What's New in Rapidform XOR3

XOR₃

RAPIDFORM® XOR/REDESIGN ™

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I. Installation Guide

How to install automatically

If the **Update Product Automatically** option is set as **True** and your computer is connected to the internet, the application scans and updates your computer when it starts. You can also use **Help > Check For Update**. This command updates the product automatically to the latest available version.

How to install manually

1. Download the zip file in the XOR3/Redesign list from the Rapidform website:
    http://www.rapidform.com/softwareupdate

2. Unzip the zip file in a temporary directory.

3. Double-click the **.exe** file and follow the instructions.

Now, you can run Rapidform XOR and check the version by clicking **Help > About**.

If you have any questions, please feel free to contact INUS Technology, Inc.

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II. What's New in XOR3 Hotfix3

1. Enhanced Function

liveScan

(1) Support VXelements from Creaform

Insert > Scanner Direct Control > Creaform Handyscan 3D not only supports **VXscan** but also **VXelements**. You can directly connect and control **Creaform Handyscan 3D** if **VXelements** or **VXscan** is installed. Internally Rapidform XOR will try to find and use **VXelements** first, and if it is not available, it will try to find and use **VXscan**.

VXelements

> **Note**
>
> *This function was missed from the XOR3 Hotfix2 release, so it is officially added in this the Hotfix3 version.*
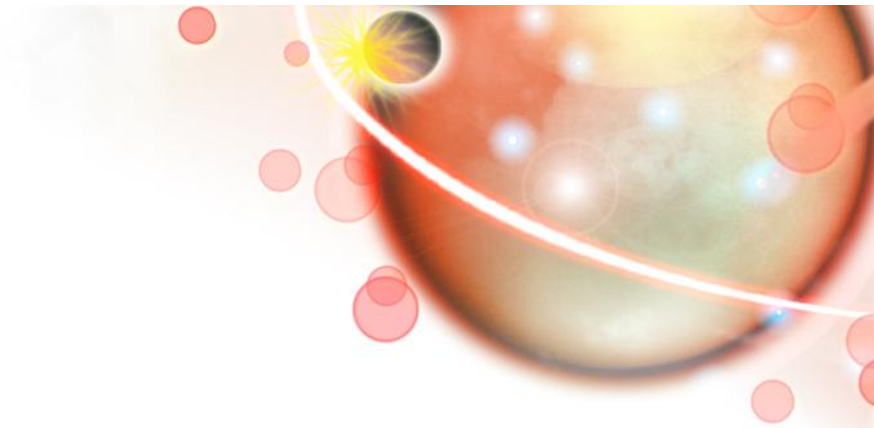
2. Fixed Bugs

Surface Body

(1) Missing faces from Auto Surfacing

Occasionally the resulting body from the **Auto Surfacing** function (**Insert > Surface > Auto Surfacing**) produces more missing faces than the previous version. This bug has now been fixed.

(2) Auto Surfacing Function Unable to Detect Features

When you moved the slider for the **Feature Detection Level** parameter under the **Feature Following Network** option in the **Auto Surfacing** command, the preview feature was not displayed. This bug has now been fixed.

III. What's New in XOR3 Hotfix2

1. Enhanced Functions

File I/O

(2) Support FARO Scene 4.8

FARO Scene 4.8 is now supported. You can read the "**.fls**" file generated from FARO Scene version 4.8 by using **File > Import** command in Rapidform XOR.

(3) Support SolidWorks 2010

The **Rapidform Exchange™** kernel has been updated and it is implemented in Rapidform XOR. You can now directly import native files ("**.sldprt**", "**.sldasm**") from **SolidWorks 2010**.

Note

Rapidform Exchange™ currently supports the native CAD file formats listed in the table below. You need to purchase and install a Rapidform Exchange™ license to directly import these file formats.

CAD	File Extension	Version Supported	Comments
CATIA V4	.model	CATIA 4.1.9 to CATIA 4.2.4	- Geometry Only
CATIA V5	.CATPart, .CATProduct	CATIA V5 R2 through R20	- Geometry Only - Unsupported non-ASCII character in the file name
Pro/E Wildfire	.prt, .prt.*, .asm, .asm.*	Pro/E 16 to Wildfire 5	- Geometry Only
Siemens NX	.prt	Unigraphics 11 to 18 and NX1 to NX7	- Geometry Only
SolidWorks	.sldprt, .sldasm	SolidWorks 98 to 2010	- Geometry Only

Mesh

(1) Speed up editing textured mesh

Rapidform XOR supports multi-thread processing technology for meshes that contains textures. The calculation speed on a multi-core CPU is 30-40 percent faster than a single-core CPU. Multiple cores are utilized when you edit textured meshes by using tools under **Mesh Tools**.
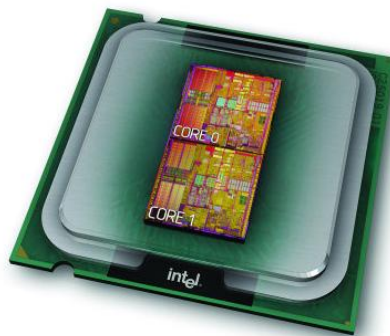
liveScan

(1) Support VXelements from Creaform

Insert > Scanner Direct Control > Creaform Handyscan 3D not only supports **VXscan** but also **VXelements**. You can directly connect and control **Creaform Handyscan 3D** if **VXelements** or **VXscan** is installed. Internally Rapidform XOR will try to find and use **VXelements** first, and if it is not available, it will try to find and use **VXscan**.

VXelements

(2) Support Shining Tech 3D scanner under scanner direct control

Insert > Scanner Direct Control supports 3D scanners from Shining Tech. You can directly connect and control Shining Tech's 3D scanners through Rapidform XOR.
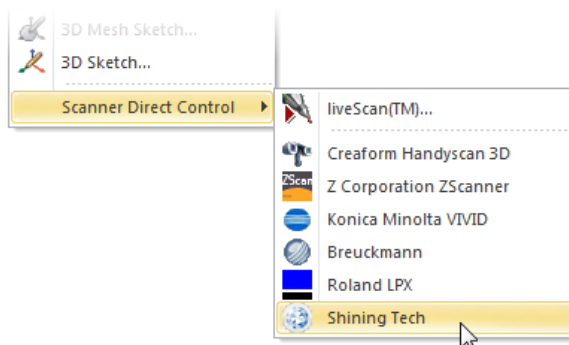
2. List of Fixed Bugs

General

(3) Fillet and Helix cause program crash or lock up

While applying "**Fillet**" or "**Helix**" commands, the application could crash or lock up. It was caused by a conflict with the web page in the **Support** tab. This bug has now been fixed.

(4) Excessively bright vertex shading

Under the following two circumstances excessively bright vertex shading was introduced;

- If the **Point Shader** setting was set to "**None**" and the **Normal** option was checked in the **Display** tab when displaying a point cloud.

- If **Vertex** and **Normal** were on when displaying a mesh.

This bug has now been fixed.
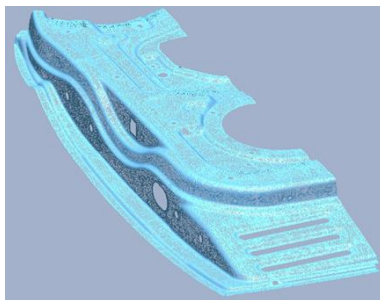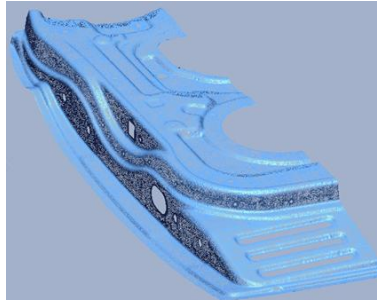
| Before Fixed Bug | After Fixed Bug |

(5) Preview box error in the Clip command

Depending on the model, the "**Clip**" command (**View > Clip**) wrongly generated a preview box when choosing the "**Inside Box**" option. This wrongly aligned the preview box making it difficult to clip the model. This bug has now been fixed to align the preview box to the X,Y, and Z directions, the same as the global coordinates.

(6) Unsuppress makes crash

When double-clicking a suppressed feature in the **Feature** tree to edit it, a dialog box appeared asking if the user wanted to unsuppress the feature or not. If the "**Cancel**" button was clicked then the application might crash. This error especially happened to **Auto Surfacing** features. This bug has now been fixed.

(7) Change option name in Batch Process

Some option names under **Action When Error Occurs** were changed to let users understand the options more intuitively. These options are located in a dialog box in **File > Batch Process > Run**.

Action When Error Occurs
- ◉ Ignore Error And Continue Batching All Source Data
- ○ Stop Batching Current Source Data And Skip to Next Source Data
- ○ Stop Entire Batch Process

New Version

Action When Error Occurred
- ◉ Ignore Error
- ○ Skip Error And Continue To Next Source Data
- ○ Stop Batch Process

Previous Version

(8) Generating normal of ".pcn" file

When importing "**.pcn**" files, they would be enhanced by the normal generation algorithm. Now normal directions are more accurately calculated than in the previous version.

liveTransfer

(1) Problem in the liveTransfer To SolidWorks command

When sending a model to SolidWorks and the surface body had an intersection with a target body that was cut by a tool body, sending could fail. This bug has now been fixed.
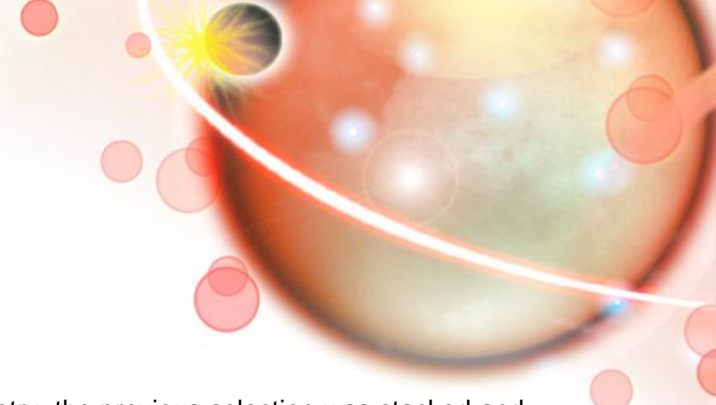
Ref. Geometry

(1) Reset error on Ref. Geometry preview

If selecting a region to generate a Ref. Geometry, the previous selection was stacked and displayed in the preview. This bug has now been fixed.

(2) Sub-option under fitting Ref. Geometry

When creating a **Ref. Plane**, **Ref. Vector** or **Ref. Cone** using the "**Extract**" method from the analytic features on a mesh, the sub-option was not activated. Now the "**Fix Axis**" sub-option is available.

Scan Data

(1) Incorrect functioning of the Global And Fine option with Partial region while the Align Between Scan Data command is running

When aligning scan data by using the "**Global And Fine**" option with regions defined as **Partial** regions while the "**Align Between Scan Data**" command (**Tools > Scan Tools > Align Between Scan Data**) is running, the following problems could occur:

- Unable to select poly-vertices when defining a **Partial** region on the Point Cloud

- The Error Message, "**Selections or parameters are not valid for this operation**" pops-up when defining a **Partial** region on the Mesh and then clicking the "**Apply**" button

- "**Region**" is displayed on the tool-tip, as one of the selectable entities, even though the region cannot be defined as the **Partial** region

These bugs have now been fixed.

(2) Incorrect performance of the Undo and Apply functions in the Align Between Scan Data command

Sometimes the "**Apply**" function would not perform after the "**Apply**" and the "**Undo**" functions had been used if the "**Align Between Scan Data**" command (**Tools > Scan Tools > Align Between Scan Data**) was running. The bug has now been fixed.

(3) Crashes in applying triangulations to small-sized scan data

When applying triangulations to small-sized scan data (smaller than approx. 10mm) by using the "**Triangulate**" command (**Tools > Scan Tools > Triangulate**) with the "**Mesh Construction**" option enabled, a crash could occur. The bug has now been fixed.

(4) Slow calculation time with the Triangulate command

When estimating the distance between vertices by clicking the "**Estimate**" button while the "**3D Triangulate**" option in the "**Triangulate**" command (**Tools > Scan Tools > Triangulate**) was being used to generate a mesh from point cloud, extremely small distance values were estimated as the Distance Criteria and the calculation time was much longer than XOR2 SP1. The bug has now been fixed.

(5) Texture problem in the Mesh Buildup Wizard command

While following the steps in the "**Mesh Buildup Wizard**" command (**Tools > Scan Tools > Mesh Buildup Wizard**) using scan data, the Textures could disappear at the final step. The bug has now been fixed.

(6) Abnormal faces occur in the mesh after the Decimate command is performed

After applying the "**Decimate**" command (**Tools > Mesh Tools > Decimate**) to mesh, there was a problem that some abnormal faces, such as folded faces and sharp-edge faces occurred in the mesh. Many of the abnormal faces occurred when applying the command while setting the "**High Curvature Area Resolution**" option to "**Dense**". The healing process has been improved and the bug has now been fixed.

(7) Real-Time display of deviation result problem in the Mesh Deviation command

Normally when hovering the mouse cursor on the mesh while the "**Mesh Deviation**" command (**Measure > Mesh Deviations**) is running, the deviation results are displayed in real-time. However, when applying the command to large point clouds the deviation results were not being displayed in real-time. The bug has now been fixed.

(8) Progress bar stops while the results are previewing in the Merge command

When clicking the "**Preview**" button to check the results while using the "**Merge**" command (**Tools > Scan Tools > Merge**) with the "**Mesh Construction**" option, the progress bar sometimes stopped at 91%. The bug has now been fixed.

Region

(1) Unstable displaying of region groups after alignment with large translation of mesh

When zooming in on the mesh segmented region groups after applying the "**Interactive Alignment**" command (**Tool > Align > Interactive Alignment**) to the mesh, the region groups could disappear. The bug has now been fixed.

Surface Body

(1) Problems in Mesh Fit command

While using the "**Mesh Fit**" command (**Insert > Surface > Mesh Fit**) to create fitting surface bodies from mesh, errors could occur, such as:

- If using the "**By Allowable Deviation**" method, only the preview of the surface constructed by minimum control points was displayed at the second stage.

- If stepping backward and changing parameters, such as Resolution Type and Control Point, at the first stage the changes were not applied to the results.

- If using the "**By No. Of Control Point**" method, the defined number of control points were not applied to the results at the third stage (**Iso-Line Density Control**).

These bugs have now been fixed.

Curve

(1) Extract Feature Curve command doesn't work for long range scan data

When using long range scan data that has a large file size and many complex features, the "**Extract Feature Curves**" command (**Tools > 3D Sketch Entities > Extract Feature Curves**) didn't work. The bug has now been fixed.

(2) Convert entity crash

Converting an edge from a body in 3D sketch mode could cause the application to crash.. The bug has now been fixed.

Scanner Direct Control

(1) Problem in setting Range7 / Range5 Hardware Preference

A variety of different types of 3D scanners can be chosen under the "**Scanner Direct Control**" section in the "**Hardware**" tab of the "**Preferences**" menu (**File > Preferences**), from the "**Scanner Direct Control**" menu (**Insert > Scanner Direct Control**) and can directly be controlled through XOR3. However, the "**Konica Minolta range7 / range 5**" menu under the "**Scanner Direct Control**" section in the "**Preferences**" was not visible. The bug has now been fixed. (**Rapidform XOR3 64bit version only**)

(2) Crash in using Z Corporation Zscanner (I)

The program could crash if the last item under the Scan List in the control panel was selected and removed while the "**Z Corporation Zscanner**" command (**Insert > Scanner Direct Control > Z Corporation Zscanner**) was running. The bug has now been fixed.

(3) Crash in using Z Corporation Zscanner (II)

The program could crash if the "**Center Volume**" button was clicked without any registered scan data in the Scan tab while the "**Z Corporation Zscanner**" command (**Insert > Scanner Direct Control > Z Corporation Zscanner**) was running. The control panel has now been improved so that the "**Center Volume**" button is set to be inactive when scan data does not exist.

(4) Crash in using Creaform Handyscan 3D

The program could crash if the "**Center Volume**" button was clicked without any registered scan data in the Scan tab while the "**Creaform Handyscan 3D**" command (**Insert > Scanner Direct Control > Creaform Handyscan 3D**) was running. The control panel has now been improved so that the "**Center Volume**" button is set to be inactive when scan data does not exist.

(5) Hold Connection problem in the liveScan command

If closing the "**liveScan**" command (**Insert > liveScan**) with the "**Hold Connection**" checked, the program could show connected device still attempting to be connected. The bug has now been fixed.

Add-Ins

(1) Register Target command is disabled when there are no point clouds or meshes

The "**Register Target**" command (**Add-Ins > Register Target**) can be used for point clouds or meshes in the Model Tree as well as for scan data in a user defined folder. However, the command was disabled when no point clouds or meshes were present in the program. The command has now been improved so that it is always activated regardless whether the scan data is present in the program or not.

Measure

(1) Problem in the Distance command

When using the "**Distance**" command (**Measure > Distance**), problems could occur such as:

- When measuring the distance between bodies, only the "**Auto**" method was available.

- Even if the Method was set to "**Along Face**", measuring the distance between bodies and meshes far away from each other was still possible.

- After measuring the distance on the body with the "**Along Face**" method and then transforming the body by using the "**Transform Body**" command (**Insert > Modeling Feature > Transform Body**), some strange edges could be created at the measured position.

  These bugs have now been fixed

License

(1) Wrong license message appears for expired licenses

A wrong license message appeared if the Activation License or Maintenance license is expired. It has been changed so that the appropriate message appears.

**(2) Wrong expiration warning message appears for expired Maintenance**

A wrong expiration warning message appeared if the Maintenance license has expired. It has been changed so that the correct expiration warning message - "Your maintenance agreement has been expired" appears.

IV. What's New in XOR3 Hotfix1

1. Enhanced Functions

User Interface

(1) New Online Support Page
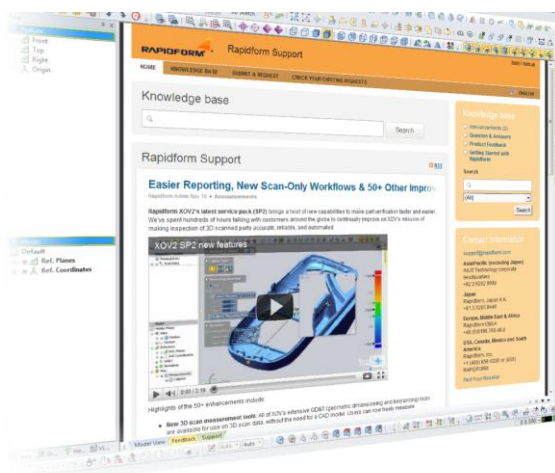
Online Support Page in the **Support** tab has been changed. It allows you to search for information faster and easier. The support tab provides you with helpful information such as the latest tutorials, FAQs, and technical tips. Also, you can send us your feedback for Rapidform products. Your feedback will be used to enhance and improve performance of Rapidform products. You can also access the **Online Support Page** via your web browser with: http://support.rapidform.com/home

(2) Change name displayed in Menu or Command Dialog from "UGS NX" to "Siemens NX"

Name displayed in Menu or Command Dialog has been changed from "UGS NX" to "Siemens NX".

File I/O

(1) Import new scan file

This application supports three new scan data file types:

- Import of FARO FLS 4.7 version is supported.

- Import of Breuckmann CTR file format is supported.

- Import of Imetric I3D file format is supported.

Display

(1) Enhanced Point Shader option

Point Shader options for point clouds are now available for meshes as well. The option is also available for previewing point clouds in **liveScan™**.

Now all data types can be viewed with similar options. With various shading methods, you can easily and view the scan data effectively.
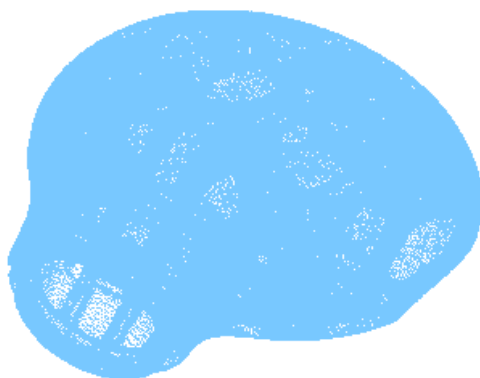
< Mesh Shader: Vertex>
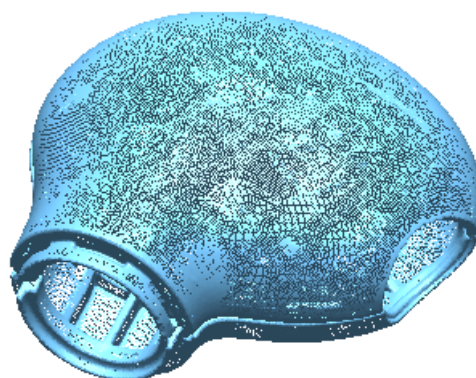
< Normal Display: On >
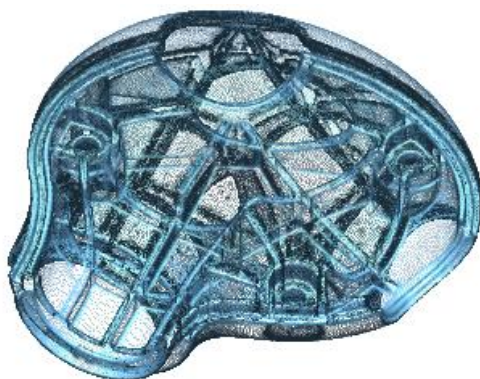
< Depth Point Shading >
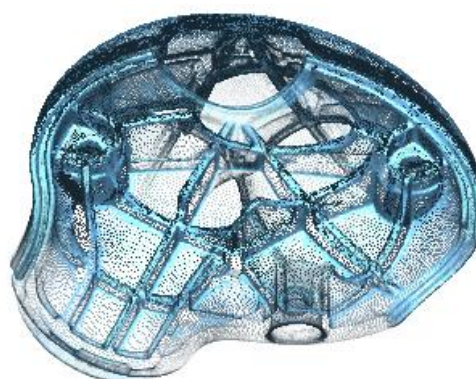
< X-Ray Point Shading >

Note

When the Point Shader option is applied to the mesh, it can be performed while the mesh is set to the Vertex in Mesh Shader.

