

Improvements

# WM | Quartis R2021-1

Update Information

# WM | Quartis



# Improvements WM | Quartis R2021-1

## At a Glance

WM | Quartis R2021-1 offers a wide range of improvements for special applications and areas of use.

WM | Quartis R2021-1 includes **optical measurement and evaluation based on point clouds**. You can easily and reproducibly extract the elements required for feature evaluation from the point clouds. You export point clouds to ASCII or PCD files for further processing in WM | PointMaster. Of course, the point clouds can also be imported again for evaluation on offline systems.

WM | Quartis R2021-1 increases productivity by **improved integration of the powerful line scanners for optical measurement**. The WENZEL WM | LS 70 and WM | LS 150 line scanners can now also be used on measuring devices with the continuous Renishaw PHS-2 articulating probe head. The display of the sensor working area as a trapezoidal, transparent plane in the 3D graphic facilitates the measuring and capturing of point clouds.

WM | Quartis R2021-1 evaluates characteristics according to current **ISO GPS and ASME Y14.5** standards. The concentricity and coaxiality tolerance as well as the symmetry tolerance have been completely revised and expanded thereby. The improvements include the selectable calculation method, with form as default, and the possibility to use material conditions on the tolerated element and on the reference.

WM | Quartis R2021-1 extends the **DMIS functionality**. Among other things, this improves compatibility with OpenDMIS measuring programs. You define input dialogs with the PROMT statement. System macros can be used as globally callable subroutines. A DMIS preprocessor automatically cleans up certain DMIS standard deviations in OpenDMIS programs, which relieves you of the manual adjustments.

WM | Quartis R2021-1 offers, besides the **updated CAD interfaces**, many further useful improvements and extensions, such as the **expression editor with additional functions**. You can find out more about them on the following pages.

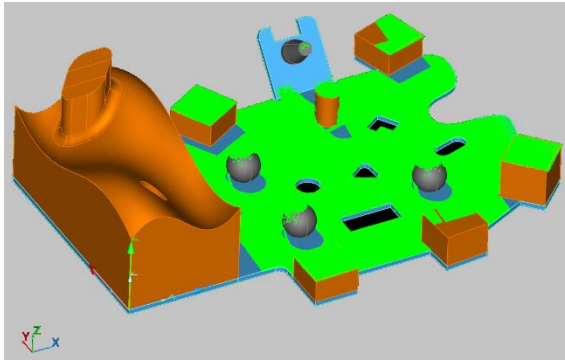
### Note:

Some improvements are not included in the standard product WM | Quartis R2021-1 and require additional, chargeable modules. These are described in the document "Products and Modules WM | Quartis R2021-1".

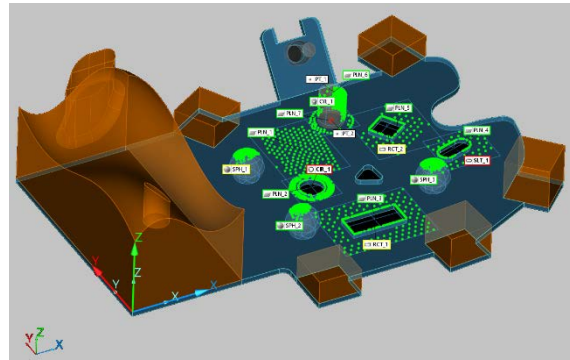
## Optical Measurement and Evaluation based on Point Clouds

You measure optically by capturing point clouds with line scanners.

Now you can easily and reproducibly extract the elements required for the evaluation of the features from the point clouds.



Measured point clouds

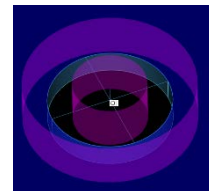
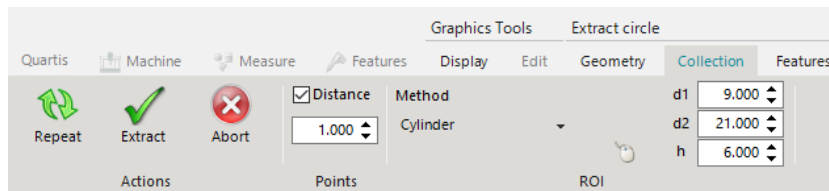


Elements extracted from point clouds

### Extract Elements from Point Clouds

The implemented methods and default values for extracting the elements are based on the Volkswagen Group standard "VW 10135 - Coordinate metrology: Measuring methods - optical".

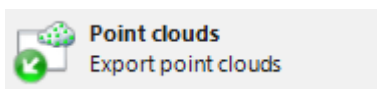
The measurement methods developed for the use case "Automotive body in white production series measurement technology" can also be used effectively for other use cases by simply adapting the parameters. The areas (ROI) in which the points for the elements are collected are displayed in the 3D graphics during extraction.



