Improvements
WM | Quartis R2020-2

Update Information

WM | Quartis

NEW **NEW** **NEW** **NEW**

Improvements WM | Quartis R2020-2

At a Glance

WM | Quartis R2020-2 offers a wide range of improvements for special applications and areas of use.

WM | Quartis R2020-2 offers an **integrated evaluation of surface texture parameters**. You measure the roughness of your part surfaces with Renishaw REVO SFP roughness sensors. New algorithms calculate the surface characteristics in accordance with current standards. In addition to the roughness profile (R), the primary profile (P) and waviness (W) are also calculated.

WM | Quartis R2020-2 works with **point clouds - the basis for optical measurement**. You use line scanners for optical measurement. With it, point clouds with several 100 million points can now be captured. The point clouds are the basis for the extraction of geometric elements and thus an important basic function for optical measurement. With the line scanner WM | LS 150 a further laser triangulation sensor from WENZEL is additionally supported.

WM | Quartis R2020-2 facilitates **alignment** in accordance with standards. You want to use the reference systems not only in the position tolerance. With the new alignment function "Determine coordinate system by reference system", a complete coordinate system consisting of several elements is created in one step.

WM | Quartis R2020-2 contains useful improvements for **evaluation**. In the characteristic "Distance" you choose whether the average, minimum or maximum distance is calculated. You evaluate position tolerances and benefit from additional reference systems with material requirements.

WM | Quartis R2020-2 outputs **element data in tabular form** on the **measurement report**. You need the data of measured elements in a text or CSV file. This output has become easier with the help of the newly available element tables. You simply define the required data in the appropriate table layout and save the measurement report in the desired file format.

WM | Quartis R2020-2 facilitates **programming** and extends the **DMIS functionality**. You use coordinate system relocate / rotate now with expression editor. This allows an interrupted loop to be continued at any point, saving your time. You measure turbine blades and evaluate them parameterized and fully automated with the WM | BladeAnalyzer. From Q-DAS files, you automatically create a measuring program that generates the characteristics according to your inspection plan.

WM | Quartis R2020-2 offers, besides the **updated CAD interfaces**, many further useful improvements and extensions, such as the **selection lists for database fields**. You can find out more about them on the following pages.
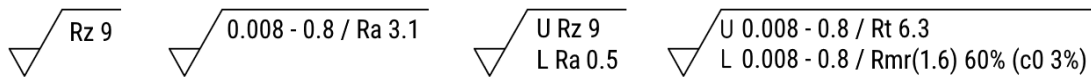
Note:

Some improvements are not included in the standard product WM | Quartis R2020-2 and require additional, chargeable modules. These are described in the document "Products and Modules WM | Quartis R2020-2".

Integrated Evaluation of Roughness Parameters

You measure the roughness of your part surfaces with Renishaw REVO SFP roughness sensors.

New algorithms integrated into WM | Quartis calculate the surface texture parameters in accordance with current ISO standards.

$$\sqrt{\quad} \; \text{Rz 9} \qquad \sqrt{\quad} \; \text{0.008 - 0.8 / Ra 3.1} \qquad \sqrt{\quad} \begin{array}{l} \text{U Rz 9} \\ \text{L Ra 0.5} \end{array} \qquad \sqrt{\quad} \begin{array}{l} \text{U 0.008 - 0.8 / Rt 6.3} \\ \text{L 0.008 - 0.8 / Rmr(1.6) 60\% (c0 3\%)} \end{array}$$

In addition to the parameters for the roughness profile (R), the parameters for the primary profile (P) and for the waviness (W) are also calculated.

Directly Evaluable Roughness Features

The essential roughness parameters (according to ISO 4287 and ISO 13565) can now be evaluated directly as specific Quartis features.

Roughness features: Ra, Rq, Rsk, Rku, Rp, Rv, Rz, Rmax, Rc, Rt, Rmr, Rsm, Rpc, Rk , Rpk, Rvk, Mr1, Mr2

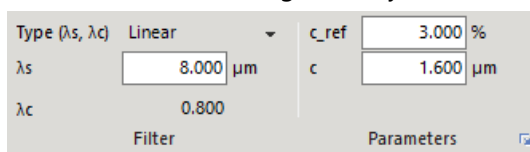| Feature	Ra	Rq	Rsk	Rku	Rp	Rv	Rz	Rmax	Rc	Rt	Rmr	Rsm	Rpc	Rk	Rpk	Rvk	Mr1	Mr2
Evaluate	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
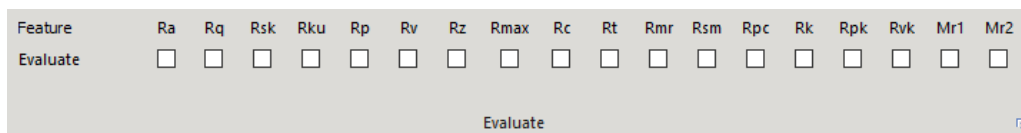
Evaluate

The selected features are evaluated immediately after the surface characteristic profile is captured. The new roughness features are stored in the database and can therefore be displayed and output in the feature data window, on reports and via export functions.

