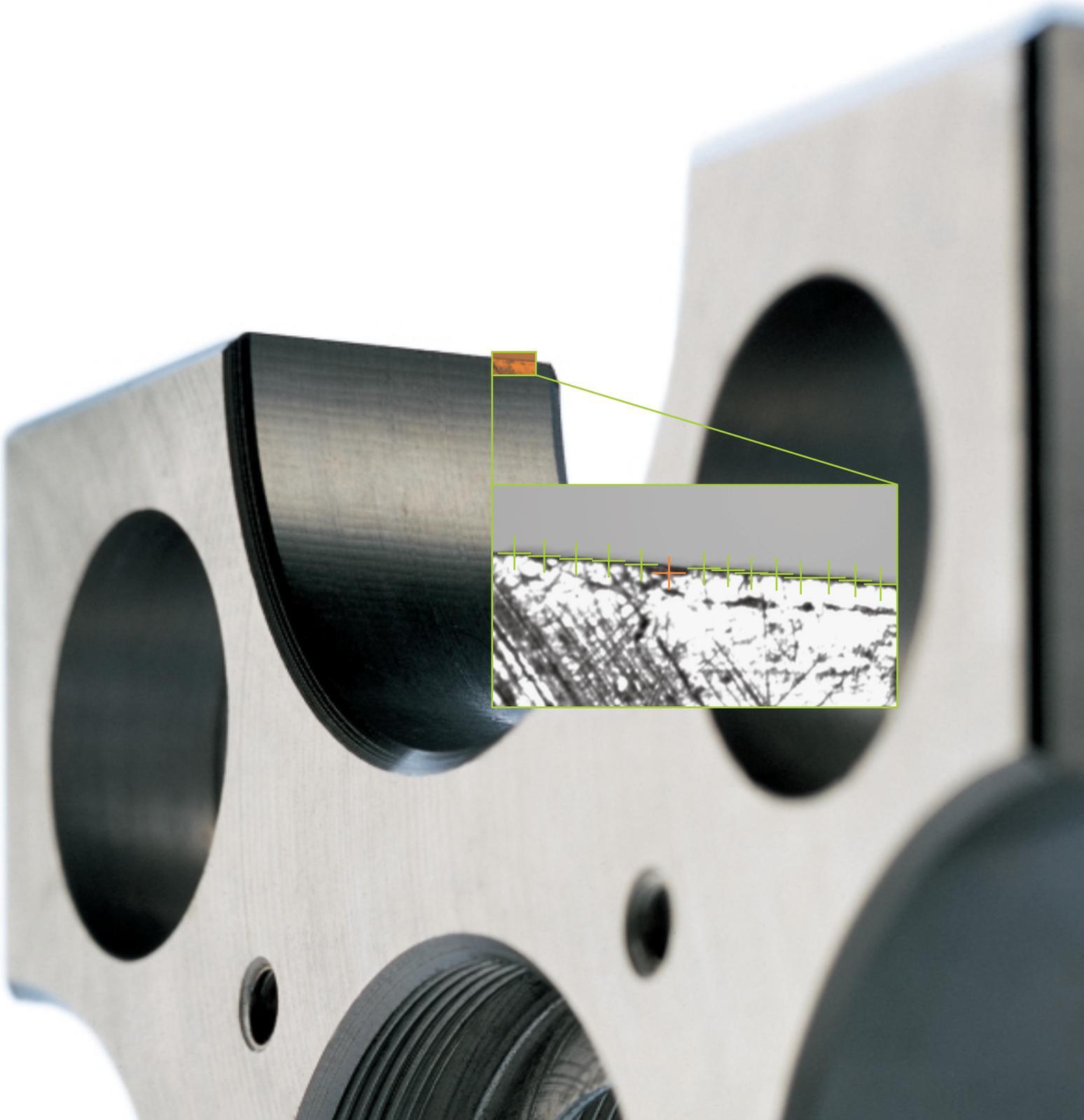




**Quadra-Chek® Metrology Software**

Know precisely





# You can't make a more accurate choice.

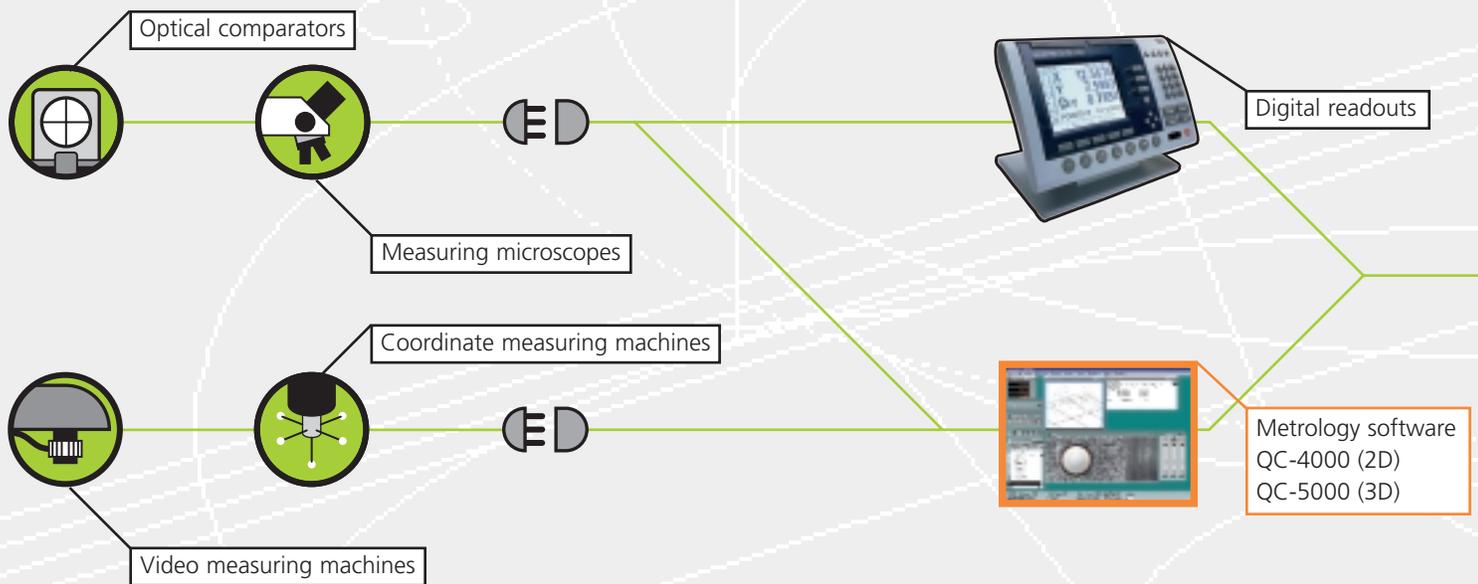
**Quadra-Chek® Metrology Software** Metronics is the world's premiere developer of metrology software and digital readouts for measuring and inspecting 2D and 3D geometric components.

