cadence®

Publish for Manufacturing User Guide

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Cadence Design Systems, Inc. (Cadence), 2655 Seely Ave., San Jose, CA 95134, USA.

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Publish for Manufacturing

Using the Publish for Manufacturing (PFM) application, you can:

- Configure the required outputs and product structure per your release process within a PFM template.
- Create a Manufacturing Data Set that includes the ECAD Bill of Materials (BOM) and source and derived files based on that PFM template.
- Publish data to your Product Lifecycle Management (PLM) system for product manufacturing.

Publish for Manufacturing is supported within the OrCAD X and Allegro X Pulse environments. In the OrCAD X environment, configuration and publish operations are performed by the individual user. In the Pulse environment, there are two sets of users who work with Publish for Manufacturing:

- Administrators who configure Publish for Manufacturing – This user must be defined as an Administrator or Design Administrator in the *Pulse User Management* module. The configuration defined by the administrator resides on the Pulse server.
- Designers - Each user running Publish for Manufacturing uses the administrator-defined configuration to publish data to the PLM system, thereby delivering consistency.

  Publish for Manufacturing also provides designers with real-time version and lifecycle feedback for objects previously published to or residing in the PLM system, such as component parts, assemblies, bare boards, and documents.

Publish for Manufacturing is used by the following schematic authoring applications:

- Allegro X System Capture in the Pulse environment
- Allegro Design Entry HDL in the Pulse environment
- Capture CIS in the OrCAD X environment

Publish for Manufacturing Prerequisites

For any integration of Cadence applications with a PLM system, you need the following:

- A supported PLM system at or above the minimum version.
- Every schematic must be fully and accurately annotated with your organization's component part numbers.
- Part numbers controlled by the PLM system and synchronized with the ECAD library. The ECAD library is not the master of this data. For environments with supported PLM connectors, part numbers can be synchronized with the ECAD library using the Cadence Library Synchronization service. In the Pulse environment, the Allegro X EDM Data Exchange utility can be used to create or update Cadence library parts based on PLM parts.
- Product part objects, such as the assembly and bare board, must be created in the PLM system before data can be published.
- For OrCAD X, the Cadence installation must be at the 22.10.005 release level or greater. Integration with Publish for Manufacturing is only supported with the OrCAD X Professional Capture product.

PLM Versions Support Matrix for Pulse

Windchill	Teamcenter	Agile	3DExperience
12.x.x minimum	11.4 (Minimum	9.3.5 (minimum)	22xFD04 (Minimum)

PLM Support Matrix for OrCAD X

The following PLM applications are supported with respect to publishing BOM and derived data from OrCAD X to the PLM system.

PLM Vendor	PLM Tool	PLM Version (Minimum)
Dassault Systèmes	3DEXPERIENCE- CLOUD	23x BASE

Related Topics

- Publish for Manufacturing Configuration
- Publishing ECAD Data in Pulse Environment
- Configuring Publish Templates
- Appendix

2

Publish for Manufacturing Configuration

The product structure in Publish for Manufacturing (PFM) must first be configured before it can be used to publish design content to the PLM system. This typically only needs to be done once.

If you are currently publishing ECAD data to your PLM system, the product structure can be used as a guide to define your PFM configuration. Use this structure as a reference for the type of documents required and where they are to be stored within the product structure.

Publish for Manufacturing Templates

Publish for Manufacturing uses templates to guide the publish process. These templates contain configuration for generating and locating the data to be uploaded and how it is organized in a PLM.

Publish for Manufacturing is shipped with sample templates for the following schematic authoring applications:

- Allegro X System Capture
- Design Entry HDL
- Capture CIS

There is a sample template for each of the following supported PLM applications:

- Dassault Systèmes 3DEXPERIENCE
- PTC Windchill
- Siemens Teamcenter
- Oracle Agile9

Each template contains:

- The template name

- A description
- The connector for which the template is being used, such as Windchill
- A set of utilities to generate or locate source and derived data
- A typical publish structure for a specific PLM

Before a sample template can be used to publish data, you must configure a PLM connection. For the Pulse environment, see Creating Managed Connection for details. In the OrCAD X environment, the configuration is user specific. See Publishing ECAD Data in OrCAD X Environment for details.

You can create multiple templates and name them as required to simplify your work. For example, if you have two Windchill servers for different purposes, you can name them `TEST` and `PRODUCTION`. Different PFM connector templates can also be used by different business units, all of which may be using the same PLM server.

For each template, you can then define the:

- Data to be published through a set of utilities that generate and or locate the file deliverables
- PLM part attributes to be displayed in the BOM preview for schematic designers
- Publish structure that dictates the objects and relationships to be updated by PFM

On the Pulse platform, all the templates are stored in the Pulse platform and available to users based on access privileges. In the OrCAD X environment, templates are user specific and are stored in the user's local file system.

