

# DELMIA Version 5 Release 21

## Product Enhancement Overview

This document lists both new and enhanced product functionality for the current release.

### Process & Resource Detailing

- DPM Process and Resource Definition
- Manufacturing System Definition
- DPM Structure Lofting
- Structure Manufacturing Preparation
- DPM Assembly Process Planner
- DPM Fastening Process Planner
- DPM Assembly Process Simulation
- 3D Functional Tolerancing & Annotation
- DPM Machining Process Planner
- Electrical Harness Simulation
- Machining Tolerancing Assistant
- Assembly Design
- Part Design
- Sketcher
- Real Time Rendering
- Wireframe and Surface
- NC Machine Tool Builder
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- Realistic Robot Simulation
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## DPM Process and Resource Definition

### Enhanced Functionalities

#### Displaying Selected Action and Modification Statement in DPM Title Bar

You can display the name of selected action and modification statement in the DPM title bar. When there is a change in the action and mod statement during re-load of project; then corresponding name gets updated in the title bar. This helps to see the current action and modification statement names without any additional action in the title bar of loaded project.

#### Simulation Positions in the Manufacturing Context

You can load the manufacturing context and get the products/resources loaded in the last assembled positions. This allows to see the current state of the assembly before that particular process. The 3D States and Positions are also supported in the Manufacturing Context.

#### Enhancements in DPM Search Dialog Box

You can show/hide selected attributes and search by specifying advanced search criteria in the `Search Criteria` dialog box. The ability to see only the needed search attributes helps to save the time as no need to scroll and sort through the non-needed search attributes.

#### Insert TSAs under Resource without behavior

You can now use the `Insert template` command to insert TSAs under resource if it does not already have behavior under it. You can also specify the number of TSAs to be inserted in the **Quantity of Objects**. This helps to make changes to process and resource planning on the fly without reloading the project or closing the `Insert template` command.

## Manufacturing System Definition

No new enhancements this release.

## DPM Structure Lofting

### Enhanced Functionality

#### **Adding to the attachment line catalog**

You can modify the attachment line catalog to include information about the profile types of intersecting faces that do not belong to the predefined profile types.

## Structure Manufacturing Preparation

### Enhanced Functionality

#### **Adding to the attachment line catalog**

You can modify the attachment line catalog to include information about the profile types of intersecting faces that do not belong to the predefined profile types.

## DPM Assembly Process Planner

### Customizing Settings

#### Commands

You can now modify the `AST Editor` settings so that you can choose to have the part name appear under its instance name, instead of the name used in the PPR tree.

## DPM Fastening Process Planner

### Customizing Settings

#### **Command: Load sort index for feature part relations**

This option enables you to load the indexing order defined on the fastener part relation.

## DPM Assembly Process Simulation

### New Functionality

#### **Section Visibility**

This is aimed at providing such capabilities for you so that the inner assemblies can be better illustrated during assembly simulation.

### Enhanced Functionality

#### **Capturing Activation through Annotation Activity**

Earlier, there was no method to activate the FTA Capture during simulation. You had to manually use Display Capture command to activate the FTA Capture. Since FTA Capture provides lots of flexibility in terms of various views (Section views / Camera positions/ FTA information), it will be beneficial if FTA Capture can be automatically activated during simulation. Then exporting this simulation into 3D XML format and use it to play the simulation in LSF-3D Live.

## 3D Functional Tolerancing & Annotation

### New Functionality

#### Dimensioning and Tolerancing Pattern of Non Cylindrical Holes

You can now create semantic annotations on pattern of non cylindrical holes.

#### Interrupting Extension Lines

You can now interrupt one or two extension lines of several dimensions, and also remove these interruptions.

### Enhanced Functionality

#### Importing an Annotation Set

You can now import and **merge** annotation features from another CATPart.

#### About Welding Symbols

You can now specify a **scarf**, a **stud**, an **edge** and a **melt thru** weld symbol in AWS 2.4 standard and an **edge**, a **surface joint** and an **inclined joint** weld symbol in ISO 2553 or JIS Z3021 standard.

#### Annotation Manipulators

You can now customize the display of manipulators for annotations, whether it is for annotation selection or text edition.

