HEIDENHAIN

QUADRA-CHEK 3000

Evaluation Electronics
For Metrological Applications

QUADRA-CHEK 3000
– The evaluation unit for intuitive 2-D measurement

The QUADRA-CHEK 3000 evaluation unit is well suited for mounting on measuring machines, profile projectors, measuring microscopes and video testing 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. The flat aluminum housing with integrated power pack and fanless passive cooling is extremely sturdy and tolerant to negative influences. The large touchscreen of specially hardened glass supports multi-touch gesture control and can be operated with gloves.

Functions
The device provides you with predefined geometries (e.g. point, line, circle, slot and rectangle) for the measurement of two-dimensional contour features. The "Measure Magic" function makes measurement especially easy. This function uses the measured points to automatically select the fitting geometry. Besides measuring functions, you can also use functions for design and definition, for example to create relationships (distances, angle) between two or more contour features.

The graphic display of measured results and geometry features grants you full control. Quickly understandable operating controls and self-explanatory symbols ensure simple and intuitive operation.

You can save your measured results in a log individually formatted as .pdf or .csv files, or print them out from a connected computer. For recurring parts, you can automatically record the measurement program and rerun it.

The QUADRA-CHEK 3000's performance range can be adapted through software options to specific requirements.

Well organized display
The high-resolution, 12.1-inch color wide-screen display presents all necessary information in a quickly understandable and clearly structured format. The screen content is context sensitive—showing only the functions available in the actual operating situation. The self-explanatory operating controls provide intuitive user guidance.
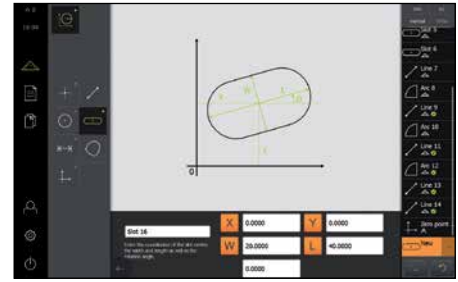

Point measurement
The QUADRA-CHEK 3000 enables you to measure points on flat 2-D contours either manually with crosshairs or automatically, depending on the option installed. The integrated measuring point acquisition via video edge detection (VED software option) is particularly helpful. Here the video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

Video edge detection
The VED option provides you with multiple tools for edge detection and specifying measuring points. You can measure 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.
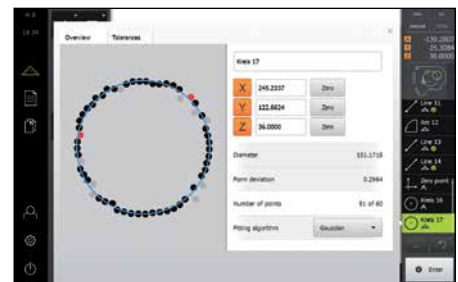
Functional features view
The QUADRA-CHEK 3000 offers you a comprehensive graphic feature view. In this view you can use previously measured geometries to design new geometry features. Of course you can enlarge this view, reduce it, zoom into or shift sections to keep a good overview of all measured geometry features.

Generating geometry features

The QUADRA-CHEK gives you several possibilities for determining geometries:
- Measuring geometry features
- Designing geometry features from previously measured features (e.g. distance between two circle center points, angle between two lines)
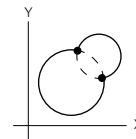- Defining unmeasurable geometry features

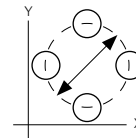You can also have the generated geometry features inspected with a tolerance test.
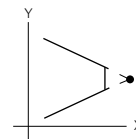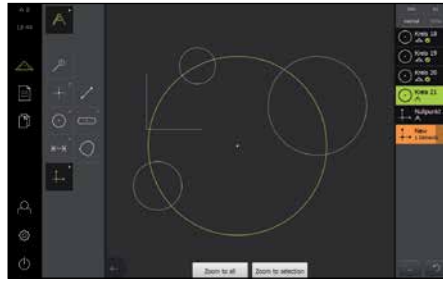
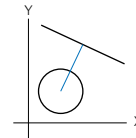Intersection of two lines
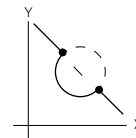
Intersection of line and circle

