

QUADRA-CHEK 3000

Evaluation unit for intuitive 2-D and 3-D measurement

The QUADRA-CHEK 3000 evaluation unit is well suited for mounting on measuring machines, profile projectors, measuring microscopes, video testing machines, and coordinate measuring machines with up to four axes. You can measure two-dimensional contour features quickly, simply, and precisely using innovative measuring tools.

Design

Thanks to its industrial design, the QUADRA-CHEK 3000 is ideal for applications both in the measuring room and in a harsh production environment. Its low-profile aluminum housing with integrated power pack and fanless passive cooling is extremely sturdy and tolerant to negative influences. The large touchscreen, made of specially hardened glass, supports multi-touch gesture control and can be operated with gloves.

Functions

Predefined geometries (e.g., point, line, circle, slot, rectangle, sphere, cone, cylinder, and plane) are available for the measurement of two-dimensional and three-dimensional features. The "Measure Magic" function makes measurement especially easy. This function uses the acquired measuring points to automatically select the appropriate geometry. In addition to the measuring functions, you can also use functions for construction and definition—for example, in order to create relationships (distances, angles) between two or more contour features.

You can save your results in a measurement report individually formatted as a PDF or CSV file, or you can print them from a connected printer. The measuring program can automatically record repetitive parts and then execute them again.

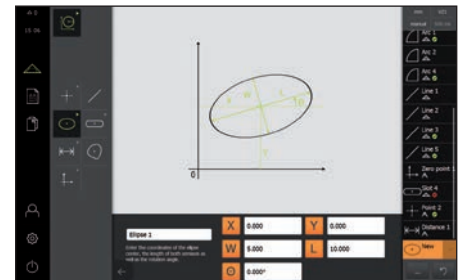
Software options

The QUADRA-CHEK 3000's performance range can be adapted through software options to specific requirements. You can enable the software options by entering a license key. Please contact HEIDENHAIN for more information.



Intuitive display

All of the information you need is displayed in a clean and easy-to-read layout on the unit's high-resolution, 12.1-inch screen. Only those functions that are actually available within a given context and situation are shown. The self-explanatory operating controls provide intuitive user guidance.



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	QUADRA-CHEK 3014 NC	QUADRA-CHEK 3024 NC
Axes	4 (XYZQ), two of which can be enabled with a software option	
Encoder interface Input frequency	$\sim 1 V_{PP} \sim 11 \mu A_{PP}$ EnDat 2.2 $\sim 1 V_{PP}: \leq 400 \text{ kHz}; \sim 11 \mu A_{PP}: 150 \text{ kHz}$	\square TTL $\leq 5 \text{ MHz}$
Subdivision factor	4096-fold (only with 1 V _{PP})	
Display step	Adjustable, max. 8 digits Linear axes XYZ: to 0.00001 mm; angular axis Q: to 0.00001° (00° 00' 00.1")	
Display	12.1-inch multi-touch screen (16:10); resolution: WXGA 1280 x 800 pixels, for position values, dialogs, inputs, graphics functions, and video display (VED software option)	
Functions	<ul style="list-style-type: none"> • Acquisition of 2-D geometry features through measurement, construction, and definition • Measuring point acquisition via crosshairs and creation of measuring programs (teach-in) • Entry of tolerances and graphic display of measurement results with user administration • Creation and output of measurement reports • Measure Magic: automatic recognition of geometries 	
Encoder input	One additional encoder input (software option AEI1)	
Edge detection	<i>Video (software option VED):</i> <ul style="list-style-type: none"> • Automatic measuring point acquisition via video edge detection and programmable light control • Display, archiving, and output of live images <i>Optically (software option OED):</i> <ul style="list-style-type: none"> • Automatic measuring point acquisition via optical edge detection 	
Assisted focus	Assisted focusing of the camera on the object of measurement (software option AF)	
3-D measuring applications	Measured-value acquisition via touch probe (software option 3D)	
Error compensation	<ul style="list-style-type: none"> • Linear (LEC) and segmented linear (SLEC) using up to 200 points • Squareness calibration; matrix compensation (NLEC) using up to 99 x 99 points 	
Data interface	1x Ethernet 100 MB/1 Gbit (RJ45); 3x USB 2.0 Hi-Speed (Type A)	
Other connections	<ul style="list-style-type: none"> • Camera connection¹⁾ (USB 2.0 Hi-Speed (Type A), Ethernet 1 Gbit (RJ45)) • Light control for up to 6 light sources 	
Accessories	Multi-Pos and Duo-Pos stand, Multi-Pos holder, power cable, measuring standard, 2-D demo part, adapter connector	
Power connector	AC 100 V to 240 V (±10 %), 50 Hz to 60 Hz (±5 %), ≤ 79 W	
Operating temperature	0 °C to +45 °C (storage temperature: -20 °C to +70 °C)	
Protection EN 60529	IP65; back panel: IP40	
Mounting	Multi-Pos or Duo-Pos stand, Multi-Pos holder, fastening systems compatible to VESA MIS-D 100	
Mass	Unit: ≈ 3.5 kg; unit with Multi-Pos holder: ≈ 4.1 kg; Unit with Duo-Pos stand: ≈ 3.8 kg; unit with Multi-Pos stand: ≈ 4.5 kg	

