

ROMER

ROMER Measuring Arms
Portable CMMs for the shop floor

From the originator of portable measuring arms.



 **HEXAGON**
METROLOGY



ROMER portable coordinate measuring machines go where traditional CMMs can't.

Designed with inherent flexibility and versatility that stationary CMMs simply can't match, ROMER portable CMMs are ideal for dimensional inspection, measurement and reverse engineering applications on the shop floor or in the metrology lab. They're the perfect answer for workpieces that are impractical or impossible to measure on a frame CMM. Available in six- and seven-axis configurations, ROMER portable CMMs provide measuring ranges from 4 ft. to 12 ft. (1.2 m to 3.6 m). ROMER measuring equipment is used worldwide in the automotive, aerospace and general manufacturing industries. In addition to portable CMMs, ROMER offers a complete selection of software and accessories to provide total metrology solutions.



ROMER portable CMMs and accessory systems offer the ideal metrology solution for hard-to-reach areas, demanding shop floor conditions and large, unwieldy workpieces.

<http://us.ROMER.com>



Optional mobile work station



INFINITE® 2.0 & INFINITE® 2.0 Plus Portable CMMs



The INFINITE 2.0's new handling and performance features — along with patented infinite rotation, quick-change probes, exclusive wireless connectivity and battery power — provide INFINITE portability and measuring power. INFINITE 2.0 Plus models, with unsurpassed repeatability and volumetric accuracy, are ideal for the most demanding inspection tasks. ROMER also offers system verification “in the field” with a NIST-traceable calibrated length standard with every arm. This allows the operator to easily verify and document system performance for ISO or vendor requirements.



Back view of base



The new INFINITE 2.0 is ROMER's easiest-to-use and most accurate articulating arm ever.

<http://us.ROMER.com>

- 1.** Patented infinite rotation of principle axes allows inspection in difficult-to-reach areas.
- 2.** With the new Bridge-CMM class TESA kinematic multiwire probe joint, you get unsurpassed measuring performance. Carbon fiber probes feature automatic probe recognition.

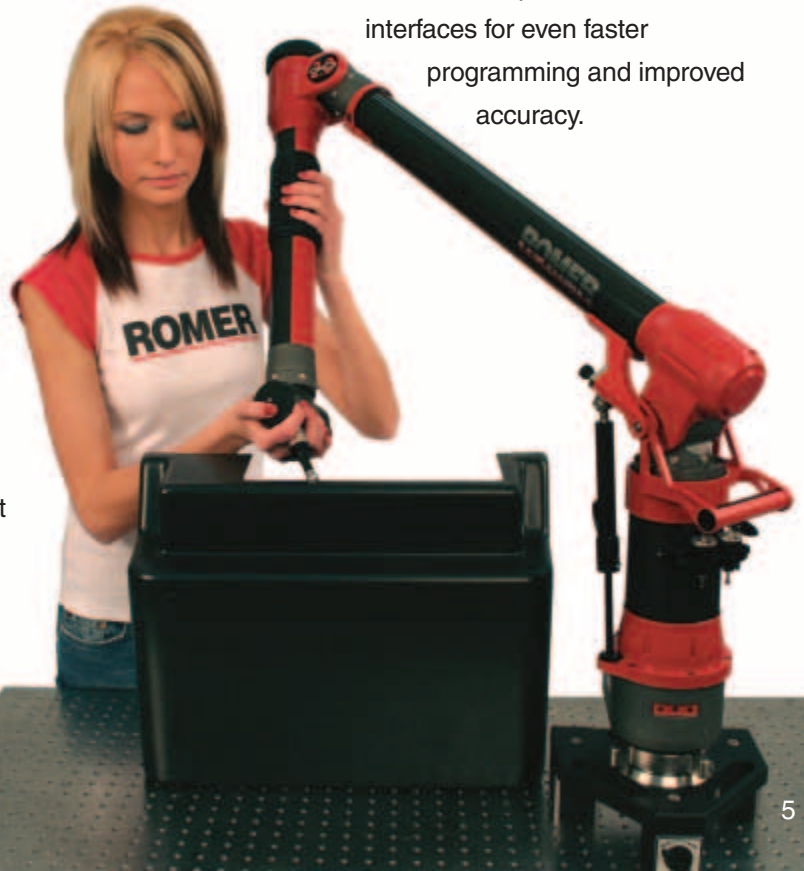


- 3.** A new smaller, easy-grip head features an LED worklight and an integrated digital camera that allows the operator to graphically document a setup.
- 4.** New SpinGrip infinite-rotating grips at elbow and forearm provide two low-friction grip positions for better ergonomics. SpinGrips allow the CMM to “float” in the operator’s hands, maximizing accuracy and minimizing operator fatigue.
- 5.** Heidenhain encoders, manufactured to our specifications, offer “wide-track” bearing support that enhances performance.
- 6.** Advanced carbon fiber arm tubes are strong, light weight, thermally stable and feature a lifetime warranty.
- 7.** An improved, low-profile Zero-G counterbalance reduces operator fatigue and delivers effortless control in all positions, including above and below the centerline.
- 8.** An upgraded 802.11g WiFi connection — transmitting up to 6 times farther and 50 times faster than Bluetooth — allows the operator to position the computer where it is most convenient.
- 9.** A Li-Ion battery allows on-site inspection without AC power or cables. A sealed battery cover prevents contamination of the battery compartment or accidental dislodging of the battery.

- 10.** A quick-clip probe holster keeps three spare probes and the change key safe and handy.
- 11.** The universal mounting system attaches to a variety of bases, including a magnetic mount for a smaller footprint and simplified set-up.