Intersection of two circles

Creating a measuring program

For difficult and recurring measuring tasks, you can automatically record all the working steps as a measuring program. The QUADRA-CHEK learns the datums, the sequence of measurements, tolerances and data-output commands. The QUADRA-CHEK visually leads you to the features to be probed when the program is run. The program view always provides you with an optimum overview of the process.
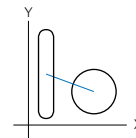
Bolt hole circle formed from three or more circles

Bisector of two lines

Line designed from line and circle

Creating a measurement report

With the integrated measurement report function you can automatically create a report immediately after the measurement. The report contains measured and tolerance results as well as further 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. You can save your report in the QUADRA-CHEK in the log format, as .pdf or .csv files, or print them out from a connected computer.
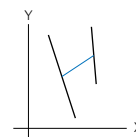
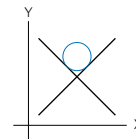Line designed from circle and oblong hole
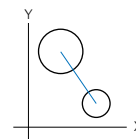
Distance designed from two circles

Distance designed from two lines

Data interfaces
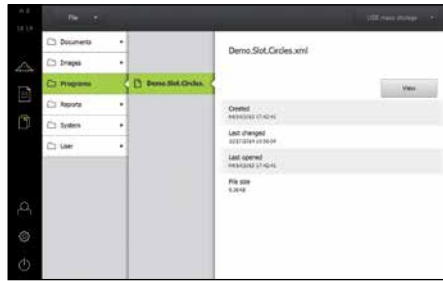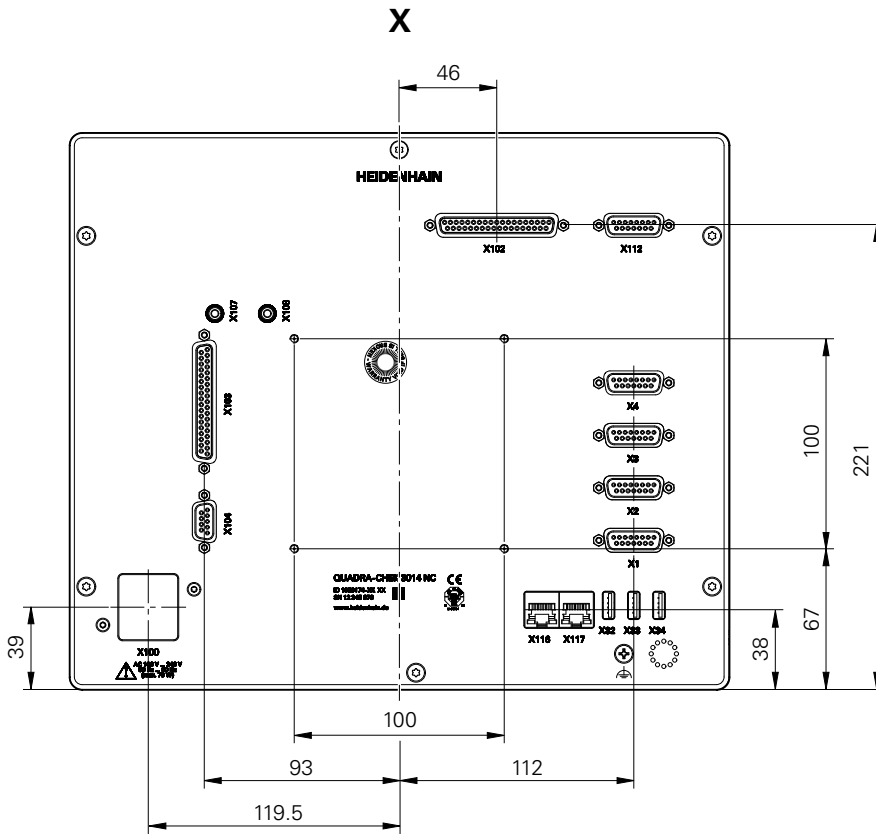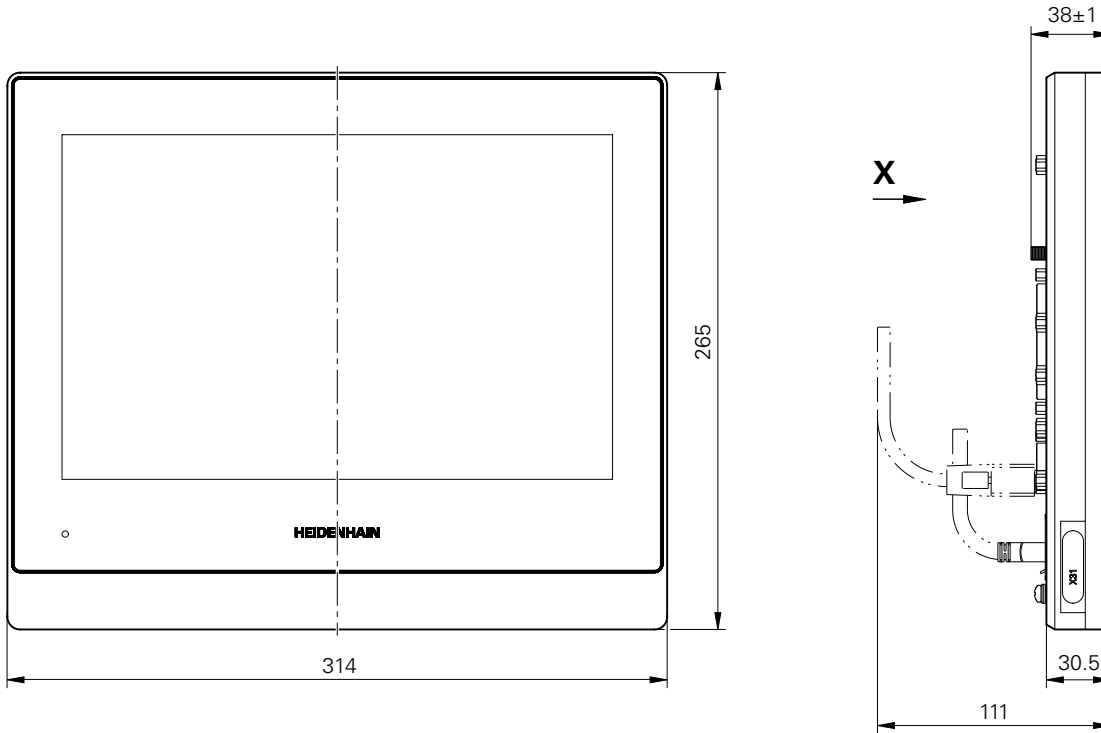
You use the data interfaces to output measuring points and reports as well as to read and transmit settings and measuring programs. You can communicate with a PC over Ethernet or with an adapter over RS-232-C/V.24. You can connect printers or memory media to the USB port. A list of possible printers is available on the Internet at www.heidenhain.de.

Circle designed from two lines

Circle designed from two circles

QUADRA-CHEK 3000

Evaluation electronics for measurement of 2-D features
- **Up to four axes**
- **Designed for industrial use**
- **Touchscreen with multi-touch gesture control**
- **Graphic display of measurement results and geometry features**

