



Comparators

Contour Projector® Technologies



**Total Quality
Systems Inc.**

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Compare the Quality



Certified Comparator Products

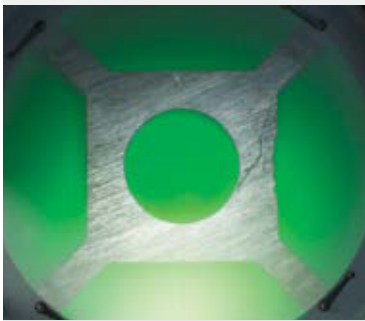
Focused on Quality

Certified Comparator Products offers a complete line of optical comparators with the world's most advanced measurement technologies. From reliable manual profile projectors to fully automatic CNC controlled vision comparators, CCP has the right measurement solution to support your manufacturing needs. Our worldwide network of certified channel partners offers expert support and service for CCP comparators anywhere in the world.

This catalog presents an overview of the many optical comparator models and unique technologies offered by CCP. In addition, we offer extensive refurbishing and re-manufacturing capabilities which can transform old but serviceable equipment into state-of-the-art measurement systems.

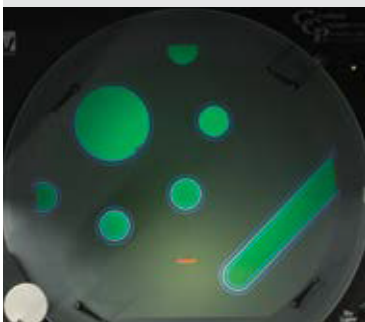
Versatile Measurement Systems

Optical comparators are among the most versatile measurement tools in any inspection lab or machine shop. Traditional methods and new digital techniques provide dozens of ways comparators can be used to inspect, measure and report on part conditions.



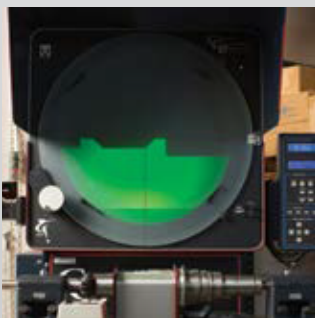
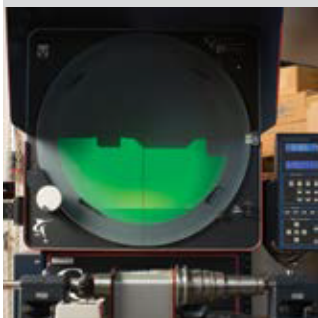
Surface Inspection

TruLight® through-the-lens surface light is a high intensity, pure-white light, projected parallel to the optical axis. This type of illumination is ideal for visual inspection of surface grain, texture, cracks, flaws or colors in the object's surface.



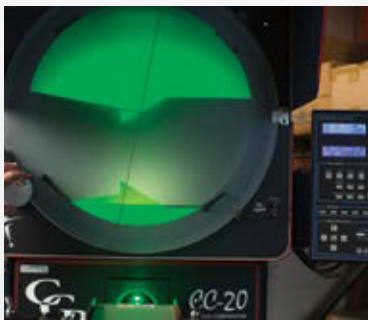
Measurement by Comparison

Overlay charts or eCAD® virtual chart gages provide a master outline of the nominal part, allowing easy comparison of the actual part to the master.



Measurement by Motion

Distances between features can be measured manually using the standard DRO controller, or even using a ruler to measure directly on the screen and simply dividing the distance by the magnification. Fully automatic measurements can be made using optional edge detection and automation software.



Angle Measurement

The rotating screen ring and digital protractor readout allow direct measurement of angles. Radius and angle chart gages are available for direct comparison as well.



Off-Axis Measurement

Helix motion allows measurement of threads, gears, and gear cutting hobs by rotating the part so that the features are presented correctly to the optics and measured normal to the part axis.



Tool Pre-Setting

The comparator's high magnification and bright light make it convenient for use as a manual tool presetter. Ample room is available in the work envelope to manipulate the part by hand to facilitate alignments.



Manual Inspection

CCP comparators offer a constant, long working distance between the part being inspected and the front lens. This large working area provides ample room for tooling fixtures, or for manual inspections without fixtures.