If required, you can output additional surface features on the measurement report. The new algorithms have already calculated these parameters for you.

Standard-Compliant Evaluation

You define the profile filters required for the standard-compliant calculation of surface parameters for λc and λs as well as other settings directly in the ribbon.

Type (λs, λc)	Linear	▼	c_ref	3.000	%
λs	8.000	µm	c	1.600	µm
λc	0.800				
	Filter		Parameters		

Selectable filters:
- Linear Gaussian filter 1st order (according to ISO 16610-21)
- Robust Gaussian filter 2nd order (according to ISO 16610-31)

Roughness Profile and Material Ratio Curve (Abbott Curve)

You manufacture highly stressed functional surfaces such as lubrication sliding surfaces and therefore evaluate the Rk parameters. The material ratio curve is often used to judge the surface.

The Abbott curve can be displayed on the measurement report next to the roughness profile.
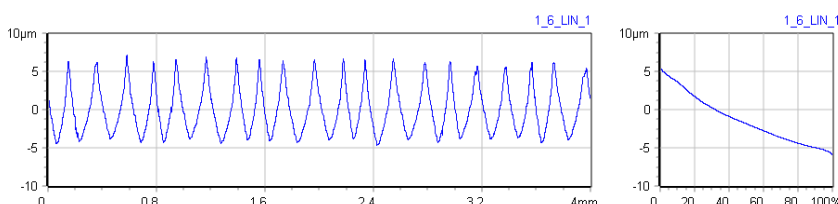
Improvements WM | Quartis R2020-2

Roughness Measurement with REVO SFP2 without CAD Model

You measure roughness, but you do not have a CAD model to click the scan path.

The surface characteristic profile can now be defined by manually pre-probing three points. After starting the measurement, the REVO SFP2 aligns itself exactly normal to the part surface and measures the surface characteristic profile.


Graphical Representation of the UCCserver Probes

The graphical representation of the probe systems configured in the UCCserver is now automatically transferred to the system database of WM | Quartis. This saves you time, as the additional, time-consuming configuration in WM | Quartis is no longer necessary. In addition, the probe systems are displayed graphically in every detail.

Point Clouds - the Basis for Optical Measurement

You use line scanners for optical measurement. Newly, point clouds can be captured on the supported WENZEL CNC measuring machines and WM | MMA measuring arms.
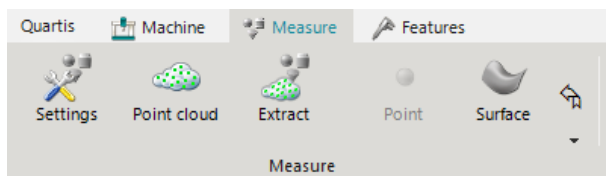
The point clouds are the basis for the extraction of geometric elements and thus an important elementary function for optical measurement. You will already be able to extract geometry elements from the point clouds in WM | Quartis R2021-1.

Depending on the PC hardware used, point clouds with several 100 million points can be measured, displayed in the 3D graphics and processed.

The point clouds can be displayed completely or with a reduced number of points.
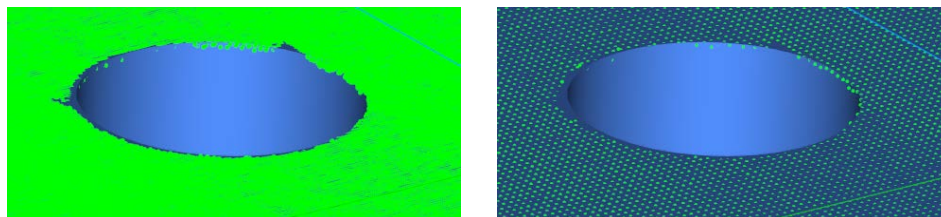
WENZEL Line Scanner WM | LS 150 Supported

With the line scanner WM | LS 150 another laser triangulation sensor is supported in WM | Quartis.

The WM | LS 150 has a maximum line length of 150 mm. The further advantages and features of this sensor can be found on the WENZEL website.

The configuration and application of the WM | LS 150 sensor is identical to the WM | LS 70, which is already supported from WM | Quartis R2019-2 on.

