

Improvements

# WM | Quartis R2022-1

Update Information

# WM | Quartis



# Improvements WM | Quartis R2022-1

## At a Glance

WM | Quartis R2022-1 offers a wide range of improvements for special applications and areas of use.

WM | Quartis R2022-1 evaluates **position tolerance** of a **pattern tolerance** in which the common position of several elements in a reference system is tolerated. In the measurement report, you output the result for the element group and, if required, additionally the individual results of the elements contained in the group.

WM | Quartis R2022-1 includes additional functions for **optical measurement and evaluation based on point clouds**. In addition to the elements circle, cylinder, cone, sphere, plane or surfaces, you now also extract points and hexagons from point clouds. General improvements in the extraction process increase quality and reliability.

WM | Quartis R2022-1 scans with the WENZEL laser scanners **WM | LS 70, LS 50 and LS 150** with a significantly higher number of laser lines per second and more uniform line spacing.

WM | Quartis R2022-1 **automatically generates measurement programs from WM | Generator inspection plan files**. These programs contain both the program sentences for measuring the elements and the evaluation of the characteristics.

WM | Quartis R2022-1 includes **improvements in the measurement of curves**. These increase measurement accuracy, improve efficiency and open up new applications.

WM | Quartis R2022-1 extends the range of applications for **measuring with rotary table**, especially on gear measuring machines.

WM | Quartis R2022-1 impresses with its **performance improvement** when **processing statistical data** and **executing REVO measuring programs**. This means that you benefit from massively shorter program execution times.

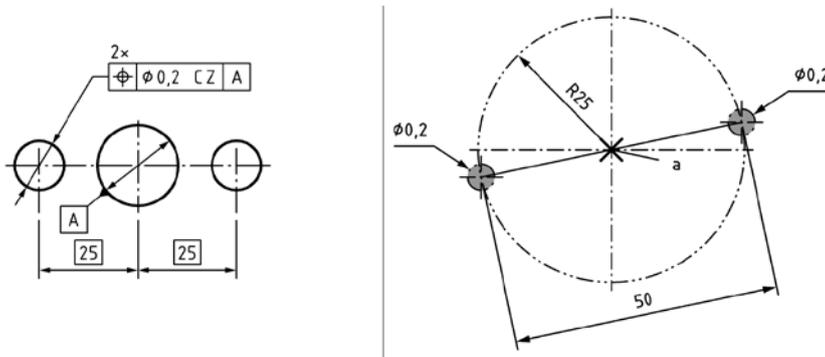
WM | Quartis R2022-1 offers **updated CAD interfaces** as well as other useful improvements and enhancements, such as the display of **collision detection in the status window**. You can read more about this on the following pages.

### Note:

Some improvements are not included in the standard product WM | Quartis R2022-1 and require additional, chargeable modules. These are described in the document "Products and Modules WM | Quartis R2022-1".

## Evaluate Position Tolerance with Pattern Tolerance

You evaluate position tolerance of a pattern tolerance in which the common position of several elements in a reference system is tolerated. In ISO GPS, the modifier **CZ** (Common Zone) indicates this.



WM | Quartis supports pattern tolerance according to ISO GPS for the reference system ISO GPS Case 5.0.0 in combination with the cylindrical tolerance zone.

This is the first pattern tolerance of a series, which will be extended in the next WM | Quartis versions with further use cases for ISO GPS and ASME.

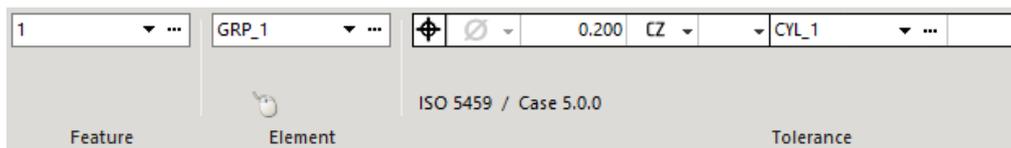
### Create Element Group

With the new construction function "Create element group", you can combine the tolerated elements to form a group.

