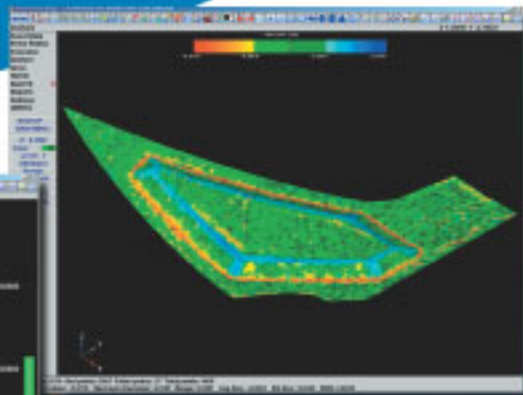
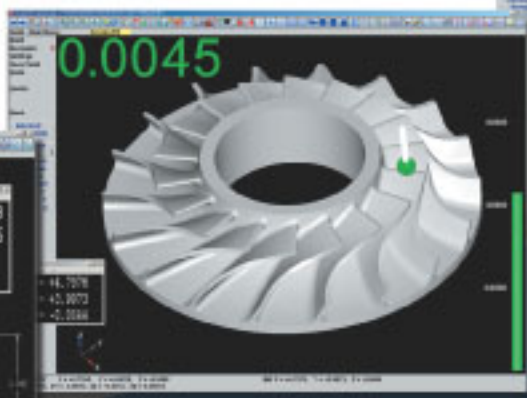
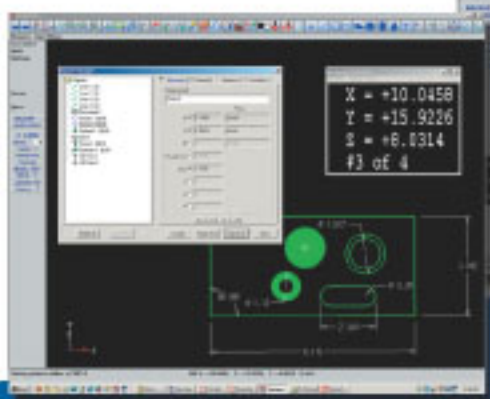


# VERISURF

*THE COMMON SOFTWARE PLATFORM  
FOR COORDINATE MEASURING*



INNOVATORS IN  
COMPUTER-AIDED  
MANUFACTURING



[www.verisurf.com](http://www.verisurf.com)



# PIONEERING COORDINATE MEASURING WITH NEW TECHNOLOGY

Verisurf came to life in the high-tech aerospace manufacturing industry. It continues to mature and flourish from concurrent development fed by solution-seeking partnership with industry leading aerospace, automotive and industrial manufacturers.

## **THE COMMON PLATFORM** ALL DEVICE TYPES & MANUFACTURERS

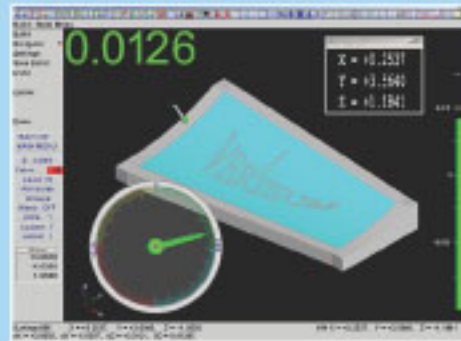
### LASER TRACKERS

- Faro
- API
- Leica



### ARTICULATING ARMS

- Romer
- Faro
- Immersion Microscribe



### OTHER DEVICES & TECHNOLOGY



- Photogrammetry
- Theodolites
- VStars
- Metronor
- Indoor GPS
- Other New Technology

### CMM's



## IT'S ALL ABOUT THE SOFTWARE!

"...CMM hardware has almost become a commodity, a peripheral device, a very expensive data gatherer. The writing is on the wall: Customers have begun to gravitate toward the application rather than the equipment and at times, [...] specify the software and not the machine." Quality Digest, May 2003

# THE VERISURF ADVANTAGE - WHY VERISURF BEATS THE COMPETITION

**THE POWER OF CAD** - Verisurf is built on the number one installed CAD/CAM system in the world. This adds functionality well beyond the competition, with features that are essential for inspection and reverse engineering.