#### Engineering Symbols

As per new revision of the ISO standard related to Geometrical Product Specification - Dimensional Tolerancing (14405-1), you can now have some new engineering symbols, to provide a standardized display and print.

You can also have some new **application zone symbols** **All Around**, **All Over** and **All About** to support ISO 10135.

#### Creating Threads using Thread Representation or Constructed Geometry Creation

You can now have CG thread representation as per Drafting standard, i.e. using collection of circles or collection of circular arcs depending on the value of the dedicated parameter defined in the selected drafting standard.

#### Reconnecting the Broken Links

You can now automatically start and validate the broken links reconnection using the `Geometry Connection Management` command, thus minimizing user interactions.

### Customizing Settings

#### Tools > Options > Mechanical Design > Functional Tolerancing & Annotation > Manipulators tab > Annotation Manipulators

The new `Annotation Manipulators` options allow you to customize the display of manipulators, whether it is for annotation selection or text edition.

#### Tools > Options > Mechanical Design > Functional Tolerancing & Annotation > Annotation tab > Geometry Connection Management

The new `Automatically propose reconnection of broken links` option allows you to define whether the reconnection of broken links is to be proposed automatically or not.

## DPM Machining Process Planner

No enhancements in this release.

## Electrical Harness Simulation

No enhancements in this release.

## Machining Tolerancing Assistant

No enhancements in this release.

## Assembly Design

No enhancements in this release.

## Part Design

No enhancements in this release.

## Sketcher

No enhancements in this release.

## Real Time Rendering

No enhancements in this release.

## Wireframe and Surface

### Enhanced Functionality

#### **Defining an Axis System**

It is now possible to have an associativity between the default computed inputs and user-defined inputs.

#### **Selecting Using Multi-Output**

You can now delete one or more elements in one instance while selecting using multi-output.

#### **Replacing Elements**

A new button enables you to cancel the inversion of the locally inverted feature.

#### **Creating Fill Surfaces**

The `Canonical portion detection` check box allows you to compute canonical portions.

#### **Creating the Nearest or the Farthest Entity of a Multiple Element**

You can now create the entity that is far from the reference surface.

## NC Machine Tool Builder

**No enhancements in this release.**

## Tool Selection Assistant

No enhancements in this release.

## DPM Review

### New Functionality

#### **Process Scene has been added**

This command enables you to see thumbnails depicting the process at the time an annotation review activity has been created.

## PPR Navigator

No new enhancements this release.

## Part Design Feature Recognition

No enhancements in this release.

# Generative Shape Design & Optimizer

## New Functionality

### Creating a Contour

This new functionality lets you create a contour.

### Simplifying Surfaces

This new functionality lets you simplify the topology of surface.

## Enhanced Functionality

### Creating Multi-Sections Surfaces

You can now define curvature continuity with section supports or guide supports.

A multi-section surface can be created with the **guide curves intersecting at extremity**.

### Creating Offset Surfaces

The new `Regularization` option enables you to regularize the offset surface locally.

### Creating Swept Surfaces

The new `Compute C0 vertices as twisted areas` check box enables you to fill the C0 vertices areas.

### Defining an Axis System

It is now possible to have an associativity between the default computed inputs and user-defined inputs.

### Selecting Using Multi-Output

You can now delete one or more elements in one instance while selecting using multi-output.

### Global Deformation on Wires

You can now select curves as an element to deform in the **Bump**, **Shape Morphing**, **Wrap Curve** and **Wrap Surface** commands.

### Splitting Geometry

The new `Approximation` tab enables you to control the quality of the result of the `Split` through several parameters and modes.

### Replacing Elements

A new button enables you to cancel the inversion of the locally inverted feature.

### Creating Fill Surfaces

The `Canonical portion detection` check box allows you to compute canonical portions.

### Creating the Nearest or the Farthest Entity of a Multiple Element

You can now create the entity that is far from the reference surface.

### Creating a Hole

The new `Axis Computation` option enables you to automatically create axis and direction lines passing through the center of the hole.

### Creating a Hole Curve

The new `Axis Computation` option enables you to automatically create an axis and direction lines passing through the center of the hole curve.