Checklist for Publish for Manufacturing Configuration

Before publishing data for manufacturing, configure your Publish for Manufacturing template by doing the following:

1. Launch the Publish for Manufacturing administrator interface. For details, see Launching Publish for Manufacturing Administrator Interface.
2. Do one of the following:
   - ❑ Create a new template based on a default configuration.
   - ❑ Duplicate an existing template.

   For details, see Managing Publish Templates.

3. Specify the template settings for PLM communication, which includes the PLM connector type and a predefined managed connection.

   For details, see Managing Publish Templates.

4. Define how the project information is shown at the top of the designers' view of the Publish for Manufacturing interface. This data is pulled from the `CUSTOMVAR` section of the site and project CPM files. For details, see Configuring Project Information Display.

5. Define a common source for locating the layout database. For details, see Defining Common Method for Locating Layout Source.

6. Configure the data to be published through a set of utilities that generate and or locate the file deliverables. For details, see Defining Mandatory Utilities for Publishing ECAD Data.

7. Specify whether any of these utilities need to run each time you publish. For details, see Defining Mandatory Utilities for Publishing ECAD Data.

8. Specify the PLM part attributes to be displayed in the BOM preview for the user. Optionally, specify a CSV file for additional BOM content. For details, see Configuring BOM Preview and Data Sources.

9. Define a publish structure that dictates the objects and relationships to be updated by Publish for Manufacturing. For details, see Configuring the Publishing Structure.

Launching Publish for Manufacturing Administrator Interface

To start Publish for Manufacturing, launch its user interface.

1. Do the following:

   - Type the following in a Command Prompt window for System Capture:

     ```
     <Cadence_installation_directory>/tools/bin/rtp -admin
     ```

   - For the DE-HDL environment, include the `-dehdl` argument:

     ```
     <Cadence_installation_directory>/tools/bin/rtp -admin -dehdl
     ```

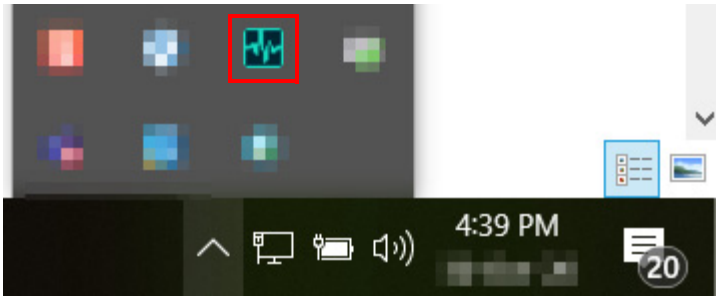
   Publish for Manufacturing is displayed and you are prompted to log in through a web browser, if you are not already authenticated to the Pulse platform.

2. In the Log In dialog, specify the Pulse user name and password.

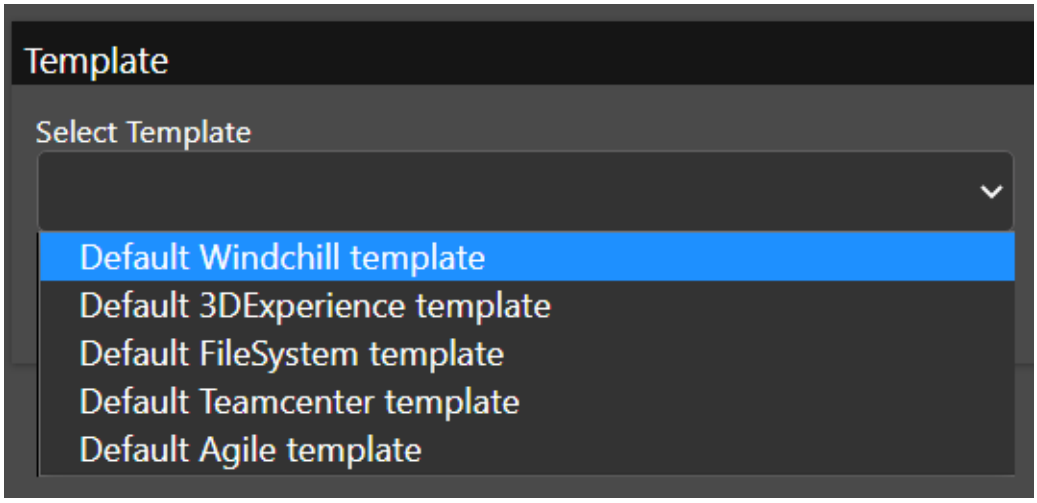
Important

This user profile must include the Administrator role, which is defined in the *Pulse User Management* module.

