



Engine Rebuilding Equipment

**Innovation
Starts *HERE!***

Master3DGage

Manufacturing Measurement Solutions

- ***Automated Inspection***
- ***Quality Reporting***
- ***Reverse Engineering***



3D Inspection & Reverse Engineering

The new PC-based Master3DGage™ portable CMM system uses precise, 3D model-based software to quickly and accurately verify part quality—right on a CNC machine or anywhere else in the manufacturing process. There's no metrology experience needed. Just align the part, inspect it, and report it. First article inspections that used to take hours or days now take just minutes. Use the internal battery to inspect parts where you want, when you want, without being tethered to an AC outlet.

Greater productivity for all types of inspections

Master3DGage's handy, quick-mount CMM system allows easy setup for on-demand measurement and inspections anywhere on the shop floor. Mount Master3DGage™ right to your machine and check parts quickly, without removing them. In-process verification eliminates worries associated with repositioning parts. Finish typical inspections, such as in-process, incoming, first article and final inspections, quickly—with surprising ease and accuracy. Measurement reports are generated automatically, using industry standard formats, so you will know immediately whether parts are acceptable.

Productivity-minded machine shops seeking an affordable, best in-class CMM will find everything they need in Master3DGage™. Powered by Verisurf's industry-leading inspection software.



Finish inspections quickly and easily with high precision, including in-process (shown above), blueprint, incoming, first article and final inspections.

Scrap rates drop. Profits soar.

Powered by Verisurf's world-class, model-based software, Master3DGage™ maintains precise digital work-flow, from the start of your inspection to the end. The ability to precisely pinpoint and resolve quality issues in real time helps reduce scrap, improve efficiency and boost the productivity of every machine. Bottom line? With the new Master3DGage™ you'll do more work, with less rework—because both process and results are repeatable, even during high-volume production.

Ultra-accurate, six-axis metrology

Nearly as impressive as its software is the compact portable CMM, an integrated Hexagon Metrology, six-axis (MM—among the world's most accurate with a remarkable measuring volume of 1.2m (4ft)). This feature provides superior dimensional control of parts, tooling, molds, castings and more. The innovative counterweight design eliminates user fatigue and assures exceptional accuracy over the full range of measurements. The ergonomic wrist and intuitive, easy-to-reach controls increase comfort and simplify use.



Quality production has never been easier

In a production environment, time is money. But historically, non-digital manual and 2D parts inspections have been very labor intensive. With Master3DGage™, simplicity and ease of use are designed right in, so that even those with little or no metrology experience can get up to speed quickly. Controls and interface are easy and straightforward, so users spend less time scrolling through screens and more time making quality parts.

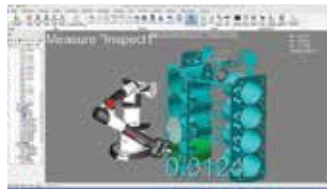
Made Easy

Verisurf Automated Inspection: 1-Align, 2-Inspect, 3-Report

Align: Verisurf quickly aligns your part to your CAD model by creating targets on the CAD model and guiding you through auto alignment by probing each target on the part.



Inspect: Verisurf displays real time part to CAD model deviation when probing the part surface and guides you through automated inspection plans. Real time visual and audible indicators combined with color deviation displays provide you with instant part quality feedback.



Report: Verisurf uses the 3D CAD model as the inspection nominal which quickly generates custom reports in industry standard formats with GD&T constraints, color deviation maps and in or out of tolerance indicators for clear, practical analysis.

RMC CMM Inspection Report				
Date: 04/23/14		Title: 04.03.10		
Serial Number: 0142		Part Name: 040003		
Work Center: RMC Master 3D Gage		Model: 040003		
Operator: J		Part ID: 040003		
Work Order: J		Operation: 040003		
KBS00 CMM				
1) Part Name	Measured	Standard	Min	Max
2) Part ID	0.0000	0.0000	0.0000	0.0000
3) Part Name	0.0000	0.0000	0.0000	0.0000
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99) Part Name	0.0000	0.0000	0.0000	0.0000
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Verisurf Reverse Engineering: 1-Measure, 2-Mesh, 3-Model

Measure: Verisurf can directly measure 3D features including planes, cylinders, cones and spheres and 2D features including lines, splines, circles and slots. In continuous point mode Verisurf can measure 100 points per second with long probes capable of reaching inside deep cavities to quickly scan 3D point clouds of complex surfaces.