Ref.Geometry

(1) Display Position and Direction (or Normal) with previewing Ref. Geometry

When a Ref. Vector or Ref. Plane is created by the **By Definition** method, the defined Position and Direction (or Normal) are now displayed with the model in Model View. You can recognize the position and the direction of Ref. Geometry more easily.
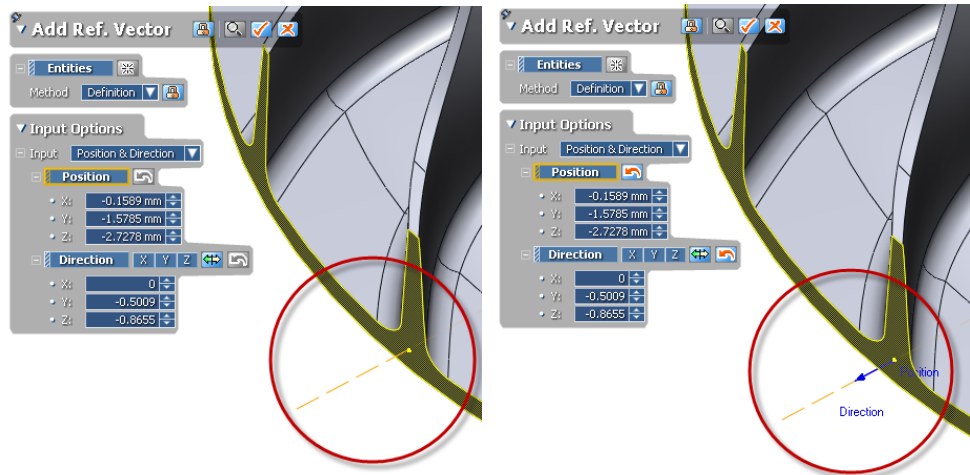
< Previous Version >   < Current Version >

(2) Create Ref. Point by importing file

When an ASCII file is imported as Ref. Points, you can now easily set one of columns in the entity list then object name by choosing the **Name** option in ASCII Converter. The entity names will be preserved as feature names.
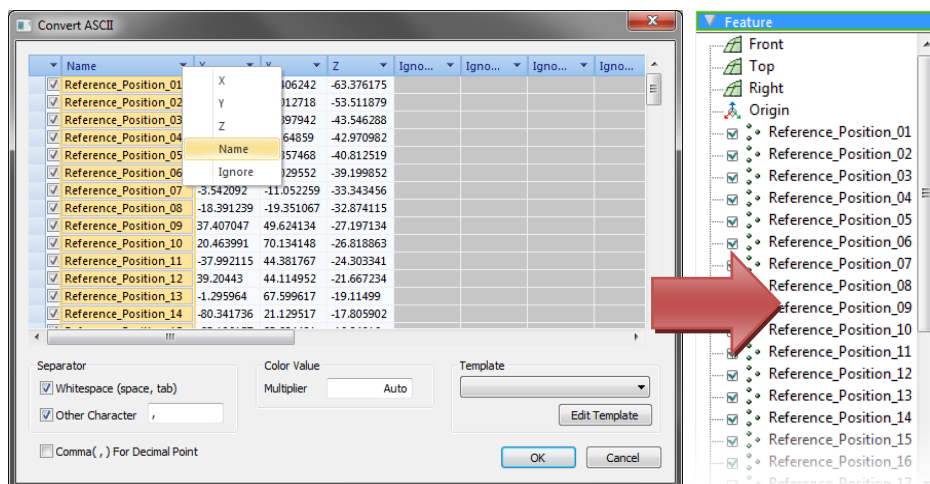
Scanner Direct Control

(1) Support Konica Minolta RANGE5 / RANGE7

You can now control **Konica Minolta RANGE7** as well as **RANGE5** scanner by clicking **Konica Minolta RANGE5 / RANGE7** in **Scanner Direct Control** menus.

It can be used in the 64-bit version only.

(2) Newly supported devices on 64-bit

The three following **liveScan™** devices are now supported in the 64-bit version:

- [NDI] ScanTRAK/OPTOTRAK   (http://www.ndigital.com)

- [Perceptron] ScanWorks   (http://www.perceptron.com)

- [LDI] SLP   (http://www.laserdesign.com)

(3) Newly supported scanner interface

New devices have been added to the software:

- [Nikon Metrology] Handheld (32-bit, 64–bit) in **liveScan™**

  (http://www.nikonmetrology.com/)

- KODEN OCM-A (32-bit)   (http://www.koden-electronics.co.jp/eng/)

- Shining Tech (32-bit)   (http://shiningtech.diytrade.com)

- 3DD (3D Digital Corp.) (32-bit)   (http://www.3ddigitalcorp.com)

(4) Configure FaroArm hardware setting
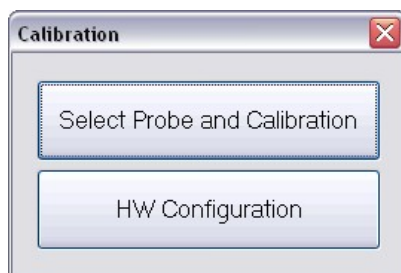
When using a **FaroArm/ScanArm** in **liveScan™,** you can now access the **Hardware Configuration** dialog by clicking the **Calibration** button.

Clicking **Calibration** shows a prompt that asks users to choose between hardware calibration process and hardware configuration settings.

(5) Enhanced Grid Sampling in liveScan

Grid sampling calculation has been enhanced. The data scanned by a scanner is processed by grid sampling when the **Sampling** option in the **Data Process** tab of the **Scanner Option** window is set to **Grid**. Now, you can get smoother and more accurate scan data with lower noise and distorted boundaries.
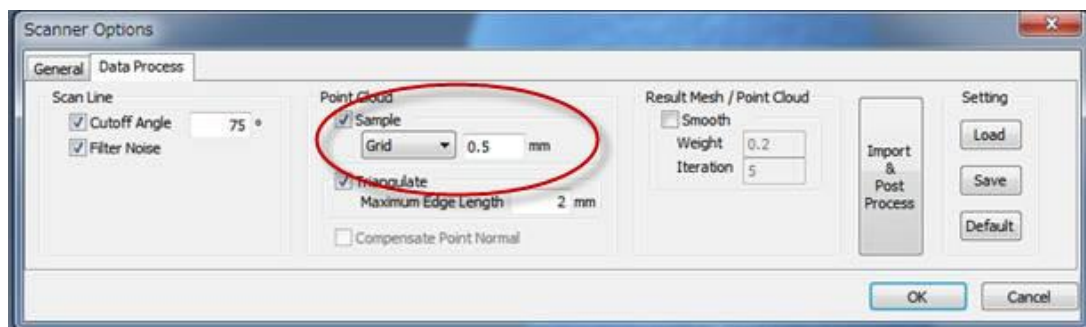
2. List of Fixed Bugs

General

(1) The warning message displayed for specifying the batch process log file location

When you executed the **Run** command in **Batch Process** and browsed the batch process log file location in the **Run Batch Process** dialog box by clicking the **File Path** browse button, a warning message which had a button withouhandy text was displayed. The button text is **Retry** and the bug has now been fixed.

(2) XOS3 Crash when XOR3 has been installed

When you started XOS3 with a user level while XOR3 was running, XOS3 crash occurred. The bug has now been fixed. If the OS is Vista or Windows 7 and you are trying to use both of XOR3 and XOS3, "**Run As Administrator**" message will appear when you right-click the shortcut icon or the exe file.

Note: You can run both applications by accessing via Administrator user level.

(3) Graphic problem

When the graphic card was NVIDIA Quadro FX series, sometimes the triangle-shape mesh was abnormally displayed. The bug has now been fixed.

(4) Thumbnail order in Mesh Buildup Wizard

When you started Mesh Buildup Wizard with a set of scan data, sometimes the order of the scan data was mixed in the Thumbnail View. The bug has now been fixed. Now the scan data is displayed in the Thumbnail View in order as in the Model Tree.

File I/O

(1) Unavailable to use the "Include Vertex normal" option for ASC format

When you imported an asc file, the **Include Vertex Normal** option in the **Import** dialog box was disabled. The bug has now been fixed.

In addition, even if the vertex normal and color were designated in Ascii Converter when the **Include Vertex Normal** and **Include Texture** options in the **Import** dialog box were off, the designated vertex normal and color were not applied. Now, if the vertex normal and color were designated in Ascii Converter, the settings of the options in the **Import** dialog box are ignored.

(2) "Not enough memory" error while importing an RVM file

When you imported a rvm file, there was a chance encounttering an error stating "Not enough memory". The bug has now been fixed.

(3) Wrong coordinates of measured-type point cloud in MDL file

When you exported planar or spherical point could as the mdl file format and loaded the mdl file, the coordinates of the point cloud were wrong. The bug has now been fixed.

(4) Mesh entity with no vertex in some imported WRL files

When you imported some wrl files, a mesh entity with no vertex was created on the model tree. The bug has now been fixed.

Scan Data

(1) Incorrect functioning of Rotate and Translate option of Transform Scan Data

In **Scan Tools> Transform Scan Data**, when you selected **Rotate and Translate** method and checked the **Use Local Coordinate** option, the manipulator did not move to the center of the local coordinate. Now it has been fixed. When you check the **Use Local Coordinate** option, the manipulator moves to the center of the local coordinate. In reverse, when you uncheck the **Use Local Coordinate** option, the manipulator moves to the center of the mesh. If you check the **Use Local Coordinate** option but there is nothing in the select set, the manipulator moves to the origin of the global coordinate.

(2) Unavailable to perform 'Undo' in the middle of aligning scan data

When you clicked **Break** button in the middle of aligning scan data using **Align Between Scan Data** command, the scan data did not stop and you could not perform **Undo**. The bug has now been fixed.

(3) 'Auto Select' button operation problem in Best-Fit stage of Mesh Buildup Wizard

When you clicked **Auto Select** button in **Best-Fit Align** step of **Mesh Buildup Wizard**, the button did not work. The bug has now been fixed.

(4) Difference between the result of Region and Mesh created using Average Meshes command

When you created regions from the mesh using region segmentation and created mesh using **Average Meshes** command, the created mesh was different from the region. The bug has now been fixed.

(5) Wrong operation of selecting vertex on the point cloud

When you selected vertexes on the point cloud using a paint brush, two operations did not correctively function; first, unselect by pressing **Ctrl** key was unavailable, and second, wrong part was selected in Walkthrough mode using the mouse pointer. The bug has now been fixed.

(6) Lost vertex normal information in the XRL file

When you imported an XPC file, created vertex normal in the point cloud by executing **Tools > Scan Tools > Normal Information Manager**, and saved the result in xrl file format, the vertex normal information of the point cloud was lost from the xrl file. The bug has now been fixed.

(7) Memory leakage

When you performed **Decimate Meshes** command and moved the mouse pointer on the shells, the memory usage was continuously increased. This is a kind of memory leakage. The bug has now been fixed.

(8) Crash in 2D triangulate

In **Triangulate (poly-vertices)** for several meshes, when you clicked the scan direction arrows to correct the scan directions, some point clouds were selected on the model tree. In this case, when you clicked **Apply** button, an error occurred. At this time, the selected point clouds were registered as a separate point cloud.

Also, when you clicked **Scan Direction magic wand** one more time after the error, the crash occurred. The bug has now been fixed.

(9) Crash in copying the suppressed mesh

When you selected a mesh data which had been imported and suppressed and pressed the **Ctrl + C** keys to copy it, a crash occurred. The bug has now been fixed.

Region

(1) Slow region drawing time

When you load a mesh data which contains more than 4 million points to create regions, region drawing speed was slower than that of XOR2. The bug has now been fixed.

Ref. Geometry

(1) Ref. Geometry fitting without Max Point Number option

When a Ref. Geometry was created by fitting using the vertex or poly-face of mesh data, the **Max Point Number** option specified in **Preference** was not applied to the fitting. The bug has now been fixed.

Scanner Direct Control

(1) Not intuitive UI buttons in liveScan™

When you executed **liveScan™**, the **Scanner Options** window was displayed. However, it was difficult to intuitively see whether the **Camera** and **Zoom** buttons in the **General** tab were pushed or not and how these buttons worked. The bug has now been fixed.

(2) Problems in HW interface commands corresponding to user account execution

When you executed **Creaform**, **ZScan** or **Range7** commands, some problems occurred due to the user authority level. The bug has now been fixed.

V.What's New in XOR3

1. New Functions

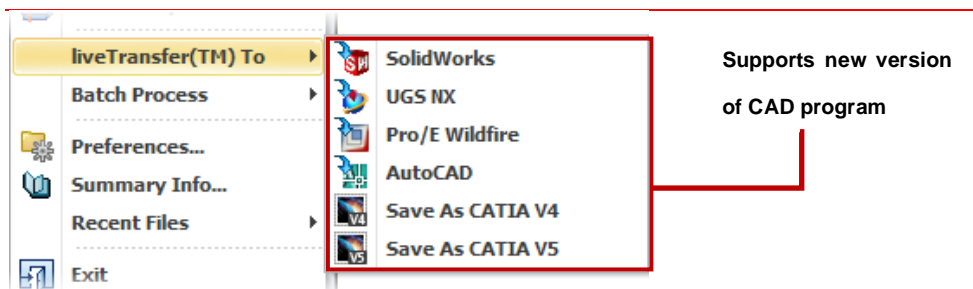### liveTransfer™

Benefits of liveTransfer™

- You can transfer parametric models as well as modeling history to your CAD system from Rapidform XOR.
- There is no need to build model up again in your CAD system.
- You can reduce time consuming job, eventually saving time and money.

liveTransfer(TM) To is in real-time and feature-by-feature CAD translation compatibility command. During the modeling process in Rapidform XOR, the application flags operations that will not translate smoothly into CAD program and also suggests alternative techniques. And you can directly send a model with its entire modeling history to other CAD software afterward.

Now, liveTransfer™ supports AutoCAD liveTransfer as well.

Functions Details

Supports new version of CAD program

The following table indicates which CAD program liveTransfer™ supports

CAD Program	Supported Version	Newly Supported Version
CATIA		CATIA V4 (CATIA 4.1.9)
		CATIA V5 (CATIA V5 R6)
SolidWorks	SolidWorks 2006	
	SolidWorks 2007	SolidWorks 2010
	SolidWorks 2008	
	SolidWorks 2009	
UGS NX	UGS NX4	UGS NX6
	UGS NX5	UGS NX7
Pro/E Wildfire	Pro/E Wildfire 3.0	Pro/E Wildfire 5.0
	Pro/E Wildfire 4.0	
AutoCAD		AutoCAD 2007
		AutoCAD 2008
		AutoCAD 2009
		AutoCAD 2010
		AutoCAD 2011

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Batch Process

Benefits of Batch Process

- You can easily design batch process in Batch Process Designer.
- You can share the defined batch process among other users.
- You can reduce time consuming job, eventually saving time and money.
- It is very useful for users who frequently perform a set of operations on the scan data and who handle a large size scan data.

Batch Process allows you to execute a set of batch jobs without manual intervention. You can easily design batch jobs by dragging & dropping and you can apply these jobs to multiple sets of scan data just in one-click. After performing batch process, you will get a report and a final result as defined.
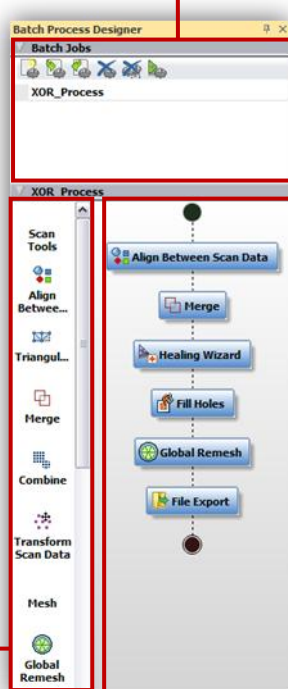
You can also export or import the designed batch jobs.

The application provides several preset template batch jobs. You can also easily use these batch jobs for your scan data.
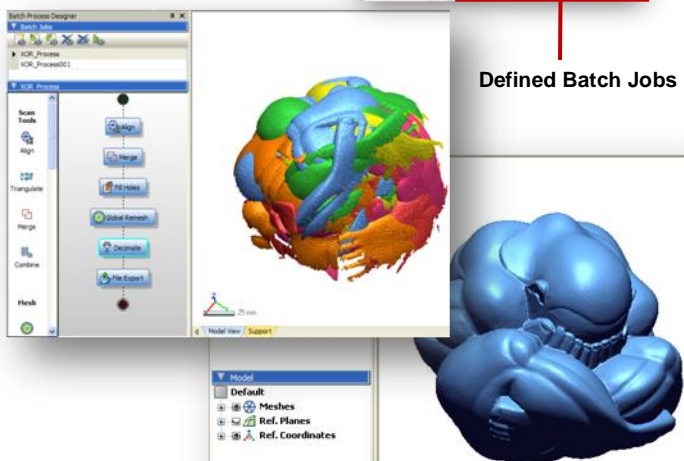
Function Details

The following table illustrates which batch jobs can be designed in Batch Process Designer.

Toolbar for Batch jobs management

Batch Jobs List

Defined Batch Jobs

Tools	Command
Scan Tools	• Align Between Scan Data
	• Triangulate
	• Merge
	• Combine
	• Transform
Mesh Tools	• Global Remesh
	• Optimize Mesh
	• Fill Holes
	• Decimate
	• Subdivide
	• Enhance Shape
	• Healing Wizard
	• Sew Boundary
	• Rewrap
	• Smooth
Surface Tools	• Auto Surfacing
Point Cloud Tools	• Smooth
	• Sampling
	• Filter Noisy Point
File	• File Export

Batch Process allows you to apply batch process to multiple sets of scan data even to the scan data that are organized by folder groups
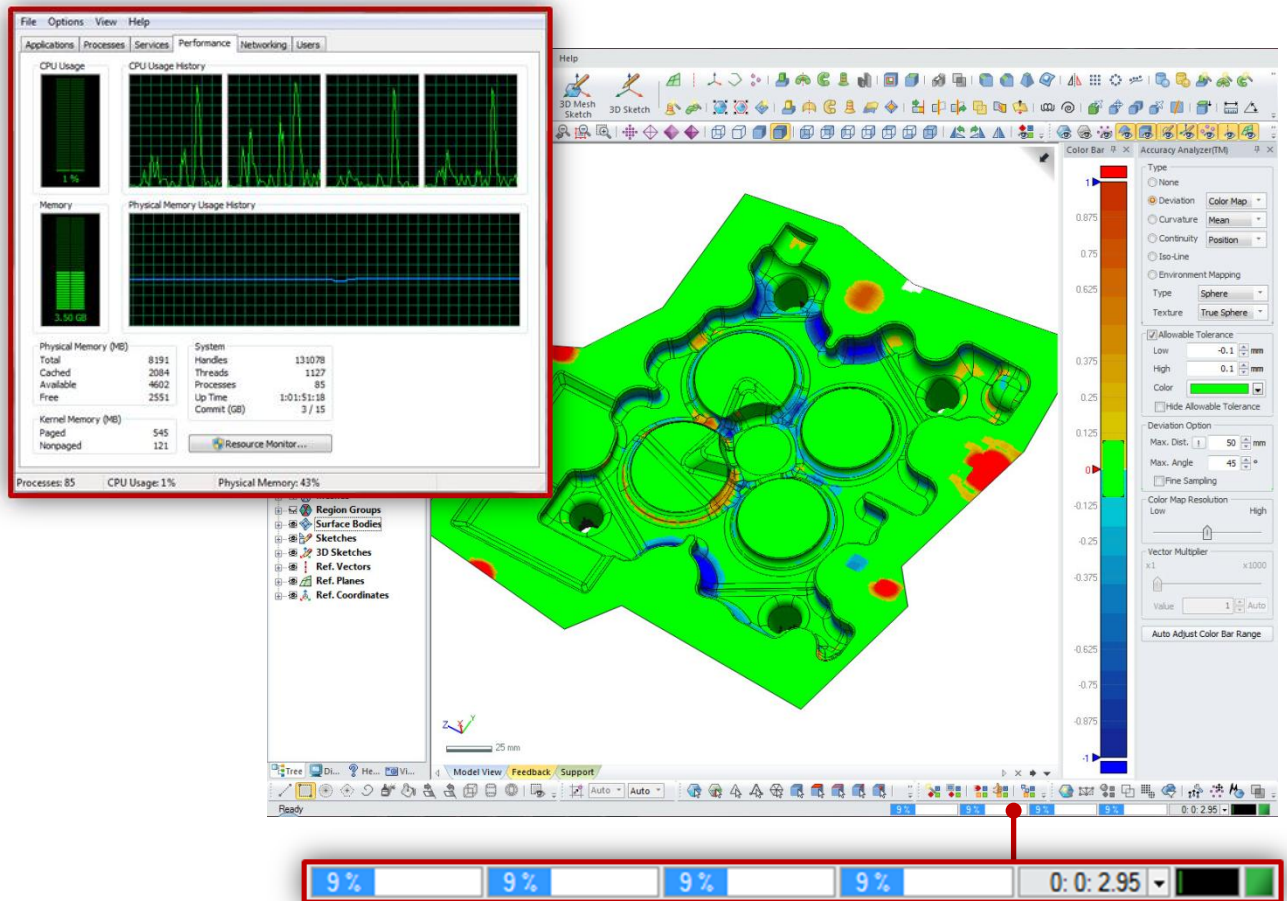
Multi-Core Processor Support

Multi-core processor is a processing system that has two or more independent cores. Rapidform XOR has supported single and dual-core processor and now supports Multi-core processor as well in some commands. It improves performance of your operations higher than that of a single and dual-core processor.

