



# HEIDENHAIN

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**HEIDENHAIN**



Product Information

## **QUADRA-CHEK 3000**

Evaluation Electronics

For Metrological Applications

May 2017

# QUADRA-CHEK 3000

– The evaluation electronics 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

Predefined figures (e.g. point, line, circle, slot and rectangle) are available for the measurement of two-dimensional features. The “Measure Magic” function makes measurement especially easy. This function uses the measured points to automatically select the fitting geometry. Besides the measuring functions, you can also use functions for design and definition, for example in order to create relationships (distance, angle) between two for more contour features.

You can save your measured results in a log individually formatted as .pdf or .csv files, or print them out from a connected computer. The measuring program can automatically record repetitive parts and then play them again.

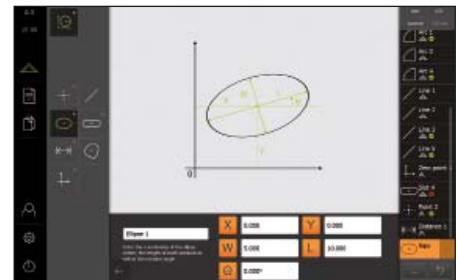


## Software options

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.

## Clearly structured display

The high-resolution, 12.1-inch color flat-panel 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.





	QUADRA-CHEK 3014 NC	QUADRA-CHEK 3024 NC
<b>Axes</b>	4 (XYZQ) of which, 2 axes can be enabled as software options	
<b>Encoder interface</b> Input frequency	$\sim 1 V_{PP}$ $\leq 400 \text{ kHz}$	$\square$ TTL $\leq 5 \text{ MHz}$
Subdivision factor	4096-fold (at 1 V <sub>PP</sub> )	
Display step	Adjustable, max. 8 digits Linear axes XYZ: to 0.00001 mm; angular axis Q: to 0.00001° (00° 00' 00.1")	
<b>Display</b>	12.1" color flat-panel display (16:10, touchscreen); resolution: WXGA 1280 x 800 pixels, for position values, dialogs and inputs, graphics functions, and video display (VED software option)	
<b>Functions</b>	<ul style="list-style-type: none"> <li>• Acquisition of 2-D geometry features by measurement, design and definition of geometries</li> <li>• Measuring point acquisition via crosshairs</li> <li>• Creation of measuring programs (teach-in)</li> <li>• Tolerance input and graphic display of measurement results</li> <li>• Creation and output of measurement reports</li> <li>• User management</li> <li>• Measure Magic: automatic recognition of geometries</li> </ul>	
<b>Additional encoder input</b> (AEI1 software option)	One additional encoder input	
<b>Video edge finding</b> (VED software option)	<ul style="list-style-type: none"> <li>• Automatic point acquisition via video edge detection</li> <li>• Light control, programmable</li> <li>• Display, archiving and output of live images</li> </ul>	
<b>Error compensation</b>	<ul style="list-style-type: none"> <li>• Linear (LEC) and segmented linear (SLEC) over up to 200 points</li> <li>• Squareness calibration; matrix compensation (NLEC) over up to 99 x 99 points</li> </ul>	
<b>Data interface</b>	1x Ethernet 100 MB/1 Gbit (RJ45); 3x USB 2.0 hi-speed (type A)	
<b>Other connections</b>	<ul style="list-style-type: none"> <li>• Camera connection<sup>1)</sup> (USB 2.0 Hi-Speed (type A), Ethernet 1 Gbit (RJ45))</li> <li>• Light control for up to 6 light sources</li> </ul>	
<b>Accessories</b>	Multi-Pos and Duo-Pos tilting bases, Multi-Pos holder, power cable, calibration standard, 2-D demo part, adapter connector (assignment of HEIDENHAIN TTL to RSF TTL and Renishaw TTL)	
<b>Power connection</b>	AC 100 V to 240 V (±10 %), 50 Hz to 60 Hz (±5 %), ≤ 79 W	
<b>Operating temperature</b>	0 °C to +45 °C (storage temperature -20 °C to +70 °C)	
<b>Protection</b> EN 60529	IP65, back panel IP40	
<b>Mounting</b>	Multi-Pos or Duo-Pos tilting base; Duo-Pos holder; Fastener systems compatible to VESA MIS-D 100	
<b>Mass</b>	Unit with Multi-Pos tilting base: ~ 4.5 kg; Duo-Pos tilting base: ~ 3.8 kg; Unit with Multi-Pos holder: approx. 4.1 kg	