¹⁾ Supported camera manufacturer: IDS Imaging Development Systems GmbH;

QUADRA-CHEK 3000

Functions

Acquiring measuring points

The QUADRA-CHEK 3000 allows you to, for example, acquire points on flat 2-D contours either manually with crosshairs or automatically, depending on the option installed. The integrated measuring point acquisition over video edge detection (software option VED) is particularly helpful. Here the video image is displayed in real-time. The evaluation electronics even assume complete control of the illumination.



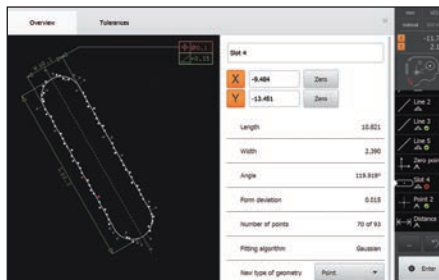
Optical edge detection

The OED option allows you to use a range of tools for edge detection and for the definition of measuring points. You can acquire measuring points either manually or automatically. With optical edge detection (OED), you can traverse any edge of a contour, and the currently active tool will detect the actual measuring point on its own.



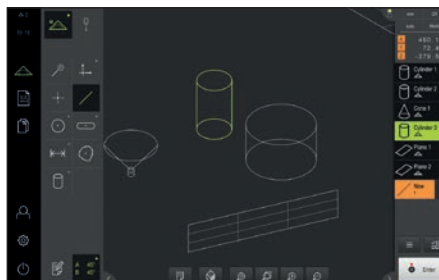
Video edge detection

The VED option provides you with multiple tools for edge detection and for specifying measuring points. You can acquire the points manually or automatically. With the VED automatic measuring point acquisition, you need only approach the position—the active tool automatically finds the actual edge. This objective point measurement permits a high degree of repeatability. This makes it possible for you to work quickly, reliably, and effortlessly, while at the same time maintaining a low degree of measurement uncertainty.



3-D measuring applications

With the 3D option you can use a connected touch probe to acquire the measuring points. The current position values are loaded during probing, and are then used to calculate the geometrical features, such as spheres, cones, or cylinders.



Functional features view

The QUADRA-CHEK 3000 offers you a comprehensive graphic features view. In this view, you can use previously measured geometries to design new geometry features. Of course, you can also enlarge or reduce this view as well as zoom into features, in order to keep a good overview of all the measured geometry features. The features view also makes it possible to add annotations to each feature (e.g., measurement information or informational texts).



Tolerancing

With the tolerance-adapting function, you can define geometric tolerances for measured or constructed features. Dimensional, positional, and form tolerances can be specified depending on the selected feature. You can also use general tolerancing as per ISO 2768 or decimal tolerancing.

Generating geometry features

The QUADRA-CHEK offers several possibilities for determining geometries:

- Measuring geometry features
- Constructing features from previously measured features (e.g., distance between two circle centers; angle between lines)
- Defining unmeasurable geometry features

You can also run your created geometry features through a tolerance check.