Benefits of Multi-Core Processor

- It allows greatly reducing calculation time and improving performance of your operations.

Function Details

Rapidform XOR now uses multi-core processor to improve performance of operation especially when you align large size scan data by using Global Alignment method, check results with Accuracy Analyzer™, extract design intent from a scan data by using Redesign Assistant™ and extract Ref.Geometries from a scan data by fitting operation.

Multi-Core Processing

Large Point Cloud Handling

Rapidform XOR greatly improves capability of massive scan data handling process and visualization. It allows real-time rendering of hundreds of millions point cloud. Now you can import and easily handle the massive scan data generated by long range 3D scanners and design geometric features in detail based on the scan data.

You can keep running your operation without compromising performance.

Benefits of Large Point Cloud Handling

- A new out-of –core massive point cloud engine handles huge size scan data

- So now, you can much more easily handle massive scan data generated by long range 3D Scanners.

- Real-time rendering of hundreds of millions point cloud

- Allows you to design geometric features in detail based on the massive scan data.

### Function Details

- **Import Massive Size Point Cloud**

  Now you can easily import massive point cloud into the application even if it is out-of-core massive data.

  When the massive point cloud is imported into the application, it is automatically stored to the cache folder in your system in divides and then efficiently loaded onto the application within capability of physical memory when some operation is performed.
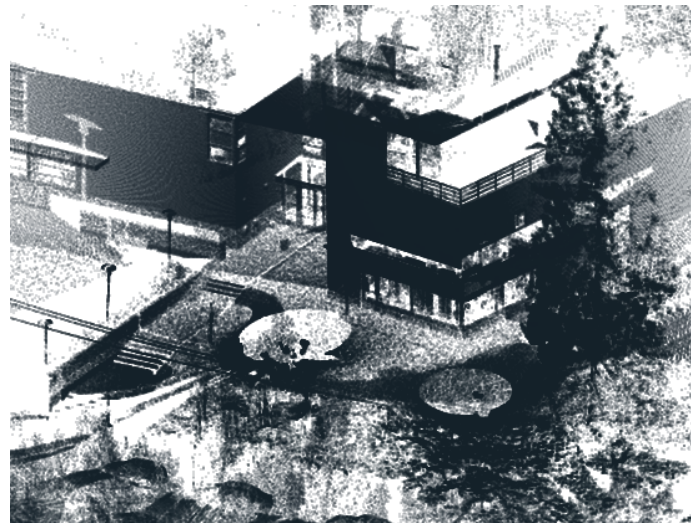
- **Real-Time Visualization of Massive Point Cloud**

  - **Real-Time Rendering of Hundreds of Millions Point Cloud**
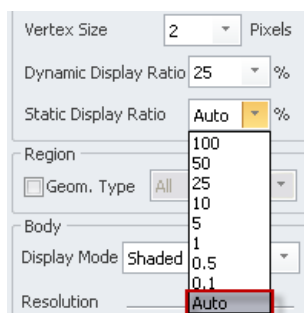

Rapidform XOR efficiently displays point cloud in an appropriate density so that you can recognize feature shape of model according to your current view point

And it also maintains fast rendering time with the Auto Frame Rate function so that you can easily have a look at the model.

■ **New Shading Methods**

Point Shader option has been newly added in the Display Tab.

It performs for point cloud with various shading methods to effectively see and analyze the complex data.
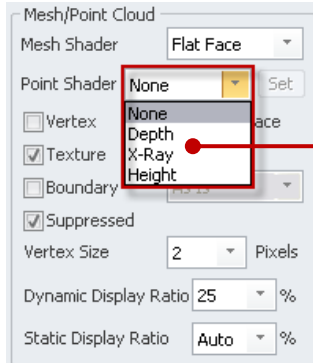
None: This is a default shading method. Point cloud is shaded with the current light condition.
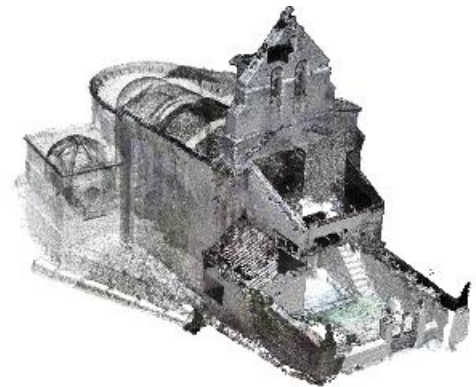
Depth: It makes closer points brighter in the view direction and further points darker.

X-Ray: it makes closer points and further points transparent in the view direction and displays the interesting area to clearly see the inside area of scan data.
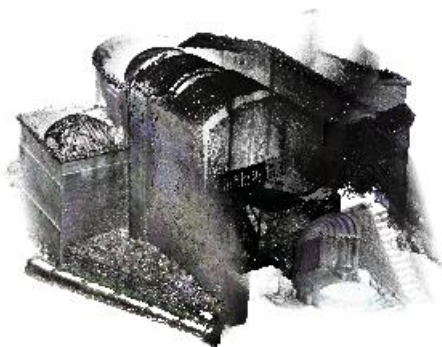
Height: It displays point cloud with different color map according to the height of the Z direction.
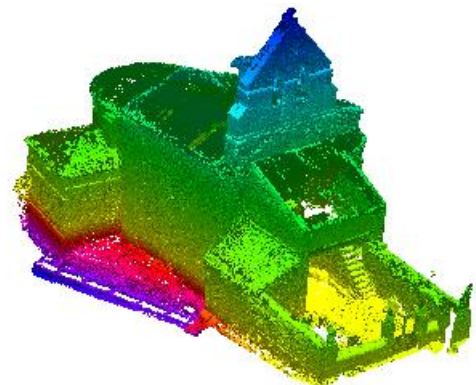

Default (None)

Depth Point Shading

X-Ray Point Shading

Height Point Shading

■ **New Viewing Method**

New viewing method called 'Walk-Through' has been added as one of the methods in the View menu.

You usually have a look in the model by rotating, panning, and zooming with the default viewing mode. So, you only can see outside of the model. Now this Walk-through command allows you to move your viewpoint as you walk through in the model and check the inside of model in detail.
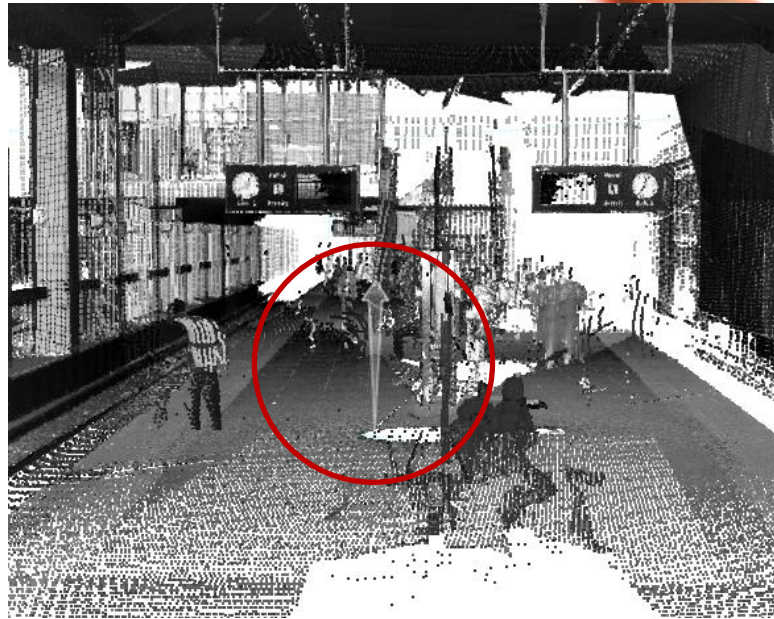
- *"Fully Editable"* **Massive Point Cloud**

  Rapidform XOR fully provides not only visualization for the massive and complex point cloud but also point cloud editing functionalities.

  - **Select and Edit Point Cloud**

    Now you can easily select the interested area on point cloud and edit them by using the various selection tools.

    If the point cloud have some noises or you have picked up some floor, side wall, or ceiling points while scanning, then you can easily select them only by using Extend To Similar or Extend To Sudden Change selection tools and remove those unwanted areas. And you can also easily select the interested features only by using Paint Brush selection tool without interference with the other complicate feature shapes and then copy, cut, or paste as new point cloud.
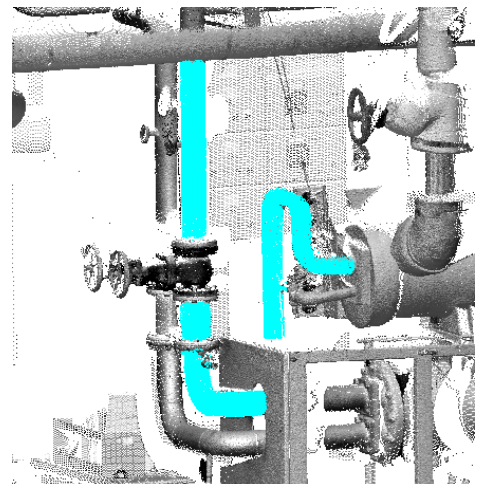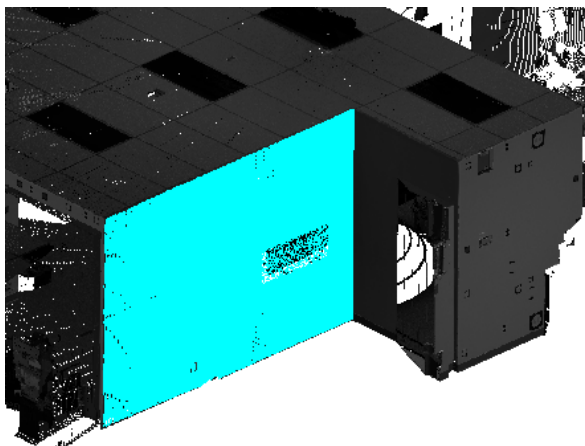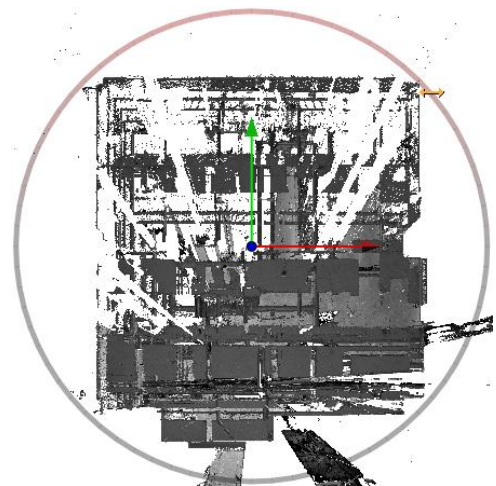
- **Optimized Point Cloud Tools for Massive Point Cloud**

    All commands in the Point Cloud Tools such as Sampling, Filter Noise, Smooth, etc. are optimized for massive point cloud. Now you can easily optimize and edit massive point cloud with by using those commands.
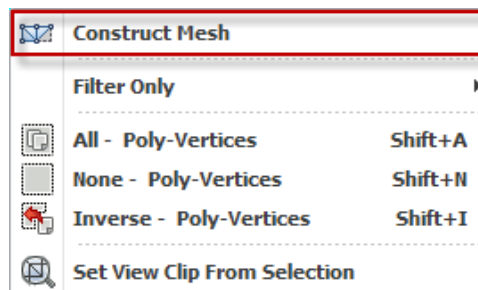
    Particularly, when you filter noises from the point cloud, you can quickly filter the outlier of point cloud with Box Volume or Scanner Range by using Filter Outlier Regions option which has been newly added in the Filter Noise command.
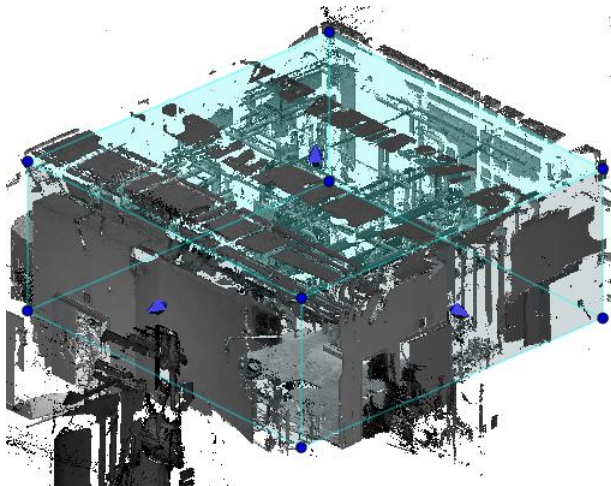

Filter Outlier Regions with Box Volume   **Filter Outlier Regions with Scanner Range**

And moreover, you can much more easily create a mesh from point cloud by using Construct Mesh command which has been newly added as one of Point Cloud Tools. You can also directly use this command in the pop-up menu.

- **Unlimited Capacity of Mesh Construction**

    There is no limit to construct mesh from massive point cloud generated by long range 3D scanners. You can easily select the entire point cloud or interested partial area of the point cloud and then you can construct a single mesh or several individual meshes from them by using Construct Mesh command. You can also directly construct a mesh or meshes from the selected area of point cloud by choosing the Construct Mesh in the pop-up menu.
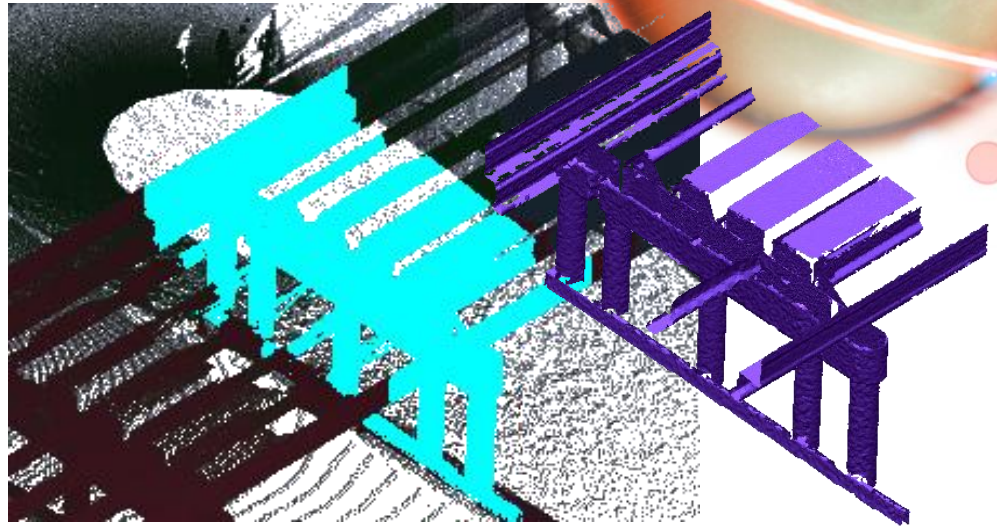
- **Sketching and Feature Modeling from Point Cloud**

  Now you can much more easily extract various design intent from massive point cloud and quickly design feature shapes from the point cloud.

  You can draw sketch profiles based on the silhouette of point cloud as well as on the point section by fitting or snapping the section points.

And if pipe shapes are in the point cloud, you can easily and quickly complete pipe modeling by using Pipe Wizard which has been newly added as one of the Modeling Wizards.
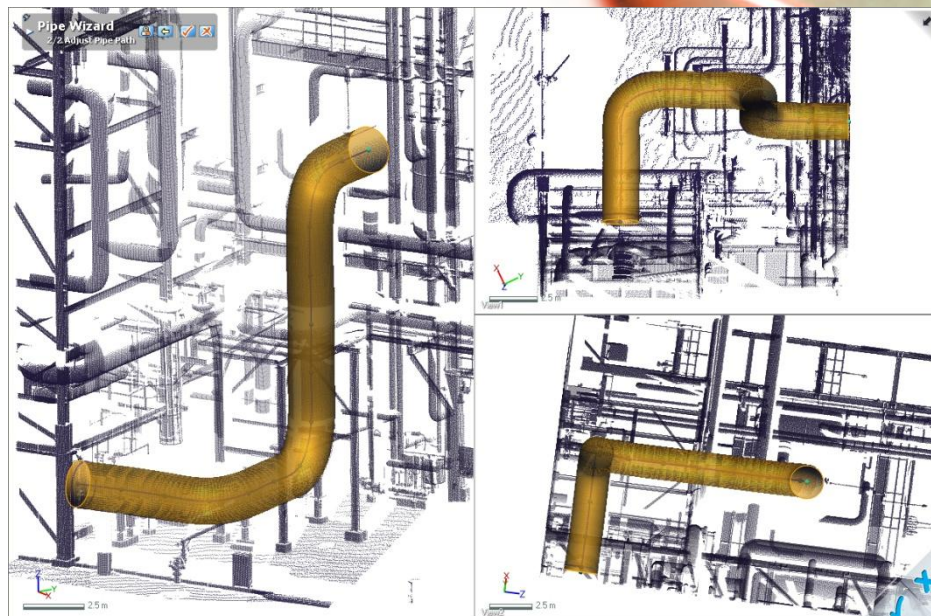
- **New File Formats for Massive Point Cloud**

  Optimized file format in accordance with new point cloud handling process has been newly added as new file format called rapidform eXtreme Point Cloud ('*.xpc').
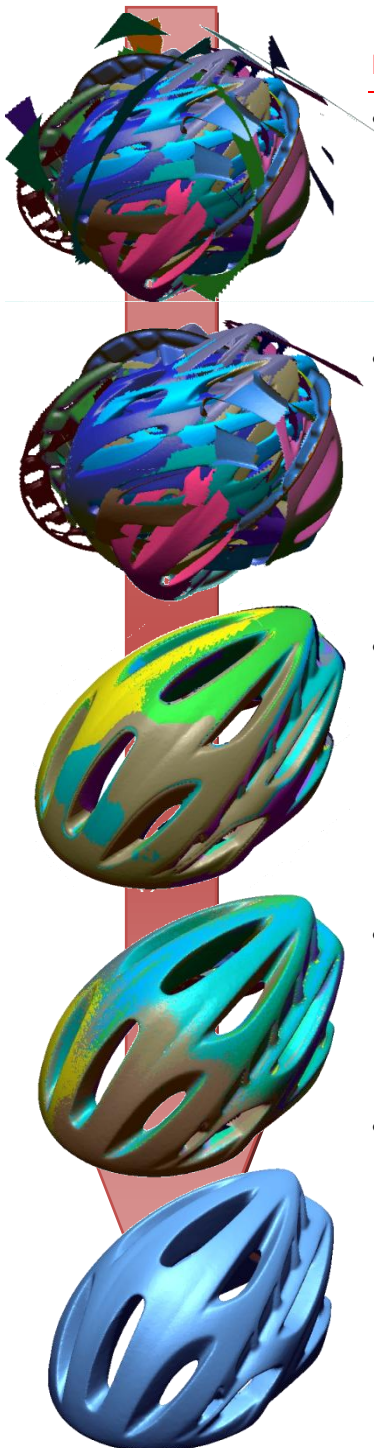
  With the new version of Rapidform XOR file format ('*.xrl') which has been upgraded up to 3.0 and the new file format will be standard for efficiently handling massive point cloud.

  Addtionally, if you want to publish huge size point cloud as Point Stream or ICF file format for sharing through the Web, now you can adjust the size of data by using sampling ratio as desired.

![XOR3 RAPIDFORM® XOR/REDESIGN™]

Mesh Buildup Wizard Enhancement

Mesh Buildup Wizard is automated tool for creating watertight mesh from raw scan data. Now this wizard-style interface has been greatly enhanced with five different stages such as Data Preparation, Data Editing, Data Pre-Aligning, Best-Fit Aligning, and Data Merging. It provides a fully optimized mesh buildup process according to the scanner type of target scan data. You can much more easily create a watertight mesh from raw scan data and also cope with any scanner type with newly enhanced Mesh Buildup Wizard.

Benefits of Mesh Buildup Wizard

- It can quickly and automatically generate watertight mesh from raw scan data.

Function Details

- **Data Preparation**

  In the first stage, you can choose a scanner type which you have used to scan a target object. It provides different parameters and options during the process according to your definition of scanner type.

- **Data Editing**

  In the second stage, it helps you to easily edit scan data. If the scan data have some noises or you have picked up some floor poly-faces while scanning object, then you can easily remove those unwanted areas with various editing tools.

- **Data Pre-Aligning**

  In the third stage, it allows you to easily align scan data no matter where the scan data are. They are automatically aligned with each other by using the geometric shape information. And you can also manually align the scan data by picking several corresponding points on the scan data.

- **Best-Fit Aligning**

  In the fourth stage, it allows you to accurately align scan data with Best-Fit alignment algorism.

- **Data Merging**

  Finally, you can merge the aligned scan data into a single mesh and then you will get a watertight mesh.

XOR3

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Auto Surfacing Enhancement

Auto Surfacing that allows you to automatically generate freeform surface patches from a mesh has been greatly enhanced.

The name of the existing method has been changed to 'Evenly Distributed Network' and now the other auto surfacing method which is called 'Feature Following Network' has been newly added in the Auto Surfacing. It allows you to automatically construct surface patches on the mesh considering its feature shape and It also can effectively construct surface patches which can cover the entire mesh with much less surface patches even if some holes are in the mesh.

Now, you can generate a freeform surface patches having evenly distributed network as well as with a patch network following the feature shape on the mesh.