After the user is successfully authenticated for the Pulse platform, the local Pulse service starts and the Pulse icon is displayed in the dashboard notification area.

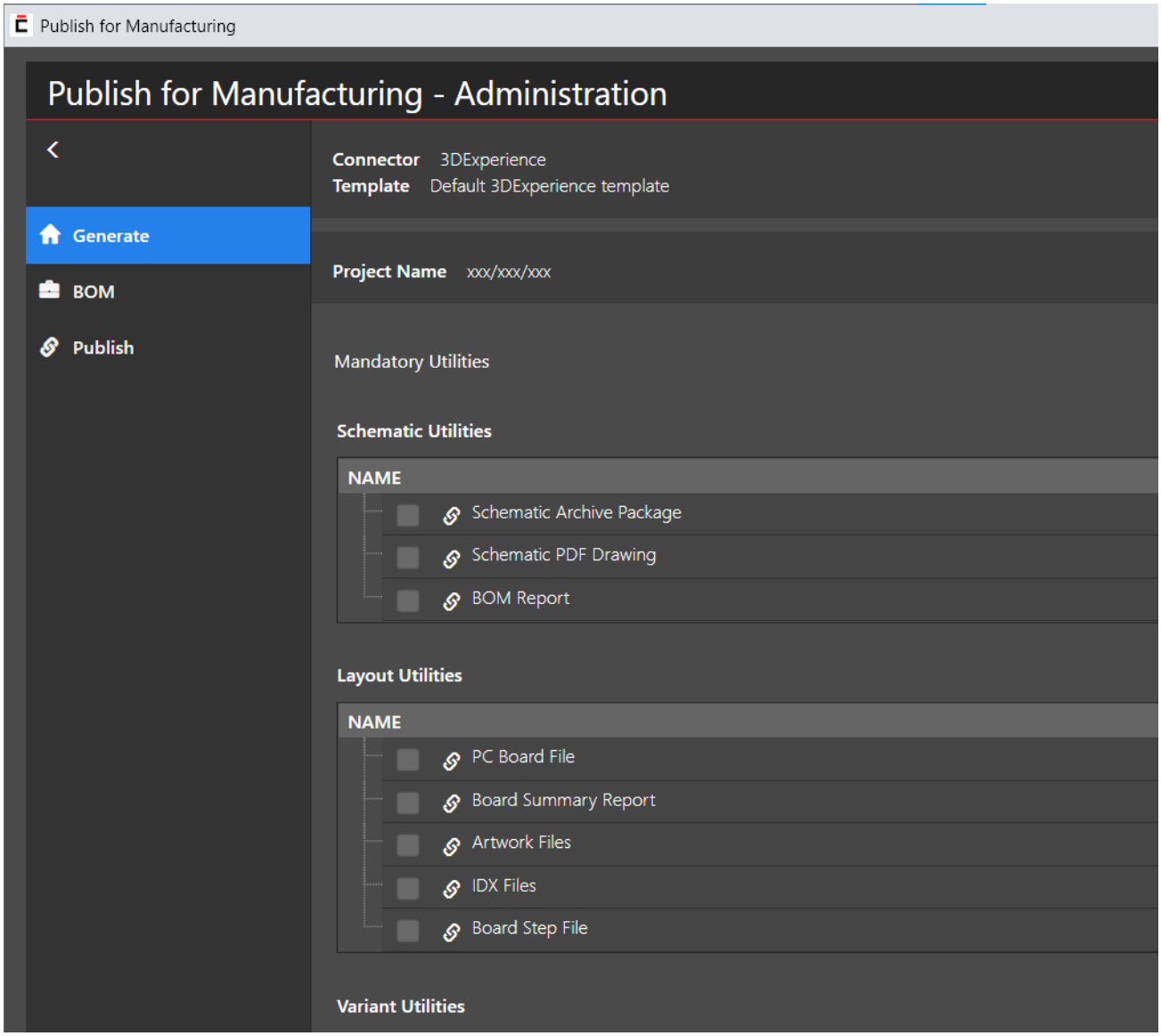


The Select Template box is also displayed.



3. Do one of the following:
   - ❑ Select a default template and click *OK* to specify connection settings for it.
   - ❑ If you have an existing custom template, select it and click *OK*.