PC-DMIS Portable is standard

With the world's largest installed base of any dimensional measurement and inspection software, PC-DMIS is the ideal match for the INFINITE 2.0. PC-DMIS Portable makes it easy to inspect parts in real-time, quickly generate new inspection programs and produce customizable results reports. PC-DMIS is compatible with most CAD files, and is available with optional direct CAD interfaces for even faster programming and improved accuracy.





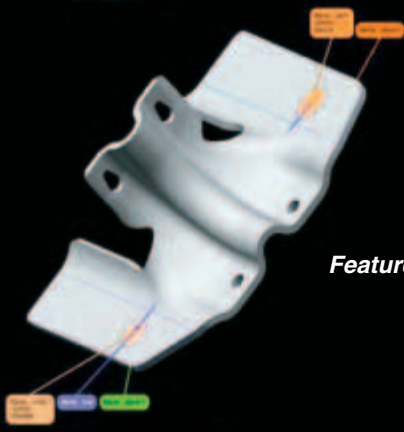
ROMER Laser Scanning



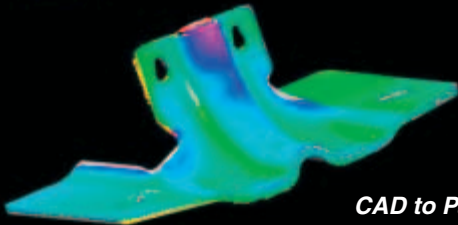
Shaded Point Cloud



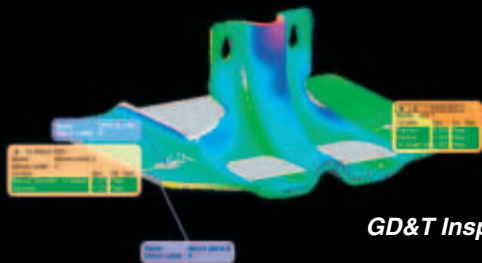
Polygonized Point Cloud



Feature Inspection



*CAD to Part
"Weathermap"*



GD&T Inspection

Why choose non-contact laser scanning? It's ideal for all kinds of dimensional data gathering tasks, including:

Inspection and validation

Laser scanning produces a 3D point cloud for Cloud-to-CAD comparison, feature recognition for dimensional inspection, and GD&T analysis.

- Verifying a part meets CAD, for incoming inspection, in-process inspection or final validation.
- Verify Tool & Die wear or rework.
- Contour measurement, comparing parts to corresponding CAD models, 2D cross-sections or 3D topographical mapping.
- Inspection of the mating of two parts.

Reverse Engineering

A 3D model can be converted to CAD that describes a sample part. Reverse Engineering software is used to import the scanned point cloud, manipulate, mathematically smooth and combine the scanned data so a representative NURBS surface model can be created.

- Create a 3D model for further CAD design or adaptation.
- Create a "legacy" or "golden" part where no CAD or part drawing exists.
- Create an "as-built" model of a tool so wear over time can be compared.
- Competitive part/product analysis.
- Archival or historical preservation of artifacts to create a 3D record or copy.

Rapid Prototyping

A sample part or physical model is scanned and converted to an STL file representation of the part, which can then be reproduced with a 3D printer.

Copy Milling

Producing a duplicate of a sample part directly from the point cloud scan data. CAM software is used to read the scan cloud data and produce machining instructions for machine tools.

ScanShark™ non-contact laser scanning devours the toughest inspection and reverse engineering jobs.

<http://us.ROMER.com>

ScanShark non-contact laser scanning combines portable CMM flexibility with laser scanning to provide real-time surface inspection and reverse engineering in a complete, powerful turnkey package. A ScanShark-equipped INFINITE 2.0 portable CMM is ideal for large workpieces that cannot be easily moved, or in areas that are difficult to access such as inside or underneath a workpiece.

- ScanShark can gather up to 25 times more points per second than other laser systems. It's perfect for quick surface inspection of large, complex areas and generating point clouds for reverse engineering.
- It's ideal for all kinds of surfaces, especially flexible, fragile or soft-bodied parts that could be marred or deflected by a contact probe.
- ScanShark probes capture up to 458,000 points per second (V5 model), comparing each point scanned to a CAD model in real-time. With so many scanned points, you get far more detailed inspection of both geometric and surface features than with a conventional touch-trigger probe.

A ScanShark laser scanning system includes a six- or seven-axis portable CMM, a laser scanning probe, and your choice of full-featured geometric, surface inspection and reverse engineering software package options.



ScanShark V5





Omega R-Scan

The ROMER Omega arm, together with the fast, easy-to-use R-Scan laser probe, creates an economical and efficient multi-purpose measurement tool perfectly suited for 3D scanning.