Benefits of Auto Surfacing

- It can quickly and automatically generate high quality surfaces no matter how complex the target mesh is.
- You can quickly get a result. You can reduce time consuming job, eventually saving time and money.

Function Details

- **Evenly Distributed Network** option allows you to automatically construct evenly distributed surface patches which can cover the entire mesh. You can manually define the target number of surface patches and then the application automatically constructs surface patches on the mesh as defined.

- **Feature Following Network** option allows you to automatically construct surface patches following feature shape of mesh. Since it's automatic, you don't need to know how to construct curve network on the mesh following its feature shape and how many surface patches are needed to cover over the entire mesh.
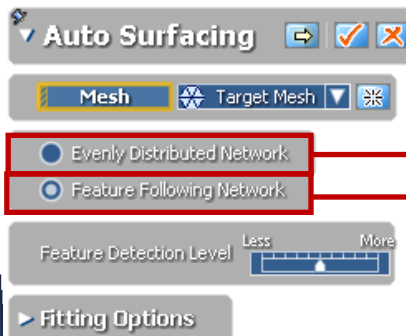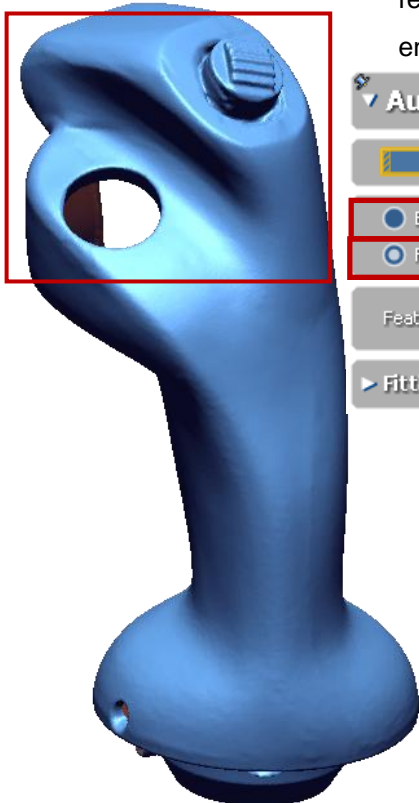
You can construct evenly distributed surface patch network on the target mesh.
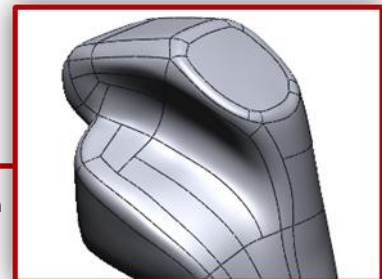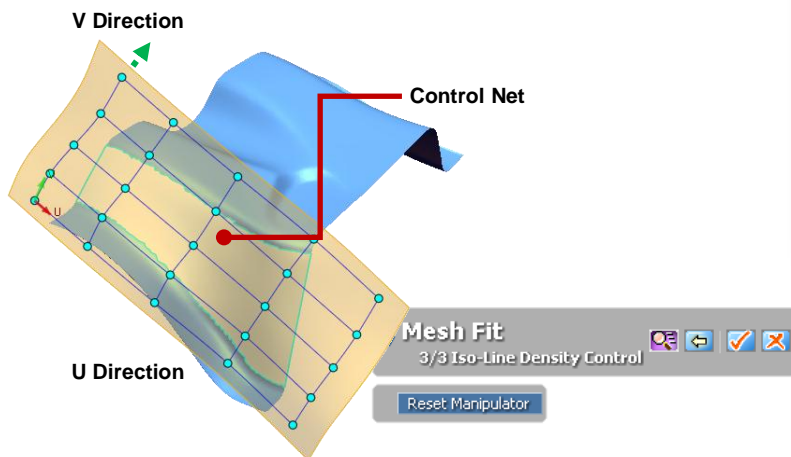
You can construct surface patch network on the target mesh following its feature shape.

Mesh Fit Enhancement

Mesh Fit allows fitting surface generation on feature regions or selected regions of a mesh no matter how complex the target regions are.

In sub-stages you can freely control a flow of fitting surface body and its Iso-Lines. This option is now added in the Mesh Fit command.

Now, you can get a higher quality surface body as well as an accurate result with less number of control points.

Benefits of Mesh Fit

- No need to create profiles for surface generation. Just with one-click on the target regions, you extract design intents and get a high quality surface body.

- It is very useful for users who want to quickly extract design intents from complex freeform regions of a mesh.

V Direction

Control Net
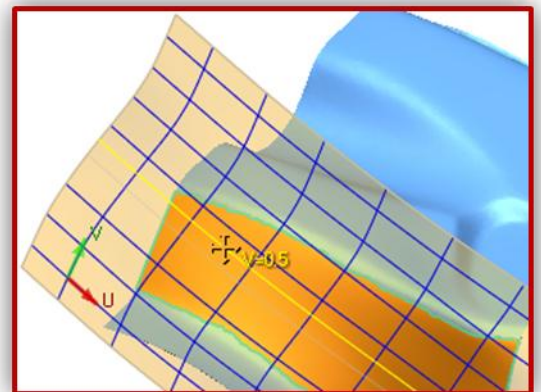
U Direction

Function Details

- **Newly Added Second Stage**

You can freely adjust a flow of fitting surface body by controlling the control net and the position of control points.
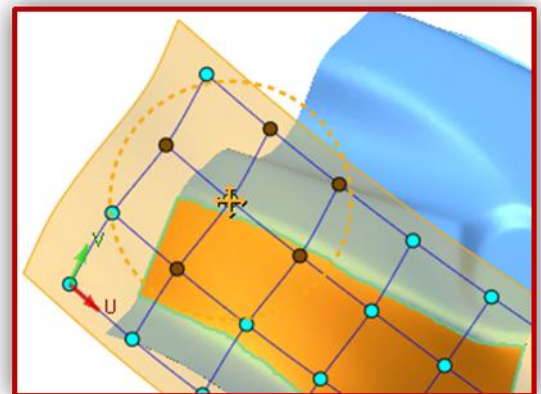
- **Newly Added Third Stage**

You can freely control the position of Iso-Lines and you can also add or remove them as well.

Auto Curve Network Generation

Benefits of Auto Curve Network Generation

- You can easily and quickly construct curve network on a mesh even though feature shapes of the mesh are complex.
- You can generate a freeform surface body on the mesh using the extracted feature curves.
- You can reduce time consuming job, eventually saving time and money.

Create Curve Network has been newly added as one of the 3D Mesh Sketch Entities.

It allows you to automatically construct feature curve network which can cover the entire feature shape of mesh.

The generated feature curves can be edited same just like the other curves.
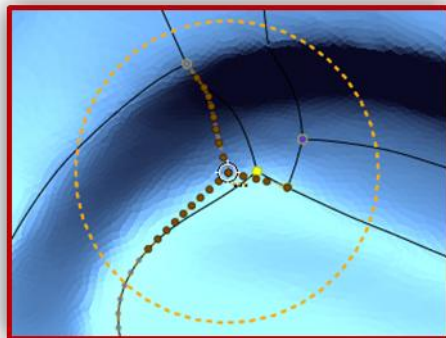
Function Details
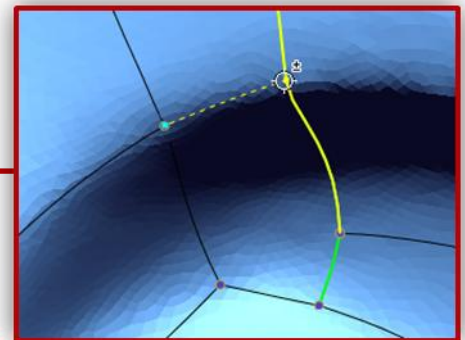
It is performed in the 3D Mesh Sketch mode only.

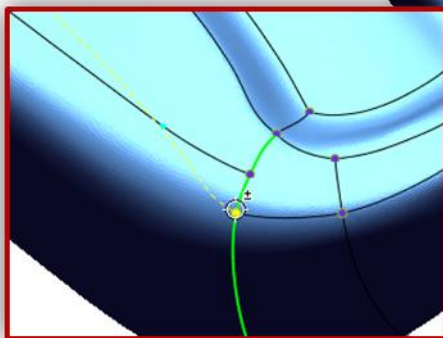You can easily construct feature curves on a mesh by controlling Feature Detection Level option.
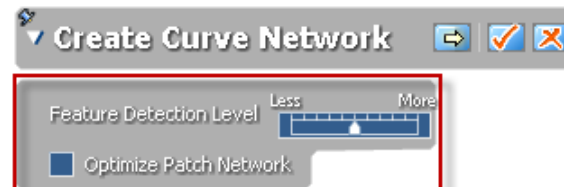
After an initial curve network is generated, you can also easily modify the feature curves in the second stage by using Deform, Merge, Remove, Split, and Detach And Move Tools.
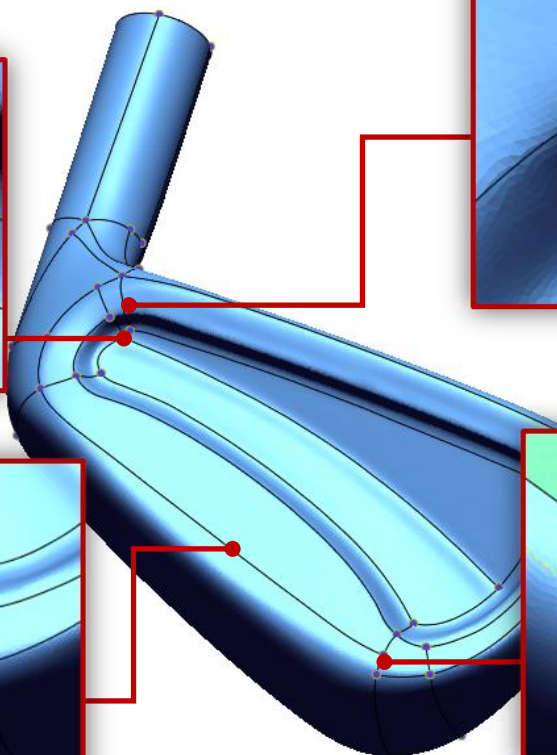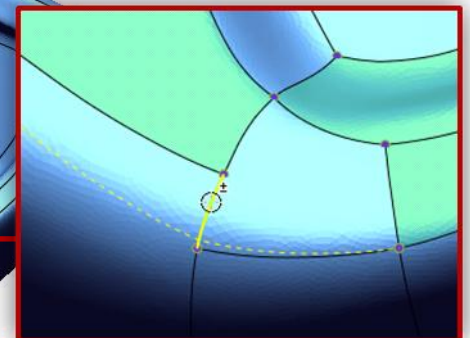

Deform Curves

Split Curve Loop

Detach And Move Curve

Extracted Feature Curves

Remove and Merge Curve Loops

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Mesh Averaging

Benefits of Mesh Averaging

- You can easily generate a master feature from a set of several scanned features.

- It is very useful for users who want to create a master model from handicraft models or several sets of scanned model.

Mesh Averaging has been newly added as one of the Scan Tools.

It allows you to generate an averaged and optimized master feature shape from a set of several scanned feature shapes. And it also allows you to extract a reasonable feature shape if you have patterned scan feature shapes.

Function Details

When you have a model which has patterned feature shapes or a set of several scanned models, this function can be used for creating a master feature shape or a master model from them.

Mesh Averaging consists of two stages as described below.

- **First Stage – Define Targets**

  You can define target features in the first stage.

  If the model has patterned features (Circular or Linear), the application automatically detects the position of features and then intelligently compensates its positions for averaging.

- **Second Stage – Check Deviation**

  You can check deviation between an averaged feature and the selected target features in the second stage. It allows you to qualify target features from the list to get a more reasonable result.

Target Features
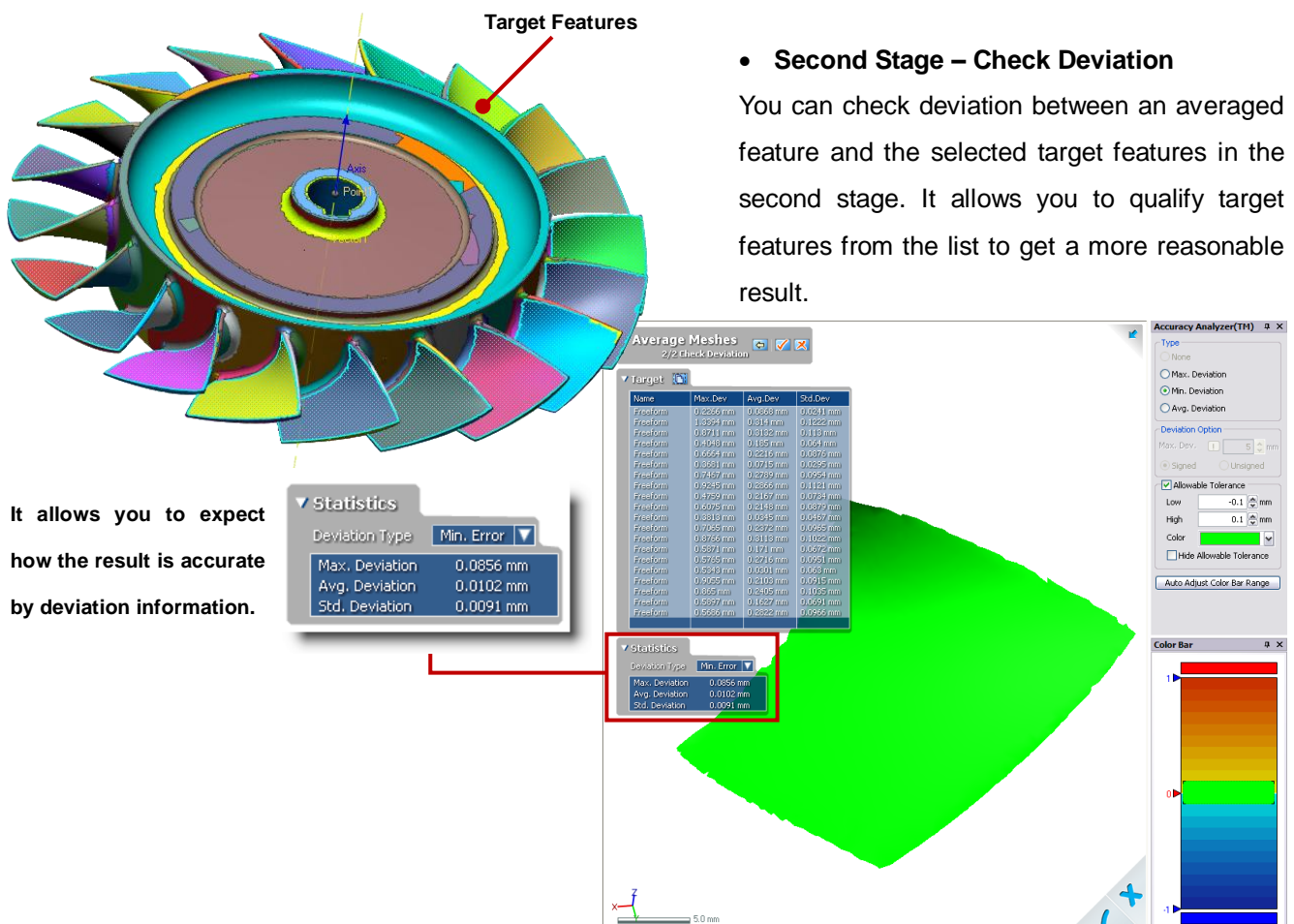
It allows you to expect how the result is accurate by deviation information.

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Sweep, Extrusion, Revolution Wizard

Benefits of Sweep, Extrusion, Revolution Wizard

- No need to analyze feature shapes to extract feature information and model a surface or solid body. You can easily complete modeling jobs as you want using these wizards.

- You can reduce time consuming job, eventually saving time and money.

Sweep, Extrusion, Revolution Wizard has been newly added in the Modeling Wizard. They help you to easily model a surface/solid body from a mesh.

These wizards intelligently analyze features from a mesh and automatically extract feature information such as feature profiles, axis, and path, etc.
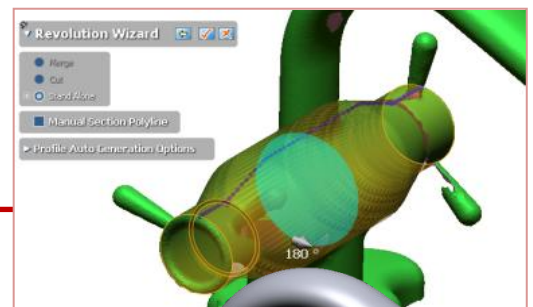
It enables you to quickly complete modeling jobs which you have to do through several steps. After a model is completely designed, you can edit the modeled surface/solid body whenever you want.

Function Details

- **Sweep Wizard -** enables you to easily create a sweep feature using feature profiles and sweep path.

- **Extrusion Wizard -** enables you to easily create an extrusion feature using feature profiles and extrusion direction.

- **Revolution Wizard -** enables you to easily create a revolving feature using feature profiles and rotation axis.
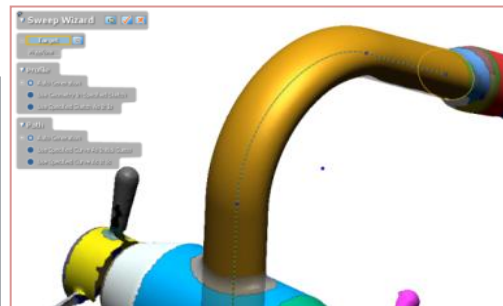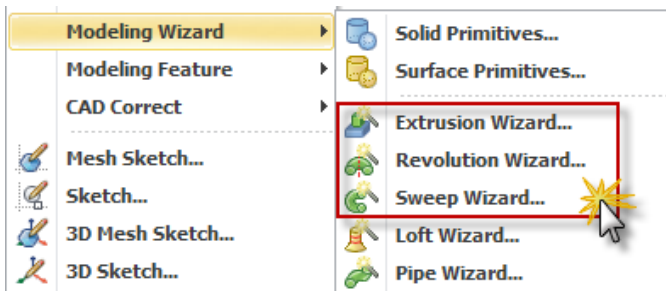
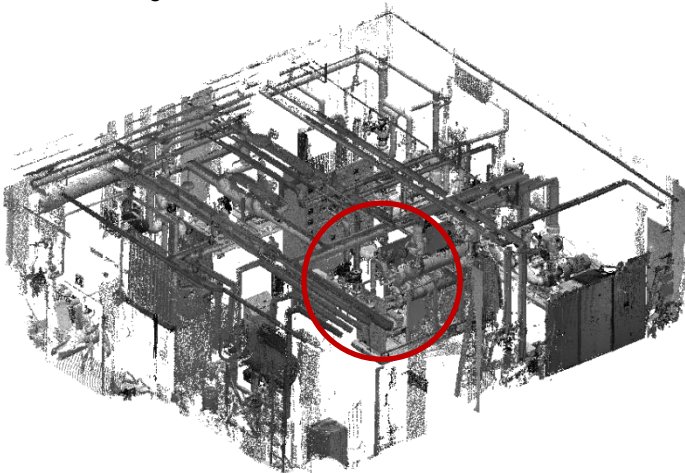

Sweep Wizard

Revolution Wizard

Extrusion Wizard

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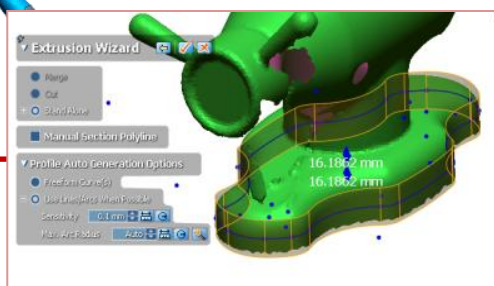
Pipe Wizard

Benefits of Pipe Wizard

- No need to analyze features to extract its information and model a surface or solid body. You can easily complete pipe modeling as you want using this wizard.

Pipe Wizard has been newly added as one of the Modeling Wizards.

It helps you to model a surface or solid pipes from a mesh or a point cloud. This wizard intelligently analyzes features from a mesh and automatically extracts feature information such as pipe radius and path.

It enables you to quickly complete modeling jobs which you have to do through several steps. And you can edit the modeled body whenever you want.

Function Details

Pipe Wizard consists of three stages. In the first stage, you can easily select pipe shapes as target features even though many complicate pipe features are in the data. In the second stage, you can check the previewed result and then define remaining bodies. In the final stage, the feature information in the extracted pipe shapes are previewed on the separated multiple viewports and then you can easily edit the parameters of the pipe feature shapes at the same time.

- It is particularly useful for users who want to create a surface or solid body from a pipe model.

- If you have data which is a scanned industrial plant and it is difficult to extract features because of complicated pipe lines, this wizard helps you to quickly complete pipe modeling.

- You can reduce time consuming job, eventually saving time and money.

Separated Multiple Viewports

Extracted Pipe Diameter

Extracted Pipe path

Add Texture

**Benefits of
Add Texture**

- It enables a mesh model
  to be used for real
  simulation, 3D gallery,
  or animation.

- If you have a rapid
  prototyping machine, it
  also allows you to get a
  result like a real object
  with texture images.

- It is very useful for users
  who want to check an
 object in the 3D space
  before the prototype is
  produced.

Add Texture has been newly added as one of the Texture Tools.

It allows you to import a 2D texture image and attach it onto the target mesh. Now, you can realistically display a mesh model with a texture image on the Model View and export the model including the texture image.

Function Details

You can easily import a 2D texture image no matter how big the size of the image is. The imported 2D texture image automatically pops up on the Texture View and then you can just define corresponding points between the imported 2D texture image and the target mesh.

The applied 2D texture image will be mapped according to your definition by expanding onto the target mesh.