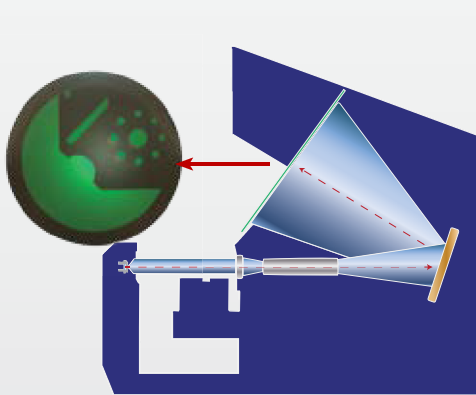
Innovative Optical Technologies

At CCP, our optical heritage goes back 70 years. CCP-designed optical systems combine extremely low distortion lens systems with illumination sources optimized for the screen size. This combination results in a bright screen and sharp image, to produce the most advanced optical comparators available today.

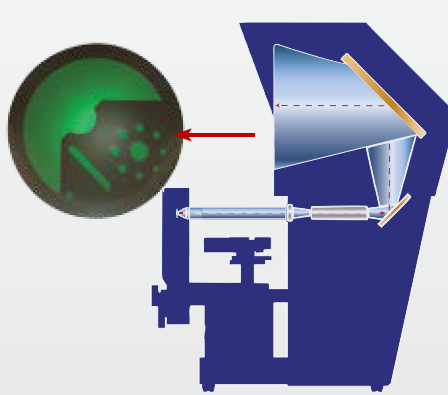
Telecentric Optics

Telecentric optics are the foundation of all CCP comparators. Each model in the CCP line uses one of our unique optical designs to ensure size measurements are accurate even when the image is not perfectly focused, allowing any user to achieve accurate measurements with ease.

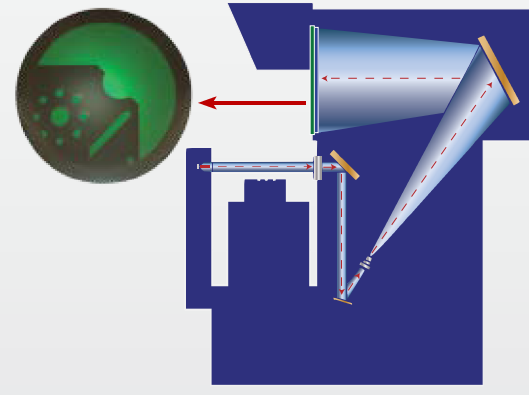
All CCP comparators provide a constant working distance between the front lens and the part being measured at all available magnifications. It is never necessary to reposition or re-stage a part when a different magnification is selected.



CC-14L single mirror optics produce an inverted and reversed image.



CC-14, CC-16L, CC-16 dual mirror optics produce an upright and reversed image.



CC-20 and CC-30 three mirror optics produce an upright and un-reversed image.

CCP's exclusive relay lens system maintains an accurate distortion free image for all magnifications. The profile light collimating lens is well matched to the front receiving lens for optimum optical resolution.

Automatic Edge Detection

CCP offers three automatic edge detection options to eliminate subjective operator judgment and improve measurement repeatability. Choose the system that best meets your manufacturing needs.

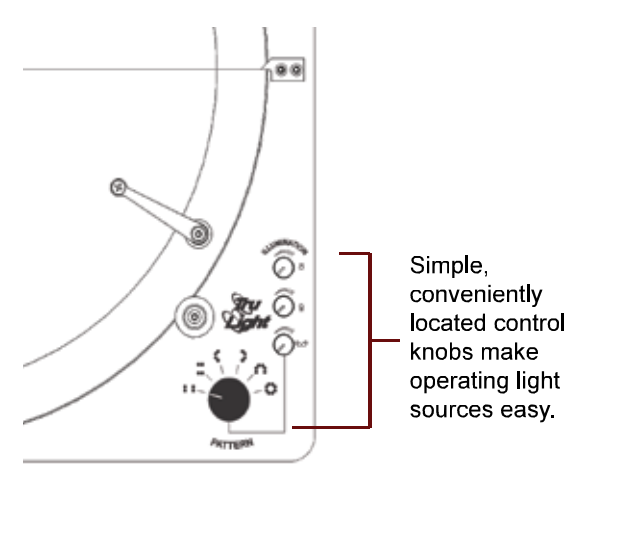
External Edge Detection offered on CC-14L and CC-16L, is an externally mounted fiber optic cable located at the center of the viewing screen.

EdgeScan™ operates with the Quadra-Chek™ DRO controllers. The EdgeScan sensor is internally mounted behind a high efficiency beamsplitter so it does not interfere with the image.

Projectron™ grayscale edge detection provides best accuracy when image brightness varies due to part characteristics. Projectron operates with the QVI® Q-Check® DRO controller. Like EdgeScan, Projectron is internally mounted where it remains aligned and calibrated at all times.