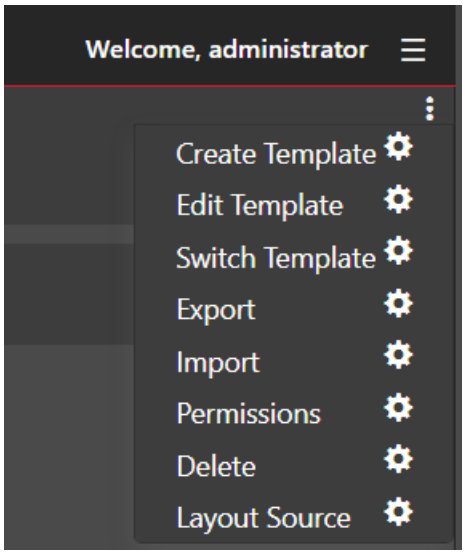
The Publish for Manufacturing user interface for administrators is displayed.



You can now manage the templates.

Managing Publish Templates

The user interface options to manage templates are all available when you click the vertical ellipsis icon on the top right of the screen under the user name.

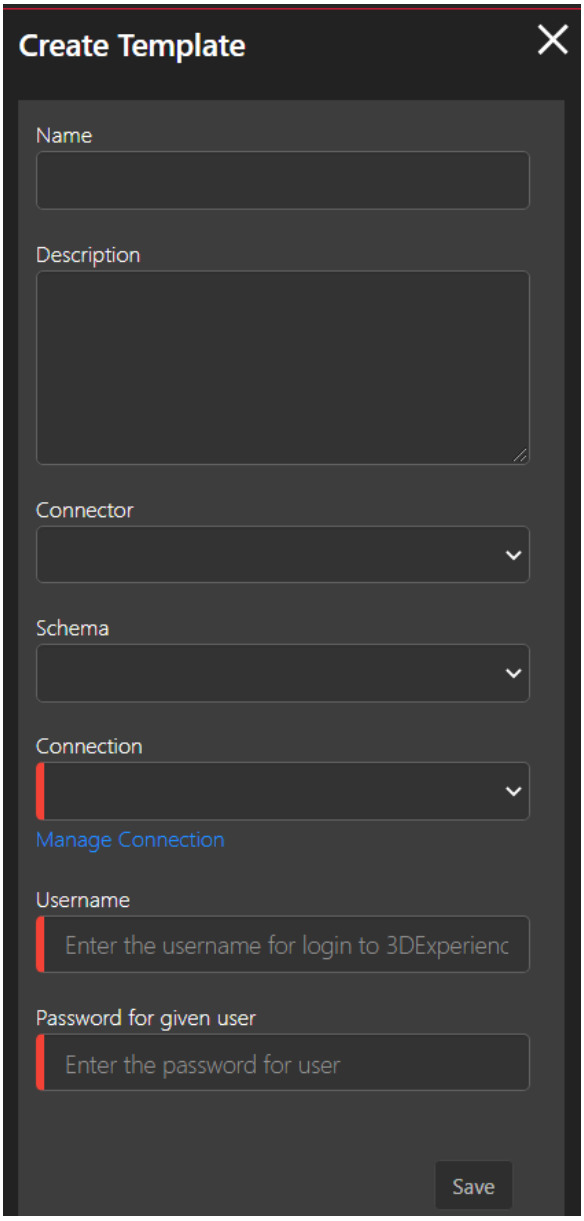


Creating a Template

To create a template, do the following:

1. Click the vertical ellipsis icon on the top right of the screen under the user name.

2. Click *Create Template* to display the Create Template form.



3. Specify the following:
   a. A name for the connection
   b. A brief description for the connection
   c. The type of connector:
      - Windchill

- 3DEXPERIENCE
- Teamcenter
- Agile
- FileSystem - The file system is a shared location within the designer's network.

  In the Pulse client-server environment, when using the File System mode, the publishing destination is a folder on the Pulse server. All users using a particular template publish to the same folder. In the Pulse individual mode, where all data is in the user's local machine, this folder is located in the user's machine.

d. The database schema - The schema defines the data model for the publish destination.

- For the File System connector, the schema are folders on the hard disk.
- For the PLM connectors, these are a set of Part and Document objects. For a PLM system, the schema defines the relationships between objects as well as the data types and attribute values set when creating document objects.

  For most users, the out-of-the-box schema suffices but as part of a Publish for Manufacturing deployment, you can update this schema to specify object types and relationships specific to your ECAD product structure. For details on updating the schema, contact Cadence Customer Support.

e. The connection for this template. The connection definition is used to establish a communication session for the PLM system or to a folder in the case of the File System connector.

The *Connection* drop-down includes a list of predefined destinations for the connector type you have selected. If you see your connection listed, select it. Else, click the *Manage Connections* link to create a connection.

See Appendix for details on creating managed connections for different connectors.

f. If you have selected any connector other than File System, specify a user name and password required to log into the connector server.