Model View

**Corresponding
Points**

Imported 2D Texture Image
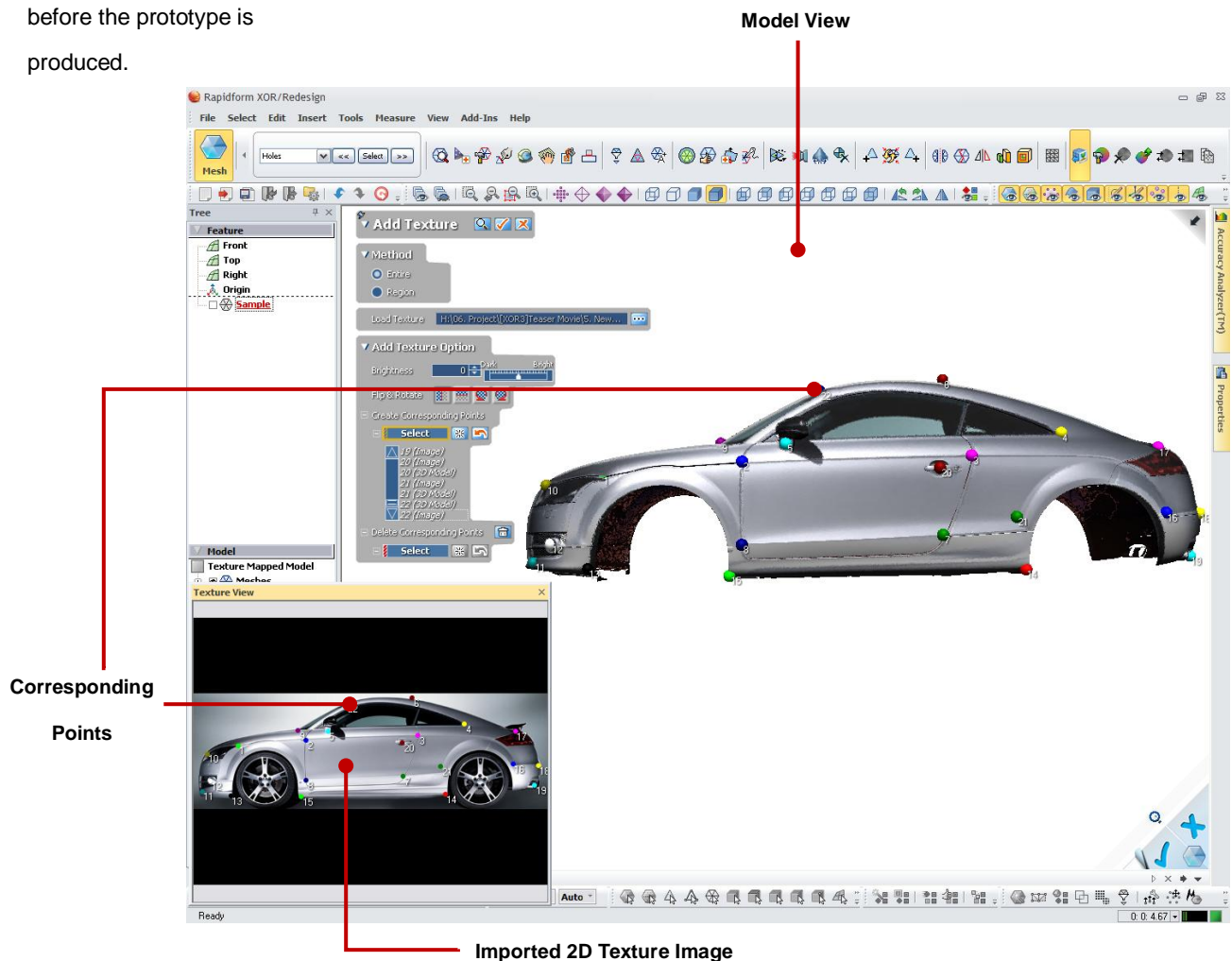
Match Color

Benefits of Match Color

- If you have a set of scan data which has different color information, it allows you to compensate the color information between the scan data.
- It is very useful for users who want to create a full 3D model with color information from a set of scan data which are scanned in different scanning environments.

Match Color has been newly added as one of the Texture Tools.

When an object is scanned with its color information in different scanning directions, the scan data may have different color information according to the scanning environments such as light, color temperature, and brightness, etc.

Match Color allows you to easily compensate the color information between the scan data.

Function Details

Before compensating color information between scan data, alignment is required to apply Match Color command.

If you already have aligned scan data, you can easily compensate the color information between them by using Choose Among Candidates option and Match Color Based On Reference option.
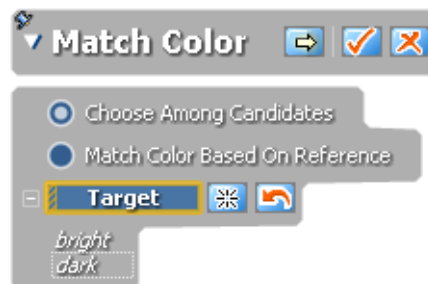
Choose Among Candidates option recommends you several compensated color candidates and allows you to easily choose appropriate color information for the model.

Match Color Based On Reference option allows you to compensate color information of the target scan data based on the color information of the reference scan data.

Target Object

Reference Object
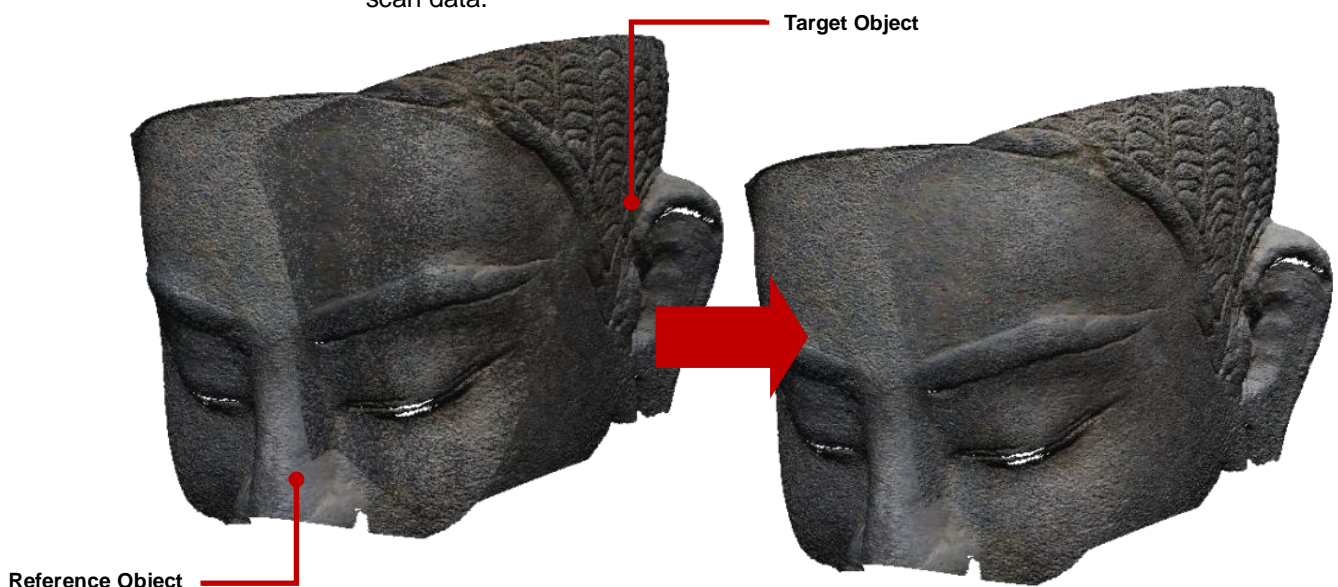
Viewpoint Management

Benefits of Viewpoint Management

- It is very useful for users who want to manage viewpoints for creating the modeling report.

Viewpoint Management has been newly added as one of the management panels. You can manage position and orientation of a model as you want to see by capturing viewpoint.

Function Details

You can easily add a current viewpoint of a model and remove as well.

The added viewpoints can be managed in the Viewpoint panel.

Anytime, if you want to set the position and the orientation of the model by using the added viewpoints, just click the captured viewpoint in the Viewpoint list. The model will be displayed by your set viewpoint in the Model View.
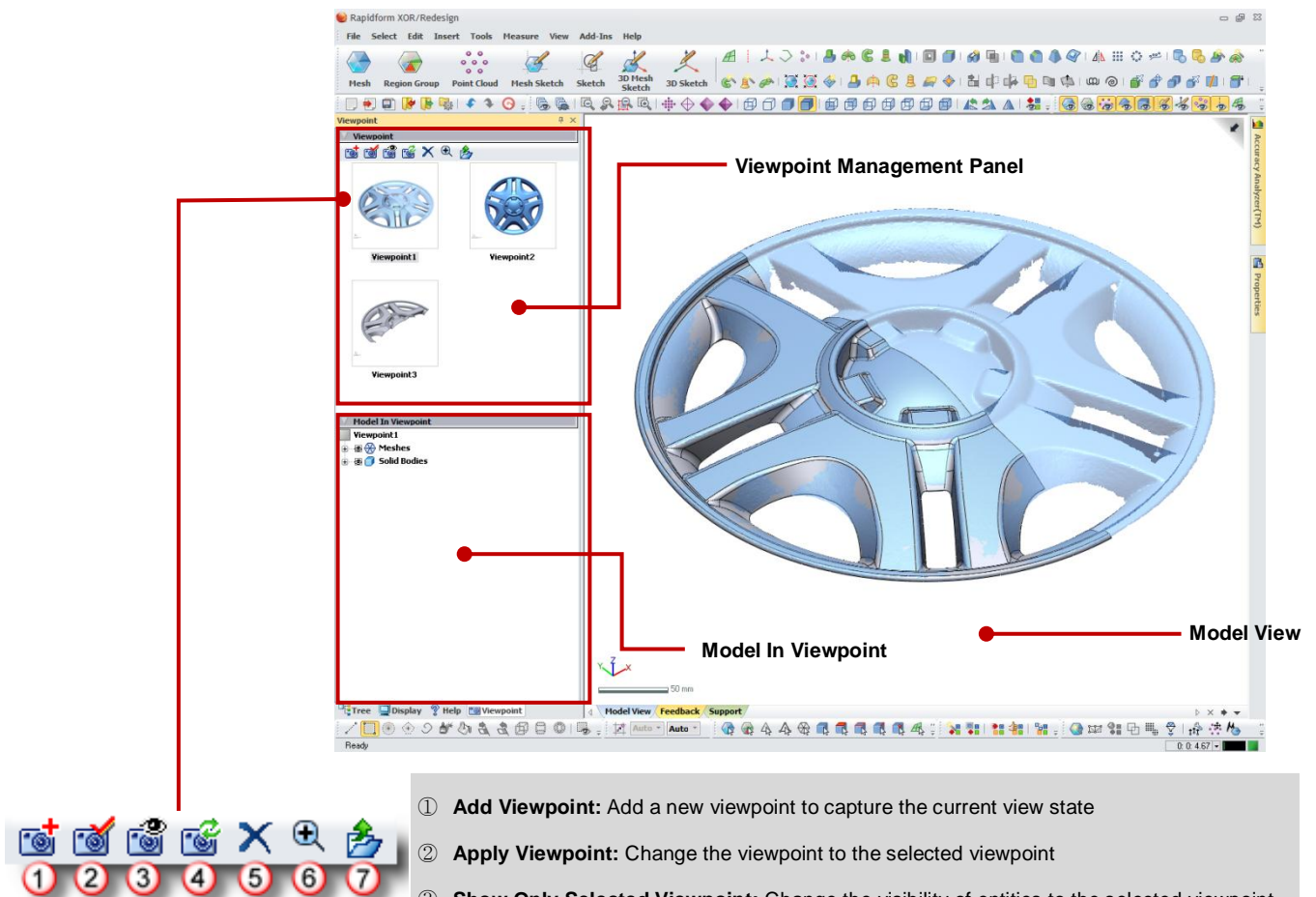
① **Add Viewpoint:** Add a new viewpoint to capture the current view state

② **Apply Viewpoint:** Change the viewpoint to the selected viewpoint

③ **Show Only Selected Viewpoint:** Change the visibility of entities to the selected viewpoint

④ **Reassign Viewpoint:** Reassign the selected viewpoint from current view state

⑤ **Delete Viewpoint:** Delete the selected viewpoint

⑥ **Zoom:** Zoom to the viewpoint image

⑦ **Export Viewpoint:** Export the selected viewpoint to image file

Flatten and Deform Mesh

Benefits of Flatten and Deform Mesh

- When a scan object has been extremely deformed, it helps you to reconstruct the scanned data as it was originally designed.
- It is very useful for users who want to redesign shape from extremely deformed scan data.

Flatten and Deform Mesh in which you can deform the shape of a mesh has been newly added as one of the Add-In commands.

If a scan object has been twisted or bended because of time, environment, and internal / external force, etc., it is difficult to extract correct design intents for the reverse modeling process.

Flatten and Deform Mesh Add-In allows you to easily deform the scanned data as it was originally designed.

Function Details

Flatten/Deform command provides three different methods such as Flatten, Deform, and Flexible Registration. With these three methods, you can easily deform mesh as desired.

	Flatten	Flattens a bent area and preserve features on the bent area.
	Deform	Deforms a flat area to a desired shape and preserve features on the area.
	Flexible Registration	Applies flatten first and then deform target area. During the process, features on the area will be preserved.

2. Enhanced or Changed Functions

User Interface

(1) Selection Filter

Now, you can define only certain specific entities that you want to select in the Model View by selecting entity type in the Selection Filter as well as in the Pop-up menu.
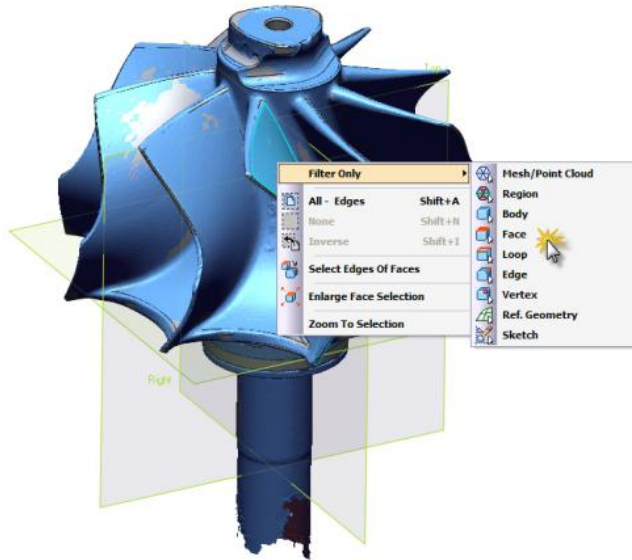
(2) Enhanced Display Tab

Point Shader option has been newly added in the Display Tab.

It performs for point cloud with various shading methods to effectively see the scan data.
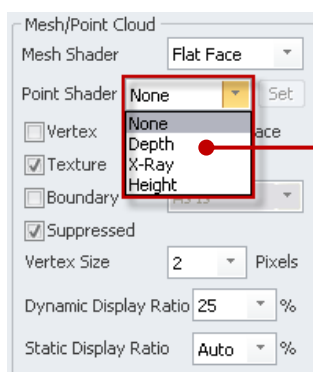
None: This is a default shading method. Point cloud is shaded with the current light condition.

Depth: It makes closer points brighter in the view direction and further points darker.

X-Ray: it makes closer points and further points transparent in the view direction and displays the interesting area to clearly see the inside area of scan data.

Height: It displays point cloud with different color map according to the height of the Z direction.
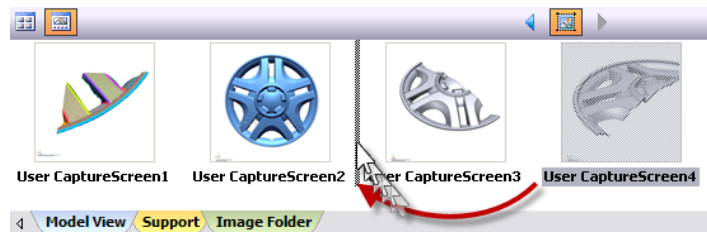
(3) Newly Added Transparent Background option

An option which allows you to set transparent background in the captured image has been newly added in the Capture Screen command.
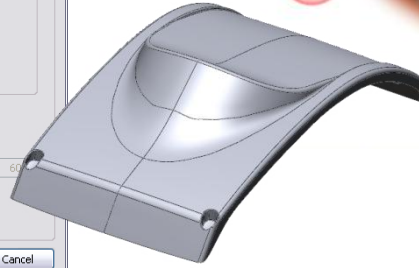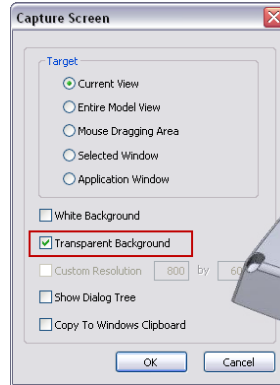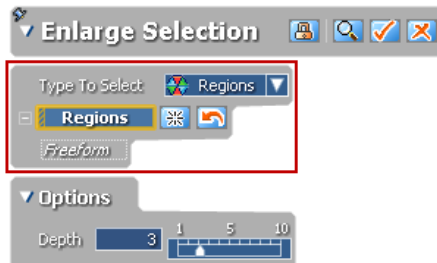
(4) Captured Image Management

Now, you can easily change the order of captured images by drag & drop in the Image Folder.

(5) Enlarge / Shrink Selection

Now, you can apply Select > Enlarge / Shrink command to the pre-defined feature regions as well. You can easily select adjacent regions by enlarging or shrinking from seed region.

(6) Interactive Alignment

Interactive Alignment has been greatly enhanced. Selectable entities have been increased and now, the application automatically and intelligently recognizes alignment datums which can be extracted from selected entities. For example, even if you just select 3 points, the application automatically recognizes the selected points as a datum plane for alignment.

(7) Enhanced Preferences

Previously, '0%' was not allowed to input in the Outlier For Allowable Deviation (%).
But, now you can input a value between '0%' and '100%' as you want. If you input '0%' in the Outlier For Allowable Deviation (%), the application uses the entire scanned mesh for fitting.

(8) Enhanced Console View
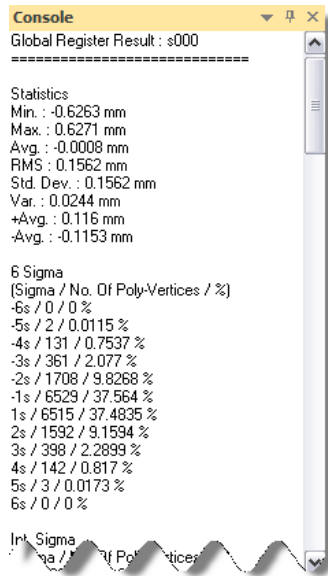
You can check what operations have been performed in the Console View and now you can also check in detail how the statistical results are computed after you apply aligning between scan data with the Global And Fine option.

(9) Enhanced Properties

Now, you can directly copy values from the Properties panel by clicking 'Ctrl + C' key and paste it on notepad or Microsoft Office Excel or anywhere else you want by clicking 'Ctrl + V' key.

### (10) Newly Added Disjoined Points Constraint in Sketch mode

Disjoined Points Constraint had been used in Mesh Sketch mode only. But now, it has been newly added in Sketch mode as well.

Now, you can easily set constraints for disjoined points of sketch curves.
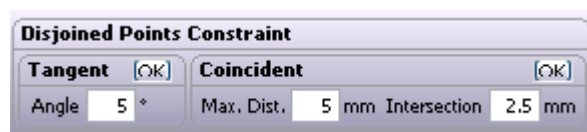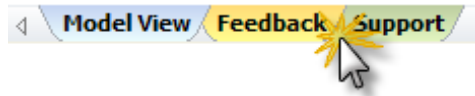

(11) Enhanced Selection Option

Now feature regions can be selected through with Rectangle Section Mode when the Visible Only button is toggled off.
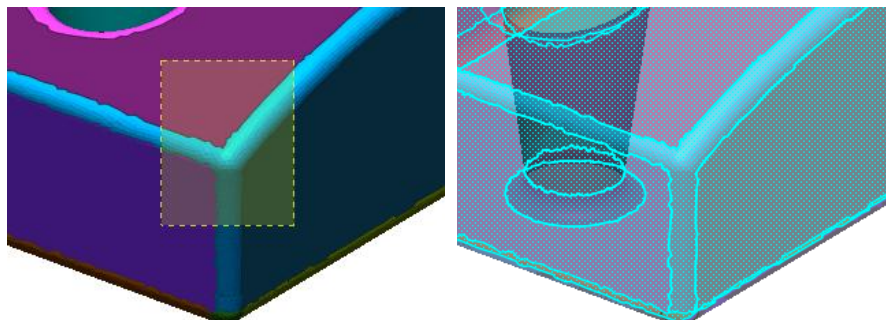
(12)Newly Added Feedback Tab

Feedback Tab which allows you to offer or suggest any idea about the product has been newly added.

Now your comments will directly be sent to the product support manager and your voice will be used for improvement of product functionalities, quality, and stability.