### Creating Multi-Sections Volumes

You can now define curvature continuity with section supports or guide supports.

A multi-section surface can be created with **the guide curves intersecting at extremity**.



## Workcell Sequencing

### New Functionality

#### **Sequencing Tasks**

Automatically create Process Activities for Robot/Device Tasks, as well as assign the Robot/Device and set the Active Task link.

## Device Task Definition

### New Functionality

#### **Editing the mount offset**

Double-clicking on a mounted tool displays the Set Tool dialog box and snaps the compass to the tool base. The compass can then be used to change the offset between the mount plate and the tool device base.

## Arc Welding

### New Functionality

#### **Modifying Tags and Tag Groups Generated via AMP**

You can modify the position and orientation of ARC tags that have been generated via the AMP toolkit.

## Realistic Robot Simulation

New Functionality

Enhanced Functionalities

## Realistic Robot Simulation II

New Functionality

Enhanced Functionality

## Production System Analysis

No enhancements in this release.

## Robotics OLP

**No enhancements in this release.**

## Device Building

### New Functionality

#### **Controller Synchronization**

Controller synchronization allows you to to synchronize a controller profile instance with the reference. Data can be imported from the reference, as well as propagated from the instance down to the reference.

### Enhanced Functionality

## Equipment Arrangement

**No enhancements in this release.**

## Resource Layout

### New Functionality

#### **MrI CATSettings**

This will provide users to automatically generate a report of actual status of CATSettings in use. You will be able to easily find the difference between different versions of CATSettings. See: Installation and Deployment Guide/Common Installation and Administration Tools / Managing Settings / Importing and Exporting Setting Files to/from XML Format.

### Enhanced Functionality

#### **Customizing option for Newly Created Attachments**

The second option, Newly created attachments in the Attachment display options is never used in the product. Hence it is being deprecated.

## Plant Layout

**No enhancements in this release.**

## Electrical 3D Design and Documentation

No enhancements in this release.

## DMU Navigator

No enhancements in this release.

## DMU Dimensioning & Tolerancing Review

No enhancements in this release.

## DMU Space Analysis

No enhancements in this release.

## DMU Optimizer

No enhancements in this release.

## DMU Fastening Review

No enhancements in this release.

## DMU Composites Review

### New Functionalities

#### **Interactive Ply Table**

Lets you visualize plies interactively

### Enhanced Functionalities

#### **Commands**

They have been grouped into a single menu and a single toolbar.

## DMU Kinematics Simulator

This section identifies what new or improved capabilities have been documented in the Version 5 Release 21 of DMU Kinematics Simulator User's Guide.

### Enhanced Functionalities

## Human Builder

### New Functionality

#### **XML Settings for VOA**

This describes the functionalities for XML Settings for VOA.

### Enhanced Functionality

#### **Defining the Occupant Posture Prediction Dialog box**

The Method section of the Occupant Posture Prediction Definition dialog box has been enhanced to reflect postures according to the J4004 reference.

## Human Activity Analysis

**No enhancements in this release.**

## Human Posture Analysis

No enhancements in this release.

## Human Measurements Editor

No enhancements in this release.

## Human Task Simulation

No enhancements in this release.

## NC Manufacturing Infrastructure

### New Functionalities

#### ROTABL Output for Machine Instruction

The `Output Axes Moves Only` check box in the `Machine Editor` dialog box helps to generate APT output with some user-defined word in X,Y,Z,I,J,K axis mode without the CATIA0 matrix.

#### Remove Coincidental Point between Machining Operations

The `Remove coincidental point between operations` check box is available in **Tool motions** tab of `Generate NC output interactively` dialog box. This check box helps to output the coincidental points even if the end point of a machining operation and start point of the subsequent machining operation are exactly the same.

### Enhanced Functionalities

#### Extend Last Selected Edge Command in EdgeSelection Tool bar

You can add an extra element to the last selected edge through the `Extend Last Selected Edge` command in the `Edge Selection` tool bar. The extension can be controlled by a given distance or by a limiting element.

#### NC Macros

- For the **Ramping up to plane** macro, the slope no longer goes down when the tool path does, thus preventing plunges into the material.
- For **HSM macros**, a new parameter lets you control the Arc Angle value.