Creating a measuring program

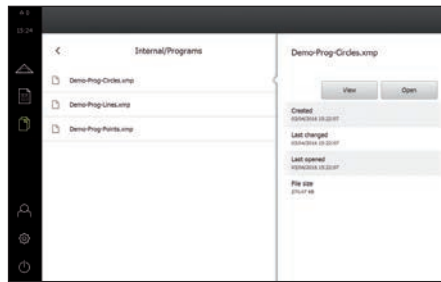
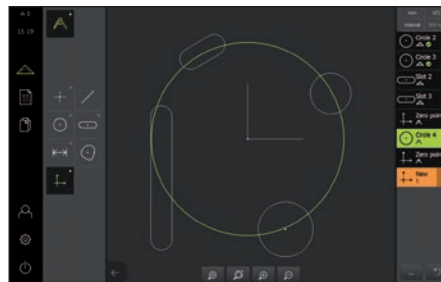
For difficult or repetitive measuring tasks, you can automatically record all of the work steps as a measuring program. The QUADRA-CHEK 3000 learns the presets, sequence of measurements, tolerances, and data-output commands. When the program is run, the QUADRA-CHEK 3000 visually leads you to the features to be probed. The program view always provides you with an optimum overview of the process.

Creating measurement reports

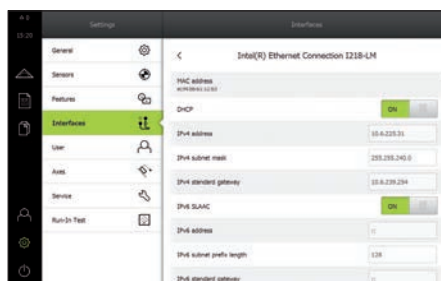
Directly after the measurement, the integrated measurement report function lets you create a report containing the measurement and tolerance results along with other information. With the template designer you can create individually configured reports. You select a standard template and adapt it to meet your needs, or you can create entirely new templates. Measurement reports can be saved in the QUADRA-CHEK 3000 using the .pdf, .csv, and measurement report file formats, or can be printed from a peripheral printer or network printer.

Data interfaces

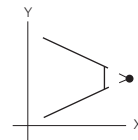
You can use the data interfaces to output measurement reports as well as to import and export settings and measuring programs. The Ethernet interface enables communication with a PC. You can also connect printers or memory media to the USB port. Network drives and printers can be connected via Ethernet as well.



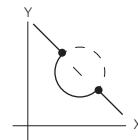
Number	Name	Type	Tolerance	X	Y	Size	Form
1	Slot 1			3.2733	18.0346	6.9982	0.0096
2	Circle 1	Passed		18.9051	13.3834	4.4864	0.0237
3	Circle 2	Passed		33.3842	8.1324	12.6949	0.0194
4	Slot 2			-1.4168	3.4789	16.4313	0.0013
5	Circle 3			11.7516	-2.1643	6.2478	0.0141
6	Slot 3	Failed		2.2869	-18.6200	10.8999	0.0071
7	Line 1			11.3952	-21.9285	6.8869	0.0321
8	Line 2			34.9294	-12.9035	10.0243	0.0229
9	Line 3			-8.3311	2.8393	10.0964	0.0092
10	Line 4			22.4600	25.1301	10.3318	0.0090



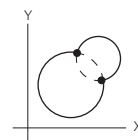
Examples of design capabilities:



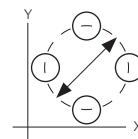
Intersection of two lines



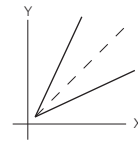
Intersection of line and circle



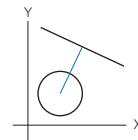
Intersection of two circles



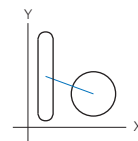
Bolt hole circle formed from three or more circles



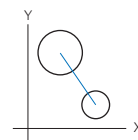
Bisector of two lines



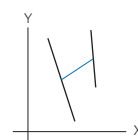
Line constructed from line and circle



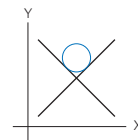
Line constructed from circle and oblong hole



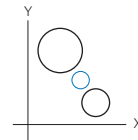
Distance constructed from two circles



Distance constructed from two lines



Circle constructed from two lines



Circle constructed from two circles