Make sure that your computer must be connected to the internet in order to use the Feedback system.
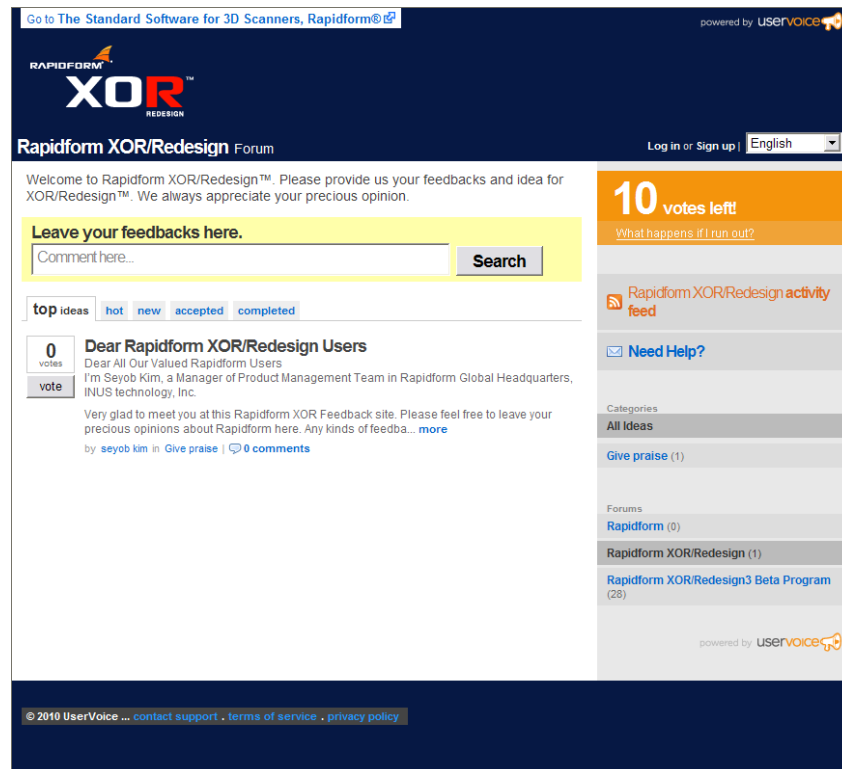
File I/O

(1) XRL File Version and Newly Added File Format for Massive Point Cloud

Rapidform XOR's file version has been upgraded from version 2.8 to version 3.0.

Now, model data can be effectively stored in the new file version in order that it can best perform in the application.

Additionally, optimized file format in accordance with new massive point cloud handling process has been newly added as new file format called rapidform eXtreme Point Cloud ('*.xpc').

If you want to store the in-process model entities, you can effectively use the data by storing in the new file format.

(2) Import Native CAD File Format

Now, native file format of major CAD systems such as CATIA V4 ('*.model') and V5 ('*.catpart, *.catproduct'), Pro/ENGINEER ('*.prt, *.prt.*, *.asm, *.asm.*'), UGS NX ('*.prt'), SolidWorks ('*.sldprt, *.sldasm') and AutoCAD ('*.dxf') can be imported into the application.
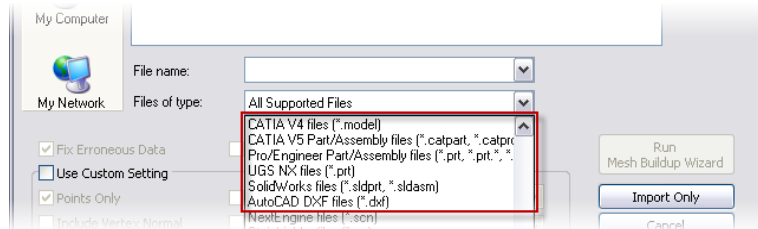
The following table indicates which version of CAD file format Rapidform XOR supports.

CAD Program	File Extension	Version Supported	Note
CATIA V4	*.model	CATIA 4.1.9 to CATIA 4.2.4	
CATIA V5	*.catpart, *.catproduct	CATIA V5 R2 through R20	Unsupported assembly non-ASCII character in the file name
Pro/ENGINEER	*.prt, *.prt.*, *.asm, *.asm.*	Pro/E 16 to Wildfire 5	
UGS NX	*.prt	Unigraphics 11 to 18 and NX1 to NX6	
SolidWorks	*.sldprt, *.sldasm	SolidWorks 98 to 2010	

> **Note**
>
> *You need to install Rapidform Exchange™ License to import these file formats except AutoCAD file format.*

(3) Export Model Data as CATIA V4 and V5 File Format

Now, you can export modeling entities such as Body, Curve, Face, and Ref.Geometry to the CATIA V4 file format ('*.model') and the CATIA V5 file format ('*.catpart, *.catproduct').
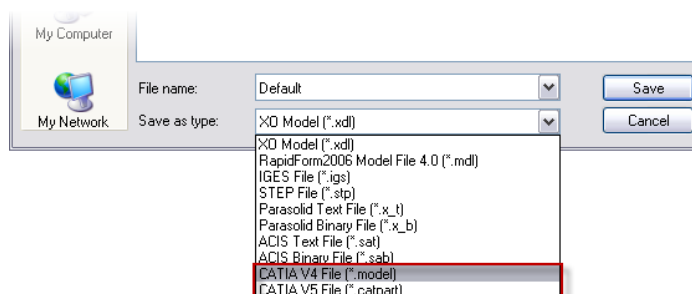
> **Note**
>
> *You need to install Rapidform Exchange™ License to export modeling entities as the CATIA V4 and V5 file formats.*

(4) Import and Export Model Data as ACIS CAD file format

Now, you can import and export CAD Models as ACIS CAD ('*.sat, *.sab') file format.

When you export models as the ACIS CAD file format, the file is formatted as ACIS R7 version file.

ACIS Assembly ('*.asat, *.asab') file format can also be imported into the application.

(5) Added New Scanner File Formats

Scanner file formats have been newly added in the File Import.

Newly Added File Formats	Property	Scanner Vendor	Web-Site
ptg	Point	Leica	http://www.leica-geosystems.com
rxp, rsp	Point or Polygon	Riegl	http://www.riegl.com
cl3	Point	Topcon	http://global.topcon.com
ptc	Point	Kubit	http://www.kubit.de

Additionally, point cloud can be exported as Leica and Kubit scanner file formats.
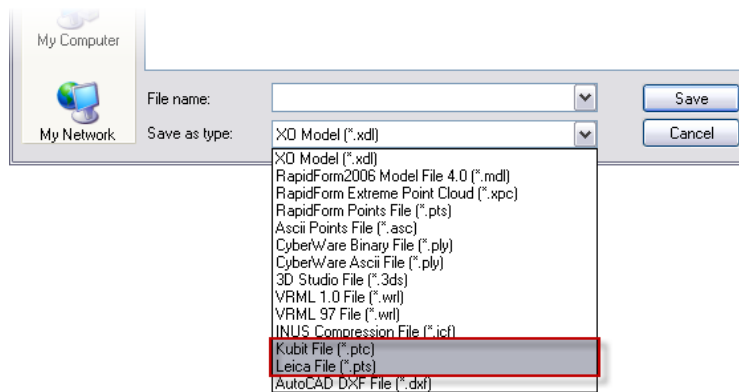

(6) Set Valid Scanning Range

When you try to import raw scan data scanned by spherical type of 3D scanner such as long range scanner, the application automatically detects that and opens the filtering dialog. Now you can easily set a radius of scanning range and filter the outlier of the scan data before the data is imported into the application. The outlier of the scan data which is farther away than the radius of scanning range defined from the origin of scanner coordinates will be automatically filtered.
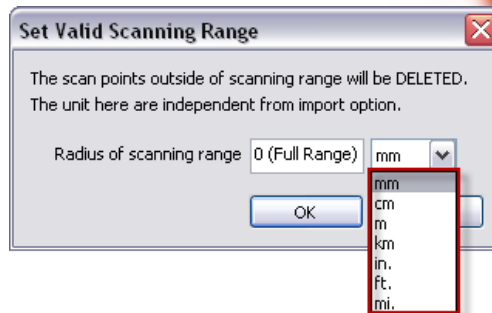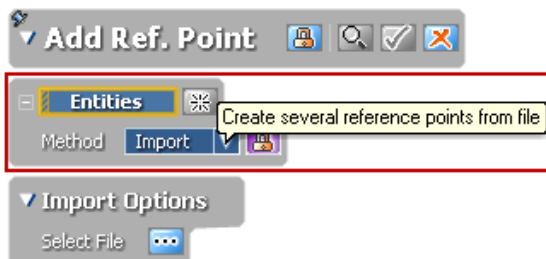
(7) Export Ref.Point

Now, you can export Ref.Points as '*.txt', '*.csv' file format as well. The exported position information of Ref.Point can be used for evaluating or analyzing.
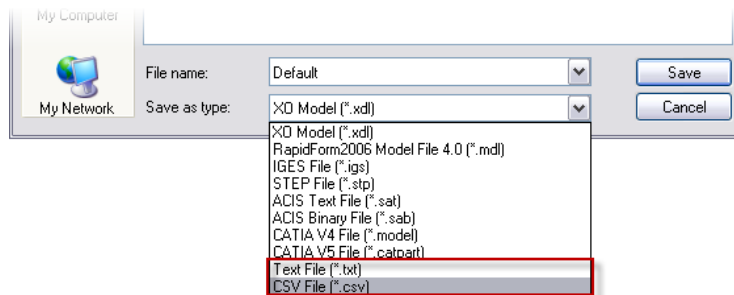
(8) Import Ref.Point

An option which allows you to import position information when Ref.Points are created has been newly added as one of the methods in the Add Ref.Point command.

Now, you can import position information into the application and you can create Ref.Points using the information.

(9) Export Transform Matrix

Now, after you apply the transform command on a surface/solid body, you can export the transformation matrix from the properties of transformation.
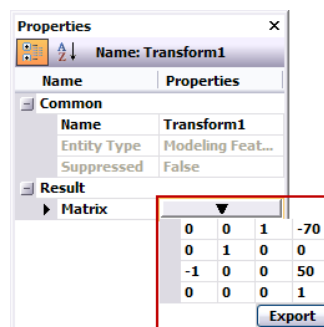
(10)Import Model Body Only

If you have a '*.xrl' file which you have designed and saved with the entire modeling history in Rapidform XOR, you can now import just the modeled bodies only from the '*.xrl' file without the modeling history. The imported bodies will be registered as an 'Imported Body' in the Feature Tree.
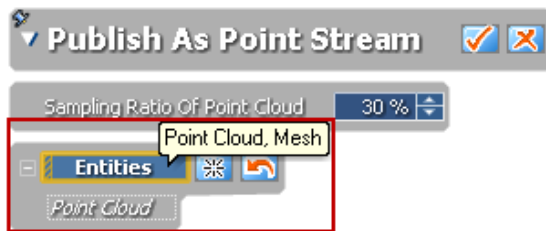
(11)Export Ref.Polyline as IGES, STEP file format

Now, you can export Ref.Polylines as IGES ('*.igs'), STEP ('*.stp') file format.

(12)Export Curves as DXF file format

Now, you can export sketch curves (2D / 3D) as AutoCAD DXF ('*.dxf) file format.
The sketch curves will be exported as polylines.

(13)Enhanced Point Stream

Publish As Point Stream command now supports point cloud as well.

You can publish a point cloud as well as a mesh as point stream.

And when you publish the selected entities as point stream, you can also set the sampling ratio to the entities.

Additionally, RPS (Rapidform Point Stream) viewer also has been enhanced to effectively see and analyze the model. Shader mode has been newly added in the RPS viewer and you can set the display environment with Use Custom Setting option.
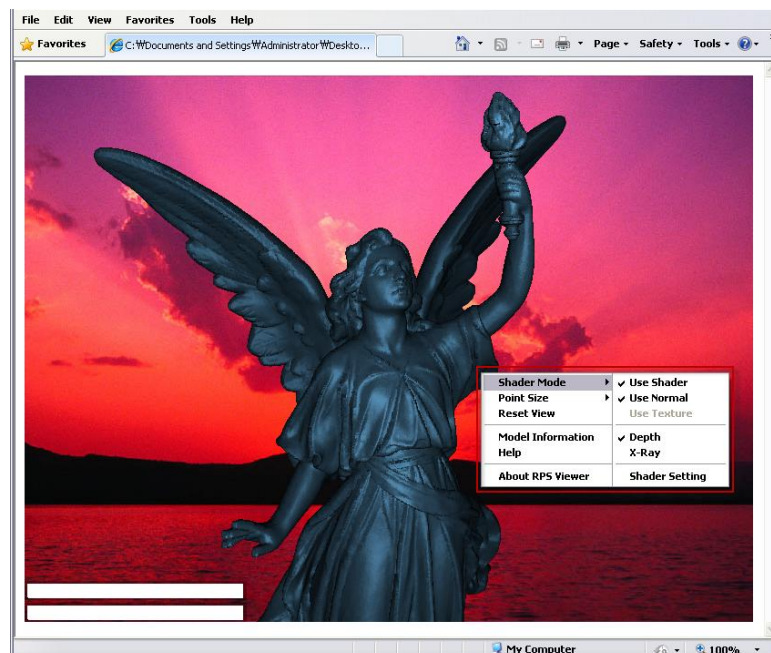
(14) Enhanced ICF file format

When you export point clouds as ICF file format, you can export the data with vertex normal information as well. You can also import the data including vertex normal information into the application.

Addtionally, if you want to publish huge size point cloud as ICF file format for sharing through the Web, now you can adjust the size of data by using sampling ratio as desired.

(15) Enhanced Import Dialog

Some options in Import dialog has been newly added and rearranged.

Triangulation Cutoff Angle option which allows you to cut some bad triangulated faces off by Angle and Suppress Mesh option which allows you to suppress a mesh as soon as a mesh is imported are newly added as importing option.

(16) Enhanced Export Dialog

Now, you can easily set units in Use Custom Setting when data are exported.
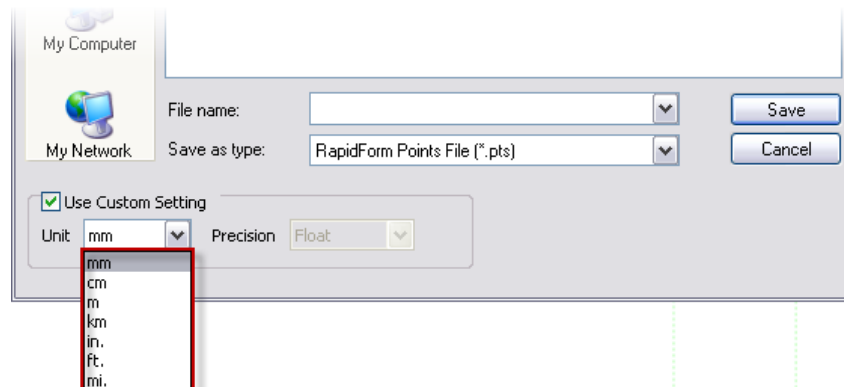
(17) Enhanced ASCII Converter

Comma (,) For Decimal Point option has been newly added in the Convert ASCII dialog.

If comma is included in the data file, the option will automatically recognize the comma as decimal point and allows you to correctly import the data into the application.

liveTransfer™

(1) Use Template in Pro/E Wildfire

When you transfer redesigned models and its entire modeling history to Pro/E Wildfire, Rapidform XOR can use user template which has been set in the Pro/E Wildfire. It enables you to solve an accuracy problem between Rapidform XOR and Pro/E Wildfire.

(2) Newly Supported CAD Program

Rapidform XOR supports new version of CAD program in the liveTransfer™

CAD Program	Supported Version	Newly Support Version
CATIA		CATIA V4 (CATIA 4.1.9)
		CATIA V5 (CATIA V5 R6)
SolidWorks	SolidWorks 2006	SolidWorks 2010
	SolidWorks 2007	
	SolidWorks 2008	
	SolidWorks 2009	
UGS NX	UGS NX4	UGS NX6
	UGS NX5	UGS NX7
Pro/E Wildfire	Pro/E Wildfire 3.0	Pro/E Wildfire 5.0
	Pro/E Wildfire 4.0	
AutoCAD		AutoCAD 2007
		AutoCAD 2008
		AutoCAD 2009
		AutoCAD 2010
		AutoCAD 2011

Note

You need to install Rapidform Exchange™ License to export modeling entities as the CATIA V4 and V5 file formats.

(3) Enhanced Feature Regeneration

When the feature which is created by Cut operation is transfer to the CAD program using liveTransfer™, the regeneration process for common cutting surface bodies has been greatly enhanced.

(4) Enhanced Transferring Speed

Transferring speed has been greatly enhanced even though a designed model in Rapidform XOR has been generated with complex features such as linear pattern or circular pattern.

(5) Transfer Sweep, Loft Feature

Try To Transfer Sweep/Loft As Parametric Feature option has been newly added in the liveTransfer(TM) command. When the features which have been designed by using Sweep or Loft modeling tools are transferred to the CAD program, this option allows that the features can be successfully regenerated as parametric features in CAD program. They are no longer dummy features.
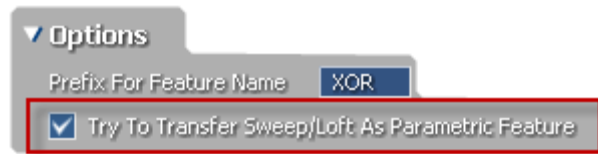
Scan Tools

(1) Transform Scan Data

Transform Scan Data has been newly added as one of the Scan Tools.

Now, you can transform your scan data as you want it.
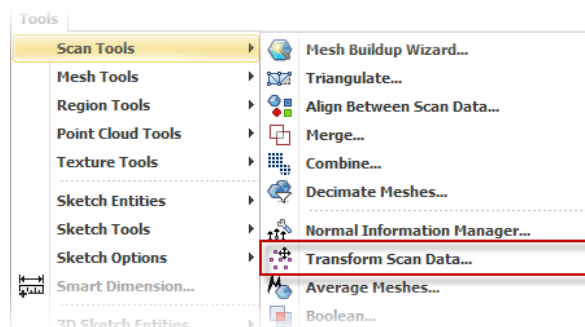
And if scan data is far from the origin of global coordinates, typically scan data generated by long range 3D scanner with GPS (global positioning system), it was difficult to handle the scan data.

Now you can easily transform the scan data to the origin of global coordinates with Transform To Global Origin button no matter where the scan data is.

(2) Normal Information Manager

Normal Information Manager has been newly added as one of the Scan Tools.

Now, normal information of scan data is automatically and intelligently generated considering which type of 3D scanner you have used to get the scan data.

If the scan data has been scanned by spherical type of 3D scanner such as long range scanner, the normal information of the scan data is generated along the origin of the scanner coordinates.

After the normal information of scan data is generated by using Generate option, you can also easily manage the normal information by using the other options such as Reverse, Remove, etc.
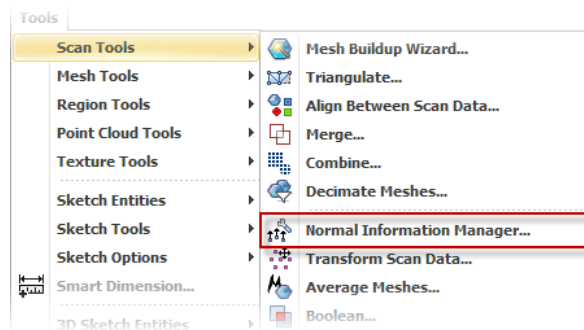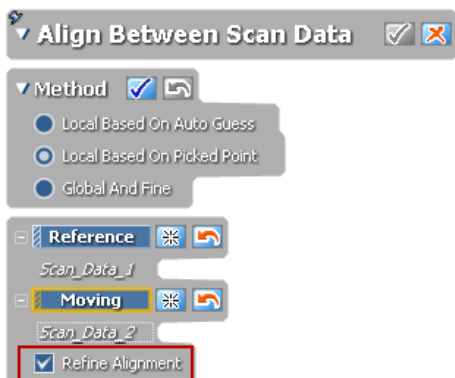

(3) Decimate Meshes

Decimate Meshes has been newly added as one of the Scan Tools.

Now, you can apply decimate command to a multiple set of meshes at one time even though some meshes are suppressed.
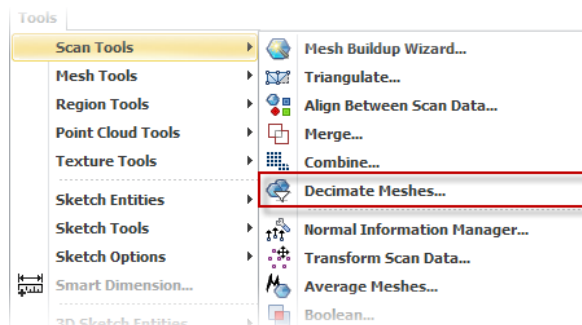

(4) Align Between Scan Data

Refine Alignment option has been newly added in the Local Based On Picked Point method.

After you define corresponding points between reference scan data and moving scan data, Refine Alignment option will try to best-fit align them. Therefore, you can get a better alignment result.

Additionally, you can now align point clouds even if they have no normal information. Normal information will be automatically generated and then they will be accurately aligned with each other.

(5) Enhanced Triangulate
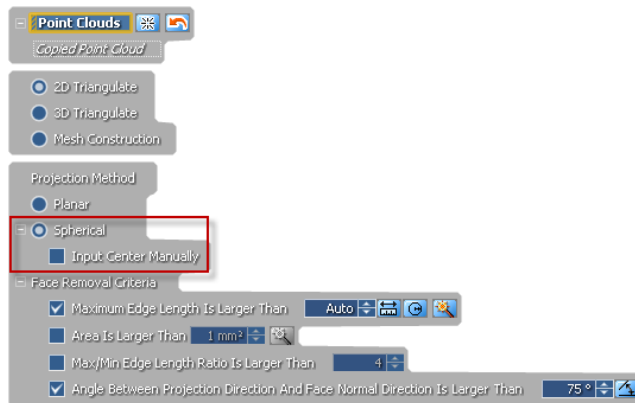
When you apply Spherical Projection Method, one of the methods in 2D Triangulate, to scan data which has been scanned by spherical type of 3D scanner such as long range scanner, the application automatically detects the origin from the geometric information of the scan data and uses the information for the triangulation process.

