



Wide Measuring and Quality Control Solutions

Smart_Projector Series

Advanced Measuring Instruments
Fast, Accurate, Compact, Powerful and Easy-to-use

Smart_Projector Series

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About Smart_Projector

Industrial Video Measuring & Dimensional Inspection Machine



"Smart_Projector allows automatic, objective, repeatable, easy and fast dimensional quality check of a wide range of items"

Fast & Easy

Smart_Projector by SmartVision is the first and exclusive instrument designed to perform a **complete and automatic check** of wide range of components in a fast and easy way.

Automatic & Productive

This machine is the **revolutionary digital evolution** of the traditional profile projector and micrometer caliper. It allows to check an **unlimited number of measurements per item in just few seconds**. There is no need for part alignment, no manual collimation nor focus and there are not moving components inside the Smart_Projector.

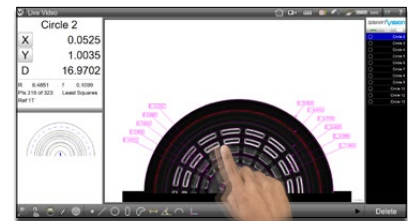
Accurate

Smart_Projector provides objective and repeatable measurements and promptly show a « Pass / Fail » semaphore output, **with no contribution nor interpretation by the operator**, ensuring a full automatic evaluation and reporting of all control activities in compatible and ready-to-print Excel files (XLSV, CSV, TSV, TXT), PDF and Image files.

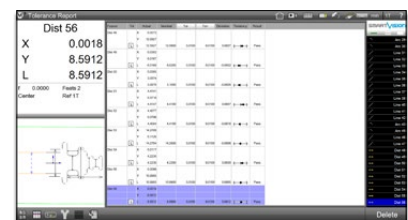
Industrial & Compact

Smart_Projector is a fast, compact, rugged, static, easy-to-use and easy-to-program device, **designed for harsh environments and heavy duty cycles use**.

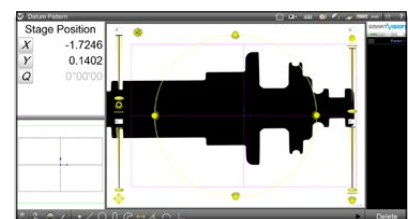
Smart Software: TOUCH & MEASURE!



- Multi touch-screen software
- Automatic feature recognition



- Automatic data report
- XLSX / CSV / TSV / TXT / PDF



- Software programmable light
- Front / Back light

Hardware Features

Vertical & Horizontal Use: The Power of Two Smart_Projectors in One

Resistant stainless steel industrial case
Compact static device

Industrial high-resolution camera

High performance Bi-Telecentric Optics

Software programmable
Episcopic Light
(4 independent sectors)



Software programmable
Collimated Diascopic Light

Protected measuring chamber
Easy object placement
Customizable loading plate
Rotating Stage for 360° Measurements