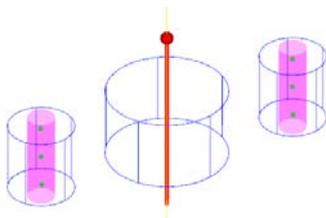


### Evaluating the Position Tolerance of the Element Group

When evaluating, select **CZ** or **SZ** and the calculation type with shape, Gauss, Chebyshev, Minimum circumscribed or Maximum inscribed as well as the tolerance zone and the tolerance value.



Live preview shows the tolerance zones of the elements from the element group.



### Report Shows the Overall Result and the Details

In the measurement report, you output the result for the element group and, if required, additionally the individual results of the elements contained in the group.

| ID      | Feature type                       | Nominal value | ISO | UTol  | LTol | Actual value | Dev   | %Dev | Graphics |
|---------|------------------------------------|---------------|-----|-------|------|--------------|-------|------|----------|
| 1       | Positions tolerance $\emptyset$ CZ | 0.000         |     | 0.200 |      | 0.109        | 0.109 | 55%  |          |
| 1_CYL_2 | Positions tolerance $\emptyset$ CZ | 0.000         |     | 0.200 |      | 0.109        | 0.109 | 55%  |          |
| 1_CYL_3 | Positions tolerance $\emptyset$ CZ | 0.000         |     | 0.200 |      | 0.098        | 0.098 | 49%  |          |

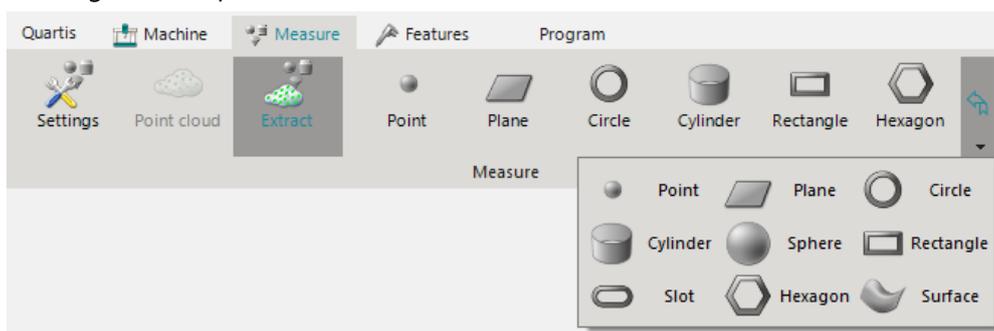
# Improvements WM | Quartis R2022-1

## Optical Measurement and Evaluation based on Point Clouds

You measure optically by capturing point clouds with line scanners and extracting the required elements from the point clouds easily and reproducibly for evaluation.

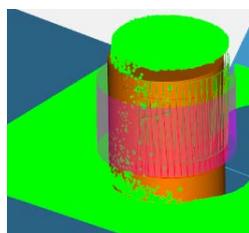
### Extract and Evaluate Element Point and Hexagon

In addition to the elements plane, circle, cylinder, sphere, rectangle, slot and surface, you now also extract points and hexagons from point clouds.



### Extraction Improvements Increase Quality and Enhance Reliability

When extracting cylinders from point clouds, you can use the new "With nominal values" option to ensure that the cylinders are calculated correctly even if the point distribution is unfavorable.



With the new ROI (Region of Interest) method "Cylinder with reference", the ROI is dynamically adapted to the actual value of the selected reference element. This ensures, for example, when measuring bolts, that the cylinders are calculated without the points on the top surface.

You can also select the point clouds that lie within the ROI and thus ensure the quality of the extraction, e.g. for thin sheets where point clouds were captured on both sides.

### Import Point Clouds from WENZEL mScan

Point clouds that you have captured with the WENZEL mScan handheld scanner can be imported to extract and evaluate elements.



### WM | LS 70, LS 50, LS 150: Improved Detection of Laser Lines

With asynchronous triggers, you can achieve a significantly higher number of laser lines per second and more regular line distances with WENZEL laser scanners.