Illumination

Exclusive TruLight® LED lighting has transformed CCP optical comparators into modern, high-tech measuring systems. High brightness LEDs offer low power consumption, cool operation, indefinite lifetime and continuously variable intensity control - all for very bright, crisp imaging.



Profile Light

Monochromatic green light provides maximum screen brightness with minimal glare, preventing eye strain.



Coaxial Surface Light

Through-the-lens coaxial surface light provides white, brightfield illumination across the entire field of view, fully illuminating part surfaces.



Oblique Surface Light

Oblique dark field ring light provides six selectable patterns allowing you to highlight surface details for maximum image clarity and change light direction to match surface geometry.

	Standard	Optional
Profile Light	CC-14L, CC-14, CC-16L, CC-16, CC-20, c-vision benchtop and floor models, CC-30 (Mercury Vapor)	
Coaxial Surface Light	c-vision benchtop and floor models	CC-14, CC-16, CC-20, CC-30 (Mercury Vapor)
Oblique Surface Light	CC-16L, c-vision benchtop and floor models	CC-14L, CC-14, CC-16



Optical Comparator Systems

Why do so many manufacturers depend on CCP comparators? Because CCP builds comparators with your success in mind. Our products are based on decades of experience making and using optical comparators. We combine rugged construction with advanced optical, lighting and software technologies to enhance your productivity and profitability.

CCP's benchtop and floor model comparators offer the industry's best value and performance for non-contact measurement. All CCP comparators use cutting-edge optical, lighting, and automation technologies, allowing you to handle the tight tolerances and wide range of applications you face in your manufacturing process.



CC-14L

CC-14L offers the innovative features of modern CCP comparators at a lower cost. CC-14L includes TruLight® variable intensity LED lighting as standard.

Manual Operation



CC-16L

CC-16L is the value leader in 16 inch comparators, combining a large viewing area and sharp imaging with easy-to-use manual X,Y stages. TruLight variable intensity LED lighting is standard.

Manual Operation



CC-14

Our most popular model, featuring TruLight LED lighting and a variety of options that allow it to handle any manufacturing challenge.

Manual or Motorized Operation



CC-16

The CC-16 is the industry's most advanced 16-inch benchtop comparator, offering motorized stage travel, an ultra-stable composite base and all-LED lighting.

Motorized Operation



CC-20

CC-20 combines a high capacity stage with a proven optical system that projects an upright and un-reversed image for easy operation. Convenient part loading makes CC-20 an ideal choice for larger, heavier parts.

Motorized Operation



CC-30

CC-30 offers a bright 30 inch screen and high capacity stage in a compact footprint. CC-30 includes mercury arc profile light, motorized stage and rotary steel screen ring protractor as standard.

Motorized Operation



c-vision™ Video Contour Projectors®

The Best of Both Worlds

c-vision combines the speed and accuracy of a video measurement system with the rugged capacity of an optical comparator to create the world's best shop floor measuring tools.

Advanced manufacturing processes require fast, accurate dimensional measurements on the shop floor, alongside production machines. c-vision offers high magnification and complete automation with the stable platform needed for handling machined parts in a harsh environment.

c-vision brings you the best of both worlds. Its innovative optics let you see the big picture while its digital zoom lets you measure the fine details. A choice of two camera options allows for field of view size up to 4 inches.





Advanced Digital Measurement Tools

Exclusive digital image tools allow CCP comparators to perform advanced measurements more quickly and accurately than traditional manual methods.

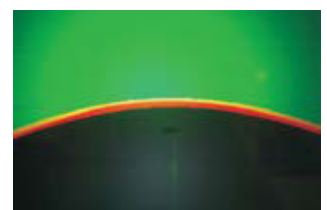


VidiProbe™

VidiProbe transforms the traditional comparator into a fully automatic video inspection system using Measure-X® 2D software. An internal video camera positioned to capture the image formed by the comparator optics provides digital image data to the software for fully automatic measurement routines.

eCAD®

Patented† eCAD projects an accurately magnified CAD model directly onto the comparator screen presenting a virtual chart gage, which includes nominal dimensions and tolerance bands. eCAD eliminates the need to produce and maintain an inventory of specialized chart overlays.