**Metronics Quadra-Chek systems are the standard control interface on the precision measuring devices of many of the world's leading precision metrology instrument manufacturers.**

Quadra-Chek software supports industries that require precise measurement and inspection of 2D and 3D parts in single-sensor and multi-sensor environments. The products feature an intuitive user interface and simple, meaningful visual displays. Their design reflects a deep understanding of user needs and a uniform work process model that supports operators at every stage in the measurement process. Metronics software leads the industry in programming and automation innovations that improve operator productivity, reduce errors and save time and money.

**Quadra-Chek 5000 Series Metrology Software** These Microsoft Windows-based applications support 3- and 4-axis measurement of 3D parts, and are designed for use with single- and multi-probe coordinate measuring machines and video inspection systems with touch probe and/or non-contact sensor configurations.

# Integrate fully



## Versatile instrument support

If you already have a Quadra-Chek product on your shop floor—on any metrology instrument—you can easily integrate our newest products. If you are just developing a dimensional inspection capability, no other company provides as broad a product offering to help you grow as your needs change. Best of all, Quadra-Chek products share measuring protocols and interface conventions across the Metronics product line, which accelerates training, promotes cross-training and improves measurement accuracy.

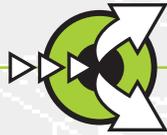
## Comprehensive instrument interfaces

Since our founding in 1983, Metronics has led the industry in the development of measurement solutions for diverse measuring platforms and modern digital readouts. The company is recognized around the world as a comprehensive resource for encoder interfaces that support both the newest tools and the existing platforms of leading metrology instrument manufacturers. We provide encoder interfaces compatible with new and existing instruments from the world's leading manufacturers.

## Complete digital readout and software-based solutions

Quadra-Chek products solve 2D and 3D measurement problems across industries and manufacturing functions, from inexpensive single-axis systems to versatile multi-axis, multi-probe platforms that expand in functionality as your measurement needs grow. The Quadra-Chek line includes Windows-based software solutions and geometric readouts, each with configuration options and complementary accessories that provide turnkey support for all of your precision measurement challenges.

Metronics develops world-class metrology software and geometric digital readouts. The Quadra-Chek product line provides unmatched support for single-axis and multi-axis dimensional measurement of 2D and 3D parts on both new and existing tool platforms. Quadra-Chek digital readouts and PC-based products integrate innovative user interface conventions, state-of-the-art ergonomics, powerful data import, export and analysis tools. All Metronics products are supported by an international team of field engineers.



### Intuitive interface design

Quadra-Chek products incorporate insights gained from ongoing human factors research. They simplify repetitive tasks, visualize measurement data, and expand the possibilities of dimensional inspection processes. Intuitive work process models and operator interface innovations extend programming, automation and measurement capabilities across instruments; advance new standards for ease-of-use; and reduce operator training time.

- › Windows® protocols
- › Graphic user interface
- › Icon-based tools and toolbars
- › Color coding
- › Audio feedback
- › Contextual help
- › Intelligent, time-saving protocols
- › IrDA communication

### Powerful data management tools

Integral communication tools enable operators to record, store and analyze measurement data. Operators can selectively or historically document measurements in dimensioned photographs and schematic drawings, as well as transfer measurement data efficiently among machines performing related tasks. Operators can also export data to online databases for offline analysis by managers and quality control specialists.

- › CAD export
- › SPC export
- › CNC control
- › Integrated databases
- › Custom reporting

### Global support network

Metronics field engineers, based in offices located all over the world, can assist in the onsite review of dimensional inspection requirements. Complete contact details are available online at [www.metronics.com](http://www.metronics.com).

- › United States
- › France
- › Germany
- › Italy
- › United Kingdom
- › Japan
- › Korea

# Understand completely



**Architecture** Acclaimed first-generation Quadra-Chek metrology software products now take advantage of the familiarity, power and speed of 32-bit Windows-based software. QC-5000 series applications incorporate intuitive drag-and-drop data fields, macros and database templates, and proprietary Quadra-Chek programming and automation tools. They also support ongoing functionality upgrades, online documentation, content-sensitive help, and a highly responsive product support system.



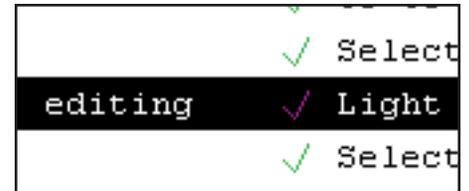
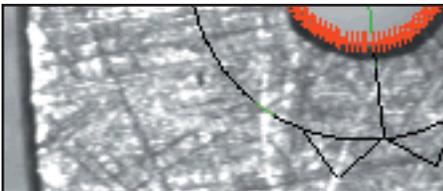
**Input** Easily configure your Quadra-Chek interface to control dimensional inspection tools through the use of single- or multi-sensor inputs—optical, video, laser, and contact probes.



**Measurement** Obtain desired feature and construction measurements quickly, easily and accurately with patented software features like Measure Magic® and Datum Magic®. Accelerate the measurement process with tools that automatically complete complex work steps.



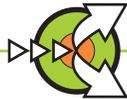
**Programming** Simplify difficult and repetitive measurement sequences with an easy-to-use and robust programming interface. Import CAD files to automatically create part programs.



Modern metrology is a complex sequence of measuring, recording, analyzing and reporting dimensional data. The conceptual model underlying Metronics software design organizes the workflow to support operator needs at every stage of the measurement process.



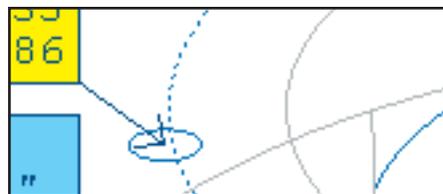
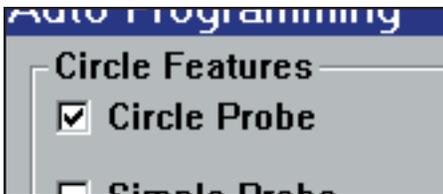
**Automation** Eliminate subjective judgments, increase throughput, and reduce user fatigue by automating portions of repetitive sequences or entire tasks.