### Nikon Laser Scanner Supported

You scan point clouds with the following Nikon 3D laser scanners on the Renishaw PH10M/MQ:



L100



LC15Dx

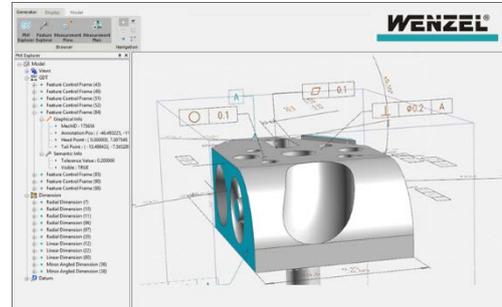


XC65Dx / XC65Dx-LS

## Create Programs from WM | Generator Inspection Plan File

Many CAD systems now offer the option of storing production-relevant data in the CAD model. In addition to the geometry description, such CAD models also contain the dimensions defined by the designer, including tolerances and references.

In this context, the experts use the terms **PMI** (Product Manufacturing Information), **MBD** (Model Based Definition) or **GD&T** (Geometric Dimensioning and Tolerancing).



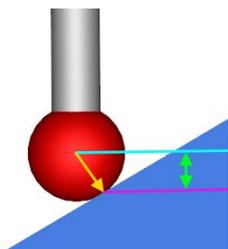
The WENZEL product **WM | Generator** reads CAD models with the contained dimensions. These are displayed in a tree view and in the graphic. If required, you can prepare the characteristics to be measured and then export them to a WENZEL inspection plan file.

In WM | Quartis you automatically generate measurement programs based on such inspection plan files. These contain both the program sentences for the measurement of the elements and the evaluation of the characteristics and can be easily supplemented with commands for alignment, selection of the most suitable probe system, intermediate points, report generation, etc.

## Improvements in the Measurement of Curves

You measure curves on your components with scanning or single points. The following enhancements increase measurement accuracy, rise efficiency and open up new use cases.

### Measure Planar Curves: Contact Points are kept in the Section Plane



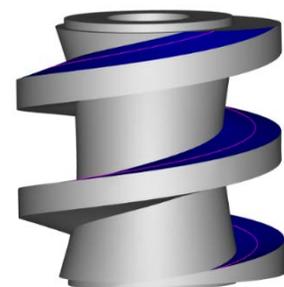
When measuring a planar curve, the probe is repositioned so that the contact point is in the curve plane (section plane). This applies to scanning as well as to probing individual points. Previously, the probe was held in the curve plane when measuring.

In the database, only the probe radius corrected points are now stored in the curve plane. This offers you advantages, among other things, when exporting the curve points and for constructions.

### Measure Axial Curves with 3D Probe Radius Correction

You measure spirals curves (worms) where the contact surfaces are not perpendicular to the cylinder cross-section direction.

The path correction developed for planar curves is also implemented for the lifting curve. As a result, the contact points automatically lie on the cylinder section curve. The 3D probe radius correction additionally increases the measuring accuracy.



### Measure Axial Curves in Probing Mode "Triggered"

You now measure lifting curves with single points in addition to scanning. This opens up new and additional application possibilities.

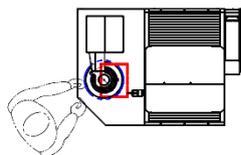
As when measuring planar curves, intermediate points are automatically generated depending on the curvature and inserted into the measurement sequence.

# Improvements WM | Quartis R2022-1

## Rotary Table Functions Expand the Range of Applications

You use a rotary table on a bridge, gantry or gear measuring machine and benefit from the following improvements, among others.

### Calibrate Rotary Table on Gear Measuring Machine with Horizontal Quill

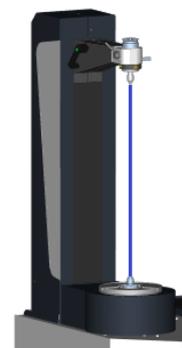


On gear measuring devices, such as the new WENZEL GT, the probe is installed horizontally. You calibrate the rotary table with this constellation by first probing a cone instead of a plane and a circle.