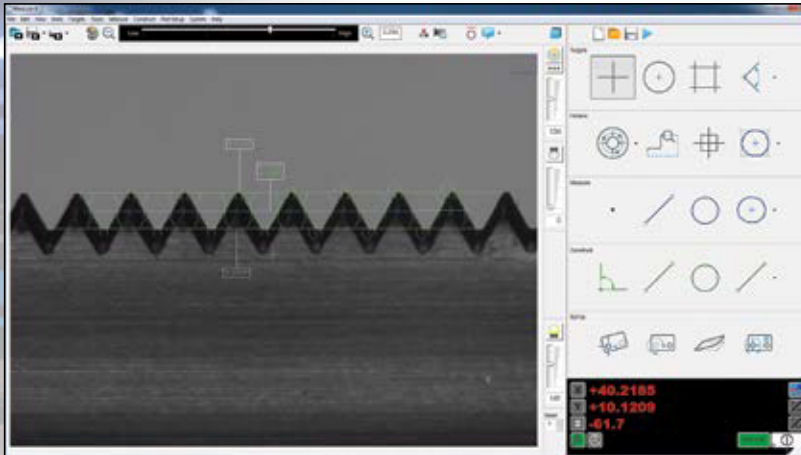


Tolerance bands projected on actual part image.

† eCAD is covered by the following patents: US 8,400,633 and US 8,269,970

Simple. Complete. Measure-X[®] 2D

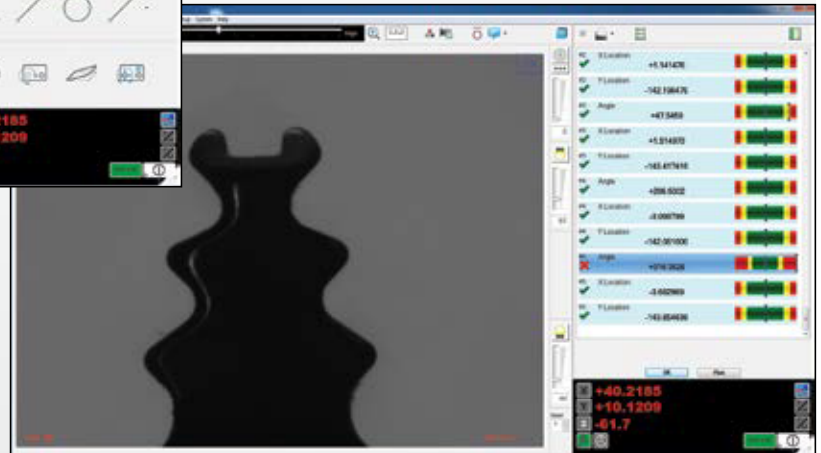
Measure-X 2D makes VidiProbe[™] and c-vision measurement systems the perfect choices for automated shop floor measurement. Measure-X 2D is powerful measurement software with an easy to use shop floor user interface designed for comparators.



The live output window tracks the results and provides instant feedback on any features that are out of tolerance.

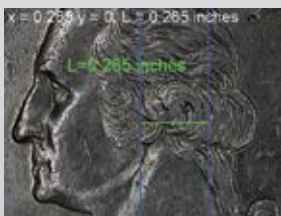
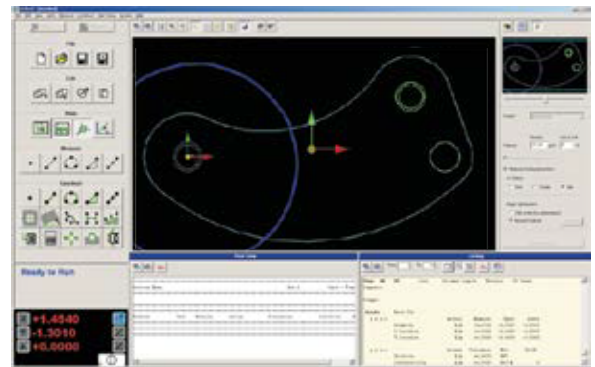
Built For The Shop Floor

Measure-X 2D features a simplified layout with oversized video window – perfect for touchscreen operation. A quick “page turn” feature switches to the full feature layout offering all available functions for building customized routines.



eChek

eChek[™] automatic measurement software combines the benefits of motorized X,Y stages and automatic edge detection to create completely automatic measurement routines. Set up a program once, and run it time and time again for maximum productivity and precision. eChek's unique CAD-based programming option allows entire parts or sections of parts to be programmed simply by indicating the area to be measured. Let eChek do the programming for you.



ImageCapture —

Uses an internal camera to capture a precise image of the screen display which can be annotated and saved for quality record keeping and troubleshooting.

MeasureFit[®] — Compare measured geometries to CAD, and perform fitting analysis to confirm complex measurements.

SmartReport[®] — Export data to custom reports or databases for further analysis or archiving.

