Products and Modules
WM | Quartis R2024-1

Specification

Products – the extensive standard equipment

WM | Quartis products contain an extensive collection of functions for coordinate measuring technology.

For extended and customized functionality, the products are completed with modules.

■ WM | Quartis

WM | Quartis is the standard product for measurement and evaluation on coordinate measuring machines. Measurement and programming can be executed online or offline.

The 3D graphics displays measuring machine (incl. reference spheres, probe changing systems, clamping accessories), work piece (CAD models in ACIS format) and measuring results.

Elements can be calculated and evaluated with a free choice of measurement strategies, different regression calculations (least squares, Chebychev, minimum circumscribed, maximum inscribed, tangential) and normalized filters.

The collision detection detects and warns of collisions between the probe and the work piece (CAD model).

The computed error correction of the machine geometry (CAA) and temperature compensation guarantee best possible measuring results.

For alignment, in addition to the basic functions "primary direction, secondary direction and origin", a powerful best-fit for free-form and geometry, alignment according to reference point system (RPS), a coarse alignment and reference systems according to ISO GPS or ASME are available.

Form and position evaluations according to ISO 1101 / ASME Y14.5M, statistical functions with machine and process capability (SPC) as well as flexible creation of reports are also included.

The quick selection table and user management offer easy user guidance for the execution of measurement programs. With an appropriate reading device, measurement programs can be started using barcode, QR code or data matrix code.

With the help of the work window "Counter" you solve simple measuring and marking tasks. The positioning aid supports measurement on manual measuring devices.

Measuring results and programs are stored and managed in the integrated relational database, which is designed for single-instance access. The file-based database can be individually expanded with user-defined properties.

The language of the user interface and the measurement reports can be set separately.

The following languages are available: Czech, German, English, French, Hungarian, Italian, Japanese, Korean, Dutch, Polish, Portuguese, Russian, Spanish, Swedish, Simplified Chinese, Slovak, and Spanish.

The following measuring devices (controller, counter, server software) can be operated without an additional module: WENZEL WPC 2030, WENZEL WPC 2040, WENZEL WPC 2050, WENZEL WPZ 50 / WPZ 55, WENZEL WPZ 100, WM | PointMaster, WM | MMA, I++ DME Server and Leadshine ENC7480.

■ WM | Quartis Offline

WM | Quartis Offline is the product for pure offline programming. It is not possible to connect to a measuring machine. Besides this restriction, the same functions as in the product WM | Quartis are included.

Notes:

The same application and device modules are required on a WM | Quartis Offline license as on the license for the measuring machine. For example, in order to program a probe rotation offline, the module IPH or CPH has to be available.

PH20 and REVO movements cannot be simulated with WM | Quartis offline. In order to do so, the product "WM | Quartis" in connection with an offline Renishaw UCCserver Software is required.

For "virtual measurement" with WM | PointMaster, the product "WM | Quartis" is needed as well, because it is not possible to establish a connection to PointMaster with "WM | Quartis Offline".

■ WM | Quartis Mobile

WM | Quartis Mobile is the product for applications with mobile measuring instruments. The following measuring arm can be operated with the product without an additional module: WENZEL WM | MMA. With the additional DME-MAN module, the measuring arms Hexagon RDS, FARO USB FaroArm, Kreon ACE and RPS Metrology are also supported. The use of other measuring devices is not possible with this product.

Note: To operate a mobile measuring device with a WM | Quartis Mobile license, the same application and device modules are required as on a standard license. The supported versions (server software and drivers) are listed in the DME-MAN module.

■ WM | Quartis Core

WM | Quartis Core is the product for applications on WENZEL CORE measuring machines. The use of other measuring devices is not possible with this product.

Note: To operate a WENZEL CORE with a WM | Quartis Core license, the same application and device modules are required as on a standard license.

■ WM | Quartis ProgExe

WM | Quartis ProgExe is the product for the pure execution of measuring programs, e.g. on a Renishaw Equator Gauge. With this product, WM | Quartis can only be started in program execution mode. The user interface is reduced to the program quick selection table.