**Data Management** Use integrated tools to capture, archive and retrieve data in a variety of formats. Use integrated spreadsheets to manage complex or non-standard calculations. Rely on both to manage the enormous data sets generated by modern metrology processes.



**Output** Streamline communication among operators, management, dispersed departments and quality control teams. Send user customizable reports to a wide variety of applications, printers or databases. Exchange formatted data easily with partners or colleagues throughout the company and around the world.

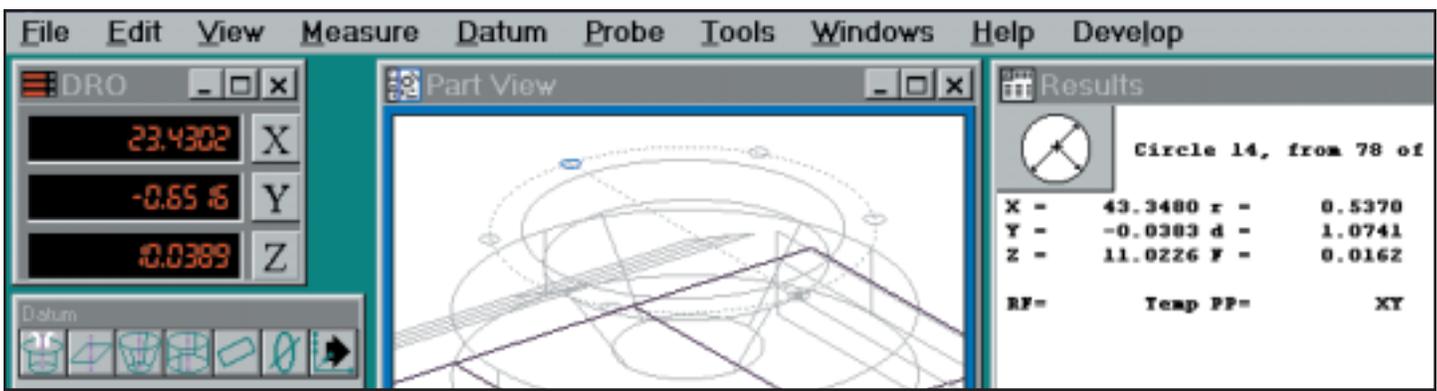


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| 22  | 35°05'09" |
| 23  | 35°03'15" |
| 24  | 35°03'04" |

The intuitive architecture of Metronics metrology software empowers operators during every step of the measurement process. Familiar interface conventions increase productivity and consistency in measurements across tool platforms.



## Architecture and Input



**Intuitive displays** QC-5000 software focuses on simplifying human-computer interaction. The core of the product experience is a simple, visual part view window with convenient toolbars that define Quadra-Chek measurement processes. Interface features of new Quadra-Chek products seamlessly integrate the leading features and annotation conventions of earlier products.

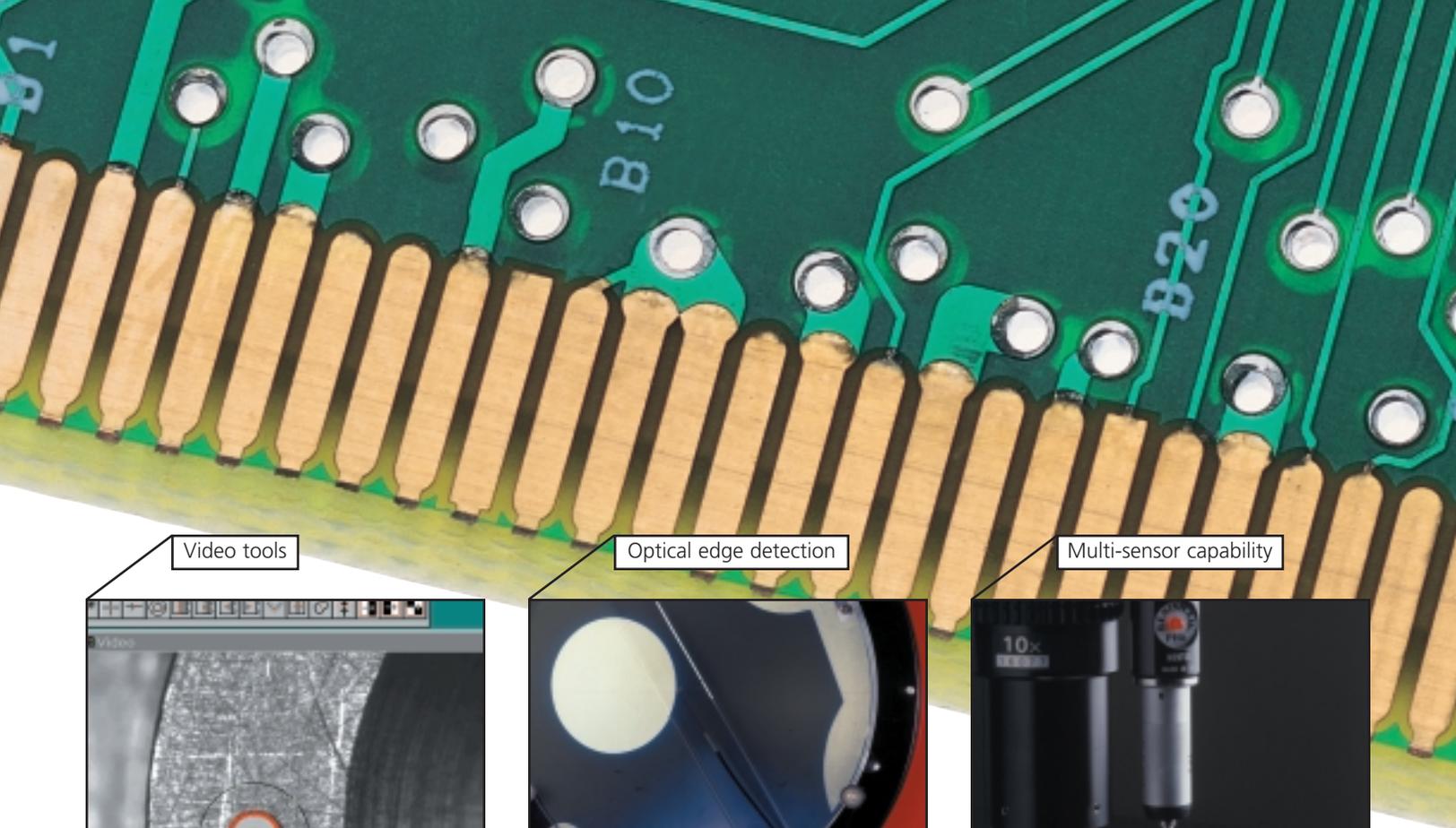
**Sensory feedback** The intuitive graphic user interface incorporates sound and color cues and animated “next-step” prompts to help guide product interaction. Interface innovations that simplify basic and advanced metrology functions support novice users without impeding experienced operators.