Suitable for the production line
Ready for automation

All-in-One PC Touchscreen

Smart_Horizontal_Adapter_Kit

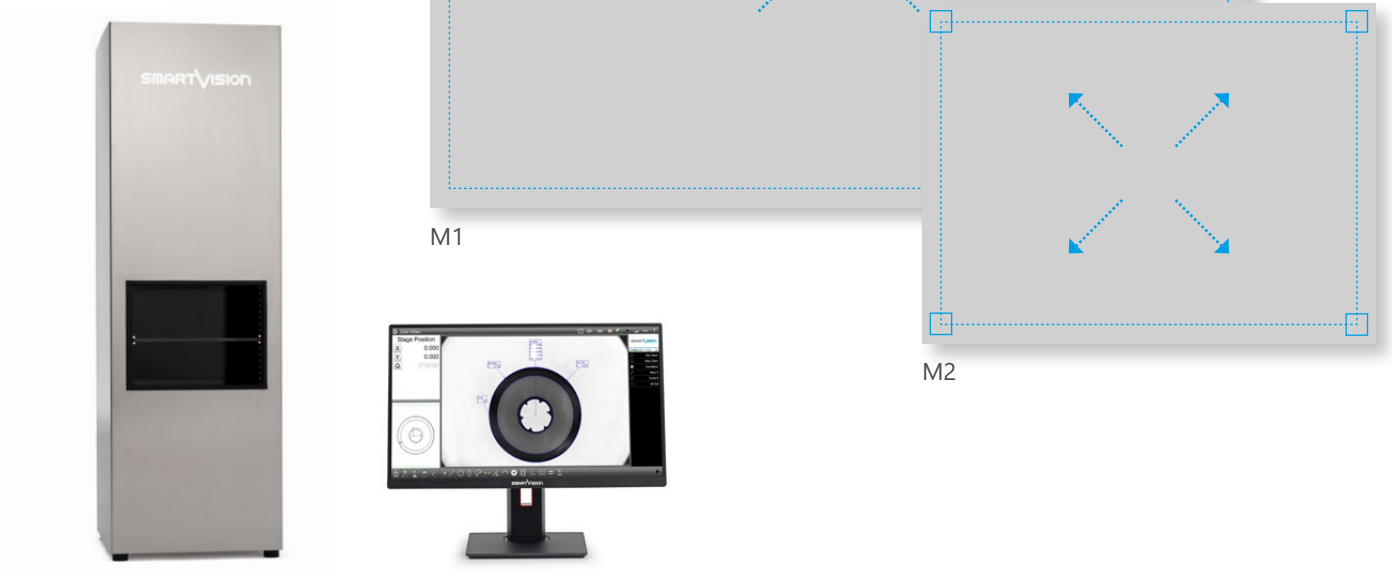


Powerful All-in-One PC with FULL HD touchscreen

To switch from Vertical to Horizontal layout

Smart_Projector_Double

Fast Industrial Bi-Magnification Video Measuring Instrument



Static & Efficient

Smart_Projector_Double is a completely static digital profile projector. The switching between the two Fields of View does not involve any movable part, therefore **no re-calibration is needed**. It is possible to create automatic programs that involve the two different FoVs, for a complete check of the items.

Two in One

There are **two different levels of magnification** in this instrument because it has been specifically designed for companies with a wide range of products' sizes and it allows to measure items with very different dimensions.

Power & Accurate

The areas of the two FoVs can be chosen among a large set, matching the configuration of the instrument to your needs. This ensures to get the **maximum accuracy** also on complicated items and components, without compromises in precision.

Highlights

- Wide choice of FoV pairs
- Capex and Opex reduction (compared to two separate instruments)
- Perfect fit between machine capabilities and production / laboratory needs
- Reduced Time for Quality Control
- Maintenance free, no need for Re-calibration
- Space-saving
- Ideal for harsh environment and heavy duty cycle use



Smart_Projector_Quattro_Pro

NEW

High Performance ZOOM Video Measuring Instrument



Automatic & Productive

Smart_Projector_Quattro_Pro is an automatic Profile Projector that combines in one unique instrument precision, objectivity, repeatability and user-friendliness of measurement for a **right Quality Control**.

Four in One

With an innovative optical solution of **zoom lenses** in only one device, this machine allows four different magnifications, changing the Field of View by software. This feature makes it in a **4-in-1 solution** for automatic and complete dimensional check of a wide items range.

Accurate

This device **guarantees measurement stability** of the image center when focusing and switching from one level of magnification to another. The benefits given by the **flexibility of the zoom lenses** and the accuracy of fixed optics are merged together in this machine with no compromises in precision. **Four different FoV in unique instrument:** precision, flexibility and cost-efficiency!

Highlights

- Suited for massive (production) quality inspection, in-line control, incoming inspection
- Increases number of quotas and quality check rate, up to 16000 checking features in a few seconds
- Performs full automatic reporting and SPC (Min, Max, Range, Average, Std Dev, 6 Sigma)
- Ready to connect with SPC software
- Suitable for unskilled operators use
- Clever investment with a fast Return on Investment



"Four Machines in One"

Smart_Projector_Ruby

Video Measuring Profile Projector for Micromechanics



Precision without compromise

Smart_Projector_Ruby is an **Automatic Digital Profile Projector** that combines the precision, objectivity, repeatability and user-friendliness in one device, guaranteed by SmartVision's Technology.

Small & Powerful

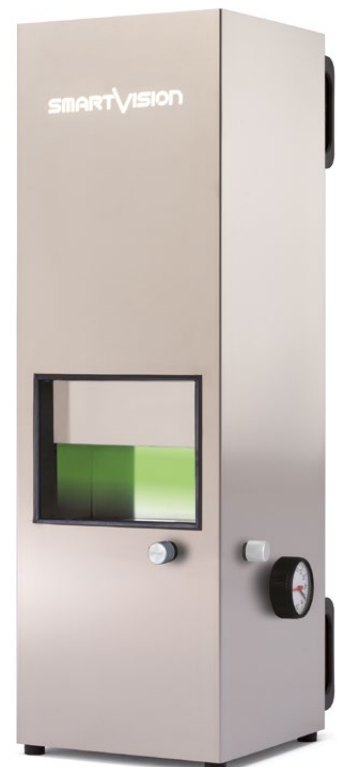
Its unique **Extra Small Field of View (FOV)** and the **X/Y moving axes** solution makes this instrument ideal for those application that require toughest precision tolerances, such as watch components, microelettronics and micromechanical items in general.

Accurate

This equipment ensures measurement stability of the image center when focusing and moving from one side to another. The benefits given by the **precision of the Double Episcopic lights** (Coaxial and Ring light) and the accuracy of the on board optics are put together in this equipment with no compromise in precision.

Industrial & Compact

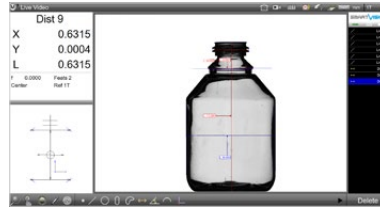
Smart_Projector_Ruby is a fast, compact, rugged, stable, easy-to-use and easy-to-program device, expressly designed for the laboratories but also industrial environments and heavy duty cycles use.