Note: You must specify a valid username for the PLM instance defined in the managed connection. For example, if you select Windchill 11.2.1.0 as the connection, this connection is mapped to a specific server URL when you defined connections in the ECAD Administration portal. The user name must exist in this server.

g. Click *Save*.

The template is successfully created.

To edit an existing template, such as its name or description, click the vertical ellipsis icon on the top right of the screen under the user name. Click *Edit Template*.

Note: To save any changes made with *Edit Template*, you must specify the PLM credentials to validate the connection.

Duplicating a Template

After creating and validating a template in a test environment, you might want to duplicate the template then switch the connection. For example, you might want to change the connection from `TEST` to `PRODUCTION`.

To make a copy of the template, do the following:

1. Click the vertical ellipsis icon on the top right of the screen under the user name.
2. Click *Export*.
3. Save the template to a local folder.
4. Click *Import.*

5. Locate the file you saved and import it.
6. Click the vertical ellipsis icon on the top right of the screen under the user name.
7. Select *Switch Template*.

   The duplicated template is available at the bottom of the list.
8. Click the vertical ellipsis icon on the top right of the screen under the user name.
9. Use the *Edit Template* option to change the name of your template.

Sharing a Template with Others

Sharing a template with others is particularly helpful in the single-user Allegro X System Capture environment where designers are not connected to a remote Pulse server. Instead of individual users creating their own configuration, designers can simply pass a configuration to another user.

To share a template with others, do the following:

1. Click the vertical ellipsis icon on the top right of the screen under the user name.
2. Click *Export.*
3. Select the folder in which you want to save the template.
4. Specify a file name for the template.
5. Click *Save*.

   The *Import Template* functionality can then be used to store the template in another Pulse server.

Assigning Permissions to Users for Publish for Manufacturing Templates

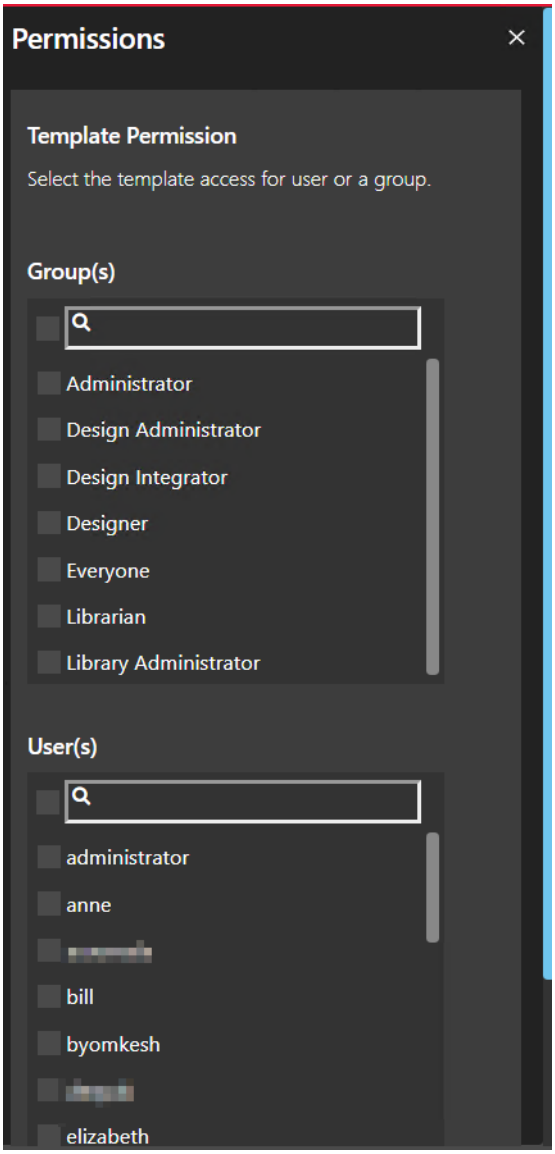
You can control access to templates by role, such as Designers, Design Administrators, Librarians, or by user name so that users are able to view and use only the publish templates for which they are authorized. Groups and users are defined using the *Pulse User Management* module.

Note: This feature is only available in the Pulse environment. This option is not available when configuring PFM templates in the OrCAD X environment.

To assign permissions for templates, do the following:

1. In the Publish for Manufacturing user interface, click the vertical ellipsis icon on the top right of the dialog under the user name.

2. Click *Permissions*.



3. Select the required check boxes.

   A template not assigned to any role can be viewed by all users on the Pulse platform. Templates assigned to particular roles can only be viewed by users associated with the role in the *Pulse User Management* module of the Pulse platform.

