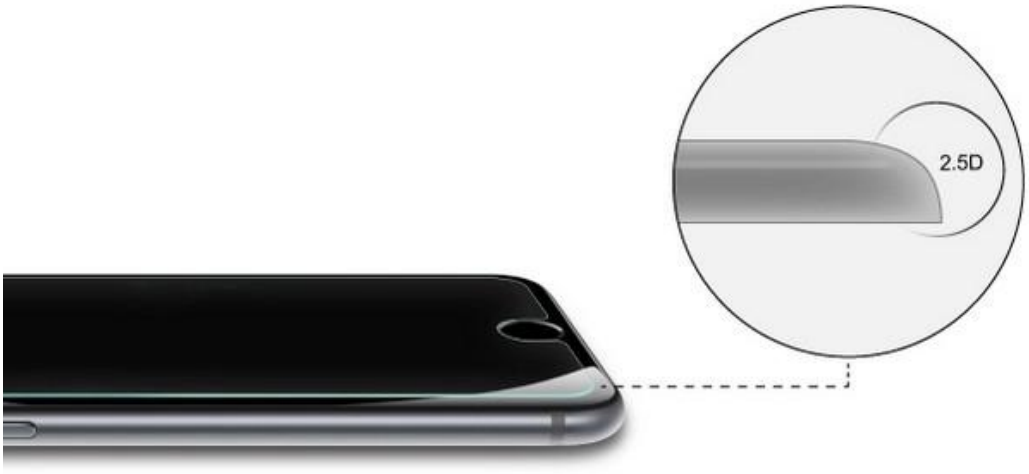
Non-contact non-destructive inspection

- Non-contact measurement of various materials such as glass and film
- Measure mobile/flat glass flatness
- Measurement of cell phone/plate glass thickness
- Measure 2.5D glass curve profile
- Narrow gap height measurement

Confocal principle and ultra-small spot make it easier to measure narrow gap heights



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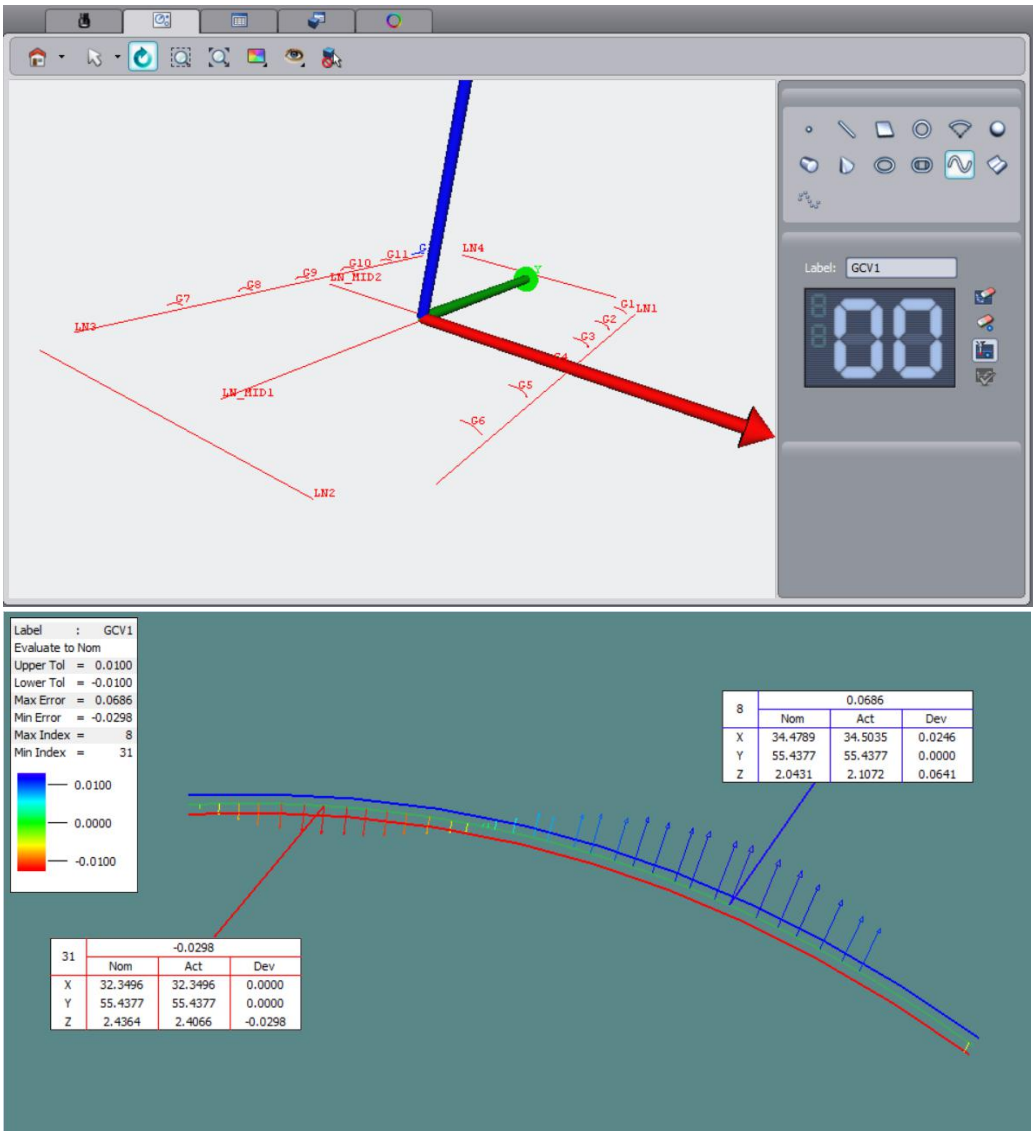

International Standard

- PTB Algorithm

The German National Institute of Physics (PTB) is a globally recognized authority for software algorithm certification. The core algorithm of RationalVue has passed PTB certification, and the accuracy, compatibility, and reliability of software algorithms have been recognized by the authorities.

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- DMIS kernel Program

DMIS (Dimensional Measuring Interface Standard): provides a unified standard for bidirectional detection data transfer between computers and measuring devices. The RationalVue kernel complies with the DMIS standard and can be extended to implement more measurement methods and more functions, and to perform procedures with other DMIS-compliant devices.

Please contact us to get to know information of vision measuring machines:

Sinowon Innovation Metrology Manufacture Limited.

China National Authorized High-Tech Metrology Manufacturer

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