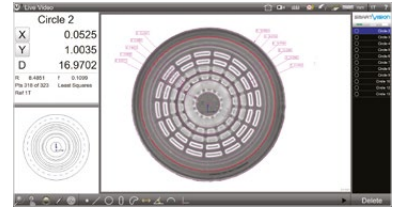
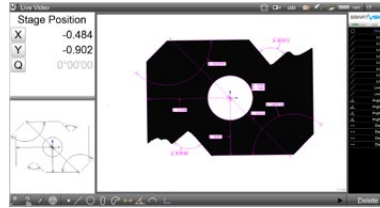
Application Cases

Wide Measuring & Quality Control Solutions

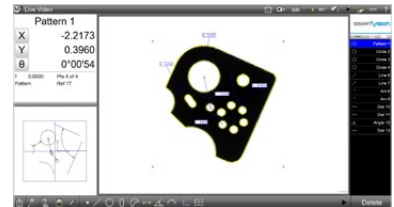
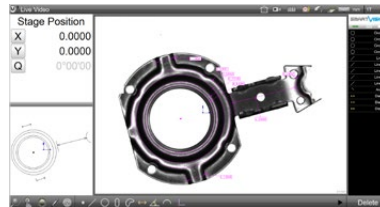
GLASS



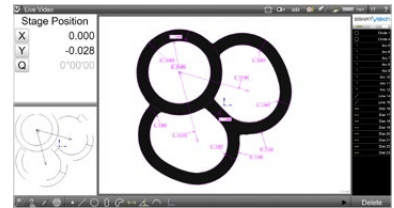
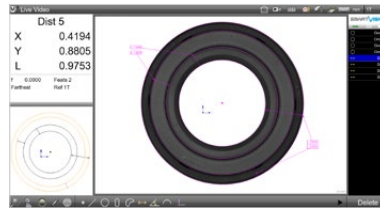
PLASTIC



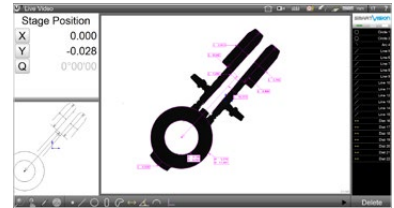
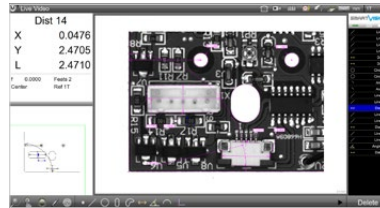
CUTTED



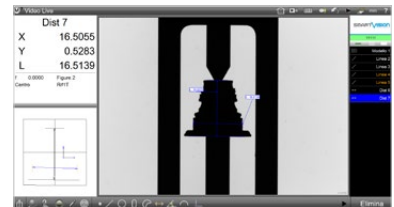
RUBBER



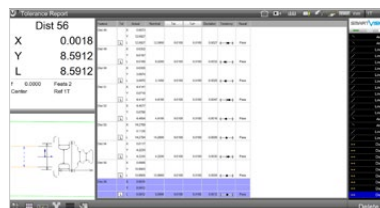
ELECTRONICS



TURNED



MICROMECHANICS



Smart_Projector: all Available Models

Technical Specifications



Layout usage	Vertical	Vertical	Vertical / Horizontal	Vertical / Horizontal
Magnification	-	-	-	-
Field of View ³ (mm)	7x4.5	29x19	55x37	108x73
FoV ³ Diagonal (mm)	8	30	60	125
FoV ³ Area (mm ²)	31	530	2000	7800
FoV ³ Type	Rectangular	Rectangular with vignetting	Rectangular with vignetting	Rectangular with vignetting
Measuring Chamber ⁵ (mm)	218x125 H.55	218x125 H.55	200x200 H.175	200x230 H.240
Repeatability ⁴	±0.07 µm	±0.2 µm	±0.5 µm	±1 µm
Accuracy ⁴	±0.5 µm	±1.5 µm	±3 µm	±6 µm
Diascopic Light ¹	Collimated	Collimated	Collimated	Collimated
Episcopic Light ²	-	-	Yes	Yes
Light receiving lens	Telecentric	Telecentric	Telecentric	Telecentric
Dimensions (mm)	324x330 H.490	324x330 H.490	284x330 H.873	284x330 H.1255
Weight (kg)	18	18	29	45

PC & Software

SmartVision PC	Powerful All-in-One PC with FULL HD touchscreen with Windows 10 PRO 64-bit, monitor resolution 1920x1080
Software interface	Multilanguage: English, German, Spanish, French, Italian, Portuguese, Russian, Simplified Chinese, Japanese, Polish, Czech, Romanian (all languages are editable).
User account control	Supervisor, Users 1 to 20 (with password login and editable rights)
Measurement points	16000 features max
Pattern search	XY θ (accepts random positioning)
Statistical Analysis	Ready to connect with SPC software
CAD export	dxf file with nominal values and tolerances
CAD import	dxf file for profile matching, nominal values and tolerances
Data Report	xlsx, csv, tsv, txt
Print Report	pdf