4. Click *Save*.

Creating Managed Connection

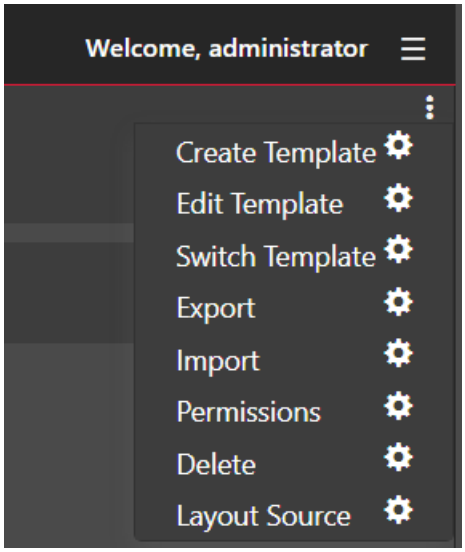
A managed connection includes a set of parameter values that allows you to establish communication to a specific instance of a PLM application. Within a single Pulse server configuration, you can create many managed connections. For example, if you have two Windchill servers for different purposes, you can name them `TEST` and `PRODUCTION`.

The list of existing managed connections is displayed in the *Create* and *Edit Template* forms in the PFM Administration interface. These forms also include a managed connection hyperlink that brings you to a different administration interface for a managed connection.

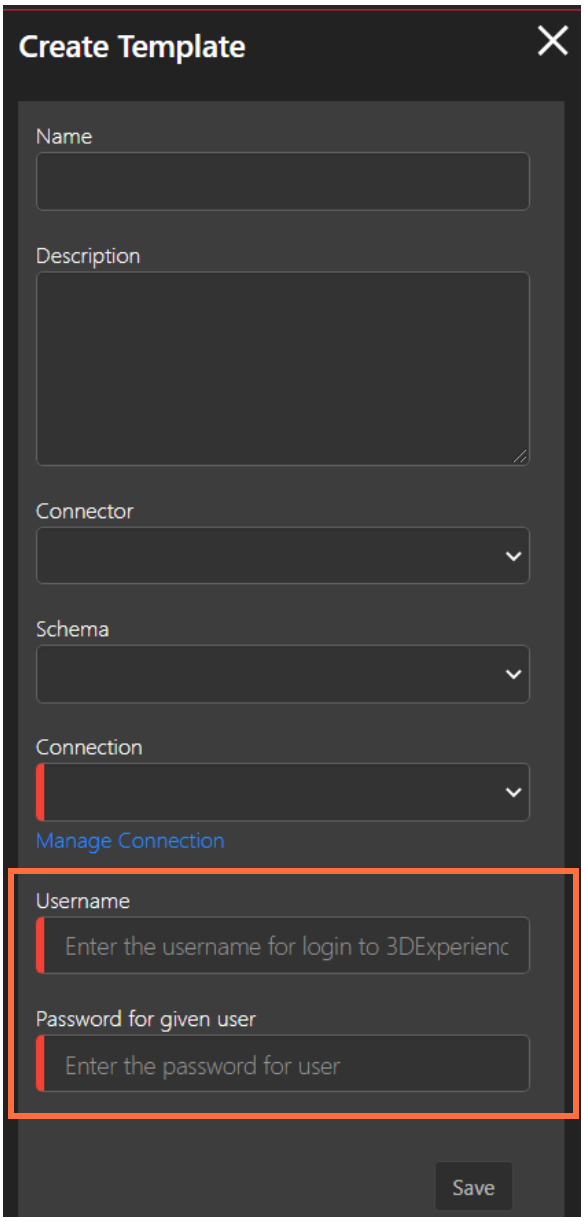
To add a managed connection, do the following:

1. Click the vertical ellipsis icon on the top right of the screen under the user name.

   Options to work with templates are displayed.