Note: To run the programs, the same application and device modules are required on a WM | Quartis ProgExe license as on a standard license. A combination with the AUTOM module is currently not possible.

■ WM | Quartis Compare

WM | Quartis Compare is the product with which on comparators, in contrast to WM | Quartis ProgExe, the measuring programs can not only be executed but also recorded and edited. The following measuring devices can be operated with the product: Renishaw Equator Gauge.

Application modules – expand the basis functionality

Application modules expand the basis functionality of WM | Quartis products with powerful functionality for specific applications.

■ CURVE

The module CURVE allows CNC measurement of plane curves against nominal curves as well as the measurement of plane curves without CAD model. The probe radius correction is carried out three-dimensional. In addition, cam profiles (cylinder intersection curves), offset curves and 3D curves can be probed or scanned. The tolerance "Line profile" can either be evaluated with or without reference, as well as with unilateral or unequally disposed tolerance zone. The curve is displayed with the tolerance zone in the element graphics. Curves can be divided in lines and circles using the function "extract".

■ SURF

The module SURF allows CNC measurement of surfaces as well as points and edge points with projection onto the CAD model. The probe radius correction is carried out perpendicular to the CAD surface. The tolerance "Surface profile" can be evaluated with or without references as well as with unilateral or unequally disposed tolerance zone.

■ POINT CLOUD

The module POINT CLOUD enables measurement based on point clouds. Point clouds can be acquired with optical sensors or be imported. The point clouds are displayed in the 3D graphics. The export of the point clouds allows data transfer to other systems such as WM | PointMaster for reverse engineering.

The following elements can be extracted from point clouds: Point, Plane, Circle, Cylinder, Sphere, Rectangle, Slot, Hexagon, Surface.

Point clouds and polygon meshes (triangulated point clouds) can be aligned and compared with the CAD nominal data. The part deviations can thus be graphically displayed as "colored images". For a standard-compliant metrological evaluation, the elements can be measured directly on the polygon meshes (e.g. on CT measurement data).

■ STP

The STP (Surface Texture Parameter) module enables the acquisition of surface characteristic lines with Renishaw REVO SFP roughness probes and the evaluation of roughness features.

The following roughness parameters can be directly evaluated as a feature: Ra, Rq, Rsk, Rku, Rp, Rv, Rz, Rmax, Rc, Rt, Rmr, Rsm, Rpc, Rk, Rpk, Rvk, Mr1, Mr2
Further roughness parameters can be output to a file.

■ EMD

The module EMD (Export Measuring Data) allows the export of measuring results in the following formats: Q-DAS ASCII transfer format, Excel spreadsheet format and BMWIpp format.

- Exporting feature data in a Q-DAS file, the K fields can be configured freely.
- Exporting feature and statistical data in an Excel file, content and format can be defined using an Excel template file (*.xlt, *.xltx).
- The BMWIpp export writes actual element data in a *.csv file.

■ IMPEX-ELEM

The module IMPEX-ELEM allows importing and exporting element data in the following formats: VDA-FS, IGES and ACIS.

Alignments can be transferred to WM | PointMaster for "virtual measuring" via the VDA-FS format as transformation matrix (TMAT).

Elements can be exported to a RenCompare calibration file (*.cal). This file is required on a Renishaw Equator gauge for calibration.

■ DMIS

The module DMIS allows the direct execution (interpreting) of DMIS programs. Supported are DMIS standard 5.2 functions for the measurement of geometry with triggered or scanning probe systems, all constructions and evaluations available in WM | Quartis and in DMIS Standard as well as high language constructs such as variables, conditions, jumps and loops.

DMIS programs are displayed in a comfortable editor where they can also be edited, checked and saved.

Measurement results can be output to a standardized DMIS results file (DMO) when running Quartis or DMIS programs.

■ EDB

The module EDB (External Database) allows to save measurement and system databases on a Microsoft SQL Server. This offers the advantages "Multi-user capability" and "Speed with large amounts of data" compared to the standard storage in file-based desktop databases.

The module EDB is required for multiple machine network with one (1) central database.