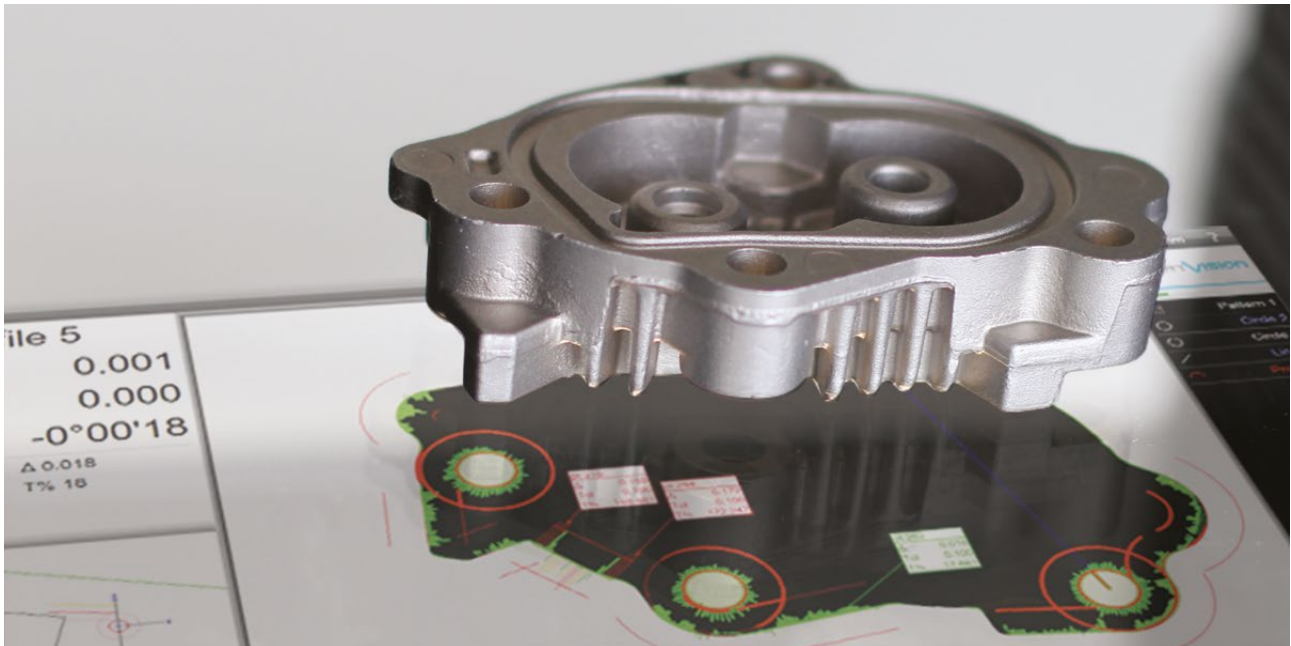
Smart_Projector 168 Smart_Projector 224 Double Quattro_Pro Ruby

Vertical ⁶	Vertical	Vertical / Horizontal	Vertical / Horizontal	Vertical
-	-	2 steps: M2 and M1	4 steps	-
168x113	224x150	60x45 / 108x73	Ø 12 / 24 / 48 / 90	2.2x1.7
195	235	75 / 125	-	2.78
18500	32550	2700 / 7800	112 / 452 / 1800 / 6360	3.74
Rectangular with vignetting	Rectangular with vignetting	Rectangular / Rectangular with vignetting	Circular	Rectangular
250x330 H.405	419x450 H.475	200x230 H.240	203x225 H.200	200x130 H.120
±1.5 µm	±2 µm	±0.5 / ±1 µm	±0.25 / ±0.4 / ±0.6 / ±1 µm	±0.075 µm
±8 µm	±12 µm	±3 / ±6 µm	±0.4 / ±0.8 / ±1.5 / ±3 µm	±0.2 µm
Directional ⁶	Directional	Collimated	Collimated	Collimated
Yes	-	Yes	Yes	Yes
Telecentric	Telecentric	Double Telecentric	Telecentric	Telecentric
335x380 H.1255	553x510 H.1813	284x330 H.1255	282x330 H.1025	282x330 H.875
41	150	46	42	29

1. Diascopic Light: Collimated Projector or Directional backlight with green led light. The Collimated light intensity is software programmable when also Episcopic light control (2) is available.
2. Episcopic Light Control: 4 independent 90° sectors, software programmable, Front / Episcopic white diffused led light.
3. Standard models - Other custom FoV available on request.
4. Precision of measurement ($\pm\mu\text{m}$) obtained measuring a specific calibration target located approximately in FoV center, best focus position, at 25° C $\pm 1^\circ$.
5. The dimensions of the measuring chamber are not the dimensions of the Field of View, therefore they have not to be considered as test area.
6. The model 168x113 is available with Collimated Diascopic Light (1) under request, in this case the layout is horizontal with the S_H_A_K Option.