2. Click *Create Template or Edit Template* to update the PLM connection details in an existing template.

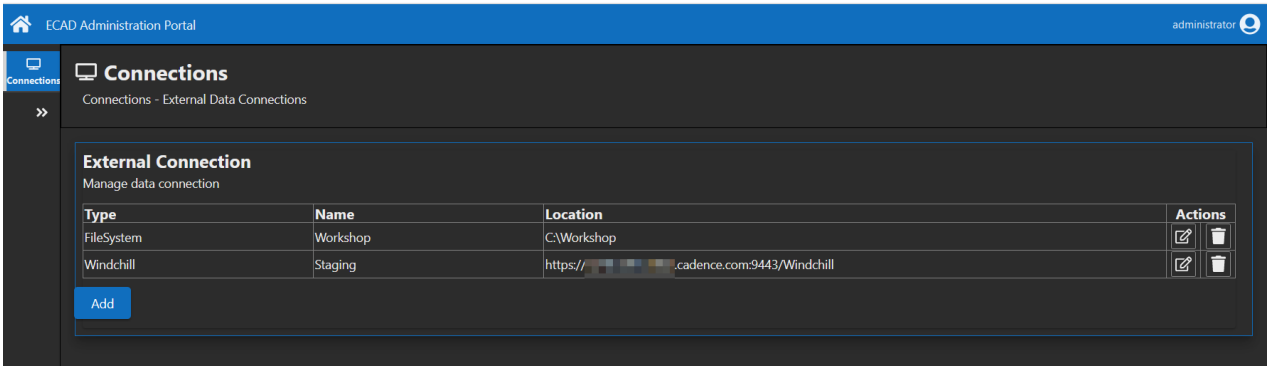


These two fields are only available for a Pulse PLM connector,

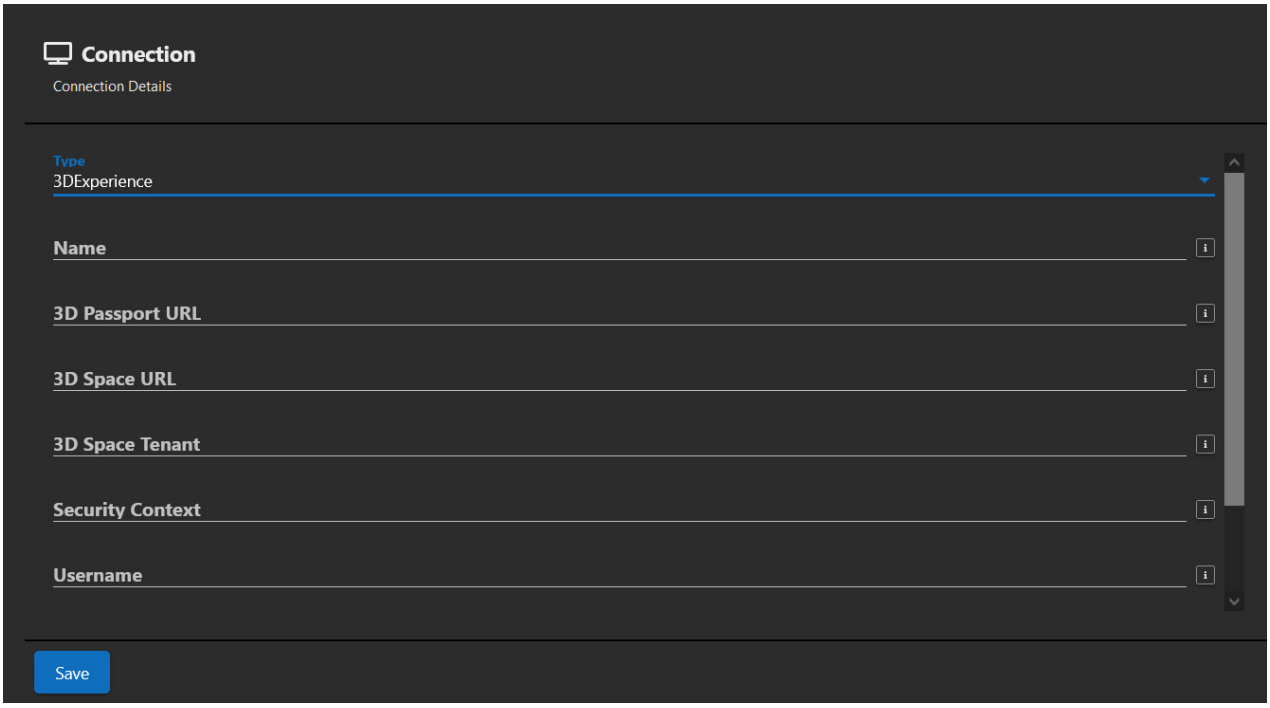
3. Click the *Manage Connection* link under *Connection*.

   In the Pulse environment, the ECAD Administration Portal is displayed. Using this portal, you can define and edit the details of external connections. If you are configuring a Template in the OrCAD X environment, move to step 7.

4. Click *Add*.



The *Connection* form is displayed.