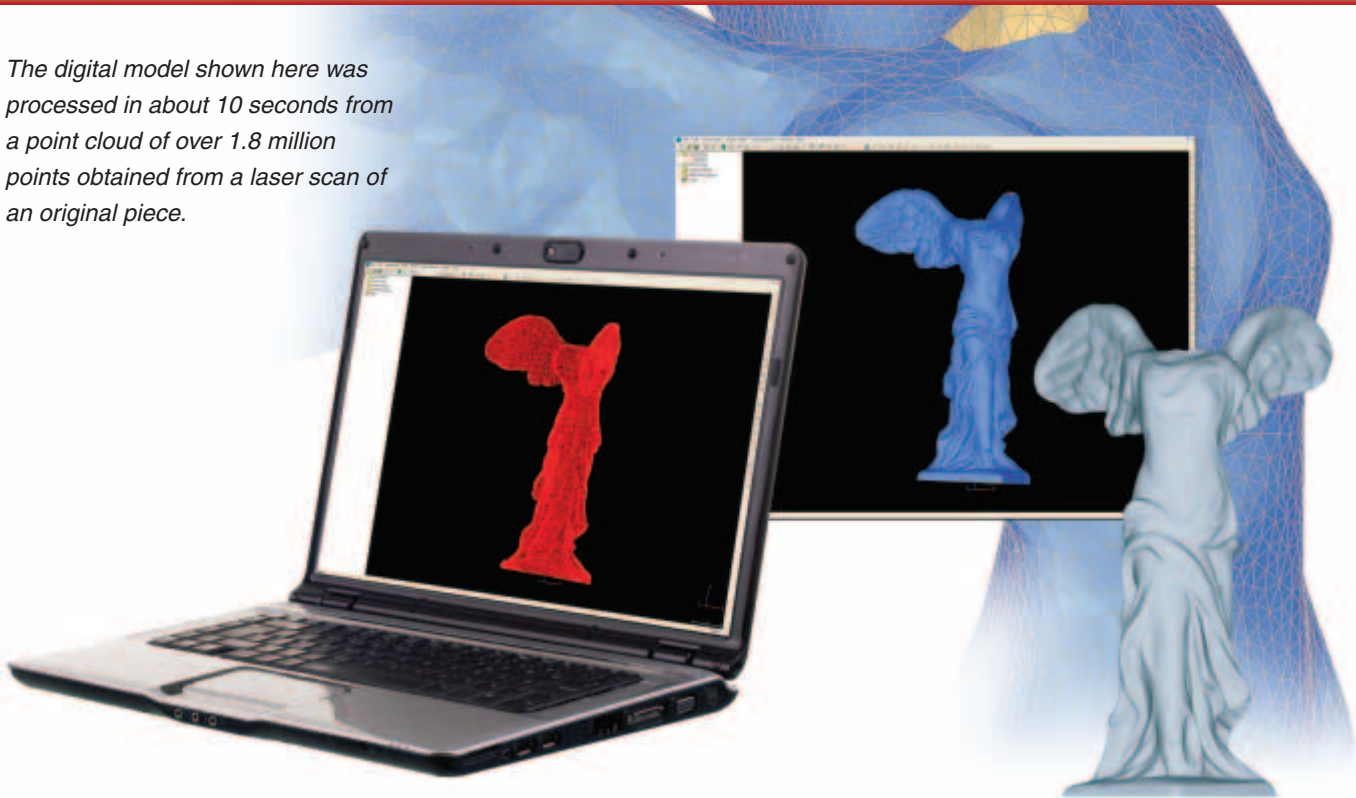
- R-Scan's simple design, plus the Omega arm's patented infinite rotation, allows for easy scanning of difficult-to-reach areas.
- Non-contact laser point scanning ensures easy, guided measurement. You get total capability ideal for reverse engineering applications, with speed, repeatability, a real-time display as well as automatic color recognition.
 - Technology plus peace of mind: ROMER supports and warrants the complete digitizing system – arm, probe and software.
 - Available in 6 ft. (1.8 m), 9 ft. (2.8 m), 10 ft. (3.0 m) and 12 ft. (3.6 m) arm lengths.



Affordable reverse engineering solution combines ROMER 7-axis arm flexibility and laser probe technology.

<http://us.ROMER.com>

The digital model shown here was processed in about 10 seconds from a point cloud of over 1.8 million points obtained from a laser scan of an original piece.



Ideal for reverse engineering applications, the Omega R-Scan with PC-DMIS Reshaper software produces 3D point cloud data that is processed to create a representative surface model. It's perfect for rapid prototyping, part duplication and other important tasks:

- 3D modeling for further CAD design or adaptation.
- Creating a “legacy” or “golden” part where no CAD or part drawing exists.
- Creating an “as-built” model of a tool so wear over time can be compared.
- Competitive part/product analysis.
- Archival or historical preservation of artifacts to create a 3D record or copy.

PC-DMIS Reshaper, standard on the Omega R-Scan system, is a complete 3D point-cloud processing software for users who need to handle rapidly generated point cloud files and high-quality 3D meshes at an affordable price. PC-DMIS Reshaper shows the point capture activity live on screen as the R-Scan is passed over the object. The resulting point clouds can then be manipulated, edited and merged prior to creating the mesh. Using advanced meshing techniques, the software can process even the largest files in just moments. *(For more on PC-DMIS Reshaper, see page 17)*



MultiGage Portable CMM



ROMER'S new, easy-to-handle portable CMM, with its innovative design and exclusive features such as tungsten counter-weight, WiFi, plug-and-measure probes, and plug-and-play MultiGage software make it the must-have 3D measurement tool for improving your productivity.

With a 4 ft. (1.2m) measuring volume, the MultiGage is ideal for dimensional control of molds, parts, tooling, castings, and more. It can quickly be set up for on-demand measurement and inspection of parts or assemblies on your machine tool or anywhere on the shop floor.

Using Swiss-made multi-wire connectors from TESA, the same type used on the TESASTAR-M motorized probe head, ROMER's long-standing automatic probe recognition feature is now coupled with a highly proven, robust kinematic joint connection. The probes are automatically recognized and identified by the software — just like on a large CMM — with no re-calibration required when changing from probe to probe.



Designed exclusively for today's machine shops, the compact, 6-axis MultiGage is the ideal whenever, wherever measurement tool.