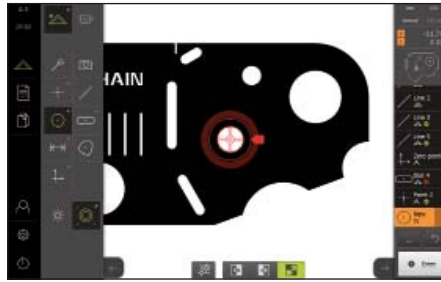
<sup>1)</sup> Supported camera manufacturer: IDS Imaging Development Systems GmbH;  
Camera resolution: ≤ 2.0 megapixels, list of approved cameras available on the Internet at [www.heidenhain.de](http://www.heidenhain.de)

# QUADRA-CHEK 3000

## – Functions

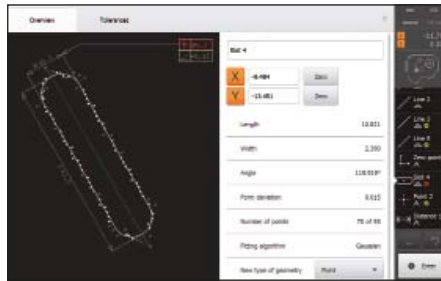
### Recording measuring points

The QUADRA-CHEK 3000 enables you to record 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 (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 record 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, and zoom into features 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 features from previously measured features (e.g. distance between two circle centers; angle between lines.)
- Defining unmeasurable geometry features

You can also have the generated geometry features inspected with a tolerance test.

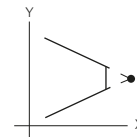


### Tolerancing

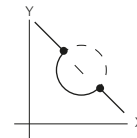
With the tolerance-adapting function you can define geometric tolerances for measured or designed elements. Dimensional, positional and form tolerances can be specified depending on the selected feature. You can use general tolerancing as per ISO 2768 or decimal tolerancing.



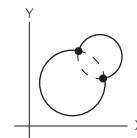
### Examples of design capabilities:



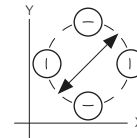
Intersection of two lines



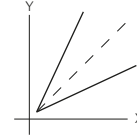
Intersection of line and circle



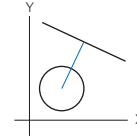
Intersection of two circles



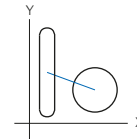
Bolt hole circle formed from three or more circles



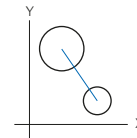
Bisector of two lines



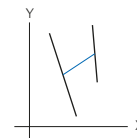
Line designed from line and circle



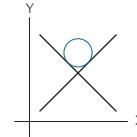
Line designed from circle and oblong hole



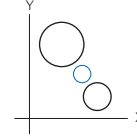
Distance designed from two circles



Distance designed from two lines



Circle designed from two lines



Circle designed from two circles

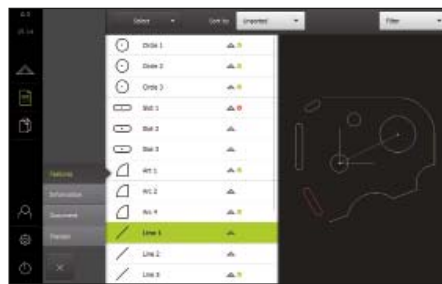
### Creating a measuring program

For difficult or repetitive measuring tasks, you can automatically record all 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.



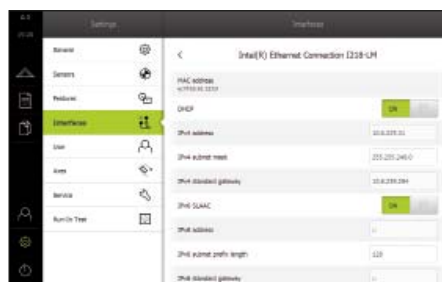
### Log measured data

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 logs in the QUADRA-CHEK in the log format, as .pdf or .csv files, or print them out over a peripheral printer or network printer.



### Data interfaces

You use the data interfaces to output logs as well as to read and transmit settings and measuring programs. The Ethernet interface enables communication with a PC. You can connect printers or memory media to the USB port. Network drives and printers can also be connected via Ethernet. A list of possible printers is available on the Internet at [www.heidenhain.de](http://www.heidenhain.de)



# Mounting the QUADRA-CHEK 3000

The QUADRA-CHEK 3000 can be mounted flexibly with the Multi-Pos or Duo-Pos base at various tilting angles. The Multi-Pos holder or other fastening systems compatible with VESA MIS-D 100 are suited for fastening it to a machine.