Currently you can extract the following elements from point clouds: Plane, Cylinder, Circle, Slot, Rectangle and Sphere.

### Export Point Clouds

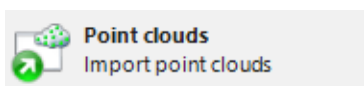
You want to import the point clouds acquired with WM | Quartis into another software and process them there. To do this, you can export the point clouds to ASCII or PCD files.



Use cases with WM | PointMaster include reverse engineering or the creation of reports that show the deviations from the nominal data in color-coded form.

### Import Point Clouds

Point clouds in ASCII or PCD format can be imported into WM | Quartis.



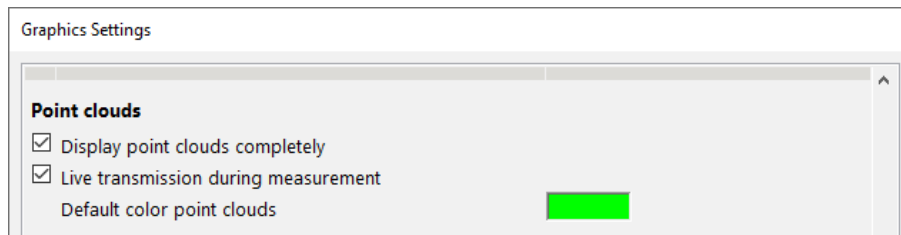
This also allows you to extract elements from externally captured point clouds or to transfer the point clouds to offline workstations and evaluate them there.

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## Graphics Settings for Point Clouds

You would like to set the display of the point clouds in the 3D graphics according to your needs. The following new graphics settings are available for this purpose.

- Show and hide point clouds in the 3D graphics
- Color individual point clouds individually
- Show point clouds completely or reduced for higher graphic performance
- Switch live transmission of points on and off when measuring with a line scanner

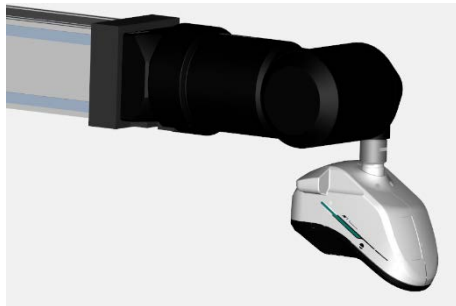


**Note:** Depending on the PC hardware used, point clouds with several 100 million points can be captured, displayed and processed in the 3D graphics.

## Line Scanners - the Powerful Sensors for Optical Measurement

You measure optically with line scanners. The following new functions and improvements make your work easier and increase productivity.

### WENZEL WM | LS 70 and LS 150 Line Scanner on PHS-2 Articulating Probe Head

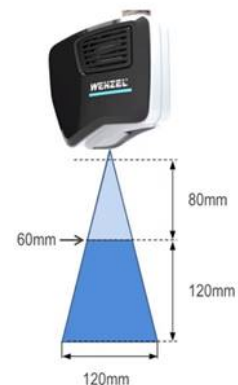


You can now also use the WENZEL WM | LS 70 and WM | LS 150 line scanners on measuring devices with the Renishaw PHS-2 continuous articulating probe head.

Once calibrated for scanning, the sensor can be rotated and swiveled to any position without having to calibrate this position.

### WM | LS and Shapetracer Line Scanner: Show Work Area in 3D graphics

You can now display the working area of the active line scanner as a trapezoidal, transparent plane in the 3D graphics. This allows you to see the width of the laser line, making it easier to define the scan paths.



### WM | MMA with WM | MLS: Show Working Distance before Starting Point Capture

You scan surfaces or capture point clouds with the WM | MLS line scanner on the mobile WM | MMA measuring arm. The laser of the sensor is now already switched on when the measurement is started. This allows you to set the correct working distance before the laser lines are captured.



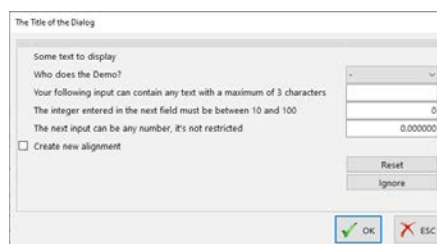
# Improvements WM | Quartis R2021-1

## Enhanced DMIS Functionality

You execute measurement programs which are written in the neutral DMIS language. This release offers numerous enhancements in the supported DMIS language scope, which among other things improves compatibility with OpenDMIS measurement programs.