<http://us.ROMER.com>

- An innovative counterweight design eliminates operator fatigue and assures the same high accuracy over the full range of measurements.
- A new ergonomic wrist design with intuitive and easy-to-reach buttons provides superb comfort of use and increases productivity.
- MultiGage provides easy installation and operation. No special requirements on-site; place the MultiGage directly on your machine and inspect parts without removal. No previous metrology knowledge is required, and measurement reports are generated automatically.
- MultiGage's internal battery gives you full freedom of operation. Enjoy the same functionality on the shop floor as in the metrology lab — with no need for an external power supply.



Measuring Range

Accuracy Values in a 1.2m Sphere According to ISO 10360-2

4 ft. (1.2 m)

$E (\mu\text{m}) = 5 + L/40 \leq 18$ $R (\mu\text{m}) = 8$

MultiGage's exclusive software is highly intuitive and easy-to-use.





STINGER Iii™ Portable CMM

The new STINGER Iii brings ROMER's patented infinite rotation portable CMM technology within your reach. It's the versatile, lower-cost solution for hundreds of inspection, measurement and reverse engineering applications. You can take a STINGER Iii to virtually any large part or fixture and begin inspection quickly and easily. STINGER Iii's compact design, weighing just 8 to 10 lbs. (3.6 kg to 4.5 kg), lets you move it easily throughout a job site.

- Patented Infinite Rotation of the principle axes allows easy inspection of hard-to-reach areas.
- Intelligent quick-change probes can be changed on-the-fly without tools or recalibration.
- Integrated ZERO-G counterbalance offsets arm weight, allowing one-handed operation.
- Carbon fiber composite arms are strong, light weight and dimensionally stable. ROMER's carbon graphite arm tubes feature a lifetime warranty.
- System verification capability – ROMER arms provide verification “in the field” with our NIST-traceable calibrated length standard.
- Available in measuring ranges from 8 ft. to 12 ft. (2.4 m to 3.6 m) to meet any measurement challenge.



STINGER Iii options include a laptop or desktop computer, PC-DMIS®, magnetic base, portable stands and a wide range of probes.



DOCS™ Tube Inspection

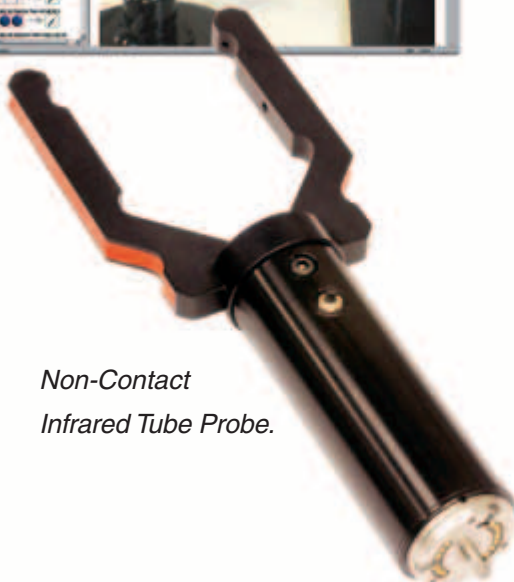
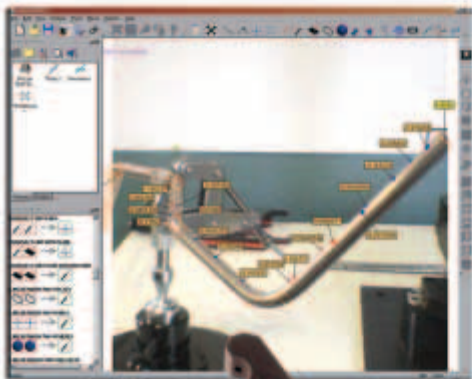
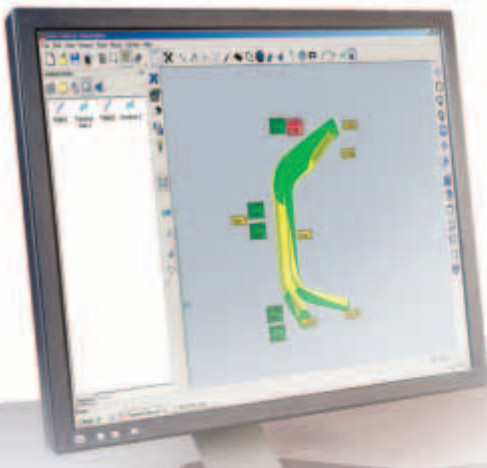
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The DOCS (Data Overlay Camera System) software package is for inspection of semi rigid or rigid tubes and wire, metallic or non-metallic, of nearly any size. DOCS allows inspection of a tube's surface features, providing true tube surface data – not a hypothetical reconstruction. DOCS combines tube and geometric measurement in a single software solution; there's no need to run multiple applications to measure with contact and non-contact probes.

ROMER's exclusive line of non-contact infrared tube probes are available in 6mm to 150mm sizes for measuring wire to large tubing. With DOCS, you can:

- Group multiple tubes in one part file. There's no need to have a separate file for every tube in an assembly. All tubes in the file can be seen at once.
- Inspect all tube parts in real-time, including bends and fittings, as well as locate and inspect geometric features like brackets, tabs, flanges, and fittings.
- Import CAD files and directly extract all tube geometry and bend data.
- Generate HTML-formatted, industry-standard reports, including complete graphics with wireframe, shaded views and other CAD graphics.
- Extract from a tube file the individual cylinders, inspection points and end planes with a single click.
- Multiple language support in nine languages.
- Modifiable HTML based reporting.
- The unique TransProjection feature uses the built-in digital camera in the INFINITE 2.0 and allows camera images to be aligned with the tube's CAD model, forming an overlay screenshot for reporting. *(See example, left)* This provides unparalleled visualization and context in inspection results.