But, if you need to manually define the origin of scan data, now you can set the origin by checking Input Center Manually option.
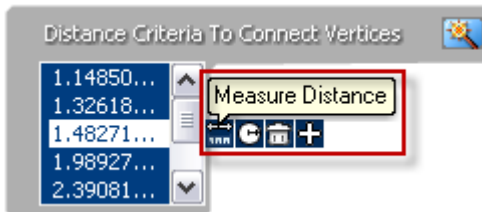
When you apply 3D Triangulate to the point cloud, you can easily add or edit the distance criteria by measuring distance or radius between points.
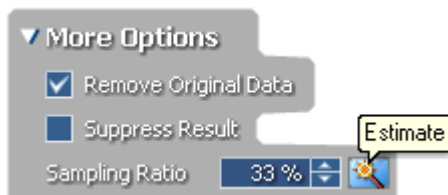
And Sampling Estimate button has been newly added as one of More Options in the 2D / 3D Triauglate method. If huge size point clouds are defined as the target entities, the application recommends you appropriate sampling ratio which is computable ratio within current available space of your physical memory. You can also manually set the radio. If the set sampling ratio is bigger than the recommended ratio, warning message is pops up and then you can decide whether you apply triangulation to the point cloud or not.

(6) Newly Added Remove Original Data Option in Triangulate and Merge Command

Remove Original Data option has been newly added as one of the more options in the Triangulate and the Merge commands. Now, you can control whether you want to remove or keep the original data by using this option.

(7) Enhanced Entity Thumbnail View

During Mesh Buildup Wizard if you delete some noisy data using Edit Tools, then the Entity Thumbnail View is automatically updated.

And now, if all poly-vertices or poly-faces of one scan entity are deleted, then the entity will be removed from the list.

(8) Support Suppressed Meshes in Scan Tools

If you have large size scanned meshes, you usually suppress the meshes for better operating in the application. With this new version, some commands such as Transform Scan Data, Average Meshes, Boolean, Combine, Merge, and Decimate Meshes have been newly added to allow that you can use the suppressed meshes.
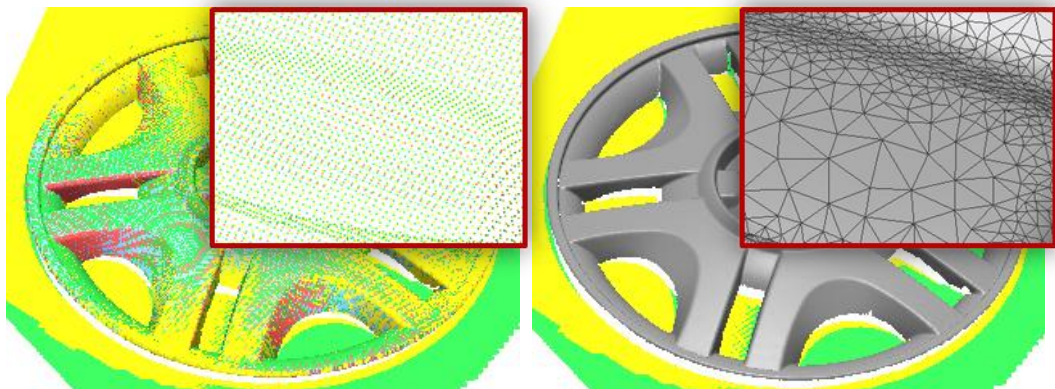
Point Cloud Tools

(1) Free and Easy to Handle Point Clouds
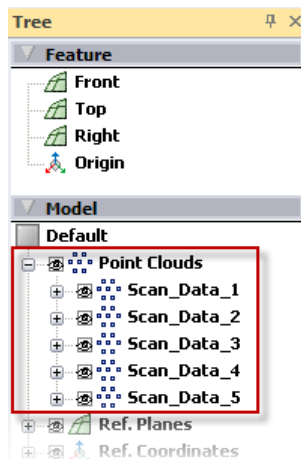
When you imported a set of point clouds into the application, all the point clouds are not registered in the Feature Tree and be free from the modeling history. So now, you can freely and easily handle the point clouds at one time no matter whether they are individually seperated or combined. With the previous version, you have to combine the point clouds into a single point cloud to edit them at one time. But now, you don't need to combine the point clouds and you can edit them as they are. You can apply sampling, noise filtering, smooth, and etc. to the point clouds at one time.

And moreover, you can much more easily create mesh from point clouds by using Construct Mesh command which has been newly added as one of Point Cloud Tools. There is no limit to construct mesh even if the point clouds are huge size. You can select the entire point clouds or interested partial area of the point clouds and then construct a single mesh or several individual meshes from them by using the Construct Mesh command.


(2) Check Result by Accuracy Analyzer

Now, you can check the modeling result between point cloud and designed body by using Accuracy Analyzer.

(3) Enable Convert Entities

Convert Entities has been newly added as one of the Point Cloud Tools.

Now, pre-defined surface/solid bodies and Curves can be converted into points in the Point Cloud mode.

The converted entities also can be checked with Accuracy Analyzer(TM) as well.
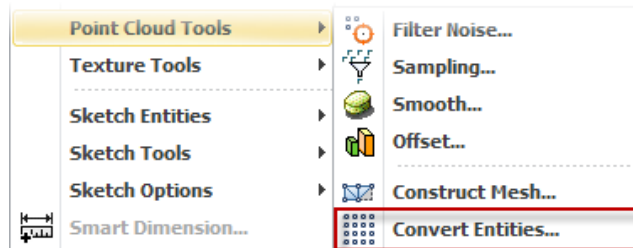
(4) Enhanced Point Smooth

Now, Point Smooth command can be applied to a set of point clouds considering the type of 3D scanner.

If the point clouds have been scanned by spherical type of 3D scanner such as long range scanner, point smoothing is performed along the direction vector to scanner center position only for reducing roughness of the point clouds effectively.

(5) Enhanced Offset

If you have a designed surface or solid body when you offset point cloud with a certain distance, you can now use the normal information of the body by checking the Use Body Normal option.

Mesh Tools

(1) Enhanced Fill Hole

Delete Poly-Face tool has been newly added as one of the Editing Tools in Fill Hole command. Now, you can select poly-faces and delete the bad faces without leaving the command.

And performance speed of hole filling operation has been greatly improved even though the target mesh has color information.

And Refine Filled Holes option also has been newly added as one of the more options.

When you fill holes by using Flat method, the Refine Filled Holes allows you to automatically adjust the edge length of the fill poly-faces based on the edge length of other poly-faces on the boundary.
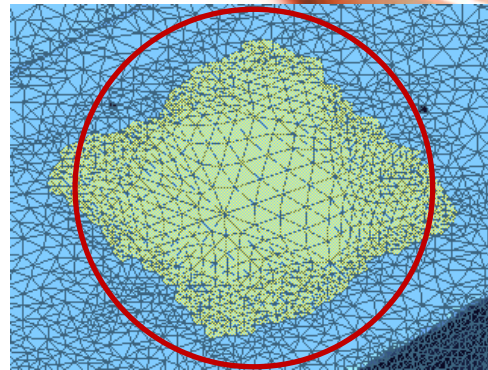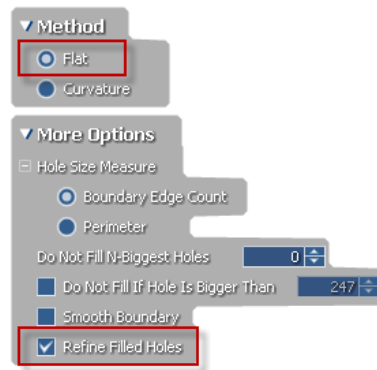
(2) Enhanced Display of Mesh Properties

Even though mesh is suppressed, now, its properties such as the number of Poly-Vertices or Faces can be checked in the Properties Panel.
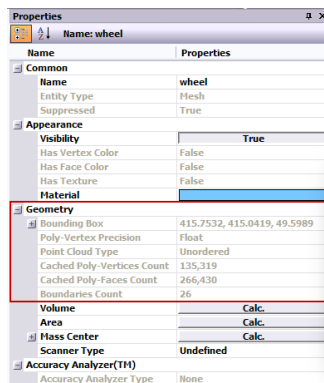

(3) Newly Added Mesh Tooltip

When you enter the Mesh mode by clicking Mesh button in the Tool Palette to edit mesh, usually you need to select target mesh before you enter the Mesh mode.

But, if you do not select any meshes in the Feature Tree or in the Model Tree when you enter the Mesh mode, the application will make a blank mesh and you cannot use any commands in the mode. If you have some created the other body entities such as surface body and solid body, you can use the Convert Body command only in the mode. To avoid this mistake, the other Mesh Tooltip, "Insert New Mesh", has been newly added. If your mouse cursor is closed over the Mesh mode to enter the mode without selecting any meshes, the Tooltip - "Insert New Mesh" - will be appeared.
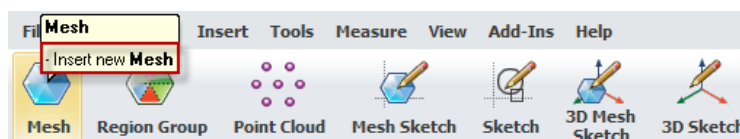
Texture Tools

(1) Import Texture

A limit on size of importable texture image has been removed. You can import a texture image no matter how big it is.

But in case of synthesizing multiple textures (e.g. merge, combine, etc), or whole regeneration of texture still has limits. The limits which was previously 2048, has been improved to 8192.

(2) Newly Added Copy Texture / Vertex Color

Copy Texture / Vertex Color command has been newly added as the one of Texture Tools.

If you have similar models and one of the models has texture or vertex color, you can copy the texture or vertex color from the reference model and paste it onto the other models.
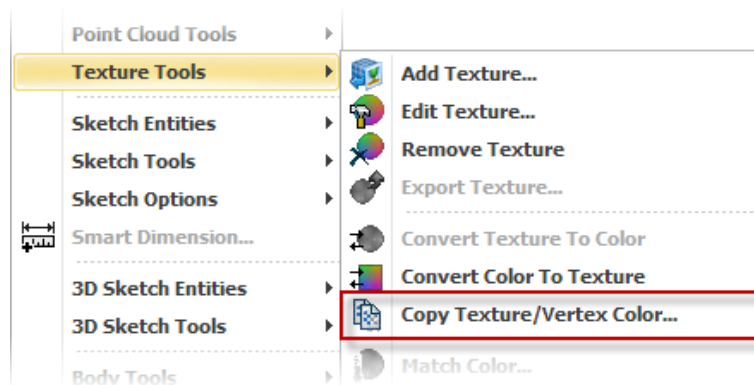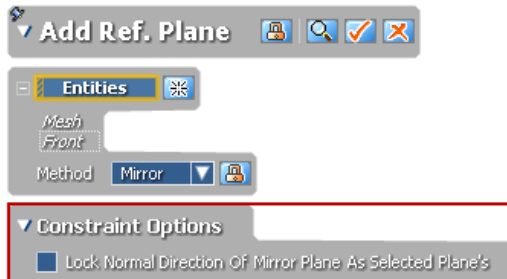

| < Before Texture Copy > | < After Texture Copy > |

Ref.Geometry

(1) Enhanced Ref.Plane

Constraint option has been newly added in the Mirror method.

Now, when you create a mirror plane, you can fix normal direction of mirror plane to that of the selected plane using this option.

(2) Added new method in Ref.Plane

A new method called as 'Extreme' has been newly added in the Ref.Plane.

Now, you can place Ref.Plane onto the extreme position of target entities along the defined direction.

(3) Added Axis Constraint Option in Ref.Vector
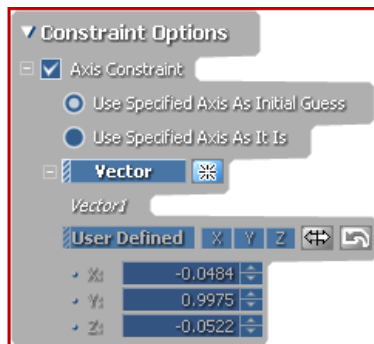
Constraint option has been newly added in Ref.Vector. When you create Ref.Vector by using Revolving or Extrusion method, you can set an axis constraint in the Constraint Options.

Sketch

2D Sketch

(1) Align Text

Now, Text sketches can be generated along the other sketches such as arc, partial ellipse, parabola, spline and fitted spline as well.

(2) Newly Added Pierce Constraint

Pierce Constraint has been newly added as one of the constraints.

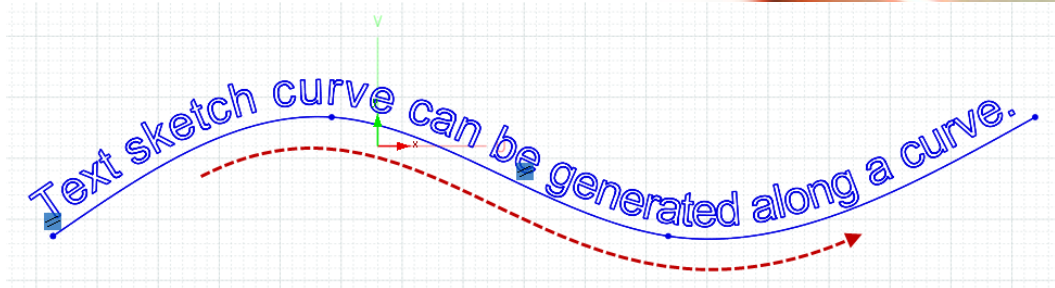Now, you can apply a constraint to a point or node points of 2D sketch on the intersection point between the pre-defined 3D sketch and the 2D sketch base plane.
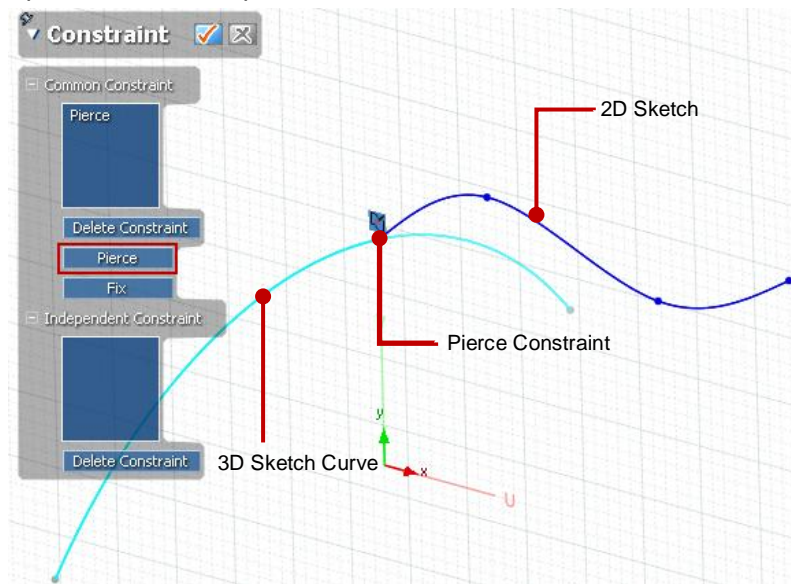
(3) Newly Added Slot Sketch

Slot Sketch has been newly added as one of the 2D Sketch Entities. You easily generate a slot sketch on the 2D sketch base plane by definition as well as by fitting on Section Polyline.
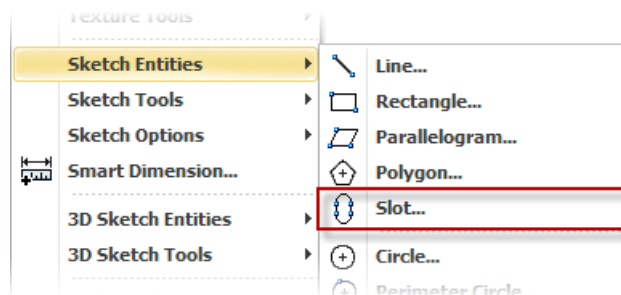
(4) Newly Added Evenly Spaced Points Option

Evenly Spaced Points option has been newly added in the Rebuild Splines Tool Palette and it can be used in 2D Sketch, Mesh Sketch mode.

It allows you to evenly rearrange the space of node points on the spline curve.

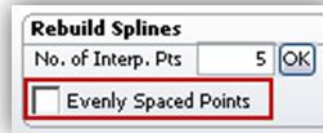**(5) Enhanced Sketch Fillet**

Add Dimension option has been newly added in Fillet command.

When you add a fillet in between sketch entities, you can easily toggle on / off to add radial dimension in the fillet command.

(6) Enhanced Convert Entities

Now, you can convert Ref.Vectors or edges of body which are orthogonal to the sketch base plane as a sketch point as well.

(7) Enhanced Sketch Setup

When the Mesh Sketch is set up with a point cloud, now, points which are within the silhouette range of defined base plane can be projected onto the sketch base plane and they will be used for sketching profile. You can design sketch entities both on the section polyline and on the projected points by snapping and fitting them.

You can also make them visible or invisible by using the 2D Section Point option in the Display Tab and you can also define its color information in the Preferences.

(8) Newly Added Spline Fitting Method

If Section Polyline had been separated into several segments, several separate spline sketches are created by fitting on those respective segments of the Section Polyline.

But now, a single smooth and continuous spline sketch can be generated even though the Section Polyline is separated into several segments.

3D Sketch

(1) Check Result in 3D Sketch Mode with Accuracy Analyzer™

Now, Accuracy Analyzer(TM) is performed in the 3D Sketch mode as well. You can easily check the deviation between 3D sketch curves and mesh with Accuracy Analyzer in the 3D Sketch mode.

(2) Newly Added Option in the Conical method
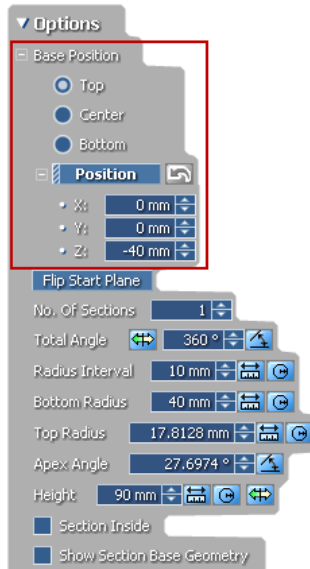
An option in which you can define the base position of a section cone, has been newly added in the Conical method in 3D Sketch Entities > Section command.

(3) Enhanced Fit From Points

Now, you can select edges of feature region and fit these edges to 3D sketch curves using Fit From Point command. This command can be used both in the 3D Mesh Sketch mode and the 3D Sketch mode. The fitted 3D sketch curves can be used for constructing 3D curve network on a mesh.
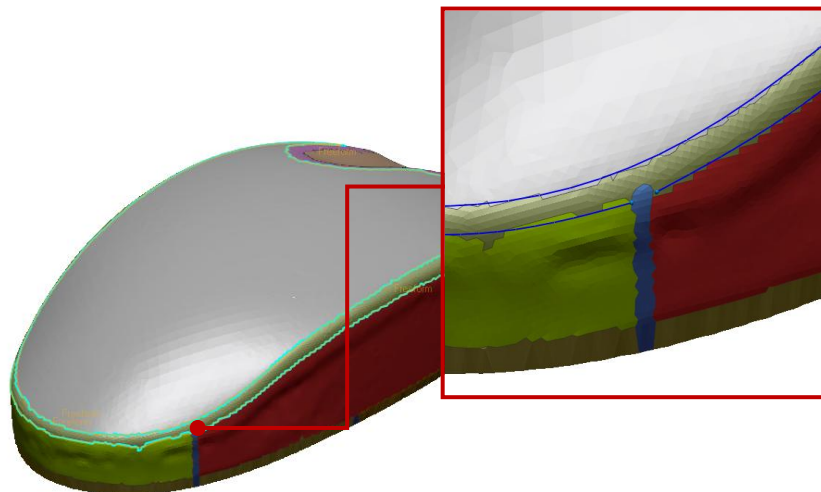
(4) Newly Added Boundary command in 3D Sketch mode

Boundary command was used in 3D Mesh Sketch mode only.

But now, you can use Boundary command in 3D Mesh Sketch mode as well as 3D Sketch mode.

Surface / Solid

(1) Attach Deviation Map to Mesh

After modeling solid / surface bodies from a mesh, now, you can attach the deviation result on a mesh which is a tessellated mesh from the modeled bodies.
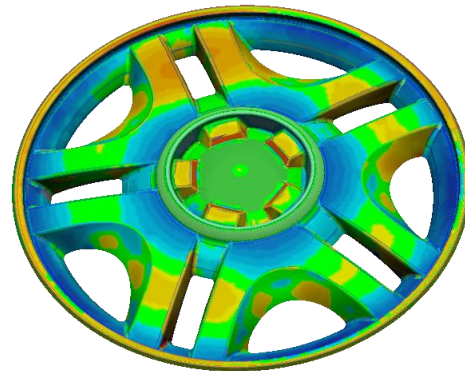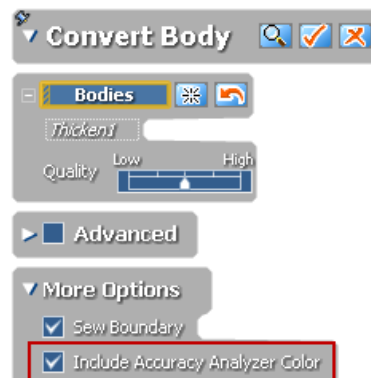
The converted mesh with deviation map can be used for RP (Rapid Prototyping) and analyzing the prototype model.

Note

Before you attach a deviation result onto the mesh, you need to check the deviation result with Accuracy Analyzer(TM). And then you can convert the modeled bodies into a tessellated mesh including the deviation color map in the Mesh mode.

The deviation color map also will be converted into a texture map on the mesh.