Notice:

The product "Microsoft SQL Server" is not included in the functionality and has to be licensed separately. Microsoft SQL Server from version 2008 R2 SP2 on are supported.

■ AUTOM

The module AUTOM (Automation Interface) is required for automation tasks. Machine-to-machine communication (M2M) takes place via the messaging protocol MQTT (TCP/IP).

The operating state of WM|Quartis can be monitored (interrogated). In case of status changes, WM | Quartis automatically sends events. In remote control mode, measuring programs can be selected, started and stopped via the automation interface.

■ DME-SRV

With the module DME-SRV (Dimensional Measurement Equipment - Server) WM | Quartis becomes WM | I++ DME Server. With it WENZEL coordinate measuring machines can be operated with any validated I++ DME capable measuring software.

WM|I++ DME Server supports the I++ DME specification version 1.7.

WM|I++ DME Server supports the following hardware and applications: WENZEL WPC 2030, WPC 2040 and WPC 2050, Renishaw PH10, PH10-iQ and PHS, probe changer, scanning and multiple machine network.

Note: The relevant device modules have to be enabled in addition to the DME-SRV module. The following modules may be considered: IPH, CPH, PRC, SCAN, ROT, MMM.

Device modules – for optional machine components

Device modules expand WM | Quartis products for optional measuring machine components and their application.

■ IPH

The module IPH (Indexing Probe Head) supports the calibration and operation of the following indexed articulating probing systems from Renishaw: PH10M PLUS, PH10MQ PLUS, PH10T PLUS, PH10-iQ PLUS, PH10M, PH10MQ, PH10T, PH10-iQ, MH8, MIH, MH20i.

Following a quick initial calibration procedure, the CAA-compensated PH10-iQ can be used in every position without additional calibration. The PH10-iQ functionality is available for triggered probe systems with spherical styli tips.

A generic indexed probe head is available if the measuring machine is controlled via an I++ DME Server.

If the machine is controlled via ZEISS CMM-OS, the Zeiss RDS articulating probing head has to be available.

■ CPH

The module CPH (Continuous Probe Head) allows calibrating and operating a continuously variable probe head that can be positioned in any direction. Once calibrated, one can directly measure with any angle position.

The module CPH supports the PH20, REVO, REVO-2, PHS1 and PHS2 from Renishaw as well as the WENZEL CORE swivel head.

The following sensors are supported on the Renishaw REVO 5-axis measuring system: RSP2, RSP3, RSP3-6, SFP2 (surface finish probe) and RUP1 (ultrasonic probe).

A generic continuously variable probe head is available if the measuring machine is controlled via an I++ DME Server. If the machine is controlled via Zeiss CMM-OS, the Zeiss DSE articulating probing head is available.

■ PRC

The module PRC (Probe Changer) allows calibration and use of the following stylus changing systems and changing rack ports from Renishaw: ACR1, ACR2, ACR3, FCR25, MCR20, SCR200, SCP80, SCP600.

■ SCAN

The module SCAN allows scanning of the elements line, plane, circle, cylinder, cone, sphere and curve. Normalized filters and outlier elimination guarantee optimal results. Scanning is carried out on known or unknown scan paths.

The module SCAN allows the self-centered measurement of points in center bores, cones, V-grooves, gearings, etc.

The following scanning probes from Renishaw are supported: SP25, SP600, SP80 and REVO.

■ OS

The module OS (Optical Sensor) allows the calibration and use of the following optical sensors: WENZEL SHAPETRACER II, WM | LS 50, LS 70, LS 150, LS 600, WM | MLS, NIKON L100, LC15Dx, XC65Dx, XC65DxLS and all optical sensors on the WENZEL CORE.

■ ROT

The module ROT (Rotary Table) allows calibration and use of a CNC rotary table. The basic functionality "Positioning axis" is available for WENZEL WPC 2030, WPC 2040, WPC 2050 and for I++ DME Server (Renishaw UCCserver and WENZEL CORE Win3DS).

With WPC 2040 / 2050, rotationally symmetrical elements can be scanned with the rotary table as fourth measuring axis or the point distribution can be approached with the rotary table.