Since tube inspection goes hand in hand with tube bending, DOCS can send corrected bend data directly a CNC tube bender with the Tube Shop Manager module of DOCS. This speeds up the bending process, eliminates data transcription errors, and enables fast correction based on the first tube bent, eliminating costly scrap and wasted time. A Tube Inspection Station (TIS) lets you choose the ROMER tools you need to inspect everything from hydraulic tubing to exhaust pipe. A TIS package consists of an inspection table, ROMER arm with DOCS, probes, computer and accessories.



*Non-Contact
Infrared Tube Probe.*





GridLOK[®]

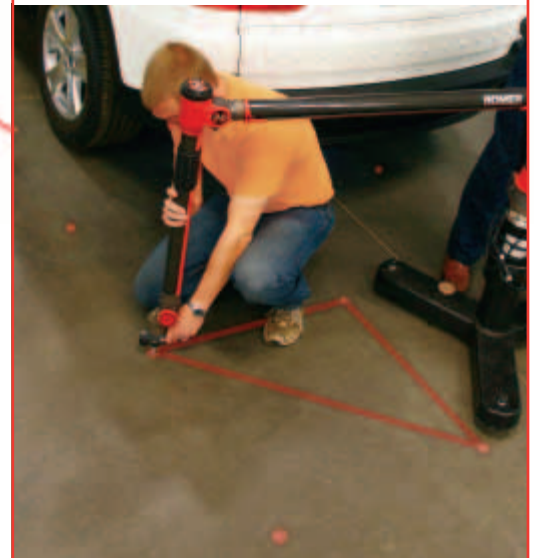
The GridLOK measurement system combines with a ROMER portable CMM to create a giant CMM — one that covers a remarkably large inspection envelope. Unlike large stationary or gantry CMMs, GridLOK's patented design lets you measure anywhere you need, including inside, behind, and underneath large workpieces.



GridLOK lets you establish an absolute reference point for any location within its 3D area. It consists primarily of a grid system of conical seats installed in a concrete floor or steel plate. Simply touch the ball probe into three different conical seats forming a right triangle and the portable CMM is locked in location automatically—no program interruption or keyboard selections. To change positions, just move the CMM and lock in place again. GridLOK enhances measurement accuracy because all measured points are in absolute dimensions relative to the same part origin—there's no accumulative error, regardless of how many times the portable CMM is moved. This replaces the old "leapfrog" method, which causes accumulative accuracy deterioration (see opposite page).

GridLOK includes software, installation and certification of the grid, and a portable CMM support stand with laptop holder. Standard measuring volume is 13 ft. x 20 ft. (4 m x 6 m); other measuring volumes quoted upon request.

Touch off a three point triangle on the conical seats anywhere inside the grid, and the new location is automatically locked in.

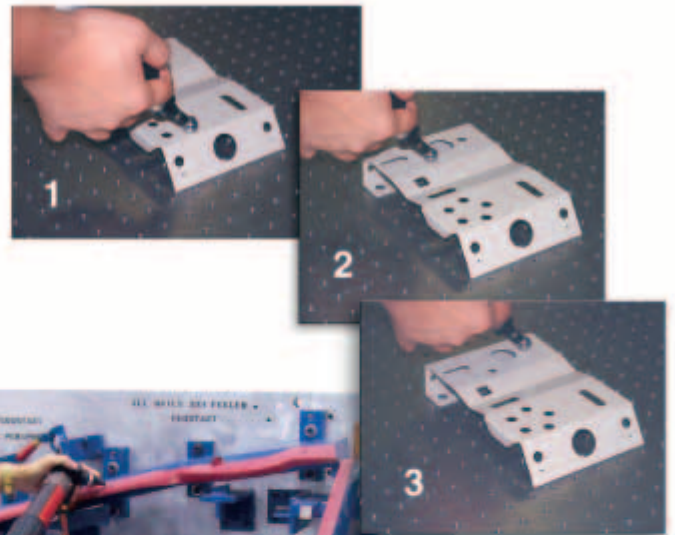


PartLOK™

<http://us.ROMER.com>

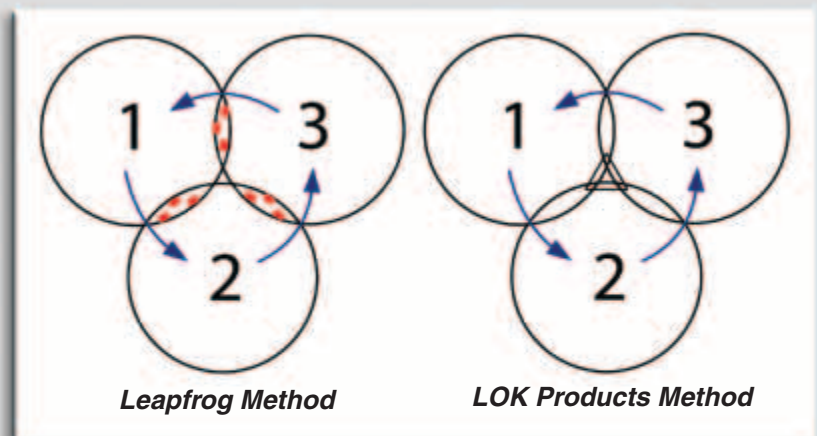
Automated inspection and set-up of fixtures, tools and parts is as easy as 1-2-3. Just contact three pre-qualified points on a workpiece with a ROMER INFINITE 2.0 or STINGER Ili portable arm probe, and PartLOK automatically recognizes and aligns the fixture, tool or part, and loads the CAD file and inspection routine. With PartLOK you can:

- Dramatically reduce set-up time. The operator simply touches the pre-qualified points on the workpiece and begins inspecting. There's no need to search through hundreds of files and routines just to prepare for inspection.
- Ensure consistency between operators via programmed inspection routines. A simple-to-use PartLOK wizard allows users to generate a "LOK" for a part, tool or fixture; this LOK serves as the reference between the part and its associated files. Once the LOK is established, a repeatable inspection routine is easily stored for recall.