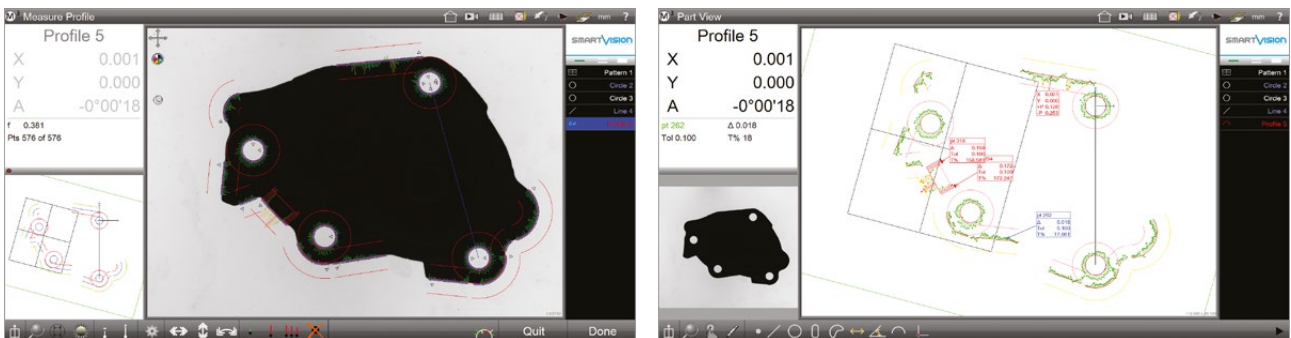
Smart_Profile_Matching Option

Advanced Digital Profile Check Tool



Smart_Profile_Matching is an **automatic Profile Check advanced feature**, which can control any item compared to a DXF master. This feature replaces the use of a traditional profile projector that requires the overlay of a glossy sheet on the component's projection.

Smart_Profile_Matching is able to perform a very fast check of a profile verifying the tolerances within a given range. Standard applications include components such as punched and formed parts, injection-molded (plastic and metal) and laser cut workpieces, die-cast, extrusions, millings, CNC machining.



Features & Benefits

- **Pattern Recognition:** the system automatically performs the Smart_Profile_Matching no matter what's its orientation nor position in the field of view.
- **Profile Fit:** the software compares a DXF file containing position, angle and tolerance data to a corresponding component shown in the live video window. It displays resulting errors with coloured arrows and returns the overall profile position, angle and form.
- **Master Creation:** the master shape can be either extracted by a real sample or obtained by a technical drawing in dxf format, allowing the Technical Office and the production line to be completely aligned.
- **Reverse Engineering:** the shape of the sample can be exported in the industry-standard DXF file format for reverse engineering or use with other software applications.

Smart_Thread_Measurement Option

Complete Threads Analysis & Check

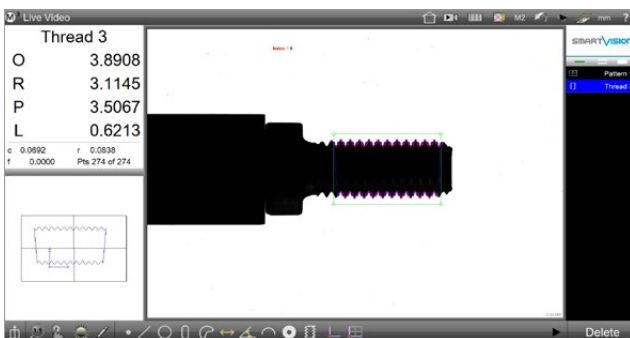


Measuring threads can be difficult. With Smart_Projector plus Smart_Thread_Measurement software *option* is now possible to perform a **complete and automatic dimensional check** of threads measurements with different tolerances according to International Standards.

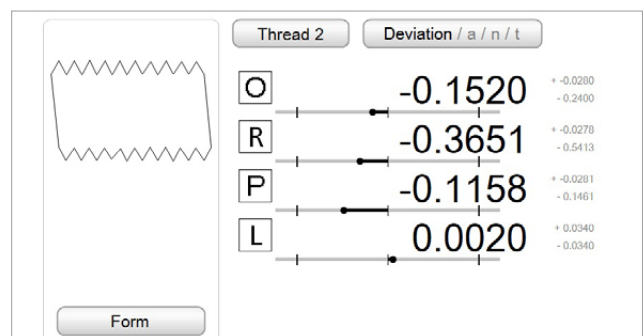
ISO Metric Thread Designation	Pitch	External Threads						
		Tolerance Class	Major Dia		Pitch Dia		Minor Dia	
			Max	Min	Max	Min	Max	Min
M8x1,25	1	6g	7.972	7.760	7.160	7.042	6.619	6.272