38±1

X

265

314

30.5

111

X

46

X102   X112

X107   X108

X103

X4

X3

X2

X1

X104

100

221

QUADRA-CHEK 3014 NC

X116   X117   X22 X23 X24

X100

67

38

39

100

93   112

119.5

mm
Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

	QUADRA-CHEK 3014 NC	QUADRA-CHEK 3024 NC
Number of encoder inputs	4 (XYZQ) (two of which can be enabled as a software option)	
Encoder interface Input frequency	$\sim$ 1 V$_{PP}$ $\leq$ 500 kHz	$\sqcap\sqcup$ TTL $\leq$ 500 kHz
Subdivision factor	4096-fold (only for 1 V$_{PP}$)	
Display step	Adjustable, max. 8 digits Linear axes XYZ: to 0.000 01 mm; angular axis Q: to 0.000 01° (00° 00' 00.1")	
Display	12.1″ color wide screen (touchscreen); resolution: WXGA 1280 x 800 pixels for position values, dialogs and inputs, graphics functions and video display (VED software option)	
Functions	• Acquisition of 2-D geometry features by measurement, design and definition of geometries • Measuring point acquisition via crosshairs • Creation of measuring programs (teach-in) • Tolerance input and graphic display of measurement results • Creation and output of measurement reports • User management • Measure Magic: automatic recognition of geometries	
Additional encoder input (software option AEI1)[1]	One additional encoder input	
Video edge detection (VED software option)[1]	• Automatic point measurement via video edge detection • Manual autofocus (only with Z axis) • Light control, programmable • Display, archiving and output of live images	
Error compensation	• Linear (LEC), and segmented linear (SLEC) over up to 200 points • Squareness calibration; matrix compensation over up to 30 x 30 points	
Data interface	1x Ethernet 1 GB (RJ-45); 3x USB 2.0 Hi-Speed (type A)	
Other connections	• Camera port[2] (USB 2.0 Hi-Speed (type A), Ethernet 1 GB (RJ-45)) • Light control for up to 6 light sources	
Accessories	Multi-Pos and Duo-Pos stand, Multi-Pos holder, power cable, calibration standard, 2-D demo part, adapter connector (HEIDENHAIN TTL pin layout to RSF TTL and Renishaw TTL)	
Power connection	100 V to 240 V AC (± 8 %), 47 Hz to 63 Hz, $\leq$ 79 W	
Operating temperature	0 °C to +40 °C (storage temperature –20 °C to +70 °C)	
Protection EN 60 529	IP 65, back panel IP 40	
Mounting	Multi-Pos or Duo-Pos stand, Multi-Pos holder Compatible fastener systems to VESA MIS-D 100	
Weight	Unit with Multi-Pos stand: approx. 4.5 kg Unit with Duo-Pos stand: approx. 3.8 kg Unit with Multi-Pos holder: approx. 4.1 kg	

[1] Option enabling in the HEIDENHAIN "License Key Request" (LKR) Web portal; enabling for prototypes available on request
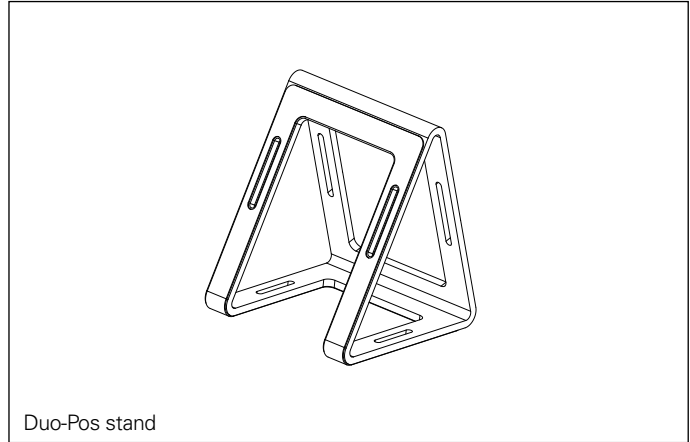[2] Supported camera manufacturers: IDS Imaging Development Systems GmbH (available on request for other manufacturers);
   Recommended camera resolution: $\leq$ 2.0 megapixels