### Customizing Settings

#### Lathe deviation (%) stock radius

You can manage the video lathe simulation accuracy through this setting, depending on the size of part.

#### Display Color for Spindle Rotation Arrow and Arrow Head

You can set the display color for the spindle rotation arrow and arrow head.

#### Compute Tool Path

Select this check box to manage disable invalid Machining Operations and continue till the end of the Machining Operations list versus stop at first error when computing a tool path.

## NC Manufacturing Review

No enhancements in this release.

## NC Manufacturing Verification

No enhancements in this release.

## Prismatic Machining Preparation Assistant

### New Functionalities

#### **Create Machinable Axial Feature from Technological Results**

A new option has been added in the `Global Feature Recognition` dialog box to create Machinable Axial Feature from the Technological Results information. It strengthens the integration between design and machining by a direct use of Technological Results (including user parameters). The former geometrical recognition of features still exists and could be used on imported models where Technological Results are not defined. A new filter: `only for existing tech.Results`/`only for non existing tech.Results` eases the hole selection for hybrid models.

#### **Add PP Word in Machining Patterns and Axial Operations**

You can insert and display PP Word instructions before any hole in the Machining Pattern and Axial Machining Operations.

# Prismatic Machining

## New Functionalities

### Add PP Word in Machining Patterns and Axial Operations

You can insert and display PP Word instructions before any hole in the Machining Pattern and Axial Machining Operations.

## Enhanced Functionalities

### Pocketing Machining Operations

Three new strategies Concentric, Inward Spiral Morphing, and Outward Spiral Morphing are added in the Tool Path Style.

These strategies are dedicated to the hard material milling and ensure:

- 1) a constant amount of material removal and load on the tool for Concentric strategy
- 2) a continuous cutting motion without retract and maximum stepover to control the load on the tool for Spiral Morphing.

### Profile Contouring Operation

The following enhancements increase automation and productivity:

- 1) **Control of the side to machine:** instead of relying on the orientation of the first curve, you can select a 3D point to indicate the material side without ambiguity.
- 2) **Improved Processing of Join in Profile Contouring:** Chain curves form a join in contiguous sets and process each set as a guide contour.
- 3) Control of the Tool Axis Motion in Profile Contouring: A parameter **Smoothing tool path along Tool Axis (%)** is added in the Stepover tab to smooth the tool path and avoid motions along the tool axis direction.
- 4) **Support of Multiple Contours:** No need to split the Profile Contouring operation into several operations.

### Improved Collision Check and Collision Avoidance

Ability to include the Part from Part Operation in the collision check performed on macro for the following Machining Operations: **Profile Contouring, Groove Milling, Pocketing, Facing, Curve Following, 4x Pocketing and Trochoid Milling** Machining Operations. The Part from Part Operation check box is added in the Collision Checking dialog box and the Collision Checking button is added where needed in the Geometry tab.

### Improved Intermediate Stock Management in Axial Machining Operations

- A **Drill through stock upto bottom** check box is added in the Geometry tab. This helps to perform the axial operation start from top of the stock up to bottom of the stock in case of Through hole .
- A **Spot drill to part** check box is added in the Geometry tab of the Spot Drilling Machining Operation. It allows the drilling from the intermediate stock up to the part (and ensures the spot-drilling depth/diameter on the part)

### Prismatic Roughing

When the tool is in contact with a revolution surface, you can choose to generate an arc interpolation output.

## Lathe Machining

### New Functionalities

#### **Start Limit Mode and Offset Support in Rough Turning Machining Operation**

Start element selection is provided in Geometry tab to limit input stock in Rough Turning Machining Operation.

## NC Machine Tool Simulation

No enhancements in this release.

## 3 Axis Surface Machining

### Enhanced Functionalities

#### **Roughing**

When the tool is in contact with a revolution surface, you can choose to generate an arc interpolation output.

#### **Rework Area**

A new option let you detects bitangency areas between Part and Check Elements

#### **Sweep Roughing, Sweeping, 4-Axis Curve Sweeping, Pencil, Contour-driven, Spiral Milling**

The slope in the **Ramping up to plane** macro is no longer allowed to go down when the tool path does, thus preventing plunges into the material.