QC-CALC[™] — Analyze and export data to spreadsheets, databases, and other SPC programs automatically.

QC-Wedge — Communicate between a Quadra-Check DRO and a Microsoft Windows[®]-based PC.

Digital Readouts

CCP offers a variety of digital readout controllers for all new comparators. All the DRO models offer intuitive user interfaces and simple displays that reduce errors, improve operator productivity, and save time and money.



QVI® Q-Check® DRO

The QVI Q-Check Digital Readout with its dual backlit two-line LCD displays and durable construction is designed to survive in almost any shop environment. Its full geometric processing power makes quick work of tough measurements.

Q-Check supports Projectron™ auto edge detection and VidiProbe™ video measurement systems.

Q-Touch™

The QVI Q-Touch Digital Readout is an advanced color graphics touchscreen controller offering multi-function geometric measurements and constructions. Q-Touch is compact and offers a bright, easily readable display in all light conditions.



	QVI Q-Check	Q-Touch	QC-100	QC-200	QC-300
DRO Capabilities					
Displays in inches and mm; Digital protractor display	□	□	□	□	□
Remote footswitch support	□	□	□	□	□
Printer support	□	□	□	□	□
RS-232 data output	□	□	□	□	□
Measurement of 2D features	□	□	-	□	□
Edge detection	+	+	-	+	□
Graphical display	-	□	-	□	□
Programming of features and parts	-	-	-	□	□
USB support	-	□	-	□	□
CNC support	□	-	-	-	+
Color (Including tolerance results)	-	□	-	-	□
Touchscreen	-	□	-	-	□
Alpha numeric keypad	-	-	-	-	□
On-screen measurement instructions	-	□	-	-	□
Automatic circle scan	-	-	-	-	+

□ Standard + Optional - Not Available

QC Digital Readouts

QC-300 DRO

The QC-300 is the most sophisticated optical comparator controller in the industry. The touchscreen offers intuitive graphical display of measured data points and errors, creating visual results that are readable at a glance.



QC-200 DRO

The QC-200 digital readout functions as a measuring computer for 2D geometries. Create automatic measuring programs, and apply tolerance values to features and relationships.



QC-100 DRO

QC-100 digital readout has a monochrome screen for displayed values, dialogs and soft keys. The robust, die-cast aluminum enclosure ensures reliability even in a harsh environment.





Optional Accessories

CCP offers a full line of comparator tooling and accessories to make measurements more convenient.



Swing Away Lamphouse allows oversized parts to be staged.



Sliding Hood controls overhead lighting glare.



Direct Projection Iris helps reduce reflections from shiny surfaces.



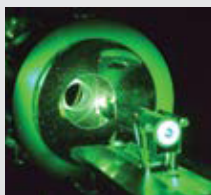
Sturdy Benches for mounting benchtop comparators.



Ergonomic Motorized Stand with adjustable height.



Helix Stage Motion allows the worktable to pivot for gear and thread measurements.



Surface Concentrator intensifies surface light for a brighter image.



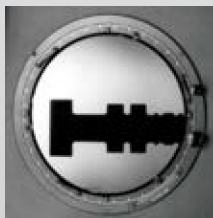
Programmable Motorized Rotary Indexer for staging shafts and cylinders.



Fresnel Lens focuses all screen illumination at the normal viewing position.



Light Curtain controls excess ambient light.



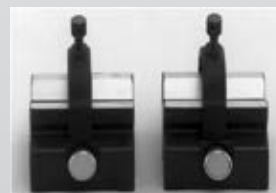
Rotating Screen Ring allows 360 degree free rotation of the glass screen for angle measurements or alignment.



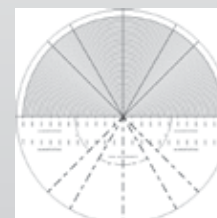
Standard and Heavy Duty Staging Centers hold cylindrical parts securely and allow free rotation.



Optical Comparator Fixture Kit for staging a range of parts.



V-Blocks are available in 1", 2" and 3" sizes to accommodate a range of parts.



Overscreen Chart Gages provide comparison of actual part features to nominals.



QUALITY VISION INTERNATIONAL – Precision for People®

Quality Vision International (QVI®) is the world's largest vision metrology company. Founded in 1945, QVI is the world leader in optical, electronic and software technologies for vision and multisensor measuring systems.

Precision for People is more than just our slogan. It's our commitment to delivering our worldwide customers precision metrology systems designed with the people who use them in mind. Precision for People - it's what we stand for.



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