**Display customization** Windows and their content can be configured to display the desired features for any job—within the application—without custom programming. Use a “point-and-click” interface to create, edit, delete and organize information within windows, and “drag-and-drop” information between windows.

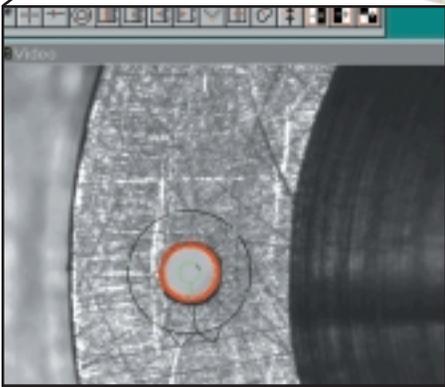
**Platform versatility** QC-5000 products are second-generation applications, programmed in C++ and designed for the Microsoft Windows environment. The software features a familiar, powerful and secure interface with a robust, network-friendly 32-bit architecture. It is a versatile platform for application innovation.

**Free lifetime updates** Functionality updates are administered through the Metronics website without annual maintenance fees or software contract requirements. Registered users receive email alerts when downloads are ready.

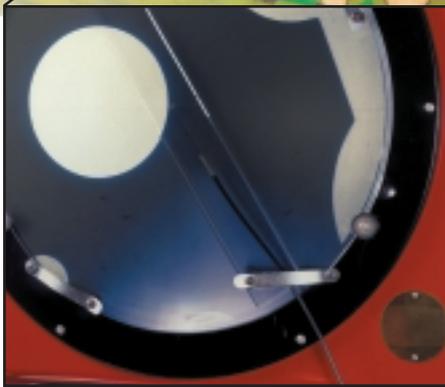
**Software support** Complete product documentation and software upgrades are provided online at the Metronics website, [www.metronics.com](http://www.metronics.com).



Video tools



Optical edge detection



Multi-sensor capability



### Video tools

**Video edge detection** Fast, accurate and repeatable edge detection for video machines or measuring microscopes. A set of powerful video probes simplifies complex measurements. Features superior surface or profile illumination controls and strong and weak edge detection.

**Magic Wand** Simple tool creation and manipulation. Sophisticated algorithms eliminate errant points for more accurate results.

**Video probes** Supports powerful probe options like: simple/buffer, arc/circle, nearest/farthest edge, width, capture, crosshair and average.

**Image processing tools** Sharpen, binarize and despeckle to clean up and enhance video images.

**Configuration options** Accommodates black-and-white or color cameras, NTSC or PAL formats, and single- or dual-monitor configurations.

**Continuous edge mode** Display edge points continuously, even while adjusting tools, lighting and focus.

**Video auto-focus** Enables fully automatic part inspection and eliminates time consuming and subjective manual focusing.

### Sensors

**Touch probe** Measure your most complex parts with extensive support for Renishaw touch probes including multi-position probe racks. Configure, calibrate and store all important probe data with the simple-to-use probe library.

**Optical edge detection** Reduces time-consuming and subjective crosshair alignment on optical comparators.

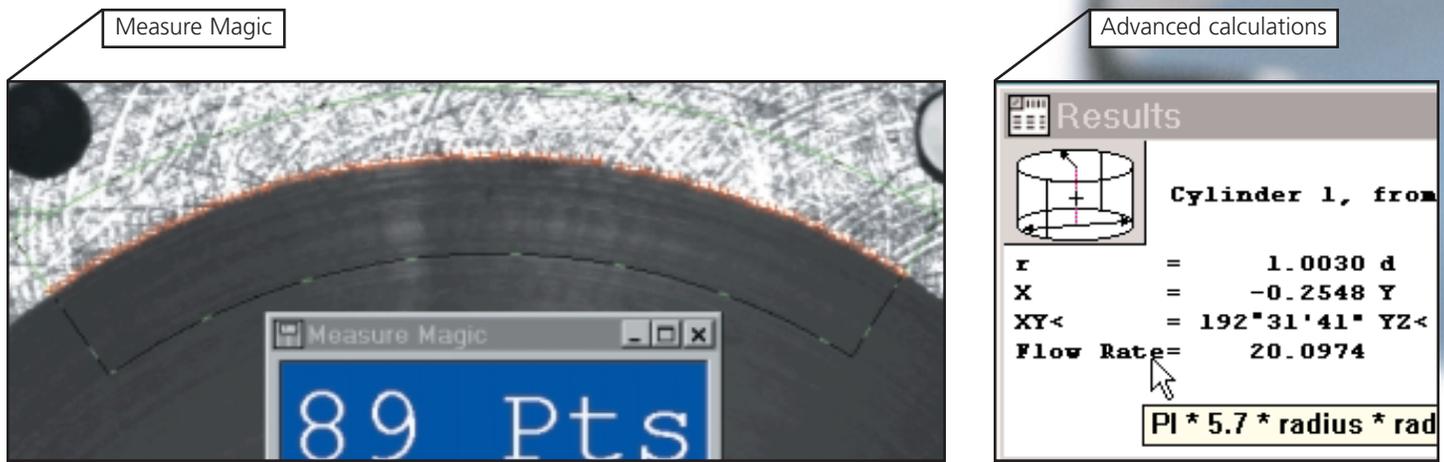
**Laser sensor** Records highly accurate Z-axis measurements and high point density.

**Multi-sensor** Measure a diverse array of 2D and 3D features on one machine with a single tool configuration by integrating multi-sensor measuring instruments. Configure sensor combinations for diverse applications.

Patented Quadra-Chek metrology software features reduce repetitive measures and simplify complex work steps throughout the measurement process.



## Measurement



**Measure Magic®** To measure, simply probe points and click. Quadra-Chek metrology software detects, without operator intervention, the feature type being measured. With this patented feature, operators can inspect features without taking their eyes off the part, which speeds throughput and reduces user fatigue.

**Datum Magic®** Automate part alignment (level, skew and zero), the first step in any measurement. Complete the zeroing and alignment of complex parts automatically based on the entry of the minimum amount of probed features. An extension of the patented Measure Magic technology.