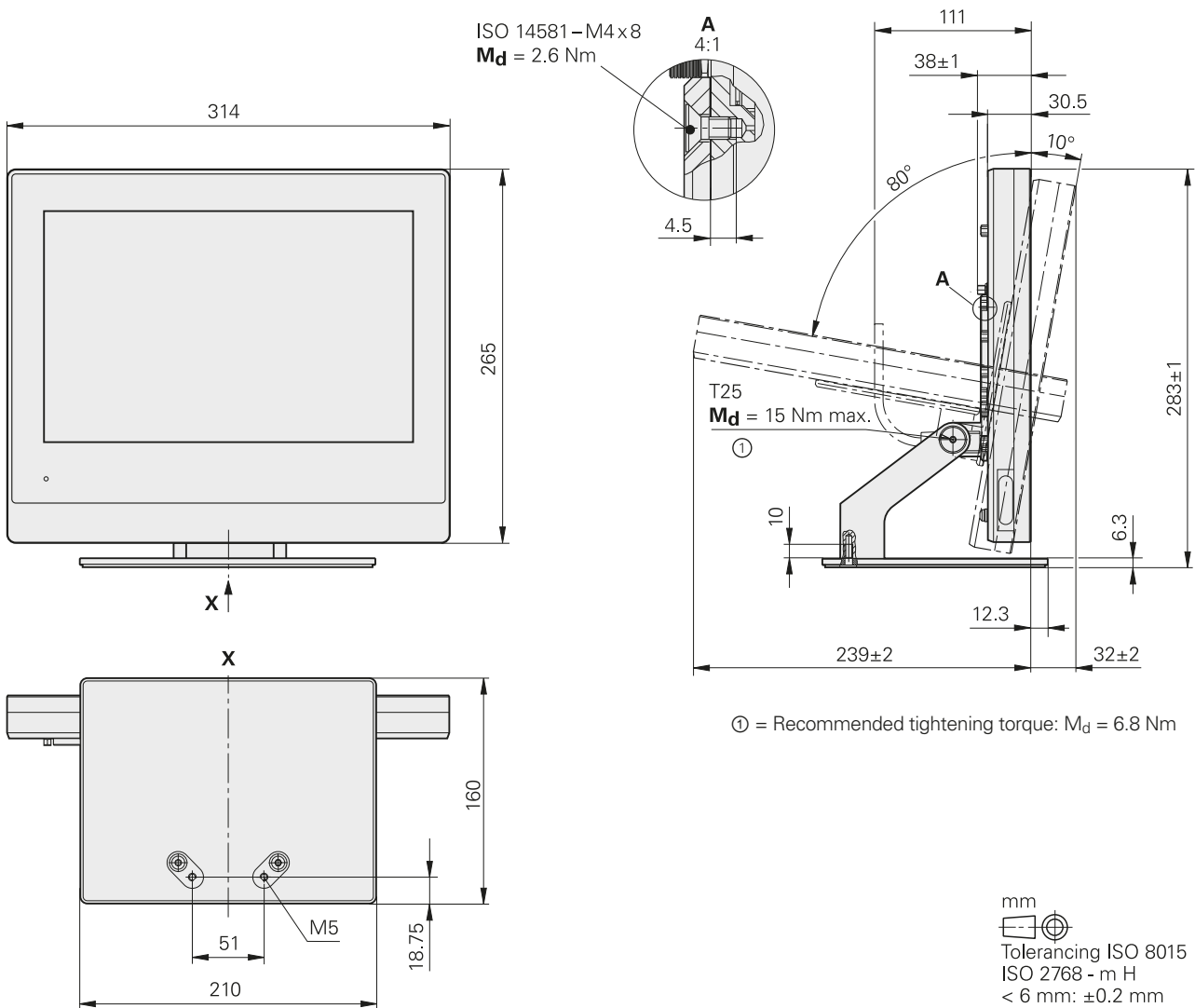
## Multi-Pos base

For mounting and fastening to a surface, continuously tiltable within an angle of 90°