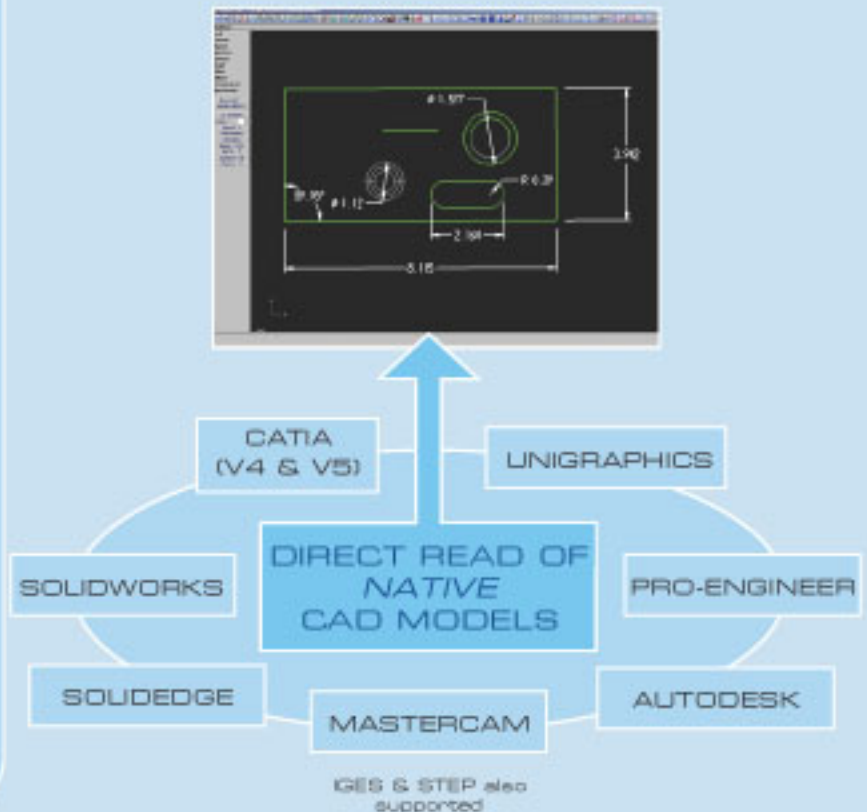
**REAL-TIME ACTION** - See the probe, CAD model, measured features, deviation, etc. live and dynamically moving on the screen. Others claim to be real time, but actually require that you take a point, and then you get information from it afterwards.

**MODEL-BASED INSPECTION TO NATIVE CAD FORMATS AND SOLID MODELS** - Unlike other systems that are dependent on IGES or STEP translations, Verisurf allows you to inspect to native solid models of all the top CAD formats.

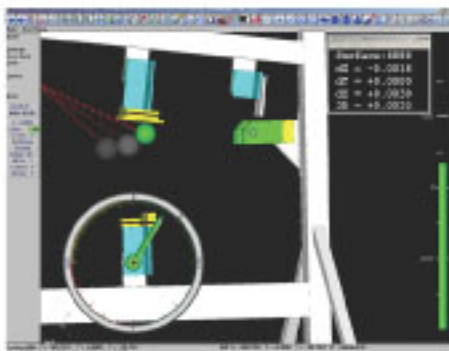
**ONE POWERFUL SYSTEM FOR ALL DEVICES** - With important device-specific features, but in a common, consistent platform. And there is **NO CHARGE** for device interfaces, as many as you want. Train on one system and benefit from one consistent method of data collection and reporting.

**SUPPORTS MODEL BASED DEFINITION (MBD)** - Through model based inspection (MBI) that includes feature tolerancing, embedded inspection routines, and GD&T.

## ROBUST, TRUE CAD/CAM PLATFORM



## LIVE ACTION!



Verisurf has legitimate real-time display.

Others allow you to take a point... Then they crunch the data... Then they give you a result.

**NEW TECHNOLOGY INCREASES EFFICIENCY AND IMPROVES THE PROCESS** - Advanced routines such as AutoAlign and AutoInspect make inspection easier, greatly reduce the time it takes to complete a job, simplify training, and add considerable process control to QA and manufacturing.

**WHERE OTHERS ARE LIMITED, VERISURF EXCELS** - Already the most powerful system available, Verisurf continues to add capability to handle almost any real-world scenario.

**EXTENSIVE, CUSTOMIZABLE REPORTING AND DATA EXPORT** - View, print & save in a vast array of easy to use formats including standard spreadsheet and database.

**LOW PRICE** - Lower than less capable competition, often significantly lower.

## BASIC

The base module includes a full CAD system, device interface (VDI), device alignments (including AutoAlign), reports and tools. [This module is required]

## BUILD

"The Virtual Gage" - Inspection to CAD surfaces and/or solid model, real-time inspection and computer-aided assembly

## MEASURE

Standard CMM measuring (when not comparing to a CAD model) - blueprint and GD&T measurement, automatic feature recognition, smart tools

## ANALYSIS

Offline comparison of measured points to a CAD model, includes best fit, color graphical and tabular reporting

## REVERSE

Digitize surfaces and measure geometric features with necessary fit routines needed to create an accurate CAD model of prismatic and contoured shapes

## VERIPROBE™

To create CAD-based inspection programs to run DCC/CNC CMMs and for machine tool probing

Select the modules needed for your unique requirements, or purchase the complete bundled system. The Basic module is the minimum requirement and is needed with any other module or combination of modules.

## BUNDLED SYSTEM\*

Complete solution for arms, trackers & CMMs

\* Bundled and multi-seat pricing available

## VERISURF DEVICE INTERFACE - "VDI"

The VDI is Verisurf's device interface application. It provides connectivity with all devices, a digital readout (DRO), and numerous device tools and settings:

- Probe Radius
- Trigger Modes
- Timer Mode
- Catia V5 Interface
- Tracker Homing & ADM
- Device Utilities
- Probe Calibration
- Smart Tools
- Remote PDA Display & Controls
- Data Export
- Units (metric/imperial)
- DRO
- Device Selection



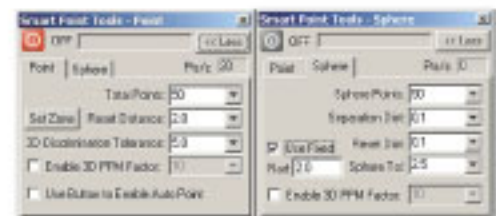
VDI Menu  
 Metric  
 Imperial  
 DRO

Timer Mode - Automatically records a point on adjustable time intervals  
 Average Mode - Acquires a preset number of points and records the average



## INCREDIBLE TOOLS FOR LASER TRACKERS!

### SINGLE HANDED OPERATION WITH SMART POINT & SMART SPHERE



**SMART POINT** - Automatically takes a point when you rest the tracker ball in the desired location... Automatic, easy, and it can be done by one person.