In addition, you can define an angular range for measuring the spheres, since the measuring range covers only slightly more than half of the rotary table.

### Determine Rotary Table Coordinate System with Alignment Functions

You use a counterholder on the gear measuring machine that influences the rotary axis of the clamped workpiece. With the proven alignment functions, you optimize the rotary table coordinate system for precise measuring results.



### Position Rotary Table: Define Angle by Expression

You want to rotate the rotary table to a certain angle based on previously measured elements in order to solve the measuring task. The rotation angle can be easily defined by an expression.

## Further Innovations Simplify Daily Work

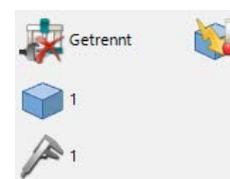
### Position Tolerance: Further Reference Systems with Material Requirement / Boundary

You evaluate position tolerance according to ISO GPS or ASME Y14.5 with material conditions on the references. The calculation algorithms in WM | Quartis emulate the function of the gauge.

Material conditions on the secondary and tertiary reference are now possible in the following reference systems: ISO case 5.5.0 and 5.1.0 as well as ASME case 2.8.

### Display "Collision Detection with workpiece" in the Status Window

You can now see directly on the user interface whether collision detection is switched on. The selected options are visible in the icon hint, which makes working even safer. After clicking on the icon, you directly change the settings for collision detection.



### Remote Control: Extended Functionality of the MQTT Interface

You operate the WM | Quartis via the WM | Shopfloor user interface. To make working on a WENZEL SF or a Renishaw Equator even more comfortable for you, the interface has been extended with additional functionality.

### Evaluate Responses to Generic I++ DME Commands using Expression Editor



Your coordinate measuring machine is operated with an I++ DME server and you use generic I++ DME commands for special use cases. The application possibilities are now even broader, since the responses from the I++ DME server are available in WM | Quartis and can be used, for example, for program flow control.

## New and Actualized CAD Interfaces

WM | Quartis R2022-1 supports the following CAD interface formats:

- CATIA V4 (4.1.9 to 4.2.4)
- CATIA V5 (R8 to R2021)
- CATIA V6 (to R2021)
- DXF (2000/2002 and R12)
- IGES (to 5.3)
- Inventor (V11 to **2022**)
- Parasolid (9 to **34**)
- Creo, ProEngineer (16 to Creo **8.0**)
- Siemens NX (NX1 to **NX1980**)
- Solid Edge (18 to SE 2021)
- SolidWorks (2003 to 2021)
- STEP (AP203, AP214, AP242)
- VDA (1.0 and 2.0)



The changed formats compared to WM | Quartis R2021-1 are shown in **bold** in the above list.

You also benefit from general improvements, optimizations and error corrections in the CAD interfaces. Among other things, the option "Take over assembly structure" now also works with the IGES, Parasolid, Siemens NX and STEP formats in addition to the CATIA V5, ProEngineer/Creo, Solid Edge and SolidWorks formats.

## Improved Performance when Processing Statistical Data

You evaluate many characteristics in many measurements. You will be amazed by the massively faster execution times in the statistics work window, in feature and statistics data export, in Q-DAS export and in the output of statistics data in tables or data boxes on the measurement report.



## Improved Performance when Running REVO Measurement Programs



With a Renishaw REVO 5-axis measuring system, measuring times are basically significantly shorter than with a rigid measuring head.

Due to various optimizations in the communication with the UCCserver, REVO measuring programs are now executed even faster.

The "Position machine" travel commands are blended with the preceding and following commands. This results in even smoother movements of the measuring machine.

## Measuring Machine Display: Further WENZEL LH and GT Models Available

In the WM | Quartis configuration, you can additionally select the following measuring machine models for the display in the 3D graphics:

- WENZEL LH 2015 P (3000)
- WENZEL LH 2015 P (4000)
- WENZEL GT 450 (Z=650 / G=900)
- WENZEL GT 450 (Z=800 / G=900)





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