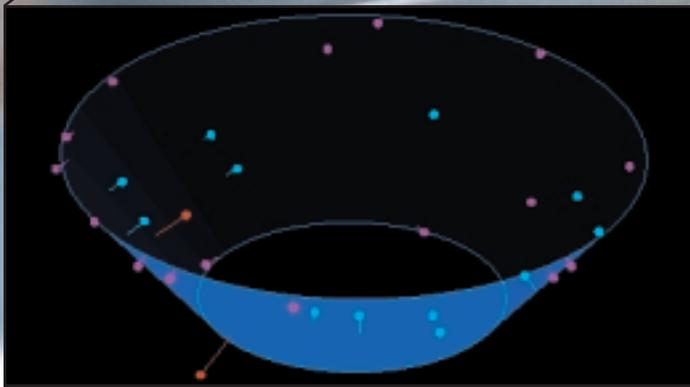
**Advanced calculations** Customize results fields for special measurement needs and complex calculations by embedding formulas (e.g., automatically calculate area or circumference dimensions with each circle measurement or perform compound calculations based on coefficients extracted from multiple features).

**Uncomplicated constructions** Select two or more features to create intersection or constructions. Reduces operator effort by eliminating confusing construction menus.

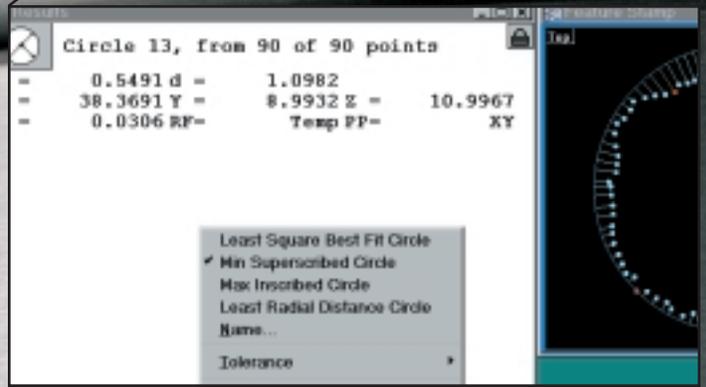
**Data Cloud** Improves the presentation of measurement data with the graphic display of measured features that reinforce operator comprehension by visualizing complex data sets.

**Alternate fits** Quickly determine minimum and maximum fits for measured diameters with an intuitive graphical display.

Data Cloud



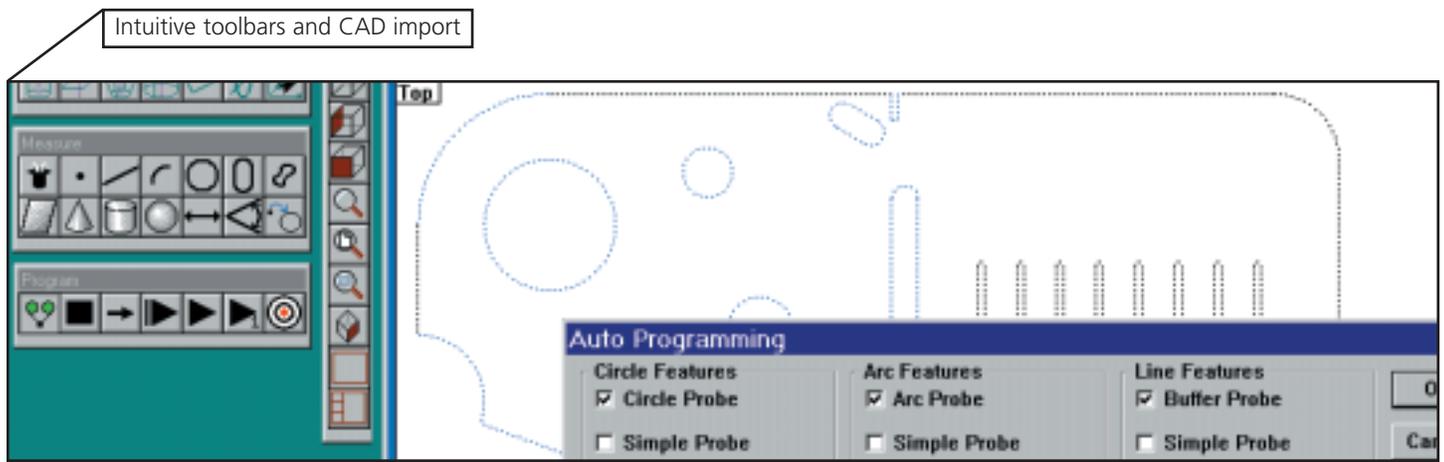
Alternate fits



Quadra-Chek metrology software features an easy-to-use programming interface that improves productivity, reduces subjectivity and simplifies repetitive tasks.



## Programming and Automation



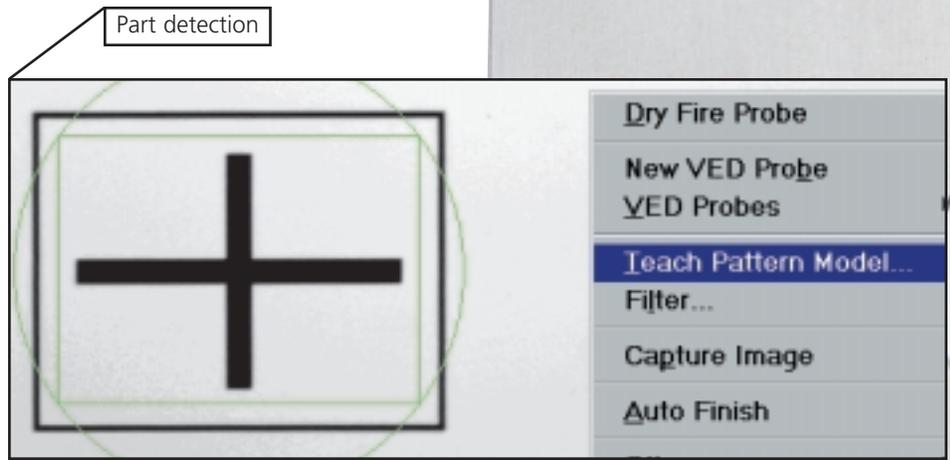
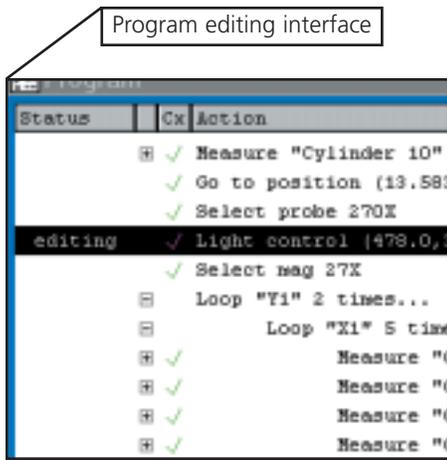
**Simplified program creation** Turn on the Record function of the Quadra-Chek software and based on the measurement steps of the first part, the software “learns” the datums, measuring sequence, tolerances and reporting functions for subsequent parts.