Avoid "Leapfrogging"

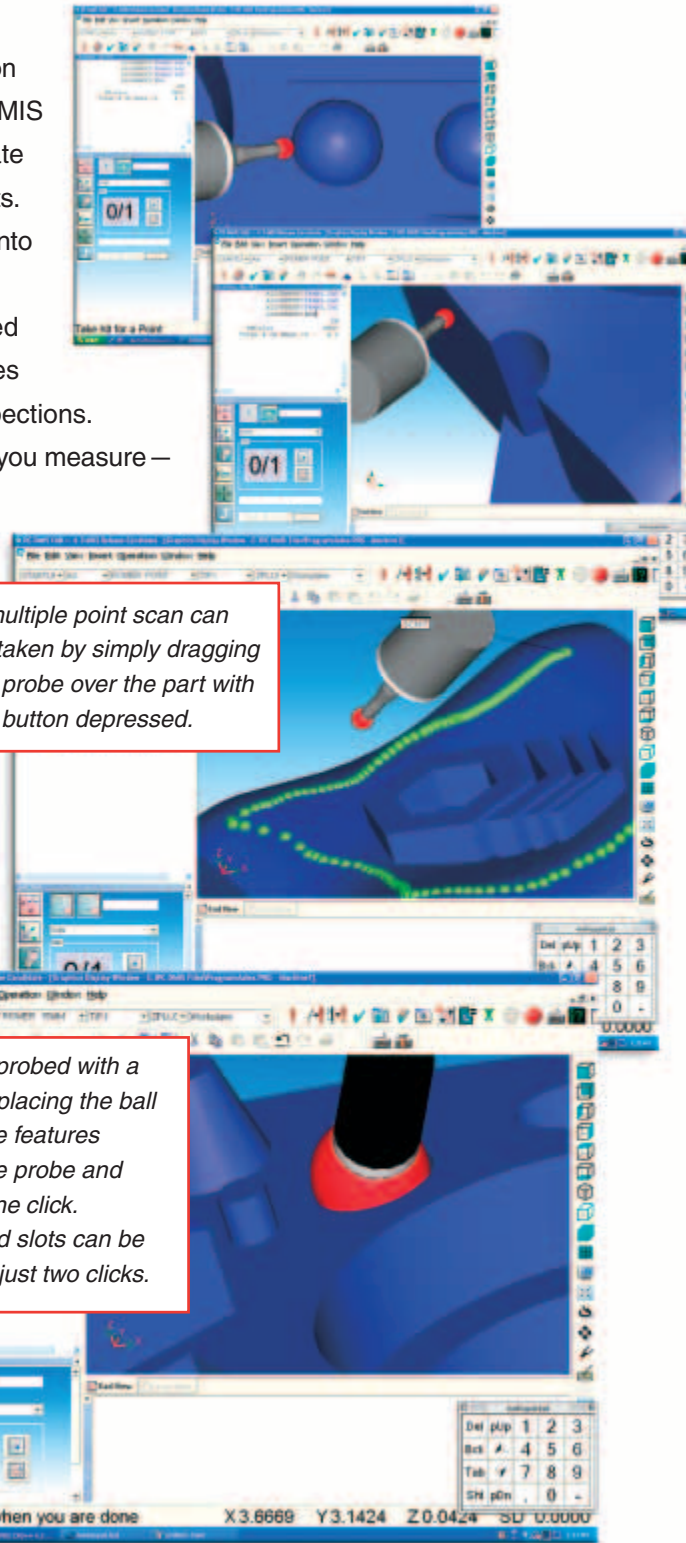
The circles in the figures illustrate three measuring volume "leaps" of a portable CMM as it moves around a large workpiece. The old "leapfrog" method requires a new reference point each time the CMM moves (shown by the red targets); measuring uncertainty compounds with each leap. The ROMER GridLOK system establishes an absolute reference point, so measuring uncertainty doesn't accumulate.



PC-DMIS® Portable

With the world's largest installed base of any measurement and inspection software, PC-DMIS is the ideal match for ROMER portable CMMs. PC-DMIS Portable makes it easy for operators to inspect parts in real-time, generate new inspection programs and produce clear, concise CAD-to-part reports.

- **Quick Start GUI** – Commonly used functions are grouped together into one compact interface for ease and speed of access.
- **Automatic Programming** – Part programs are automatically created during inspection, for recall and later re-use. Guided inspection routines with visual cues and comments are easily created for repetitive inspections.
- **Guess Mode** – PC-DMIS automatically recognizes feature types as you measure – just measure a circle and it's recognized as a circle.
- **Automatic Nominals** – Feature nominal values are automatically retrieved from the CAD file during measurement, no manual data entry is required.
- **Any-Order Measure™** – Lets operators probe parts in the most convenient and efficient order without having to follow the steps of an inspection routine. The software keeps track of what is measured and only evaluates dimensions when all of the necessary information is available.
- **Aligning contoured parts** – PC-DMIS Portable quickly aligns even the most complex parts. An optional CAD++ configuration includes a range of algorithms for best fit and iterative alignments.
- **Sheetmetal measurements** – PC-DMIS Portable offers an optional library of sheetmetal measurement routines.
- **CAD File Compatibility** – PC-DMIS has translators for nearly any CAD format, plus optional direct CAD interfaces, which read and use the native CAD formats, improving accuracy.
- **Customizable reporting tools** – Customizable inspection reports are created automatically. Compatibility with Microsoft Excel™, PDF and RTF formats.