### Define Input Dialogs with PROMPT Statement

With the PROMPT statement you define complete dialogs with titles, texts, input fields, list boxes, checkboxes and buttons. The dialog on the right shows an example of how you can design an input dialog using the PROMPT minor words TITLE, LIST, EDIT, CHECK and BUTTON.



### Using System Macros as Globally Callable Subroutines

You create program routines which you want to use and call in different workpieces. The so-called system macros offer you this functionality. You can use the centrally stored system macros directly in any DMIS program.

### Preprocessor Cleans Up OpenDMIS Programs



You run OpenDMIS programs in WM | Quartis.

The QrtDmisPreProcessor software tool automatically cleans up certain DMIS standard deviations. This relieves you from manual adjustments.

### Further Improvements

- DMIS: Use variables and MACRO parameters more flexibly
- DMIS: RECALL/D(),DID(), SAVE/D, DID and OPEN/DID(),PCS are executed Quartis-compliant
- DMIS: Execute simplified DATSET/FA() statement
- DMIS: Query SNSET/CLRSRF parameters with VALUE/SNSET,CLRSRF
- DMIS: Execute OBTAIN/SS(myCharVar) with variables without @
- DMIS: DEVICE/STOR,'MyFile.txt' with placeholder in file path
- DMIS: Execute MEAS/ARC as MEAS/CIRCLE
- DMIS: GOTO/...,HEADCS,... supported (5 axis intermediate point)
- DMIS: CONST/CPARLN,,PROJECT,, for projection of a rectangle or oblong hole into a plane

## Further Innovations Simplify Daily Work

### Q-DAS Export: Export Characteristic Class K2005

You want to assign an attribute to the characteristics that indicates the importance and transfer this to your CAQ system. In the Q-DAS ASCII transfer format, the field K2005 Characteristic Class is defined for this purpose.

During the Q-DAS export, the field K2005 can now be automatically filled with the corresponding values and output.

K2005 Characteristic Class

Value	Description
0	unimportant
1	little important
2	important
3	significant
4	critical

## New and Actualized CAD Interfaces

WM | Quartis R2021-1 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 **2021**)
- Parasolid (9 to **33**)
- Creo, ProEngineer (16 to **Creo 7.0**)
- Siemens NX (NX1 to **NX1926**)
- Solid Edge (18 to **SE 2021**)
- SolidWorks (2003 to **2021**)
- STEP (AP203, AP214, AP242)
- VDA (1.0 and 2.0)



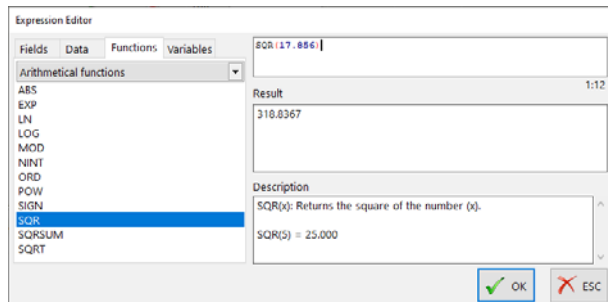
The changed formats compared to WM | Quartis R2020-2 are shown in **bold** in the above list.

You also benefit from general improvements to the CAD interfaces. For example, the import of assemblies has been improved.

## Expression Editor Supplemented with Additional Functions

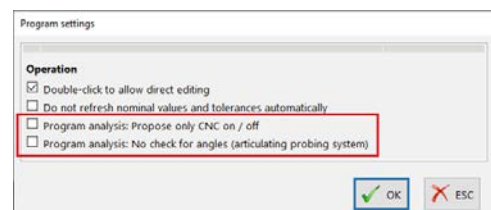
The expression editor contains four new functions. In addition to squaring and exponentiating numbers, the sum of squares of several numbers can be formed and the circle number PI can be used.

- **SQR(x)** Returns the square of the number (x)
- **SQRSUM(x1,...)** Returns the sum of the squared arguments (x1, x2, ...)
- **POW(x, y)** Returns the number (x) raised by the exponent (y)
- **PI()** returns the value 3.14159...



## Further Improvements

- **Increased Security for Probe System Loading during WM | Quartis Startup**  
Now the probe system ID is written directly and automatically to QuartisSystemSession.QrtSysCfg after each successful loading of a probe system.
- **Automatic Reduction of Measuring Distance for Inside Elements Improved**  
The probe now dips exactly at the nominal position and no longer offset by 0.1 mm.
- **Projection Rectangle / Slot in Plane Extended**  
In addition to the point, the rectangle or the slot can now also be selected as the target element.
- **Optional Analysis of Program Context for Safe Program Start from Line**  
In the program settings, you can now select whether the program analysis should only be carried out for the CNC status and/or the angles of the articulating probe head should be ignored.





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Subject to technical modification and to changes in scope and design.