Example of external metric table chart and fastner size M8

- The software is capable to autodetect sizes from M1.6 to M200
- Related Pitch from 0.35 to 6.0
- Tolerances Classes : 6g, 6h o 4g6g



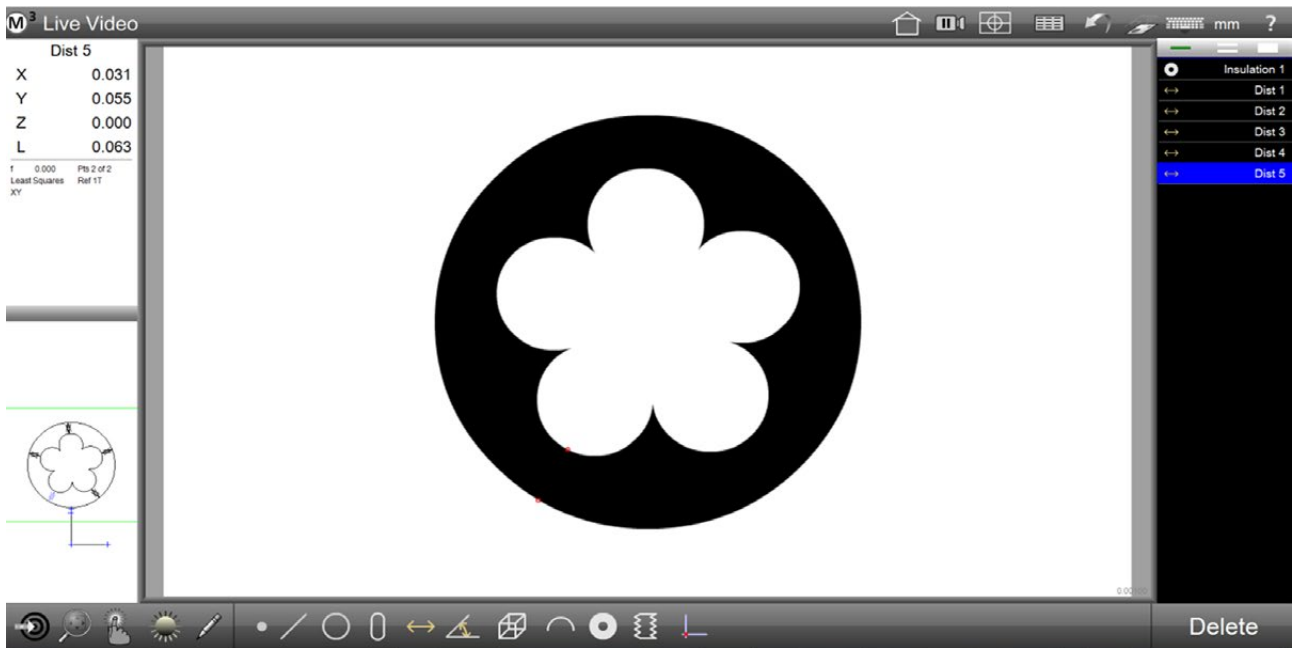
Automatic thread etching



Characteristics Analysis

Smart_Wire_Measurement Option

Measure Wire insulation samples according to Standards



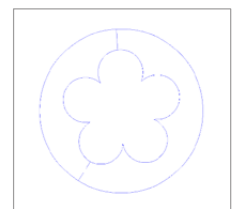
Thanks to the **Smart_Wire_Measurement** insulation tool it is possible to determine the number of strands in a wire automatically, as well as manually select the appropriate figure.



The Wire Insulation Measurement function calculates the absolute minimum distance between the outer "blob" of the insulation profile and the inner "blob" of the insulation profile. Once this minimum distance is determined, the system breaks the diameter of the insulation into six 60 degrees segments, based on the minimum distance at 0 degrees. The minimum distance between the inner and outer "blobs" is determined from within each of these 60 degrees segments. This mechanism is used when there is a single strand on the inside lobe (like in a simple gasket), or there are 6 or more lobes or wire strands.

- "d0" represents the minimum distance
- "d1" represents the maximum distance
- the character "d" in the detail information screen represents the average distance
- "c" is the percent concentricity

Insulation 1	
d0	0.058
d1	0.062
d	0.060
C%92.3	X 0.001
Y 0.423	I 0.000
Pts 2415 of 2415	Centroid
Ref 1T	XY



Features & Benefits

- **Automatic:** by selecting the "Auto Strand" button and clicking on an edge of the insulation sample, the System determines the number of strands automatically.
- **Fixed-Strands Measurement:** when the wire sections is blurry the number of strands can be manually specified by choosing one of six different strand count selections.
- **Distance Results Mode:** if the Distances Mode button is enabled, the Software automatically displays and creates every distance between strands and edges during the regular insulation measurement. It also determines the minimum, maximum and average distance between strands and edges within the insulation profile.