#### **Sweeping, 4-Axis Curve Sweeping, Pencil, Contour-driven, Spiral Milling**

You can control the Transition angle value in **HSM macros**.

#### **Multi-points Probing Machining Operation**

Probe along the **normal to the part** for each point is now possible.

#### **All Probing Operations**

You can now:

Customize the **NC\_PROBING\_CYCLE\_OFF** for each probing operation.

Set **different values** for each point for a user parameter.

Define the **Compensation** for APT generation.

## Multi-Axis Surface Machining

### Enhanced Functionalities

#### **Multi-Axis Spiral Milling**

The slope in the **Ramping up to plane** macro is no longer allowed to go down when the tool path does, thus preventing plunges into the material.

You can control the Transition angle value in **HSM macros**.

## Common Functionalities

### Enhanced Functionalities

#### **Define Spindle Way of Rotation during Replay and Simulation**

You can get information on spindle associated with a machining operation by placing pointer on machining operation node in PPR tree or on bar (associated to machining operation) in Gantt chart. The Spindle contextual menu helps to activate or deactivate the display of spindle rotation arrow. This helps to give a quick understanding of the spindle rotation.

## Interactive Drafting

### Enhanced Functionality

#### Creating a Welding Symbol

You can now specify a **scarf**, a **stud**, an **edge** and a **melt thru**weld symbol in AWS A2.4 standard and an **edge**, a **surface joint** and an **inclined joint** weld symbol in ISO 2553 standard or JIS Z3021.

#### Annotation Manipulators

You can now customize the display of manipulators for annotations, whether it is for annotation selection or text edition.

#### Engineering Symbols

As per new revision of the ISO standard related to Geometrical Product Specification - Dimensional Tolerancing (14405-1), you can now have some new engineering symbols, to provide a standardized display and print in any application.

You can also have some new **application zone symbols All Around, All About** and **All Over** to support ISO 10135.

#### Zoomable High Resolution Preview in Catalog Browser

You can now identify smaller details within a large and complex 2D component by zooming on its high resolution preview.

### Customizing Settings

#### Tools > Options > Mechanical Design > Drafting > Manipulators tab > Annotation Manipulators

The new `Annotation Manipulators` options allow you to customize the display of manipulators, whether it is for annotation selection or text edition.

## Generative Drafting

### New Functionality

#### **Reduction of Required View Update Cycles after 3D Graphic Attribute Changes**

You can now avoid updating a view which is not impacted by a show/no-show modification done in the 3D. This improves productivity.

### Enhanced Functionality

#### **Fillet Symbolic Representation Enhancements**

You can now avoid extraneous fillet representation which overlaps with the actual geometry edge, thus enabling you to create associative dimensions on views.

## DPM Work Instructions

No enhancements in this release.

## Shop Order Release

### New Functionality

#### **E5 Shop Order Release for SMG Generation**

This provides an executable (DELE5SOR.exe) as part of “E5-Shop Order Release (ESR)” product. DELE5SOR.exe can be invoked in batch for generation of PPR & WKC data for a job.

#### **Delivery of On-The-Fly Context**

This allows Shop Floor workers to see the same 3D visualization and mark-ups/measurements/annotations as the Planner sees during authoring in WKC.

#### **JobXML Generation based on User-specified XML Schema**

##### **Guidelines in creating JOBXML Specifications**

This is aimed at generating JobXML based on a user-specification in form of a XML Schema. The specified XML schema will be based on the E5-PlanType set. This kind of implementation for JobXML is expected to improve deployment of the JobXML functionality by eliminating the burden of having to write CATScripts.

## DPM Shop Floor Viewer

No enhancements in this release.

## CSM Module & Block Editor

### Enhanced Functionalities

#### **Partial Import**

Some data can be added to a block using the **partial import**.

#### **Ergonomics Improvements**

New icon in the Product tree for the Internal Logic, Control Logic and Runtime view

The user can sort names and types by alphanumerical order in the dialog box

The user can add comments in the different editors (the comment are represented by a kind of post-it).

## HMI Control Panel Design

### New Functionalities

#### **Save and Restore Panel State**

During a simulation, the user can save and restore the state of the panel by controlling the inputs SaveValues and ReadValues.