(2) Enhanced Loft Surface
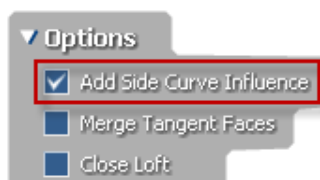
Add Side Curve Influence option has been newly added in the Loft Surface command as one of the options. When you create a loft surface body connecting the adjacent edges of bodies, you can set constraints to the start or end edge of loft surface as well as you can consider how the side edges of adjacent faces flow by using the Add Side Curve Influence option to get a better result.
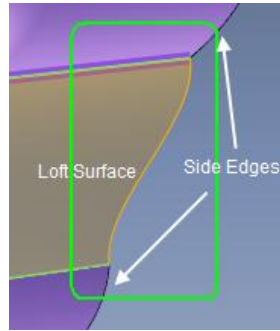
Without Side Curve Influence **With Side Curve Influence**

(3) Enhanced Transform Body

Now, you can interactively control the scale factor when you scale a surface/solid body up or down. And you can also apply transformation matrix file to the target surface/solid body.

(4) Changed Option Name in CAD Correct > Refit

The name of Projection Multiplier option in CAD Correct > Refit command has been changed to 'Compensation Factor' for clear explanation.

(5) Enhanced Variable Fillet Method
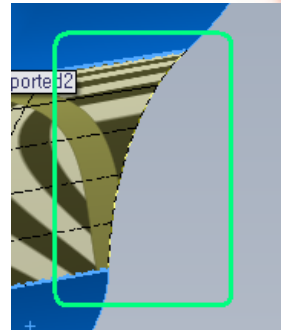
Previously, if you click the Estimate Radius From Mesh button when you apply variable fillet to a surface/solid body, only the estimated radius of the target filleting edge had been displayed on the Profile View. Now the Variable Fillet Method has been greatly enhanced. If you select several connected edges of the surface/solid body and then when you click the Estimate Radius From Mesh button, you can check the entire estimated radius about the selected edges on the Profile View at the same time. And you can also easily remove filleting node points using 'Delete' key.
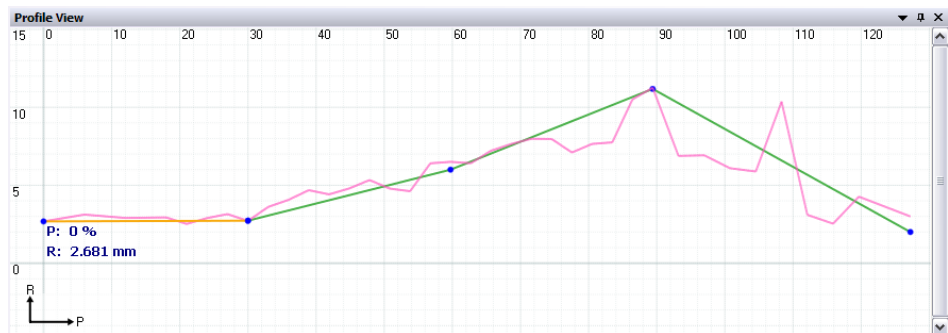
(6) Changed Option in Mesh Fit

With previous version, Mesh Fit command had an option called 'Create Single Surface'. It allows you to generate a single surface body from selected regions when you create fitting surface from a mesh. But you had to check the option whenever you want to create a single fitting surface body because the option is by default unchecked.

Now, it is checked by default.

(7) Enhanced Loft Wizard

Loft Wizard command has been highly enhanced. When you create a surface body by using Loft Wizard, now, all profiles which have same number of control points considering the target feature shape will be automatically generated and you can get a high quality surface body from the profiles.
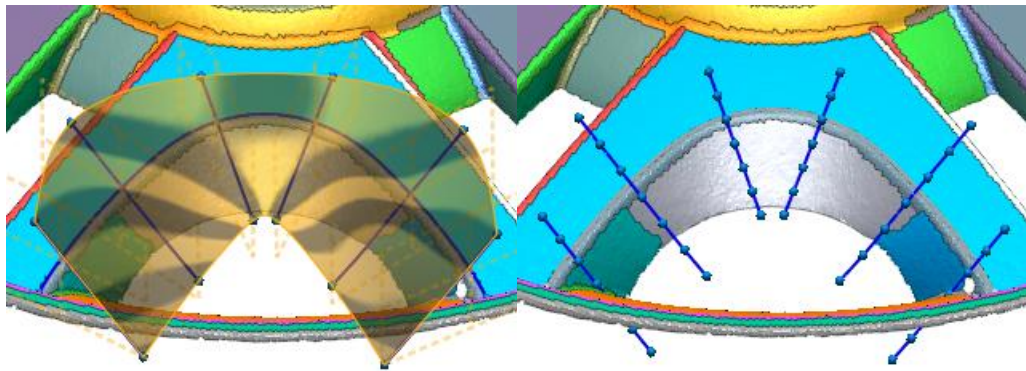
Measure

(1) Enhanced Measurement Annotations

Even though measurement is completely done, now, annotations of measured result will not disappear. You can check the measurement result whenever you want to see.

(2) Enhanced Distance Measurement

Along Faces option has been newly added in the Measure Distance command.

Now, you can measure linear distance between selected entities as well as distance along the faces.

Distance Along the Faces

Measurement1
Value 32.393

26.8211 mm

Linear Distance Between Point / Point

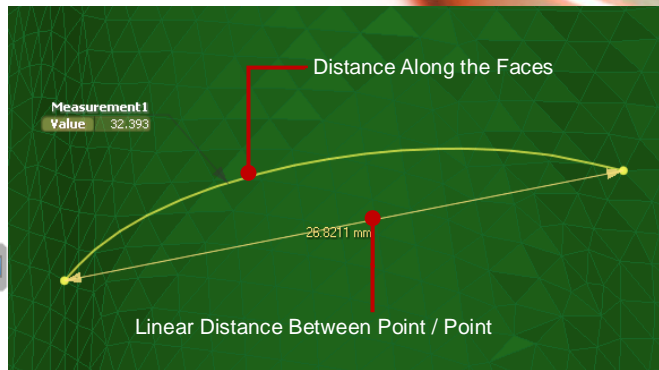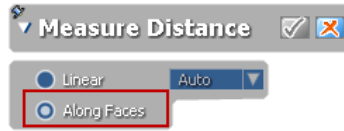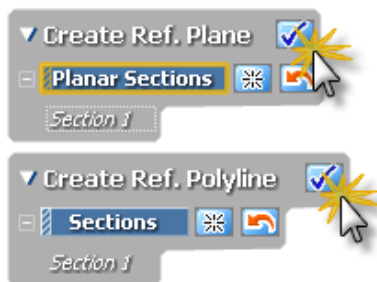**(3) Enhanced Section Measurement**

Now, you can directly create Ref.Polyline as well as Ref.Plane after you measure section profile by selecting the created section profiles.

Scanner Direct Control

(1) Newly Added Scan-To-Reference Alignment Method in liveScan™

Alignment method in which you can align scan data to reference body such as surface body or solid body by using geometric shape information or specific datums is newly added in the liveScan(TM).

(2) Newly Added Probe Method in liveScan™

New probe method which compensates probe radius using normal information of target surface body is added in the liveScan(TM).

(3) Newly Added Hot Key setting option in liveScan™

Hot Key setting option has been newly added in the liveScan(TM).

Now, you can set hot keys in the Scanner Options or the Probe Options.

Currently, this option is provided in the specific scanner devices as below.

1) [API] IntelliScan/IntelliProbe: scanning with 'B' button and probing with 'A, B, C' buttons.
2) [Leica] T-Scan: probing with 'A, B, C' buttons.
3) [Steinbichler] T-Scan: probing with 'A, B, C' buttons.

You can set Hot Keys for controlling the scan job
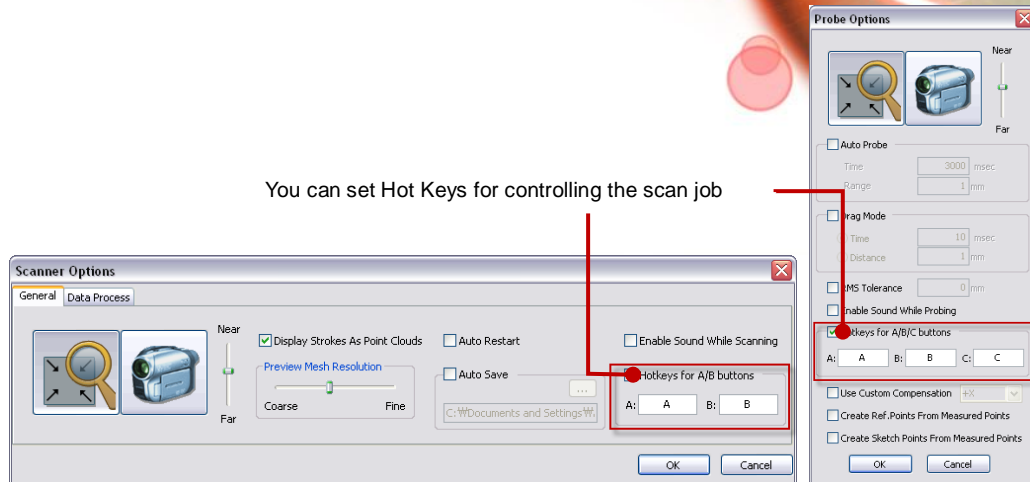
(4) Kreon Scanner Library

Now the Kreon liveScan drivers are no longer provided by Rapidform, but the "Rapidform plug-in Installer" can be obtained from Kreon.

View

(1) Enhanced View Clip

View Clip has been enhanced. If you have clipped the model, now you can make section profiles which are formed until the boundary of the clipped area of model.

You can use this functionality in Measure > Section, 3D Sketch Entities > Section, and Mesh Sketch Setup.
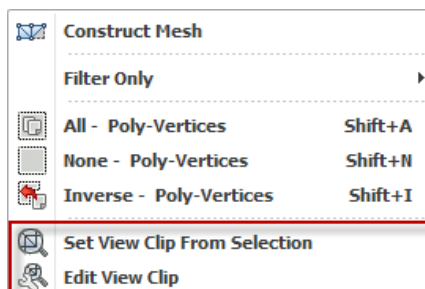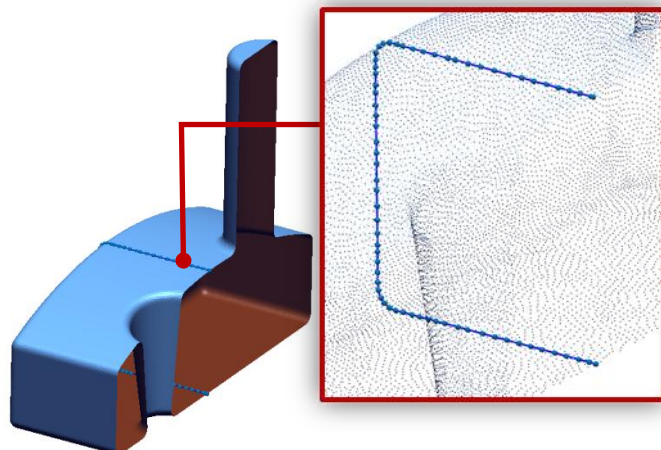
If you select poly-vertices from point cloud in Point Cloud mode, you can easily set view clipping range from the selected poly-vertices by choosing the Set View Clip From Selection option in the pop-up menu and you can also edit the defined view clip by choosing the Edit View Clip option.

Add-Ins

(1) Changed Operation Method

Now, Delete Poly-Faces allows you to delete poly-faces by Delete key as well.

(2) Newly Integrated and Moved Add-Ins

Some Add-Ins has been newly integrated and moved to Scan Tools.

> **Import Large Data:** Integrated to Insert > Import
>
> **Global Register:** Integrated to Scan Tools > Align Between Scan Data
>
> **2D Triangulate, 3D Triangulate:** Integrated to Scan Tools > Triangulate
>
> **Triangulate/Merge Large Data:** Integrated to Scan Tools > Triangulate, Merge
>
> **Surface Merge, Volume Merge:** Integrated to Scan Tools > Merge
>
> **Combine:** Moved to Scan Tools > Combine
>
> **Find Scan Direction:** Integrated to Scan Tools > Triangulate as one of the sub options.
>
> **Generate Vertex Normal, Reverse Normal:** Integrated to Scan Tools > Normal Information Manager

(3) Enhanced Register Target
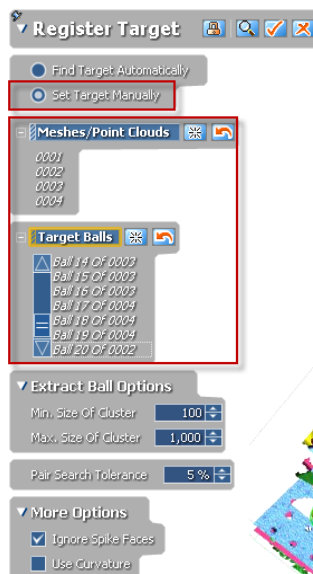
Set Target Manually option is newly added as one of the registration methods in the Register Target command.

If you have a set of scan data which is scanned with reference target balls, you can align a set of scan data by using automatic target ball detection method as well as you can align a set of scan data by manually selecting reference target balls.
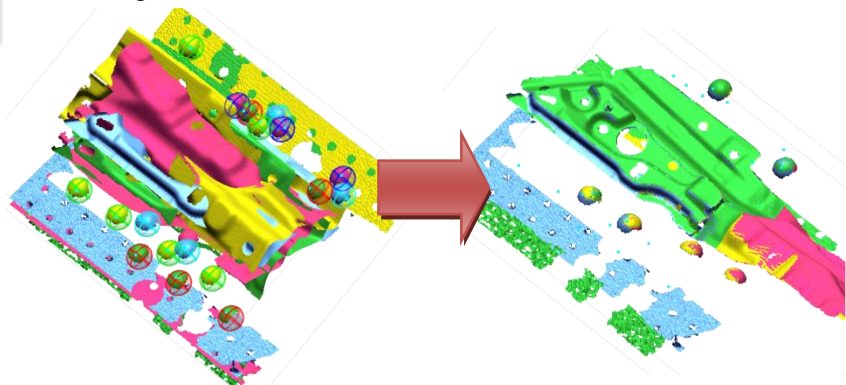
(4) IGES Point Importer
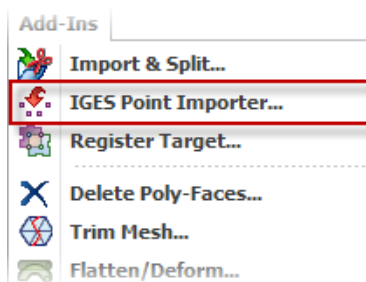
An add-in function that imports points from IGES files as point cloud has been newly added as one of Add-Ins. This add-in performs faster than the general import function in case of IGES points.

3. List of Fixed Bugs

General

1) Disappearing volume name in Property

If you clicked the **Calc.** button to measure entity's volume in the **Properties** panel, the volume name disappeared. This bug has now been fixed.

2) Unable to connect file accessing

When you imported a scan data and executed the **New** command to clear all data, the application still made a connection with the folder of previously imported file. Therefore you could not delete the folder and change its name. This bug has now been fixed.

3) Repair broken license

If the borrowed license was broken, **License Utility** could not repair it. This bug has now been fixed.

4) Floating license on Windows XP 64-bit

The floating license did not work on Windows XP 64-bit environment. This bug has now been fixed.

5) The Enter key on License Utility

If you press the **Enter** key to move to the next procedure in **License Utility**, it was terminated. This bug has now been fixed.

6) Registry Clean in License Utility

If you applied **Registry Clean**, all folders named with prefix "Rapidform" in the **My Document** were removed. This bug has now been fixed.

7) Multiple scan to CAD alignment

If there were multiple scan data and apply **Quick Alignment** with the **Run Best Fit Alignment** option, the selection for **Moving Mesh** was cleared. This bug has now been fixed.
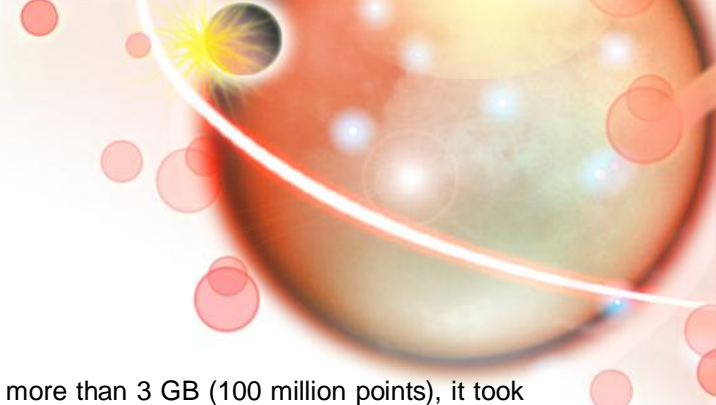
File I/O

1) Importing huge .fws and .fls files

If you tried huge .fws and .fls files that size is more than 3 GB (100 million points), it took long time or crashed. This bug has now been fixed.

2) Missed file formats from All Supported Files

The .ptx, .fls and .fws files were not seen on the **Import** dialog box when you choose **All Supported Files**. This bug has now been fixed.

Point Cloud

1) Decimation with color preservation

If a textured mesh was decimated, the texture quality was compromised. This bug has now been fixed.

Mesh

1) Mesh Buildup Wizard with texture

If you ran **Mesh Buildup Wizard** with textured scan data, the application was very slow and it might look freeze. This bug has now been fixed.

2) Mesh Buildup Wizard with wrong normal information in scan data

If scan data had wrong normal information and fixed with manual command during **Mesh Buildup Wizard** process, the result of registered mesh was slightly slipped. This bug has now been fixed.

3) Fill holes with textured mesh

If you tried filling holes with a textured mesh, it took much time. This bug has now been fixed.

4) Split a mesh without a plane

If you tried to split a mesh with the **By User Defined Plane** option but you clicked the **Next** button without selecting the plane, the application might crash. This bug has now been fixed.

5) Mesh quality from Mesh Buildup Wizard

The result mesh from **Mesh Buildup Wizard** generated more bad poly-faces than the previous version's result. This bug has now been fixed.

6) Boolean meshes

When you performed boolean operation with meshes that contain very short length poly-edges such as less than 0.01 mm, the application might crash. This bug has now been fixed.

Sketch

1) Split curve

If you selected multiple curves and tried to split curves, it incorrectly worked or might crash. This bug has now been fixed.

2) Section of 3D Sketch with the Conical method

If the base plane was perpendicular to the axis of the **Radial**, **Cylindrical** and **Conical** method in the **Section** command on 64-bit edition, the application might crash. This bug has now been fixed.

3) Afterimage in Mesh Sketch Setup

If you set a base plane and clear it in **Mesh Sketch Setup**, the afterimage of sectional poly-lines was shown. This bug has now been fixed.

4) Cylindrical and Conical sectioning

If you turned off the **Equal Spacing** option at **Radial** method and changed method to **Cylindrical** or **Conical**, the **Interval Angle** option was displayed and the **Total Angle** option was not displayed. This bug has now been fixed.

5) The wrong draft angle in Mesh Sketch Setup

Sometimes the draft angle was estimated to the negative direction in **Mesh Sketch Setup**. This bug has now been fixed.

6) Cannot copy and paste construction geometries

You could not copy and paste construction geometries to another sketch plane. This bug has now been fixed.

7) Unsavable settings in Spline

The parameters under **Fit Spline** in the **Spline** command were not preserved. This bug has now been fixed.

8) Preview of 3D curve

If the offset value is 0 while generating a 3D curve from a mesh boundary, the preview curve changed whenever you checked on and off the **Offset** option. This bug has now been fixed.

9) Merge curves

The result shape of the **Merge** command was different as your selection order of curves. This bug has now been fixed.

Ref. Geometry

1) Ref. Plan on the curve node

If you used the **Definition** method when creating a perpendicular ref. plane to a curve, it was not created on the node point of the curve. This bug has now been fixed.

2) Revolution axis from tessellated CAD

The application could not find the revolution axis from the perfectly symmetry mesh such as the tessellated mesh from CAD. This bug has now been fixed.

Solid / Surface / Feature

1) Region selection in Mesh Fit

Sometimes you could not select multiple regions during **Mesh Fit**. This bug has now been fixed.

2) Selection problem in Surface Loft

If you turned off **Preview** and tried to select multiple edges to make a composite curve under **Surface Loft** command, some edges were not selected. This bug has now been fixed.

3) Mesh Fit on complex boundaries

Sometimes **Mesh Fit** surfaces were not generated especially on complex mesh boundaries. This bug has now been fixed.

liveTransfer™

1) liveTransfer to Pro/E problem with multi-byte character set entities

If entities are named with multi-byte character set (MBCS) or some symbols, they were not transferred to Pro/E. This bug has now been fixed.

2) Extrude to the same surfaces in both directions

If a single surface is used for the **Up To Surface** option in **Extrude** with the **Both Direction** option, it made an error when you exported it using **liveTransfer To SolidWorks**. Now it is sent as a dummy entity.

3) Wrong error message in Error List

If you extruded a sketch with the **Blind** and **Draft** option, a wrong error message appeared regardless of the **Blind** option while you check **CAD compatibility** to **Pro/E Wildfire** in the **Error List** panel. This bug has now been fixed.

4) Loading UGS NX

If your system used multi-byte character set account name, **liveTransfer** could not start **UGS NX**. This bug has now been fixed.

5) liveTransfer a sketch to SolidWorks

After **liveTransfer** to **SolidWorks**, sketch entities might be located at a wrong position and be flipped. This bug has now been fixed.

Scanner Direct Control

1) Texture problem with Konica Minolta data

When scanning data created by using **VIVID Direct Control** or importing .vvd format in the **Konica Minolta VIVID** panel, the texture image was slightly offset from its original position. This bug has now been fixed.

2) Unable to save/Import raw data file

The application could not import or export raw data when the file path includes multi-byte character set under the **liveScan** command. This bug has now been fixed.

3) Unable to connect Kreon device

It was not able to connect Kreon device in the liveScan command. This bug has now been fixed.