Alignment, Evaluation of Features, Output of Measurement Reports

## Alignment According to the Rules of Reference System Formation

You want to use the reference systems not only in the position tolerance. With the new alignment function "Determine coordinate system by reference system" a complete coordinate system consisting of several elements is created in one step.
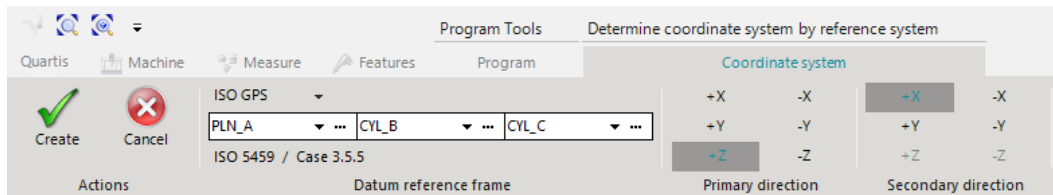

The new function calculates the coordinate systems according to the standardized rules of reference system formation (ISO GPS and ASME Y14.5). This makes the aligning process even easier for you.

Evaluate Minimum and Maximum Distance

You evaluate distance features and would like to include the radii of the elements involved in order to determine the internal or external distance between two holes or shafts, for example.
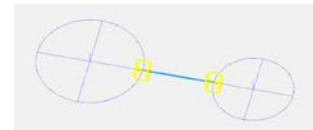
In the feature "Distance" you select whether the average, minimum or maximum distance is calculated.
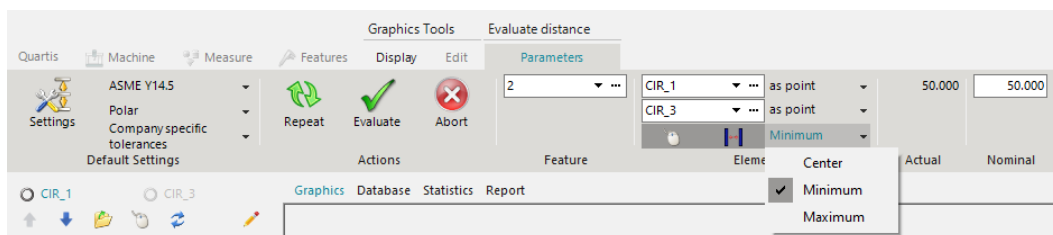
This allows you to evaluate the distance to the element surfaces even faster. The previously required additional work steps in the form of constructions are no longer necessary.

Output Element Data in Table Form

You need the data of measured elements in a text or CSV file. This output has been simplified with the newly available element tables. You define the required data in the corresponding table layout and save the measurement report in the desired file format.

CIR_2 / Circle, Least squares, inside, measured							Measuring		
Nominal value	660.66	-765.12	-765.12	-765.12	1.00	-0.03	13.97		
Actual value	660.66	-765.13	172.40	0.00	1.00	-0.04	13.98	8	0.02	24.03.2020

The element tables supplement the feature tables and facilitate further digital processing.

## Further Improvements

- Position tolerance:
    - Further ASME reference systems with material boundary supported
    - Input of the effective length for reference systems ISO case 5.0.0 and ASME case 2.1
- Measurement report:
    - Select data box layout easier
    - Selection "Features (via element selection)" improved

More Comfortable Programming and Extended DMIS Functionality

Relocate / Rotate Coordinate System with Expression Editor

You work with program loops. This is now even more comfortable. The shift or rotation of the coordinate system can be programmed using the loop index.
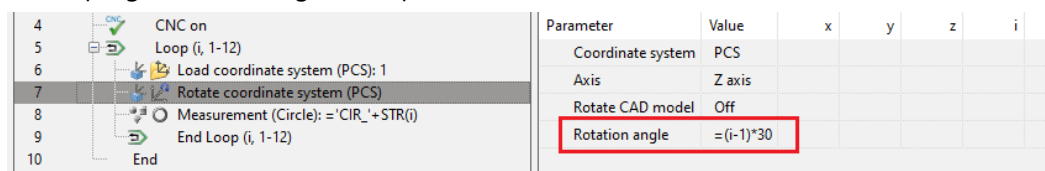

This allows you to continue an interrupted loop at any point, which saves you a lot of time.

The expression editor is also useful outside the program loops. For example, end faces on thin-walled pipes can be accurately probed depending on the actual diameter.

External Programs: Expression Editor for Program Parameters

You measure turbine blades and evaluate them with the WM | BladeAnalyzer. When calling the external program, you can define the program parameters as expressions now. The evaluation of the blades can thus be fully automated via the WM | Quartis measuring program.