**SMART SPHERE** - Automatically measures a sphere when you scan a sphere or "swing" a hidden point.

UNLIKE OTHERS, VERISURF DOES NOT CHARGE EXTRA FOR THE DEVICE INTERFACE! AND YOU CAN ADD AS MANY DIFFERENT DEVICES AS YOU WANT FOR NO EXTRA COST.

The primary elements of the Basic module are:

- Device Interface (VDI)
- CAD System
- Verisurf Settings
- Verisurf Tools
- Alignments
- Reports

The Basic module is a required component that is needed along with any of the other modules.

Verisurf is built upon the number one installed CAD/CAM system in the world. It is a robust system that is manufacturing oriented, has interoperability with other CAD platforms, includes solid modeling, and adds significant capability to the application.

## CAD System



- Create
- Edit
- View
- An
- Util
- Split
- Lene
- Surface
- Example
- Setting
- System

CAD Formats Included With Basic System:

- IGES
- VDA
- Parasolid
- SolidEdge
- SolidWorks
- AutoCAD
- Inventor
- SAT
- CADL
- STL
- HPGL
- ASCII
- Mastercam

Optional CAD Formats:

- Catia V4 & V5
- Unigraphics
- Pro-Engineer
- STEP
- Solid Models

### WHY DO YOU NEED A BUILT-IN CAD SYSTEM?

- Inspect to the native CAD model (eg. Catia, UG, Pro-E, etc.) Essential for reverse engineering
- CAD models often need enhancement or modification to allow for inspection
- Allows analysis/interrogation of the CAD model's geometries and surfaces
- Infinite viewing angles/zoom
- Organize data and geometry on layers/levels with changeable colors
- No need to create graphic images for viewing, inspecting and reporting
- Avoid uncertainty of inspecting to a "representation" of a CAD model
- Solid model capability
- Able to handle large CAD files
- Mirror, offset, extend, unwrap, etc.
- When no CAD model exists for inspection to the model, or when component or tool features need to be added, the capability exists within your inspection system
- Release GA and Manufacturing from reliance on Engineering

### Device Alignments

- Axis Align
- Feature Align
- 2 Points
- On-Use Point
- On-Use Line
- On-Use Plane
- On-Use Axis
- On-Use Surface
- On-Use Edge
- On-Use Hole
- On-Use Slot
- On-Use Fillet
- On-Use Chamfer
- On-Use Groove
- On-Use Thread
- On-Use Hole
- On-Use Slot
- On-Use Fillet
- On-Use Chamfer
- On-Use Groove
- On-Use Thread

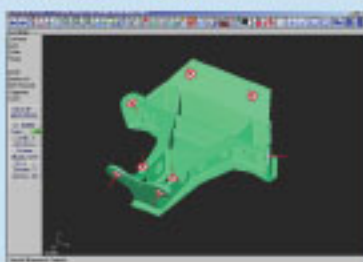


Feature Alignment  
Traditional 3-2-1  
Type Alignment from  
Measured Features  
Intuitive & Easy to  
Use

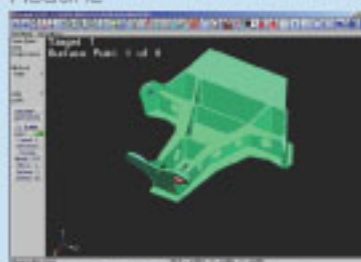
## AUTOALIGN

Revolutionary New Alignment Technique

**STEP 1**  
Create Alignment Targets on CAD Model



**STEP 2**  
Run AutoAlign, User Prompted Routine



Provides a Major Process Improvement

**STEP 3**  
Take points at the indicated targets with your device, the software guides you through it and...  
**VOILA - YOU'RE ALIGNED!**

Align to surfaces, holes, tooling targets - Verisurf uses each target type differently, with each one influencing the alignment fit with clever logic

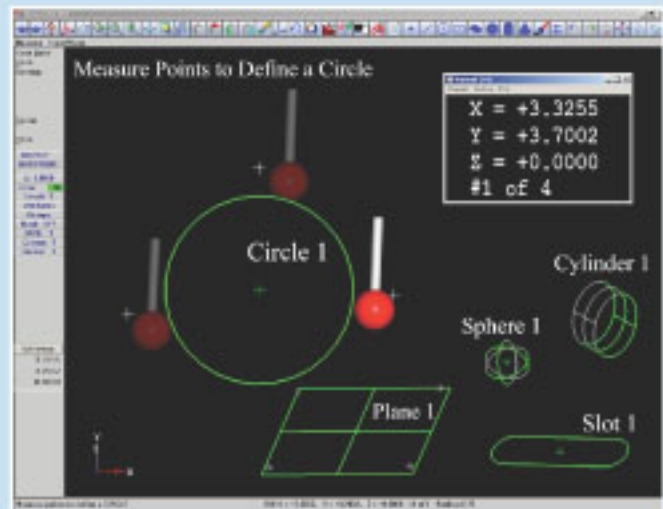
- Automated routine, improves process control
- See the roughly aligned probe/ball on the screen after the 3rd point; fit is refined with each point
- Easier to learn and apply
- Faster, more accurate, more consistent
- Accurate alignment of complex contours even when no tooling datums exist
- Simplifies and speeds device relocation (and re-alignment)
- Can be applied to fixed datums such as tooling balls, etc.