**Guided program use** Visual and audio cues guide operators through programmed sequences, simplifying the measurement process for entire parts (on fully automated systems) or for specific sequences.

**Program editing interface** Reduce time spent editing programs with an easy-to-learn graphic user interface that organizes measurement work steps for visual review. Troubleshoot long and complex programming sequences with understandable debugging tools. Integrate advanced programming tools including advanced looping, conditional branching, and palletizing controls.

**CAD file import** Import pre-existing part specifications from CAD programs to jumpstart the part programming process and eliminate transcription errors.

**Video focus** Automates the manual zooming procedure typically used to focus video sensors, eliminating a time-consuming and tedious work step, and ensuring that operators always work with nominal display settings.



**Part detection** Machine-vision technology and pattern recognition algorithms automatically find features within the camera's field of view, accommodating part-to-part variation and enabling uninterrupted measurement.

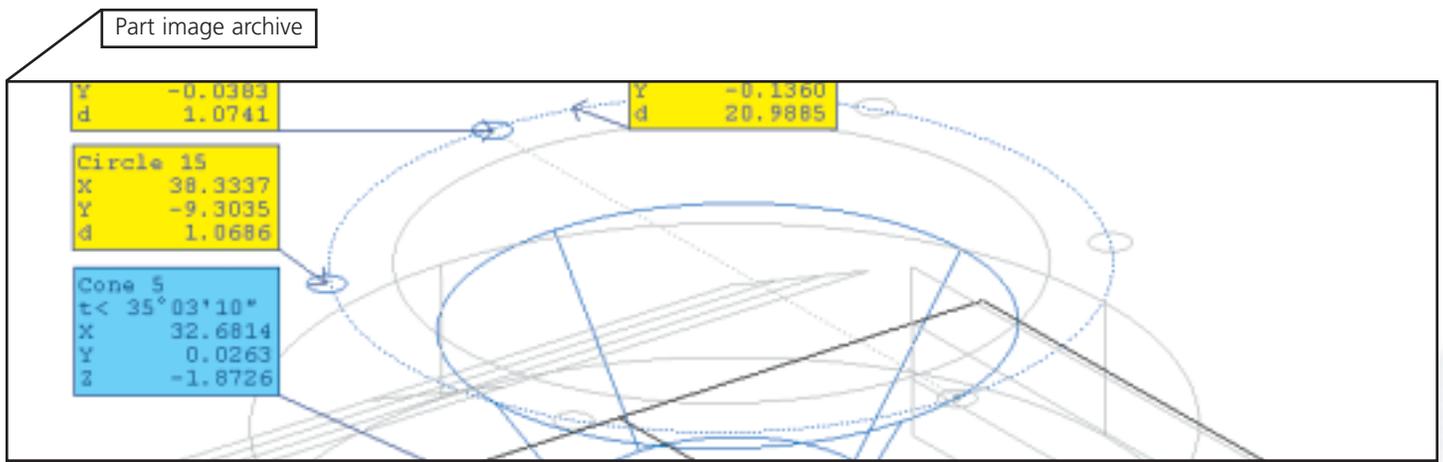
**Stage motion** Move a part between measurement positions and initiate a series of measurements at each position automatically to improve the accuracy of repetitive measurements and reduce operator fatigue.

**Palletization** Metronics closed loop CNC control of 2-, 3- and 4-axis instruments provides turnkey automation solutions for gang fixturing and other automated measurement applications.

Operators can easily format, analyze and communicate measurements throughout the company and around the world.



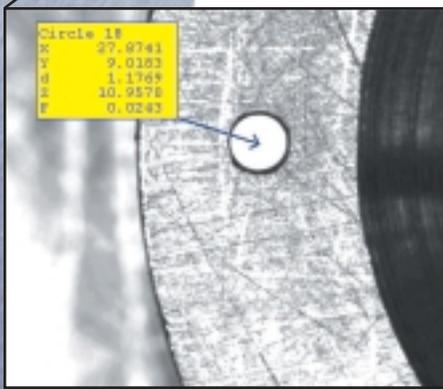
## Data Management and Output



**Part image archive** Record and store graphic measurement results of parts, along with dimensions and other information, on your PC or elsewhere on your network. Maintain organized, up-to-date records online for convenient, ongoing quality control and archival reference.

**Image view** Drag and drop measurement data from part view displays onto a video-capture image, instantly appending accurate dimensions and witness lines. Save, print or email annotated images electronically in BMP file format to expedite the resolution of quality control issues with dispersed work partners.

Image view



Tolerance display

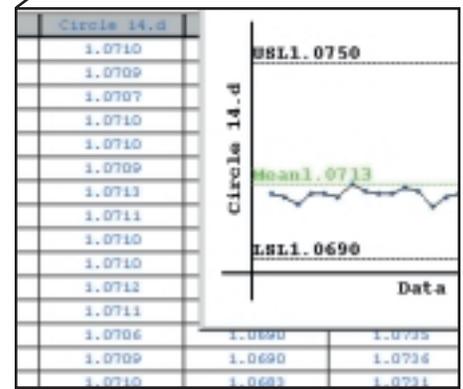
**MMC Tolerance Results**

| Position |         |         |        |
|----------|---------|---------|--------|
|          | Nominal | Actual  | Error  |
| X        | 22.5620 | 22.5618 |        |
| Y        | -0.0700 | -0.0698 | 0.0006 |
| Z        | 10.9466 | 10.9466 |        |

| Size |         |        |           |
|------|---------|--------|-----------|
|      | Nominal | Actual | Deviation |
| D    | 1.0660  | 1.0657 | -0.0003   |

Sorting tools



**Tolerance display** Translates data-intensive reports into informative graphics so operators can quickly see the results of tolerances applied to geometric features.

**Integrated database** Store, retrieve and manage enormous amounts of measurement data on the shop floor. Check quality control at the instrument platform within a familiar and intuitive interface. Share information locally and globally. Export to Microsoft® Office® applications.