Accessories

Duo-Pos stand
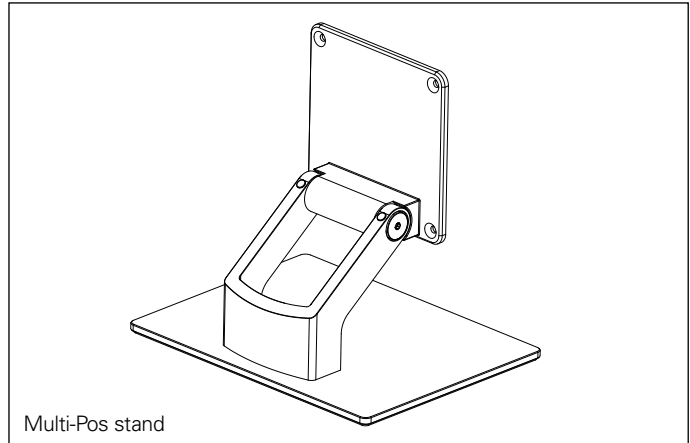For setup and fastening on a surface in two positions (20° or 45° tilt)

ID 1089230-02

Duo-Pos stand

Multi-Pos stand
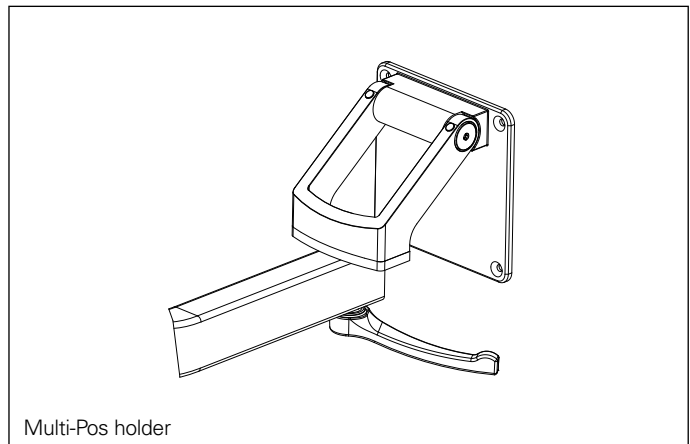For setup and fastening on a surface, continuously tiltable (90° range)

ID 1089230-03

Multi-Pos stand

Multi-Pos holder
For fastening on an arm, continuously tiltable (90° range)

ID 1089230-04

Multi-Pos holder
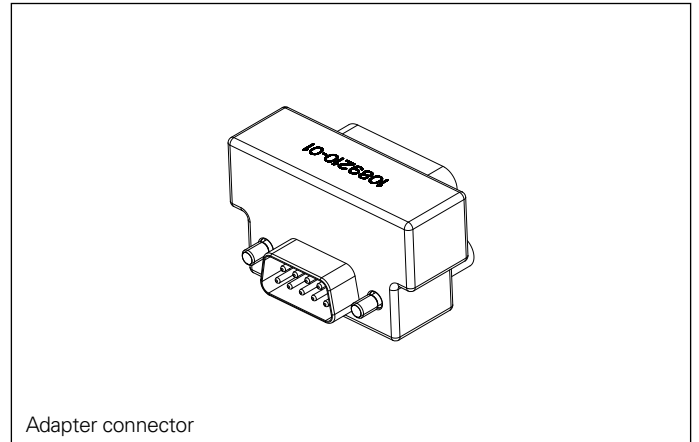
Adapter connector
For conversion of pin layout from
HEIDENHAIN TTL to RSF TTL and
Renishaw TTL

ID 1089210-01

Adapter connector

Calibration standard
For the calibration of video measuring
machines, measuring microscopes and
profile projectors. It can be traced back to
national or international standards.

ID 681047-01

Calibration standard

2-D demo part
Demo part for 2-D applications, e.g. for
video measuring machines

ID 681047-02

2-D demo part

Power cable
EU power cable, length 3 m

ID 223775-01

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