A multiple point scan can be taken by simply dragging the probe over the part with the button depressed.

Circles can be probed with a single point by placing the ball probe inside the features smaller than the probe and measuring in one click. Square or round slots can be measured with just two clicks.

PolyWorks®, PC-DMIS® CAD++ and PC-DMIS® Reshaper scanning software

<http://us.ROMER.com>

The ScanShark laser scanning system (see page 7) includes PolyWorks and PC-DMIS CAD++ software for complete inspection and reverse engineering capability:

PolyWorks®/Inspector™ uses high-density point clouds and contact-probe datasets to control the quality of parts and tools at every phase of your manufacturing process. The illustration at right shows a PolyWorks/Inspector high-density “weathermap” of point-cloud tolerances and GD&T callouts.

PolyWorks®/Modeler™ is a comprehensive software solution for creating accurate, smooth polygonal models and NURBS surfaces from high-density point clouds. Preferred by automotive design studios worldwide, PolyWorks Modeler is the only software solution that has demonstrated the capability of creating Class A polygonal models for stringent polygonal manufacturing applications such as 3- and 5-axis milling, aerodynamic simulation, and digital review. It also offers a powerful, rapid surfacing methodology that delivers the most usable NURBS surfaces in CAD software such as CATIA and UG.

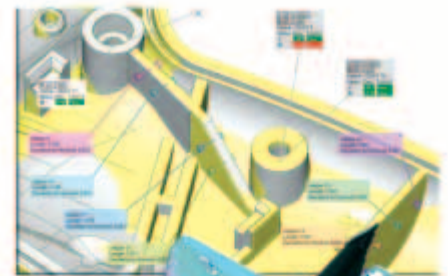
PC-DMIS® CAD++ incorporates scanning and digitizing functions for fast and efficient measurement of complex shapes. Point clouds from PC-DMIS can be imported into PolyWorks/Modeler and processed independently on an offline station to reduce interruption on the CMM. Features include:

- Link to CAD bi-directionally using built-in DES, DMIS, DWG, DXF, IGES, STEP, STL, VDAFS and XYZJK translators.
- Direct CAD Interface (DCI) option to create part programs directly from CAD models utilizing the native CAD system algorithms and tools. Connect to many popular CAD systems, including Unigraphics, Solidworks, Pro-E, CATIA, V5, IDEAs and ACIS.

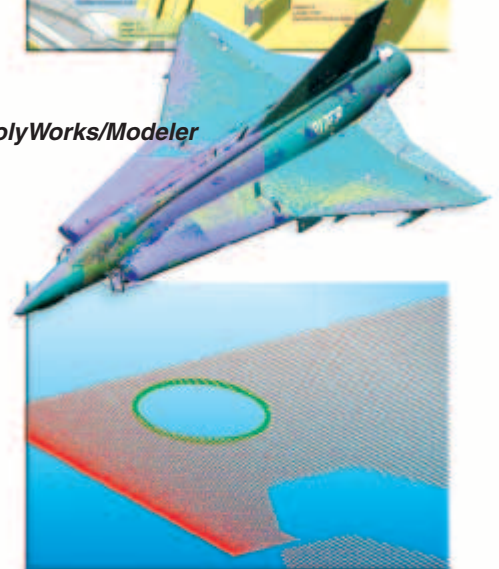
Developed specifically for 3D modeling, **PC-DMIS Reshaper** software captures and processes 3D point cloud data generated from measurement points to quickly create high quality digital models. Standard on the Omega R-Scan system (see page 8), PC-DMIS Reshaper offers:

- Point cloud processing.
- Meshing features.
- 3D Control and inspection.
- CAD preparation and rapid prototyping.

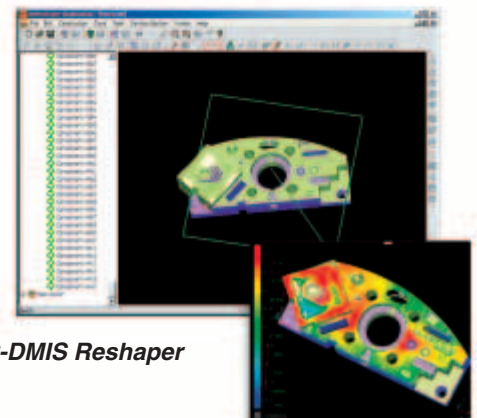
PolyWorks/Inspector



PolyWorks/Modeler



PC-DMIS CAD++



PC-DMIS Reshaper

“The portable CMM offered us a real opportunity for business transformation. This is the first time anyone in the matrix pump business has ever stepped out to offer a warranty of 18 months. Our competitors started calling us and saying we must be crazy. Without this transformation, we might never have had a chance to be a major player in bearing assemblies for mining”

*— Randy Arnett, Vice President,
Townley Engineering & Manufacturing Company, Inc.*

“...we can get an inspection in a fraction of the time without upfront programming and practically no setup time.”

— Taylor Finley, Dimensional/Gage Engineer, Esco Inc.

“We can now do much shorter runs and still make money [with a ROMER laser scanning system]. Not long ago we needed thousands of pieces for a good market, now 300 to 500 pieces is very attractive to us.”

— Tom Corbin, COO, Corbin-Pacific, Inc.