- Easily name, skip, undo, edit the targets
- Save alignment routines for future aligning including multiple alignment schemes
- Add to automated inspection routine (AutoInspect)
- The preferred alignment method for almost any model-based inspection scenario
- Replaces outdated alignment methods
- Reports complete bundling results

# VERISURF MODULE: MEASURE

When not inspecting to the CAD model, metrologists need a diverse set of tools for measuring features and characteristics dimensioned from blueprints. Measure provides these tools with dazzling user-friendly intelligence and great flexibility. Smart geometry recognition virtually builds a CAD model as points are measured. With any measured feature you can choose to reference the measurement from origin or use any other feature as your datum. Unique nominal values and tolerances for each item can be set by the user. Choose to report any or all measurements and include a graphical representation for clarity.

- Traditional blueprint part inspection
- Real-time inspection of primitive geometric features
- Online or offline fitting of lines, circles, slots, planes, spheres, cylinders, or cones from measured points
- Smart measuring tools for automatic feature recognition
- See the probe move on-screen as you measure, making a CAD model representation as you go
- Measures all basic GD&T callouts
- Create inspection report for all entities
- User-selectable referencing from datum or features
- Export measured geometry in numerous CAD formats
- For making automated, controlled routines (inspection plans), use AutoInspect



Verisurf's powerful Report Manager (see next page) provides full control over the analysis and reporting of measurements, including the ability to set individual nominals and tolerances



Measure with icons or menus



## MEASURE OPTIONS

### Drag/Scan Mode

Puts device in data acquisition mode taking a constant stream of point data. This is especially useful for surface inspection, color mapping and reverse engineering.

### Notes

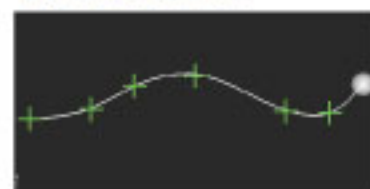
Save notes to identify points. Useful for tooling locators, etc.

### Save

Choose to save points, vectors, notes, probes, lines and splines.



### Measure Points with Dynamic Splines



# REPORT MANAGER

You are in command of your measured data with the Report Manager. It provides a flexible means of data management with capabilities well beyond simple canned reports. It is easy to use with drag-and-drop simplicity. Reference any measured feature from origin or select another measured entity as your datum. It even allows you to give features unique tolerances and nominal values. It also includes GD&T and numerous data export methods. The Report Manager gives you all the freedom you need to measure to blueprint requirements.

Report all or select individual measurements. Choose html or MS Excel formats. Include graphical image of measurements.

## REPORT MANAGER

Comprehensive list of measured data/features with full discretion of its use

The "raw data" of your measurements are available for you to work with if needed.

SET NOMINALS

SET TOLERANCES

Select reference from origin or any other measured features or datum

Verisurf Inspection Report

Report: 1  
Date: 10/20/2010  
Part: 1000000000  
Rev: 1  
Date: 10/20/2010  
Rev: 1