■ MMM

The module MMM (Multiple Machine Mode) allows to control up to eight machines (carriages) simultaneously in multiple machine mode or within a multiple machine network. An ahead looking collision control between the machines that is based on moving safety zones is included.

Multiple machine mode: One Quartis controls multiple machines via DMIS programs.

Multiple machine network: Multiple Quartis control multiple machines via Quartis or DMIS programs, whereby the module MMM has to be unlocked on each individual Quartis license within the network.

With the MMM module, individual machines (carriages) can be coupled in order to create a common reference coordinate system.

■ DME-MAN

The module DME-MAN (Dimensional Measurement Equipment - Manual) allows operating manual machines, which are not included in the products "WM | Quartis" and "WM | Quartis Mobile".

The following server software and driver are supported: Hexagon RDS (Version 6.2), FARO USB FaroArm driver (version 6.4.1.2), Kreon Toolkit Common Files (Version 21.4.0), RPS Metrology KArm (Version 2.0.0.33).

The Hexagon RDS interface supports currently following measuring arms: ROMER Absolute Arm, Cimcore CA7 Arm, ROMER and Tesa Multi Gage, Infinite and Stinger Arm.

The FARO USB interface supports currently following measuring arms: Edge, Fusion, Prime, Platinum, Quantum, Quantum S / M, Titanium and Advantage. FARO Gage measuring arms can not be used.

The Kreon interface supports the WENZEL WM | MMA and the Kreon ACE measuring arms.

The RPS Metrology interface currently supports the following measuring arms: R-EVO R, R-EVO S and R-EVO Titanium. These measuring arms are sold by FESTO, among others, in connection with their automation systems.

Note: The RPS Metrology measuring arms can only be operated with a fixed measuring tip. The other measuring arms can additionally be operated with a trigger probe. On the WENZEL WM | MMA and Kreon ACE measuring arms, optical sensors can also be used. Elements can be measured with single points or with scanning.

■ DME-CNC

The module DME-CNC (Dimensional Measurement Equipment - CNC) allows operating CNC machines, which are not included in the product "WM | Quartis".

The following server software is supported: Zeiss CMM-OS (from version 2.8, only triggered probing systems, no scanning, no optical sensors).

CAD interface modules – basis for efficient measurements

CAD interface modules allow importing CAD models in different formats.

Some CAD interface modules optionally support reading and displaying the GD&T annotations (PMI - Product Manufacturing Information).

WM | Quartis internally uses the ACIS format from Spatial Corporation.

Data sets in ACIS format (up to version 2024 1.0.0) can be imported without an extra module.

■ VDA-FS

Import of CAD data in VDA-FS format (versions 1.0 and 2.0)

■ IGES

Import of CAD data in IGES format (up to version 5.3)

■ STEP

Import of CAD data with PMI in STEP format (versions AP203 and AP214 and AP242)

■ DXF

Import of 2D CAD data (curves) in DXF (AutoCAD) format (versions 2000/2002 and R12)

■ CATIA-4

Import of CAD data in CATIA V4 native format (versions 4.1.9 and 4.2.4)

■ CATIA-5

Import of CAD data with PMI in CATIA V5 native format (versions R8 up to R2024)

Import of CAD data with PMI in CATIA V6 (CATIA 3DEXPERIENCE) format (up to version R2024), if these are exported beforehand from the 3DEXPERIENCE platform (database) as CATPart or CATProdcut files.

■ PRO-E

Import of CAD data with PMI in Pro/ENGINEER, Wildfire, Creo native format (versions Pro/E 16 up to Wildfire 5.0 up to Creo 10.0)

■ NX

Import of CAD data with PMI in Siemens NX native format (versions NX1 up to NX2306)

■ PS

Import of CAD data in Parasolid native format (versions 9 up to 36)

■ SE

Import of CAD data in Solid Edge native Format (from version 18 up to ST11 up to SE2023)

■ SW

Import of CAD data with PMI in SolidWorks native format (versions 2003 up to 2024)

■ INV

Import of CAD data in Autodesk Inventor native format (version V11 up to 2024)