Mesh: Verisurf's powerful point cloud and STL mesh editing tools helps prepare large data sets for 3D mesh surfacing and 3D printing. Verisurf has all the mesh tools you need to create watertight mesh models including; align and merge meshes, filter, smooth and fill holes.



Model: Verisurf has all the reverse engineering tools to transform 3D point clouds and meshes into 3D surfaces and solid models for precision manufacturing. Verisurf imports and exports popular CAD formats making it the ultimate interoperability platform for automated inspection, guided assembly and reverse engineering.



Optional Laser Scanning

The new scanner is designed to complement Master3DGage, the affordable and portable rapid 3D inspection and reverse engineering solution that enables shops to significantly increase production and improve part quality.



The non-contact laser scanner, delivers excellent price/performance and is easily interchangeable with tactile probes on the Master3DGage, portable CMM. This expands application flexibility between contact probing used in many inspection processes and high-speed non-contact 3D scanning, typically used in reverse engineering.

System Specifications

Complete System Comprises

- Six-axis Hexagon Metrology portable CMM
- Ergonomic counterweight design
- Durable, hard-sided transport case
- Master3DGage™ training part
- Verisurf Coordinate Metrology Software
 - NIST Tested
 - PTB Certification
- USB and power cables
- WiFi connectivity
- Internal lithium-ion battery
- 1-year warranty
- Certified qualification sphere
 - Size +/- 0.0005mm (0.00002 in)
 - Spherical within 0.0001 mm (0.000005 in)
- Probe kit with 3mm ruby, 6mm ruby and 15 mm steel spherical hard probes with quick disconnect, automatic probe identification and probe case
- Magnetic base kit with 3 precision ground magnetic bases with cap screws

Accuracy and Precision

Certification: ASME B89.4.22

Probing volumetric accuracy: $\pm 0.025\text{mm}$ (.00098in)

Probing point repeatability: 0.014mm (.00055in)

Operating Temperature

0° C to 50° C (32° F to 122° F)

Relative Humidity

10% - 90% non-condensing

Power Requirements

Universal worldwide voltage 110-240 V AC, 50/60 Hz

Weight

Complete system with transport case 33.5 kg (74 lbs.)

Transport Case Size

30.5 x 53.3 x 96.5 cm (12 x 21 x 38 in)

Verisurf Software Flexibility

Verisurf software is modular so you can configure the right functionality for your application and budget.



Supported Operating Systems

- Windows 7 and 8

Supported File Formats

- ACIS Kernel SAT Files (*.SAT;*.SAB)
- Alibre Design Files (*.AD_PRT;*.AD_SMP)
- ASCII Files (*.TXT;*.CSV;*.DOC)
- AutoCAD Files (*.DWG;*.DXF;*.DWF)
- Autodesk Inventor Files (*.IPT;*.IAM;*.IDW)
- Cadkey CDL Files (*.CDL)
- HPGL Plotter Files (*.PLT)
- IGES Files (*.IGS;*.IGES)
- KeyCreator Files(*.CKD)
- Mastercam Files (*.MCX;*.MC9;*.MC8)
- Parasolid Files (*.X_T;*.X_B;*.XMT_TXT)
- Rhino 3D Files (*.3DM)
- Solid Edge Files (*.PAR;*.PSM;*.ASM)
- SolidWorks Drawing Files (*.SLDDRW)
- SolidWorks Files (*.SLDPRT;*.SLDASM)
- SpaceClaim Files (*.SCDOC)
- STEP Files (*.STP;*.STEP)
- Stereolithography Files(*.STL)
- VDA Files (*.VDA)
- Optional formats:
 - CATIA V4 Files (*.MODEL;*.EXP)
 - CATIA V5 Files (*.CATPART;*.CATProduct)
 - Pro/E Files (*.PRI;*.ASM;*.PRT.*;*.ASM.*)
 - Unigraphics NX (*.PRT)

Master3DGage™
AFFORDABLE, PORTABLE CMM



RMC

Engine Rebuilding Equipment

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In order to bring you the most advanced features as soon as possible, all features, descriptions and technical specifications are subject to change