VERISURF

Measurements

Measure	Measured	Nominal	Unit	Min	Max	Dev
Length	1.000	1.000	mm	0.999	1.000	0.000
Width	1.000	1.000	mm	0.999	1.000	0.000
Height	1.000	1.000	mm	0.999	1.000	0.000
Circle 1	0.000	0.000	mm	0.000	0.000	0.000
Circle 2	0.000	0.000	mm	0.000	0.000	0.000
Circle 3	0.000	0.000	mm	0.000	0.000	0.000
Circle 4	0.000	0.000	mm	0.000	0.000	0.000
Circle 5	0.000	0.000	mm	0.000	0.000	0.000
Circle 6	0.000	0.000	mm	0.000	0.000	0.000
Circle 7	0.000	0.000	mm	0.000	0.000	0.000
Circle 8	0.000	0.000	mm	0.000	0.000	0.000
Circle 9	0.000	0.000	mm	0.000	0.000	0.000
Circle 10	0.000	0.000	mm	0.000	0.000	0.000
Circle 11	0.000	0.000	mm	0.000	0.000	0.000
Circle 12	0.000	0.000	mm	0.000	0.000	0.000
Circle 13	0.000	0.000	mm	0.000	0.000	0.000
Circle 14	0.000	0.000	mm	0.000	0.000	0.000
Circle 15	0.000	0.000	mm	0.000	0.000	0.000
Circle 16	0.000	0.000	mm	0.000	0.000	0.000
Circle 17	0.000	0.000	mm	0.000	0.000	0.000
Circle 18	0.000	0.000	mm	0.000	0.000	0.000
Circle 19	0.000	0.000	mm	0.000	0.000	0.000
Circle 20	0.000	0.000	mm	0.000	0.000	0.000
Circle 21	0.000	0.000	mm	0.000	0.000	0.000
Circle 22	0.000	0.000	mm	0.000	0.000	0.000
Circle 23	0.000	0.000	mm	0.000	0.000	0.000
Circle 24	0.000	0.000	mm	0.000	0.000	0.000
Circle 25	0.000	0.000	mm	0.000	0.000	0.000
Circle 26	0.000	0.000	mm	0.000	0.000	0.000
Circle 27	0.000	0.000	mm	0.000	0.000	0.000
Circle 28	0.000	0.000	mm	0.000	0.000	0.000
Circle 29	0.000	0.000	mm	0.000	0.000	0.000
Circle 30	0.000	0.000	mm	0.000	0.000	0.000
Circle 31	0.000	0.000	mm	0.000	0.000	0.000
Circle 32	0.000	0.000	mm	0.000	0.000	0.000
Circle 33	0.000	0.000	mm	0.000	0.000	0.000
Circle 34	0.000	0.000	mm	0.000	0.000	0.000
Circle 35	0.000	0.000	mm	0.000	0.000	0.000
Circle 36	0.000	0.000	mm	0.000	0.000	0.000
Circle 37	0.000	0.000	mm	0.000	0.000	0.000
Circle 38	0.000	0.000	mm	0.000	0.000	0.000
Circle 39	0.000	0.000	mm	0.000	0.000	0.000
Circle 40	0.000	0.000	mm	0.000	0.000	0.000
Circle 41	0.000	0.000	mm	0.000	0.000	0.000
Circle 42	0.000	0.000	mm	0.000	0.000	0.000
Circle 43	0.000	0.000	mm	0.000	0.000	0.000
Circle 44	0.000	0.000	mm	0.000	0.000	0.000
Circle 45	0.000	0.000	mm	0.000	0.000	0.000
Circle 46	0.000	0.000	mm	0.000	0.000	0.000
Circle 47	0.000	0.000	mm	0.000	0.000	0.000
Circle 48	0.000	0.000	mm	0.000	0.000	0.000
Circle 49	0.000	0.000	mm	0.000	0.000	0.000
Circle 50	0.000	0.000	mm	0.000	0.000	0.000

# DATA MANAGEMENT

LEVELS, COLORS, GROUPS, ENTITY I.D.s, TIME/DATE STAMP

Extensive Levels/Layers Management

Change Line & Point Attributes

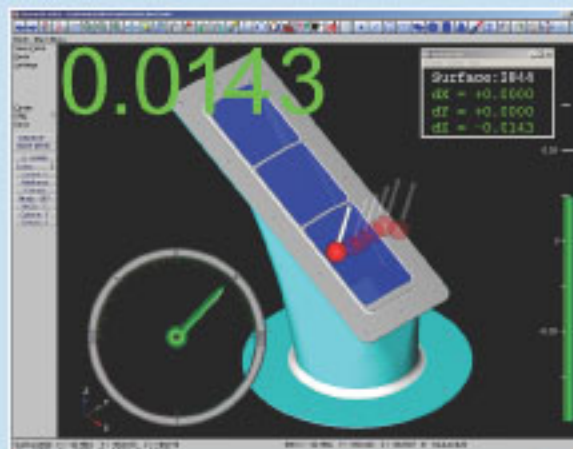
Database - Full Export Capability with Mapping

# VERISURF MODULE: BUILD

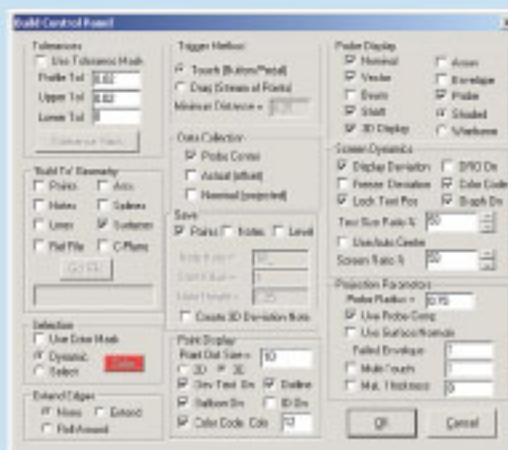
## The Virtual Gage

This module puts manufacturing and QC personnel into the virtual world by providing real-time inspection and assembly to the CAD model. With advanced tools such as AutoAlign, one can instantly align the measuring device with the CAD model in its part, aircraft, or vehicle coordinate system.

- Real-time model-based inspection
- Inspect to "native" CAD models
- See the probe move on the screen relative to the live model, indicating deviation as it varies
- Build to surfaces, lines, arcs, splines, points, notes, reference file, & construction plane; and turn any of these entity types on or off
- Computer aided "virtual" assembly - Arrow and deviation readout directs precision placement of components on an assembly LIVE, in real time
- Select highly visible, color coded, on-screen bar and dial gages to enhance readability from a distance
- Color-coding indicates in/out of tolerance and +/- condition
- Save points on the same level as the entity being inspected, or select any level
- Greatly enhance productivity, accuracy, and quality control
- Automatically record points at preset nominal locations
- Multiple inspection devices can be used simultaneously on the same 3D CAD model
- Eliminate hand tooling using gageless graphical software
- Same software for all device types but with selectable features for their unique requirements and use
- Select individual CAD entities or colors on the model to which you can project with the ability to exclude other entities and colors
- Employ multiple tolerances
- Meaningful, useful build sounds
- Dynamic auto ballooning of point data



Live on-screen, real-time display of probe, deviation & gages.