**Sorting tools** Review extensive feature lists in an integrated, Microsoft Access®-like database module. Sort by tolerance failure, feature type or reference frame, streamlining access to related information.

**Report generator** Build high-quality reports with easy-to-use, "drag-and-drop" report templates that simplify the selection and formatting of data. Save, print or email measurement result reports to team members for review.

**Export data** Conveniently transfer measurement data to CAD for reverse engineering applications, or to Microsoft Access or Microsoft Excel® for enhanced data processing.

# Product comparison



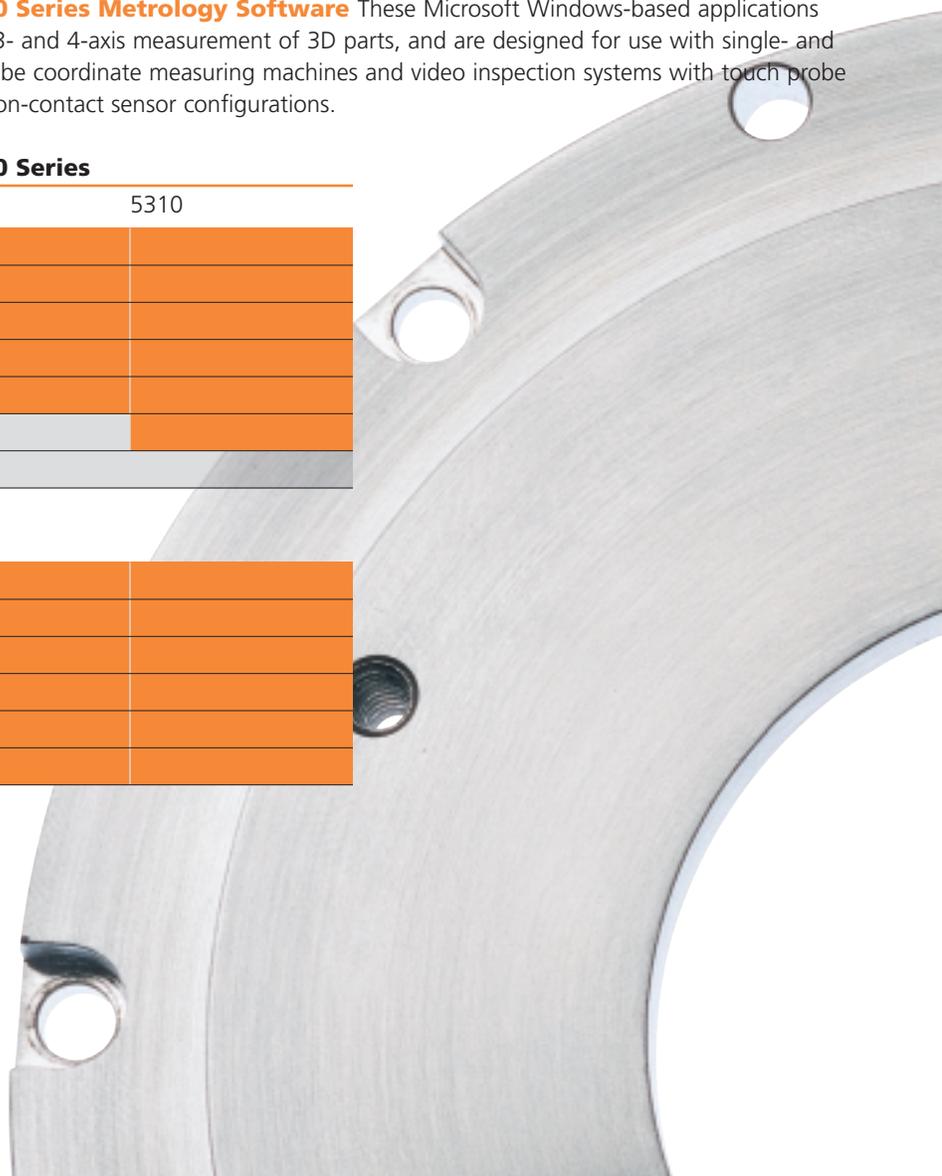
**QC-5000 Series Metrology Software** These Microsoft Windows-based applications support 3- and 4-axis measurement of 3D parts, and are designed for use with single- and multi-probe coordinate measuring machines and video inspection systems with touch probe and/or non-contact sensor configurations.

## QC-5000 Series

| Configurations                    | 5300 | 5310 |
|-----------------------------------|------|------|
| 2D measurement                    |      |      |
| 3D measurement                    |      |      |
| X-axis                            |      |      |
| Y-axis                            |      |      |
| Z-axis                            |      |      |
| Q-axis (Electronic protractor)    |      |      |
| Optical edge detection (optional) |      |      |

## Options

|                                     |  |  |
|-------------------------------------|--|--|
| Motion control system               |  |  |
| Video edge detection (color or b/w) |  |  |
| Programmable light control          |  |  |
| Auto-focus (Z-axis only)            |  |  |
| Programmable zoom                   |  |  |
| Non-linear error correction         |  |  |





**QC-5000** Shown in a dual-monitor configuration connected to video probe and touch probe instrument platforms. This fully automated multi-sensor system obtains, stores, manages and distributes precision measurement data directly from the lab or the shop floor.

# Full feature list



## Architecture

- › **32-Bit Windows application**
- › **Intuitive visual displays**
  - Dynamic part view graphics with layer control
  - Feature graphic with data cloud
  - Image view: video image with text and data
- › **Audio feedback from measurement results**
- › **Display customization**
  - Window sizing and arrangement
  - Custom tool bar
  - Flexible view rotation and zoom tools
  - Preset plan and isometric part views
- › **Platform versatility**
  - Connectivity to MS Office and other Windows applications
- › **Free lifetime software updates**
- › **Graphics-rich online HTML help system**
- › **Criteria-based feature finder**
- language support:**
  - English
  - German
  - French
  - Italian
  - Spanish