Smart_Data_Collection_SPC Option

Analyze & Collect Data



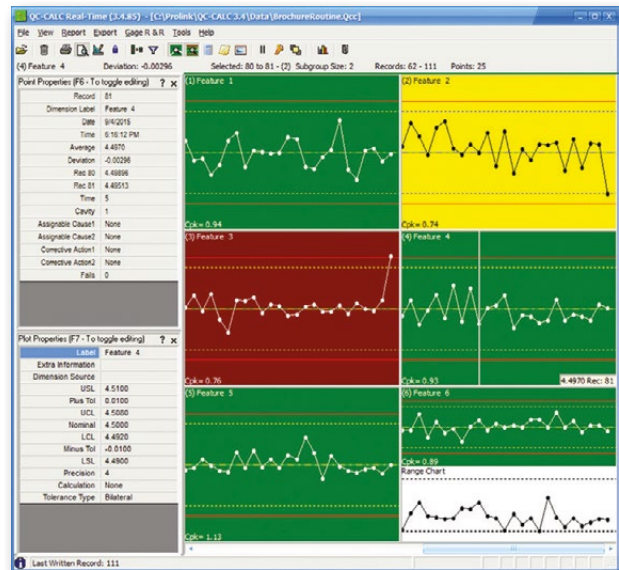
SPC Package

SV_CALC SPC is a complete SPC package that analyzes the data collected by SV_CALC Real-Time. The wide variety of charts and reports available in SV_CALC SPC allows close monitoring of the manufacturing process in order to stay in control. In few seconds, SV_CALC SPC gives a precise picture of how the production line is performing with easy-to-use menus.

Data Integrity Report							Printed on January 27, 2020	
<p>Prolink</p> <p>SamplePart:Quc</p> <p>This report lists all changes made to the raw CMMCA. The remaining inspection data will continue to be processed and related by record number, size, and volume for the inspection.</p> <p>If you receive a report for a specific part, serial number, or other condition, please create a report filter to reduce the results. An email alert will be sent to the user who created the report. If you need to see all reports for a specific part, serial number, or other condition, you can search for a specific value in the filter or create a report filter for all reports for that value.</p>								
Rec	Date	Part	Feature	Dimension	Obs Value	MSA Value	User	Reason
4	10/15/2018 13:59:59	Prolink	Feature 4	Dimension 4	4.4970	4.5000	Prolink	Out of tolerance
5	20/12/2018 13:25:11	Prolink	Feature 1	Dimension 1	4.4970	4.5000	Prolink	Out of tolerance
14	20/12/2018 13:25:11	Prolink	Feature 1	Dimension 1	4.4970	4.5000	Prolink	Out of tolerance
22	10/20/2019 14:42:18	Prolink	Feature 4	Dimension 4	4.4970	4.5000	Prolink	Out of tolerance
48	10/20/2019 13:31:50	Prolink	Feature 5	Dimension 5	4.4970	4.5000	Prolink	Out of tolerance

Features & Benefits

- Record and Dimension filtering
- Control charts
- Process capability charts
- Attribute charts
- Ability to print to PDF and email reports
- Built-in report designer
- Remote Real-Time monitoring
- Multiple database grouping
- Built-in password protection



SV_CALC Real-Time

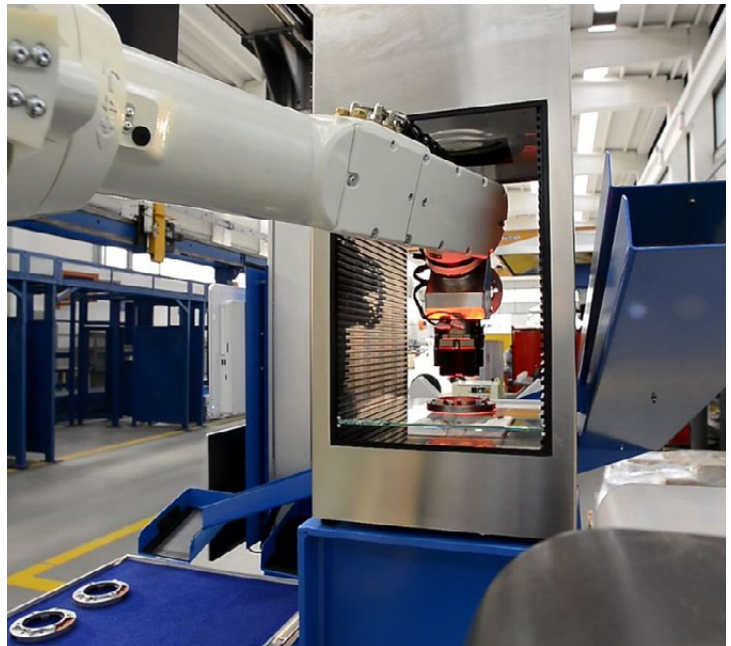
SV_CALC Real-Time is used to collect and display measurement results from all CMMs, Video CMMs, and hand gages without operator intervention. Reports can be created and data can be exported to spreadsheets, databases, and other SPC programs. This means it is possible to transfer data from all measurement devices to any SPC package using one program.