Numerous options to handle a multitude of special needs.



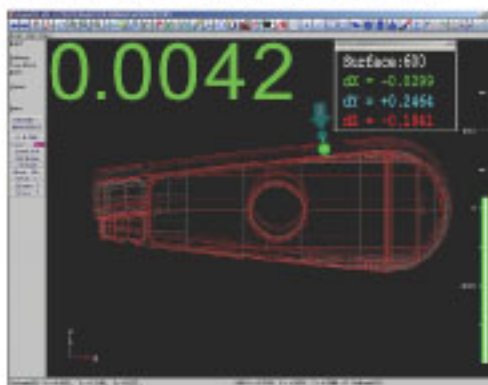
### LASER TRACKER TOOLS

PDA INTERFACE DEVICE READOUT (DRO) & CONTROLS

- DRO
- COLOR-CODED DEVIATION GAGE
- TRIGGER POINT
- HOME TRACKER
- SMART POINT
- SMART SPHERE
- SET TRIGGER MODES

### VIRTUAL MANUFACTURING

Set Assembly Details  
With Live Graphical Assistants



- Dynamic display with arrow shows direction and magnitude that the detail needs to move
- Indicator "rubber band" shows entity to which you are projecting

AutoInspect provides automation and control of coordinate measuring inspection. Create plans/routines to direct the device operator through inspection. Take control of the inspection process improving productivity, accuracy and speed. Enhance lean manufacturing by allowing inspection to be moved to the production technician rather than a separate QC inspector.

- Graphics-based inspection plan authoring
- Automate functions, ensure accurate and repeatable data acquisition
- Promotes lean manufacturing and enhanced process control
- A step beyond traditional scripting and complex programming
- Intuitive structure and flow for creating routines and reports

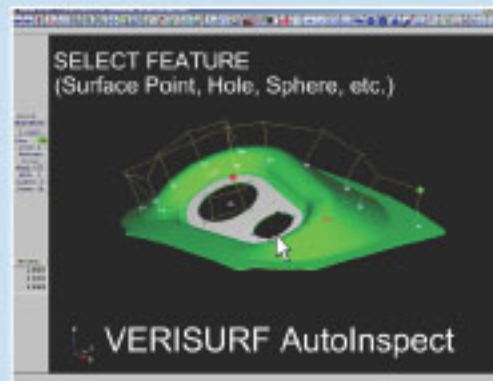
**SIGNIFICANTLY ENHANCE YOUR PROCESS CONTROL!**

**APPLY LEAN TECHNIQUES TO YOUR QUALITY ASSURANCE**

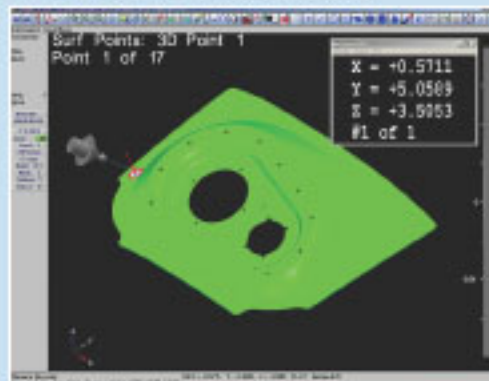
## AutoInspect's Easy Programming

Step 1) Select feature type, then select features from the CAD model.

Remembers views & zooms



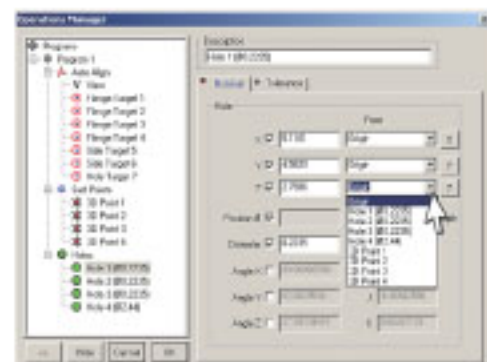
Step 2) Run AutoInspect



AutoInspect directs you through the inspection with prompts, targets, and arrows...

**Operations Manager** - Once you have mouse-selected the features on the model you wish to add to the AutoInspect routine, the Operations Manager displays them in a tree that allows you to view, move, delete and setup the inspection with numerous options.