The new function `Edit Saved Values` allows the user to edit the state of the panel and to modify it if necessary.

Refer to **Editing Saved Values**

### Enhanced Functionalities

#### **"Display" gadget in write/read mode**

Until now, the gadget "Display" displayed values of the input signal. Now, the user can enter the value in the gadget field during the simulation.

Refer to **Inserting a Display Value**

## CLM Device Logic Design

### Enhanced Functionalities

#### Automatic Internal Logic Generation

A new command allows the user to generate automatically the code of the internal logic that manages Device Tasks, Robot Tasks and Robotic IO's.

Refer to **Generating Internal Logic Automatically**.

#### New Commands Replacing the External Functions

The 3D interaction functions in the SmartDeviceLib library are now replaced by commands. It is no longer necessary to enter the name of the function and its parameters in an SFC action.

Refer to:

**Piloting a Device Task**

**Getting and Setting the Joints of a Device**

**Moving a Device to a Home Position**

**Setting a Device Color**

**Tracking the Click on a Device**

**Selecting a Home Position**

**Getting and Setting TCP values**

**Reading and Writing Robotic IO's**

**Defining a Device Motion from the DOF Values**

#### Partial Import

Ports, instances, signals, connections and SFC behaviors can be updated/added to an existing block using the command `Partial Import`. Refer to **Using Partial Import**.

#### New Management of the Resource Sensors

In order to ease the management of the data returned by the sensors, the behavior of the signals `Detected` and `Value` has been changed. Refer to **Creating a Resource Sensor**.

## CLM SFC Editor

### Enhanced Functionalities

#### **Usability Improvement**

The user can add comments in the SFC+ and Block editors (the comments are represented by a kind of post-it).

## CLM FBD Editor

### Enhanced Functionalities

#### **Usability Improvement**

The user can add comments in the FBD editor (the comment are represented by a kind of post-it).

## CLM Ladder Logic Editor

### Enhanced Functionalities

#### **Usability Improvement**

The user can add comments in the Ladder editor (the comment are represented by a kind of post-it).

## CSM Device Control Connection

### New Functionality

Mitsubishi EZsocket Gateway

This new functionality allows DELMIA Automation virtual cells to be connected to MELSEC controllers and simulators directly through the EZsocket layer.

## Installation and Deployment

### New Functionality

#### **New Licensing Middleware**

Dassault Systèmes License Server (DSLS) is introduced as the new default Licensing middleware in addition to License Use Management (IBM LUM).

#### **Supporting Platforms on Vault Server**

Vault (64-bit) is supported on Windows (64-bit) and AIX (64-bit) platforms.

#### **Supporting Windows Server 2008**

ENOVIA V5 Server (32-bit) installation is also supported on Windows Server 2008 SP2 / R2 (64-bit).

#### **Supporting DB 2 9.7**

DB 2 9.7 is also supported by Vault and Windows Server.

### Enhanced Functionality

There are no enhancements in R21.

## Infrastructure

### Enhanced Functionality

#### Customizing

##### Document

A new option lets you load a file even if you are not authorized to access some of its sub-documents.

## Product Structure

### Enhanced Functionality

#### **Defining Contextual Links**

You can **reroute** broken unpublished external references using the `Reroute` button.

## Data Exchange Interfaces

### New Functionalities

#### IGES 2D Import

IGES 2D files can be imported directly into 2D Layout for 3D Design via `Tools > Import from File`.

### Enhanced Functionalities

#### STEP

Infinite Planes are now **imported** and **exported**.

#### DXF Import

DXf tolerances are now imported as semantic geometrical tolerances.

### Customizing Settings

#### STEP

**AP214 edition 3** is now supported.

**User Defined Attributes** are now imported and exported.

#### DXF

The new option `Map DXF Layers with 2D Layout for 3D Design Sheets` maps geometries and annotations with 2D Layout for 3D Design sheets, from the number of the layer the geometries and annotations belong to, if any.

## Component Catalog Editor

No enhanced functionalities in this release

## Product Knowledge Template

No enhancements in this release.

## 3d Simulation for Manufacturing

No enhancements in this release.