ID 1089230-03



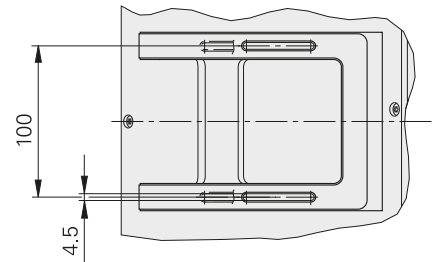
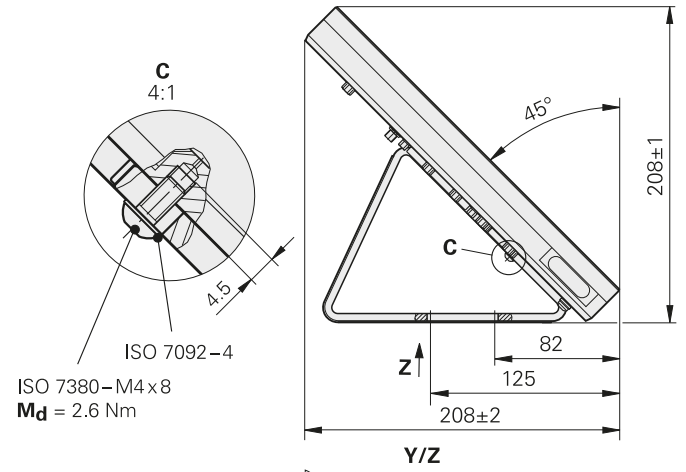
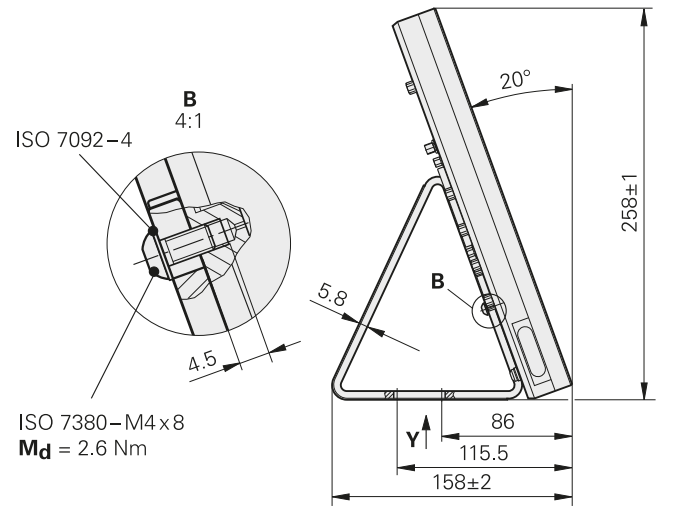
**QUADRA-CHEK 3000  
with Multi-Pos base**



**Duo-Pos base**

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

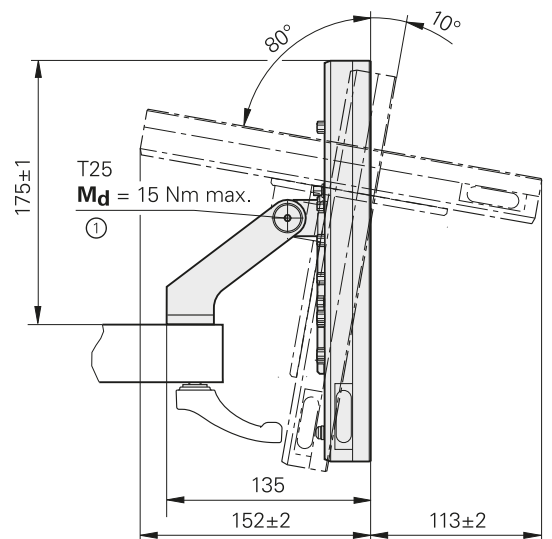
ID 1089230-02



**Multi-Pos holder**

For fastening to an arm, continuously tiltable within an angle of 90°

ID 1089230-04



① = Recommended tightening torque:  $M_d = 6.8 \text{ Nm}$

# Accessories

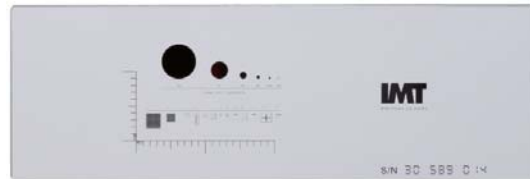
## Calibration and demonstration parts

HEIDENHAIN offers various calibration parts as accessories in order to calibrate the optical and tactile edge detection methods.

### 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

The 2-D demo part is included with the ND 1200, ND 1300, QUADRA-CHEK 3000 and IK 5000. The application examples in the User's Manuals are based on this part. It can be reordered if a replacement is necessary.

ID 681047-02



2-D demo part

### Adapter connector for QUADRA-CHEK 3000

For conversion of the pin layout from HEIDENHAIN TTL to RSF TTL and Renishaw TTL.

ID 1089210-01



TTL adapter connectors



Adapter connector for light control

### Adapter connector for QUADRA-CHEK 3000

For conversion of the pin layout for light control (without zoom) from QUADRA-CHEK 3000 (X103) to assignment for ND 1300 QUADRA-CHEK (light)

ID 1089212-01

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# HEIDENHAIN

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