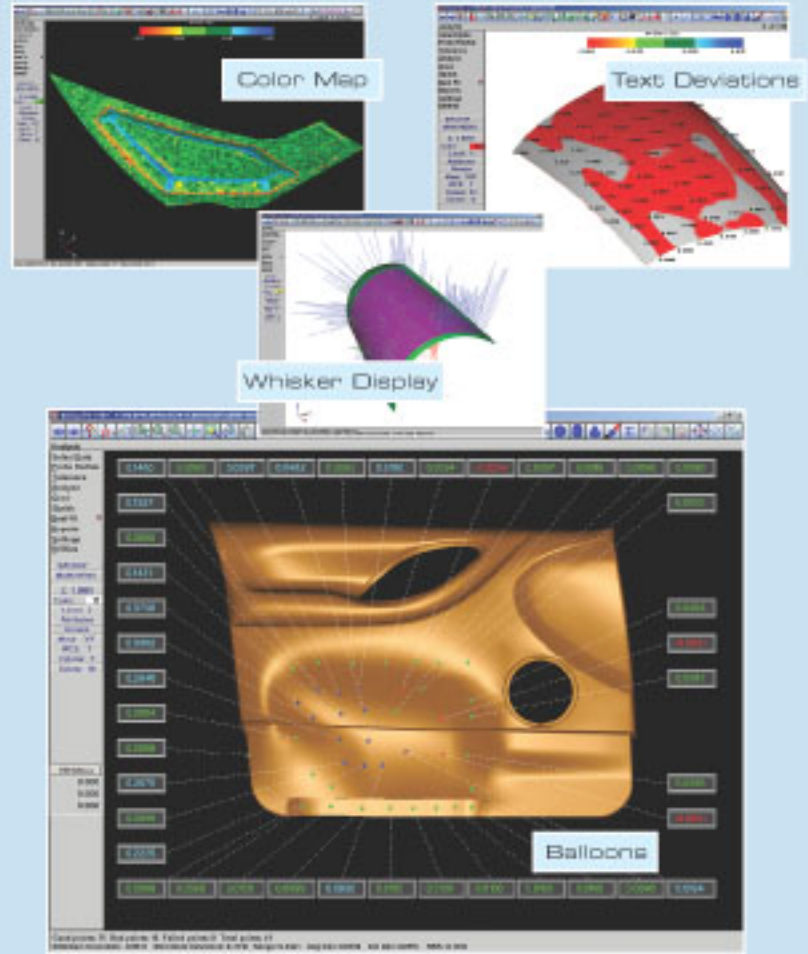
- Tree of selected operations and features to be measured
- Remembers views/zooms from the selection process
- Re-name, move (drag & drop), delete operations
- Add/modify views, sounds, levels, constructs, comments, probe change, temperature, prompts
- Includes AutoAlign alignment routine



# VERISURF MODULE: ANALYSIS

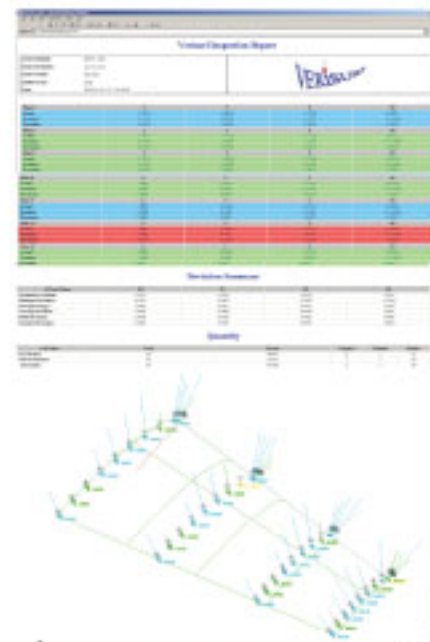
The Analysis module provides comprehensive, powerful comparison between the CAD model and measured point data. With extensive analysis features, this module provides best-fit with control over all six axes. Included are customizable text reports and color plots. Analysis is indispensable for inspection and reporting on complex 3D surfaces.

- Powerful, model-based inspection analysis
- Reports the deviation between the CAD model and measured points
- Provides best-fit with full control over all six axes
- Graphical and text reports and color plots for hardcopy printouts
- Export/save in numerous file formats including html and MS Excel
- Customizable color mapping
- Get results instantly
- Set multiple surface tolerances
- Automatic probe compensation
- Can be used to compare any set of coordinate data to a CAD model
- Preferred means of analysis of complex contours by many major aerospace companies



## BEST FIT

- Discretion over all 6 axes
- Numerous best-fit control options
- Detail of offset results
- Optional fit algorithms
- Shift points on alignment



Detailed or Summary Reports With Graphics



**ANALYSIS SETTINGS**  
Numerous Settings Providing Great Flexibility

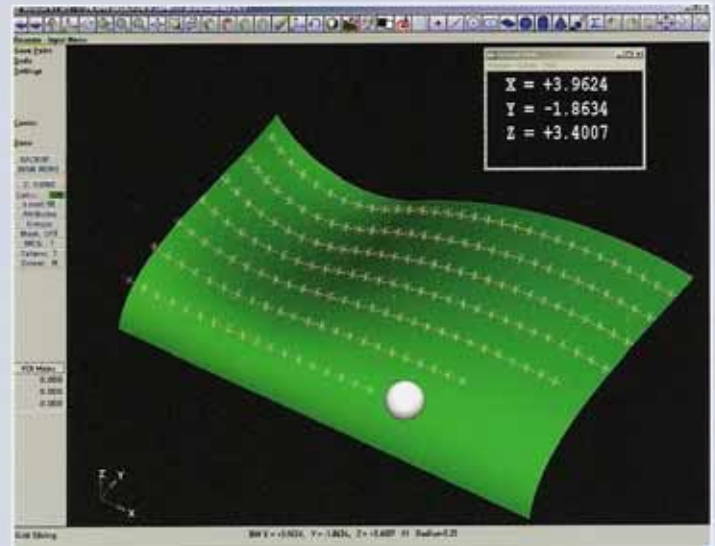
# VERISURF MODULE: REVERSE

This module gives the user a complete reverse engineering solution for digitizing a manufactured component. Data are taken, viewed and worked in real-time on Verisurf's CAD screen. Powerful tools aid in the creation of an accurate CAD model from scratch. Enjoy the benefits of having an integrated system for capturing data including smart recognition of features in a live real-time CAD environment that lets you build the model as you go.