Features & Benefits

- Fully automatic data collection from over 200 types of machines
- View up to 1200 live plots (dimensions) while collecting data for many more
- Manual and automatic export capability to over 40 different output formats
- Manual and automatic report generation
- Trend detection with email alerts
- Dynamic filtering of dimensions
- Multiple gage output combined into one screen (MultiSource)
- True Position Charting with 2D position charts
- Flexible plots support I&MR, XBar & Range, Scatter, Whisker, and True Position Plots

Smart_Automation_Suite Option

Automation Features for Smart_Projector



Smart_Automation_Suite is an Hardware-Software combination that includes an integrated I/O Module and a dedicated software and allows to manage the **Automatic Measuring System** functions through the automation of the production process.

Smart_Automation_Suite enables the **automatic in-line feeding** of the Smart_Projector and moreover, after being analysed based on « Pass / Fail » output, a sample may be placed in Good or Bad collecting area.



"A complete solution for automated Quality Control Process"

Features & Benefits

- Record and Dimension filtering
- Control charts
- Process capability charts
- Attribute charts
- Ability to print PDF and email reports
- Built-in report designer
- Remote Real-Time monitoring
- Multiple database grouping
- Built-in password protection



Smart_Rotating_Robot Option

Automated 360° Measurements for Smart_Projector

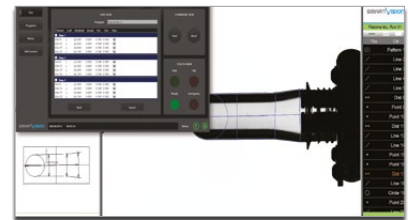


The innovative **Smart_Rotating_Robot** is designed to extend the Smart_Projector's application range, allowing **quality control of cylindrical components** and any other item that needs to be examined on different projection planes at defined angles.

It is made of a special automated test plan inserted in the **Smart_Projector's measuring chamber** and connected to the supplied Pc All-In-One through a dedicated Control Station. Smart_Rotating_Robot allows the operator to place in the test area components such as bottles and vials vertically.

The pieces are secured on a robotic rotation chuck system controlled by software and a dedicated control box. **Results are instantly showed.**

The integration of the Smart_Rotating_Robot in the Smart_Projector System grants **maximum flexibility** and reduces the time needed to control parts from different angles of views thanks to the automatic load of different programs for different views.



- Full integration with the main software

FEATURE	NOMINAL	TOL+	TOL-	MIN	MAX	AVERAGE	PASS/FAIL
Cha 14	50.000	0.000	0.000	---	50.000	---	PASS
Angle D1	89.000	0.000	0.000	---	89.000	---	PASS
Angle D2	45.000	0.000	0.000	---	45.000	---	PASS
Cha 15	13.000	0.000	0.000	---	13.000	---	PASS
Cha 16	2.250	0.000	0.000	2.250	---	2.250000	PASS
Cha 17	0.000	0.000	0.000	0.000	---	0.000000	PASS

- Easy to use software
- Automatic data visualization
- Excel / PDF data report

Specifications

ROTATING ROBOT

Technical Features	Angular Accuracy $\pm 0.1^\circ$
	Rotational speed (self-centering chuck and tailstock)
	Interchangeable spacer blocks
	Custom fixing tools arrangements
	Software controlled angular positioning (from 0° to 360°)
Material	Number of positioning (association of compatible measuring programs via software)
	Unlimited number of programs
Material	Anodized Aluminum

CONTROL STATION

Main Functions	Rotating_Robot manual movement
	Run or Abort the program
Dimensions & Weight	Output features (warning, power on, ready, Pass/Fail result)
	275x245 H.175/270 mm
Weight	1 Kg
Power supply	220 V
Communication interface	USB 2.0
Case	Black opaque painted Aluminum

Product Highlights

Features & Benefits of Smart_Projector

Main Features	Related Benefits
Optical contactless system	No deformation of the sample No operator based errors No influence of sample shape
Multi-Purpose Instrument with Wide Range of Tools	Wide range of uses and configurations
Fast control	Up to 16000 dimensions checked in few seconds Multiple parts analysis
User-friendly Software Interface	Fast programming Suitable for unskilled operators Multilanguage
No moving parts	Maintenance free No recalibration No manual focusing No collimation
Protected Analysis Chamber	No influence from external light and dust Higher Accuracy
Ready for Automation	In-line integration available
Easy Data Management	Automatic reporting Readily export data in multiple formats
Horizontal layout	Quick sample positioning
All-In-One PC	Reduced downtimes thanks to external PC Prompt analysis using Touchscreen
Plug and Play	No need of time and money consuming setup
Rugged, Static, Fanless & Compact	Usable in any industrial environment Save space on site
Smart	Wide range of Benefits with affordable price No need of expensive on-site service Easy setup of SW updates and upgrades Available Support in short time in all the World by TeamViewer app Save time and money
Invented & Designed by SmartVision	Based on many years of experience in industrial field and lab Customizable solutions possible
Made in Italy	High Level of Quality and Innovation



Reach Excellence in Quality Control with SmartVision's Technology