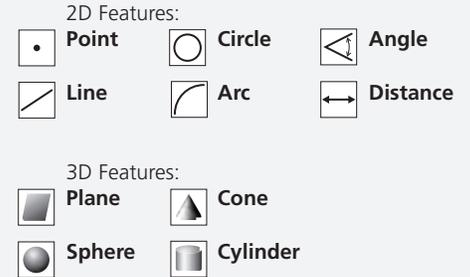


## Input

- › **Universal self-characterizing encoder interface**
  - › **Laser sensor**
    - High-accuracy Z-axis measurement
  - › **Optical edge detection**
    - Repeatable, automatic edge detection for optical comparators and toolmakers' microscopes
  - › **Touch probe**
    - Extensive Renishaw touch probe and probe rack support
- Video edge detection*
- › **High speed/high point density camera-based edge detection**
  - › **Video edge detection probes**
    - Single-point probes
    - Blob probes
    - Buffer probes
    - Capture probes
    - Circle/arc probes
    - Crosshair probes
    - Nearest and farthest point probes
    - Width probe
    - Pattern finder
  - › **Video edge detection features**
    - Single- or dual-monitor video configuration
    - NTSC and PAL compatible
  - › **Detect edges from dark to light, light to dark or first edge**
    - Detailed edge-scan informational graphic
    - Strong edge/weak edge detection
    - Powerful edge teaching tools
    - Continuous fire edge detection display
    - Video auto-focus
    - Video overlay charts
    - Magic Wand® video probemaker
    - Intuitive video probe manipulation
    - Auto-probe determines size, shape and scan direction of video probe
    - Image view video snap shot with measurement data/notes
    - Image processing tools
  - › **Pattern recognition**
    - Find edges, features and parts
  - › **Point filtration tools**
  - › **Variable outlier detection**



## Measurement



Measure Magic® measurement productivity enhancer  
Measure up to 1000 points per feature  
Magnetic planes snap features to specific planes  
Display in inches or centimeters  
Display angles in DMS or DD

- › **Color-coded pass or fail for features**
  - › **Integrated SPC**
  - › **Part view feature; part graphics with data/notes**
    - Results feature
    - Create custom formulas for feature measurements
- Alternate fitting algorithms
- Least square best fit
  - Minimum superscribed circle
  - Maximum inscribed circle
  - Least radial distance circle fit
  - ISO fit line
  - ISO fit plane
- Constructions*
- › **Points**
    - Mid-point of features
    - Intersection of 2D and 3D features
    - Apex of cone
    - Closest point of approach between two features
    - Perpendicular point on a plane or a line from a positional feature
    - Intersection point of 3 planes
    - Pierce point of a feature and a plane
  - › **Lines**
    - Axis of a cylinder or cone
    - Tangent lines from a point and a radial feature or two radial features
    - Intersection of two planes
    - Bisector or perpendicular bisector line between two features
    - Line of closest approach between two features
    - Perpendicular line from a line and a feature
    - Parallel line to a line and through the center point of a feature
    - Perpendicular line to a plane and through the center of a feature
    - Gauge line between two lines
  - › **Circles**
    - Equator of a sphere
    - Gauge circle of a given diameter in a cone
    - Intersection of a cone and cylinder
    - Tangent circle from intersecting lines

### › Planes

- Mid-plane or perpendicular mid-plane between two planes
- Plane through a positional feature and parallel to another plane
- Plane through the midpoint of a line using the line as an axis
- Plane using a line as an axis through a positional feature
- Plane through line perpendicular to another plane

### › Spheres

- Gauge ball of a given diameter in a cone

### › Distances

- Between two 2D or 3D features
- Center to center distances between circles, radii and cylinders
- Nearest and farthest distance between circles, radii and cylinders
- Center of a circle, radii, and cylinder to a line (nearest and farthest)

### › Angles

- Two lines
- Two axes of cylinders or cones

### *Geometric tolerancing*

### › Location

- Bi-directional
- True Position (RFS)
- Concentricity
- Maximum Material Condition (MMC)
- Least Material Condition (LMC)

### › Form

- Straightness
- Roundness
- Flatness
- Cylindrically

### › Orientation

- Perpendicularity
- Parallelism

### › Runout

- Circular

### › Size

- Angle
- Length
- Radius/diameter
- Height

### › Group Tolerancing

- Apply tolerancing to a group of selected features

- Datum
- Datum Magic®
- Align on planes, offset planes, cones and cylinders
- Skew (secondary alignment)
- Axis preset

- Translate/rotate
- Zero on any coefficient of any feature
- Multiple reference frames
- Features color-coded by reference frame
- Auto or manual projection



## Programming

- Self teach mode
- Intuitive program editing interface
- Import CAD File; DXF
- Auto program from CAD

- Conditional branching
- Step and repeat; Grid and Polar array
- Chain programs
- Run external DOS or Windows program
- Change light levels dynamically

- Cut, copy and paste program steps
- Single-step edit mode
- Program messages
- Guide features
- Integrated program debugging tools



## Automation

- Up to four axes of closed-loop Stepper, Servo, or linear motor control
- Motorized zoom lens capability
- Centerfire video probing
- Pattern recognition
- Optimize CNC path

- Rotary stage control
- Video auto-focus
- Auto-home on reference marks
- Axis lock
- Level lock

- Part following
- Profile joystick and trackball
- Collision avoidance
- Go to feature
- Go to position

- Detect reference marks
- Eight channels of programmable light control
- Vector probing
- Adjustable probing velocity
- Software fence



## Data Management

- Drag-and-drop feature coefficients
- Integrated SPC
- RUNS database: historical record of part measurements
- Customizable feature list

- Formulas in feature list and reports
- Sort/find features and data



## Output

- WYSIWYG custom report generator
- Customize data: format and layout
- Include company logo
- Customize input fields for operator, part number and machine information
- Include part view graphics with dimensional annotation

- Include video snapshot with dimensional annotation
- Real-time SPC data export
- Real-time linking to Access, Excel and other Windows applications
- CAD output for reverse engineering

- Export with append to ASCII, CSV, Tab-delimited, and Access or Excel formats
- Video archive



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Metronics® is the world's premiere developer of metrology software and digital readouts for measuring and inspecting 2D and 3D geometric parts. Metronics' Quadra-Chek® systems are the standard control interface of the world's leading precision metrology instrument manufacturers.

### **Metrology software**

**Quadra-Chek 4000 Series** 2- through 4-axis Microsoft Windows®-based measurement system for 2D applications.

**Quadra-Chek 5000 Series** 2- through 4-axis Microsoft Windows®-based measurement system for 3D applications.

### **Digital readouts**

**Quadra-Chek 100 Series** 1- through 4-axis, 1D digital readouts.

**Quadra-Chek 200 Series** 2- through 4-axis, 2D geometric readouts.

**Quadra-Chek 300 Series** 3- and 4-axis, 3D geometric readouts.

**Gage-Chek 100 Series** 1- to 8-channel, metrology displays.

### **Automation Kits**

**Stage Retrofits** Bolt-on kits for microscope stages.

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