- Powerful, versatile reverse engineering software
- Tools to create CAD models from measured data
- Define plane, grid or radial cross sections through the 3D CAD model and the device will dynamically record points only at the pre defined plane locations
- Digitize and create a surface patch (Nurbs)
- Trim, blend, offset, extend and modify any surface
- Very accurate trimmed surface creation
- Can be operated in either online/live mode or used offline to fit features to previously acquired data
- Use the Verisurf Build module for instant verification of the newly created CAD model
- Export model in numerous CAD formats
- Reverse engineer surfaces from point clouds
- Point cloud filtering

## REVERSE ENGINEERING SOFTWARE

Digitize your parts or tools using the Reverse module's extensive online and offline capabilities.

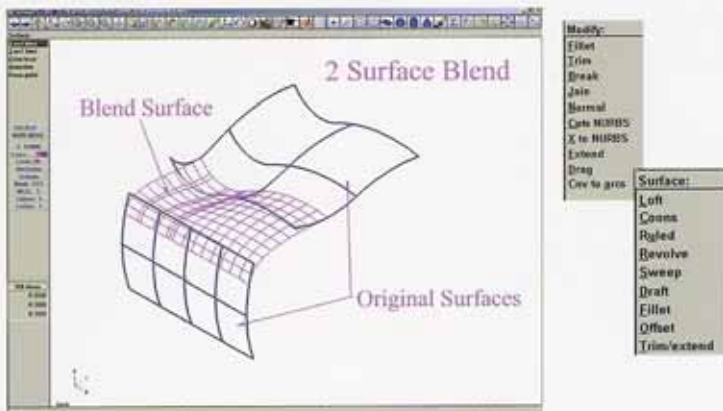


## Export CAD Model in Numerous CAD Formats:

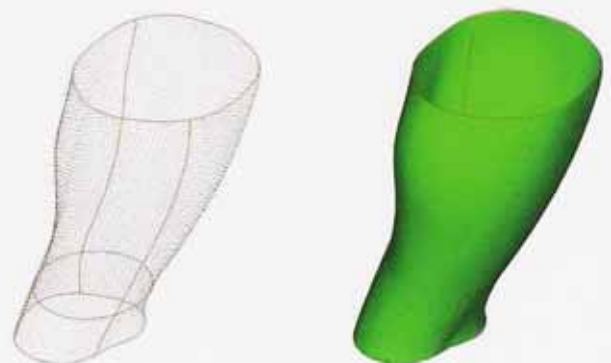
- IGES
- ACIS
- VDA
- Autodesk (including Inventor)
- STEP
- Parasolid
- CADKEY
- STL
- Mastercam
- Catia V4 & V5

Export of surfaces for all of the above and solids for Catia, Parasolid, ACIS, STEP and Mastercam

## Works Inside a Robust CAD System Essential for Reverse Engineering



## Create Surfaces from Point Clouds



# VERISURF MODULE: VERIPROBE™

## Programming for Automated CMMs & Machine Tool Probing

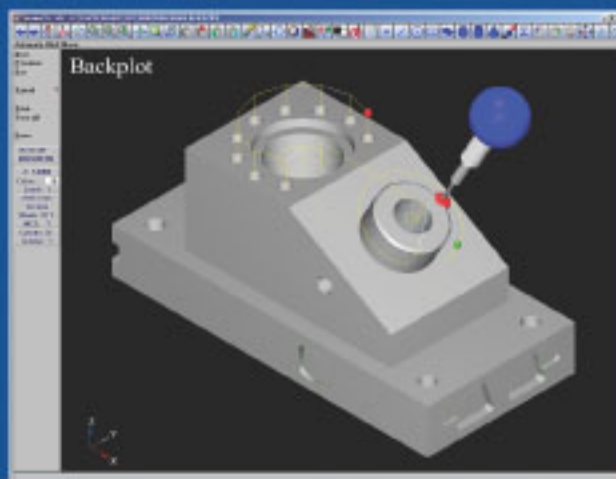
CAD-based programming system that generates probe "tool" paths for coordinate measuring machines and machine tool probing. Instead of needing highly-skilled programmers, Veriprobe provides simple, 3D graphical, fully interactive programming requiring only limited skills.

- Faster and easier offline programming system for automated CMMs and CNC probing
- Fully interactive 3D graphical methodology
- Probe angles and changes, clearance planes, goto moves, operator comments, tolerances, surfaces, contours, holes, bosses, etc.
- Tool path and probe simulation
- Works just like AutoInspect (used for creating inspection routines for manual devices); just select "manual inspection" or pick a post processor for automated machine inspection
- Built-in DMIS V4 post (Dimensional Measuring Interface Specification)
- Custom post processors for all CNC driven devices

### Simple CAD (graphical) Based Programming

The same system for programming in Verisurf AutoInspect is used for Veriprobe (see previous page on AutoInspect)

### Programming for Automated CMMs



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### Machine Tool Probing



Renishaw Probing