Of course, the expression editor can be used with all configured "external programs" and is therefore useful in various applications.
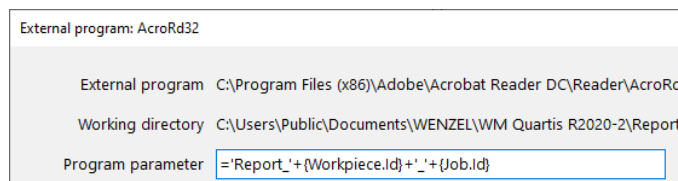
Create Evaluation Program from Q-DAS Inspection Plan File

You define the features to be inspected using an inspection planning system or so-called ballooning software. In this process, the information such as feature ID, feature type, nominal values and tolerances are stored in a file in the Q-DAS ASCII transfer format (*.dfq).

You now automatically create a measuring program which generates the characteristics out of the Q-DAS file.
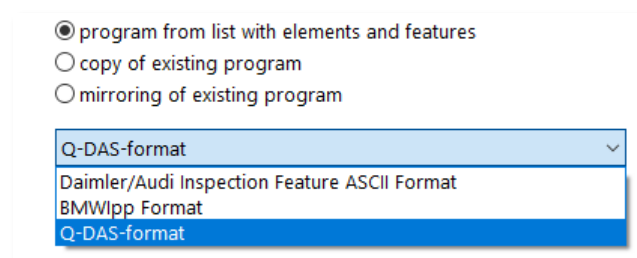
For parts with many features, such as an engine block with several thousand features, the automatic creation of the evaluation program is extremely helpful, time-saving and error-avoiding.

The names (IDs), nominal values and tolerances in the program sentences correspond one hundred percent with the inspection plan.

Enhanced DMIS Functionality

You use DMIS programs. The following improvements make your work easier and increase your benefit.

- Use PROMPT/TEXT, /PICTURE and /SOUND to display dialogs and images and play sounds
- New variable window shows the variables used in the DMIS program and their values
- System variables ensure compatibility when running OpenDMIS programs

Further Innovations Simplify Daily Work

New and Actualized CAD Interfaces

WM | Quartis R2020-2 supports the following CAD interface formats:

- CATIA V4   (4.1.9 to 4.2.4)
- CATIA V5   (R8 to **R2020**)
- CATIA V6   (to **R2020**)
- DXF   (2000/2002 and R12)
- IGES   (to 5.3)
- Inventor   (V11 to **2020**)
- Parasolid   (9 to 31)
- Creo, ProEngineer (16 to **Creo6.0**)
- Siemens NX   (NX1 to **NX1899**)
- Solid Edge   (18 to **SE2020**)
- SolidWorks   (2003 to **2020**)
- STEP   (AP203, AP214, AP242)
- VDA   (1.0 and 2.0)

The changed formats compared to WM | Quartis R2020-1 are shown in **bold** in the above list. You also benefit from general improvements and error corrections for the other CAD interface formats.

Selection List, Comments, Write Protection, Mandatory Fields for Database Fields

You use user-defined properties to save additional information in the measurement database for the workpieces and measurements. Now you can select default values from a **selection list**. You can define **defaults** and display **comments** in the list. A **write protection** prevents the defaults from being changed. In addition, **mandatory fields** can be defined with a minimum number of characters.
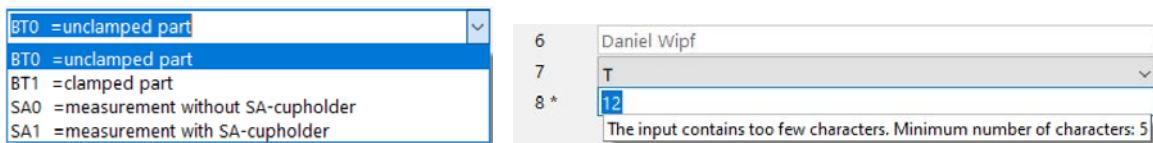
These improvements help you to ensure that the correct information for unambiguous identification of the measurement is output on the measurement report or in the export files.

Further Improvements

- Intersection Construction with Curves axial, direct (Cylindrical Cam)

- Successful testing of the compensation algorithms according to Gauss and Chebyshev by the Physikalisch-Technische Bundesanstalt (PTB)

- Collision Warning: Default Option is "Abort Execution"

- Expression Editor: Place Holder for Directories, e.g. ::Qrt.Data::

- Improved Program Interoperability between WENZEL CORE and Tactile CMM

- Execute 5-Axis "Intermediate Point" and "Position Machine" on a 3-Axix CMM

- WENZEL XO Measuring Machine Models of the Latest Generation Available.
  The following measuring machine models can be selected for display in the 3D graphics:
  WENZEL XO (3G) 55 (500, 700, 1000), 87 (1000, 1500) 107 (1500, 2000)

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