“The ROMER system comes into play every day to verify dimensional controls that were implemented for safety and cost containment.”

— Jerry Kaproth, Safety Coordinator, NASCAR

“When we consider ROI on this purchase, we have reduced setup time on inspection by nearly 40%. We have tried other measurement methods with hard gauges and layouts with less than satisfactory results. Just a few years ago, our scrap per unit produced was at its historical lowest level. This year, we have lowered the rate down to 1/6 of what it was. This is due to the new [ROMER] inspection system.”





— Joe Dombkowski, Forge Manager, Smith & Wesson

“The arm’s versatility sold itself. Our 3D measurement capability sped up our in-process inspection and delivery has increased.”

*— John Hamel, Quality Assurance Manager,
Astronics-Luminescent Systems Inc.*

ROMER

Portable CMM Specifications

	Measuring Range	Point Repeatability	Volume Length Accuracy	Arm Weight	
INFINITE 2.0 (Six Axis)	4 ft. (1.2 m)	0.0004 in. (0.010 mm)	0.0006 in. (0.016 mm)	15.19 lbs. (6.89 kg)	
	6 ft. (1.8 m)	0.0006 in. (0.016 mm)	0.0009 in. (0.023 mm)	20.02 lbs. (9.08 kg)	
	8 ft. (2.4 m)	0.0008 in. (0.020 mm)	0.0011 in. (0.029 mm)	20.95 lbs. (9.50 kg)	
	9 ft. (2.8 m)	0.0011 in. (0.029 mm)	0.0016 in. (0.041 mm)	21.56 lbs. (9.78 kg)	
	10 ft. (3.0 m)	0.0013 in. (0.034mm)	0.0020 in. (0.050 mm)	21.87 lbs. (9.92 kg)	
	12 ft. (3.6 m)	0.0020 in. (0.050 mm)	0.0027 in. (0.068 mm)	22.76 lbs. (10.32 kg)	
INFINITE 2.0 (Seven Axis)	6 ft. (1.8 m)	0.0009 in. (0.024 mm)	0.0014 in. (0.035 mm)	21.34 lbs. (9.68 kg)	
	8 ft. (2.4 m)	0.0011 in. (0.028 mm)	0.0016 in. (0.040 mm)	22.36 lbs. (10.14 kg)	
	9 ft. (2.8 m)	0.0018 in. (0.045 mm)	0.0025 in. (0.064 mm)	22.84 lbs. (10.36 kg)	
	10 ft. (3.0 m)	0.0020 in. (0.050 mm)	0.0028 in. (0.071 mm)	23.20 lbs. (10.52 kg)	
INFINITE 2.0 Plus (Six Axis)	8 ft. (2.4 m)	0.00070 in. (0.017 mm)	0.00098 in. (0.025 mm)	20.95 lbs. (9.50 kg)	
	12 ft. (3.6 m)	0.0017 in. (0.043 mm)	0.0023 in. (0.058 mm)	22.76 lbs. (10.32 kg)	
Stinger Ili	6 ft. (1.8 m)	0.0016 in. (0.040 mm)	0.0022 in. (0.055 mm)	12.46 lbs. (5.65 kg)	
	8 ft. (2.4 m)	0.0019 in. (0.050 mm)	0.0027 in. (0.070 mm)	12.83 lbs. (5.82 kg)	
	10 ft. (3.0 m)	0.0031 in. (0.080 mm)	0.0043 in. (0.110 mm)	13.23 lbs. (6.00 kg)	
	12 ft. (3.6 m)	0.0043 in. (0.110 mm)	0.0061 in. (0.155 mm)	13.63 lbs. (6.18 kg)	
	15 ft. (4.6 m)	0.0079 in. (0.200 mm)	0.0112 in. (0.285 mm)	14.33 lbs. (6.50 kg)	

Specifications are subject to change without notice. Go to <http://us.romer.com> for latest information.

Humidity: 5% - 95% noncondensing **Vibration:** (55 to 2000Hz): < 100 ms/s² **Shock & Impact:** 6ms, <1000 ms/s²

Power requirement: Universal worldwide voltage 110-240 **Certification :** CE compliant

Point Repeatability Test (also known as Single Point Articulation Test, or S.P.A.T.): Results analyzed via Range/2 method. The probe is placed within a trihedral seat or conical socket, and individual points are measured from multiple approach angles with maximum articulation of all of the principal joints. Each individual point measurement is analyzed as a range of deviations about the average value for the point locations. This test is to assess the arm's ability to provide similar values of a point coordinate, when the arm is articulated through the maximum possible range of motion for that single point.

(Volumetric Performance Test): Results analyzed via Range/2 method. Volumetric length accuracy is determined by using certified length standards (included with all arms) that are measured at various locations and orientations throughout the measuring volume. This test most accurately represents the reasonable expectations for machine performance in practical measuring applications. The Volumetric Length Accuracy Test is the most appropriate test for determining machine accuracy and repeatability since it involves measuring a certified length standard many times in several locations and orientations and compares the resultant measurements to the actual length.

ROMER

Responding to needs throughout industry for portable, flexible solutions to measurement and inspection applications, ROMER's co-founder patented and marketed the first multi-axis articulated arm for tube inspection in 1973. Today's ROMER® arms are direct descendants of that first innovation.

Since then, ROMER has continued to lead the field with technological innovations such as our infinite rotation arm design (patented in 1998), WiFi wireless connectivity, integrated USB camera and battery operation. Advanced dimensional inspection products have included the 1000 Series portable CMM, Linear Rail System, 3000i™ portable CMM, GridLOK® 3D large volume measurement system, STINGER II™ and INFINITE® series CMMs.

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