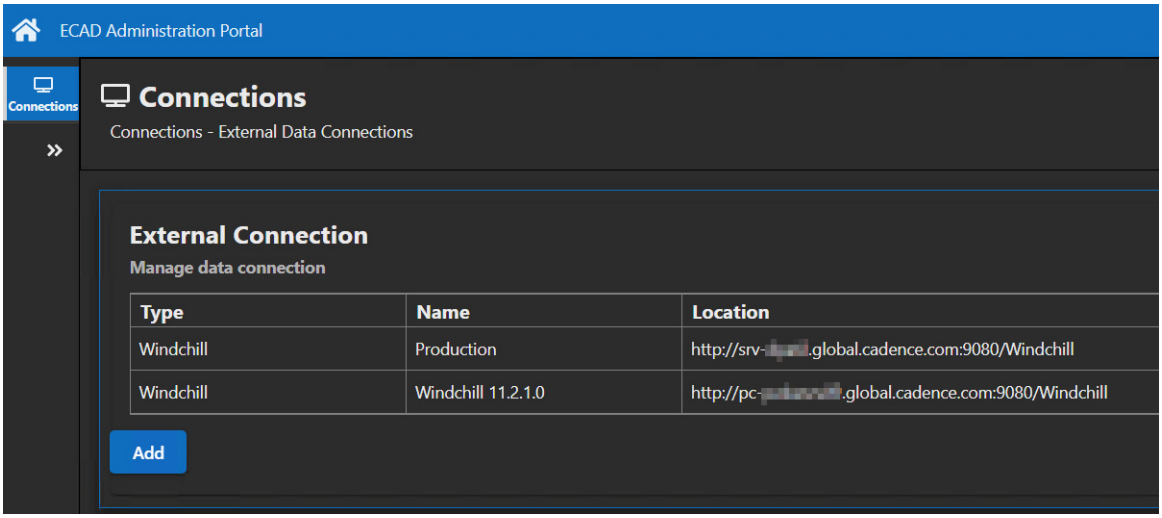


5. Specify the connector type.

   The *Connection* form is refreshed and displays fields specific to that PLM application. Click the following links for more information on the parameter values specific to your PLM application:

   - ❑ Additional Details for 3DEXPERIENCE Connector Configuration
   - ❑ Additional Details for Windchill Connector Configuration

- Creating a Managed Connection for Teamcenter Connector
- Creating a Managed Connection for Agile Connector



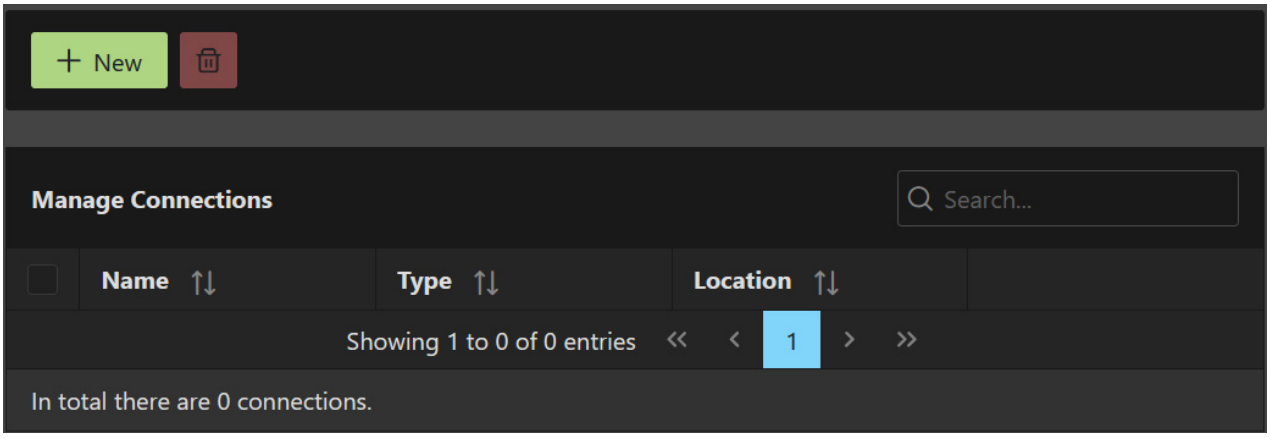
6. Click *Save*.

   After you complete the Publish for Manufacturing connection settings and create the external data connection, the new connection is listed in the *Connection* drop- down in the *Create Template* form.

   Note: If there is a failure in validating your connection parameters, the *Connection* form remains open and an error message is displayed. More details on connection errors can be found in the following server log file: `<Pulse Primary Node HOME>/server/log/adwserver.out`.

7. Click *New Connection*.

In the OrCAD X environment, the following page is opened in a browser.



8. Click *+New* and specify a type for the connection.

   In the OrCAD X environment, only 3DEXPERIENCE is currently supported.

   The *Connection* form is refreshed and displays fields specific to 3DEXPERIENCE. See Additional Details for 3DEXPERIENCE Connector Configuration for more information on the parameter values specific to 3DEXPERIENCE.

9. Click *Save*.

10.

Configuring Publish Templates

Publish for Manufacturing must first be configured before it can be used to publish design content to the PLM system. This typically only needs to be done once and involves the following tasks:

- Configuring Project Information Display
- Defining Common Method for Locating Layout Source
- Configuring Publishing Utilities
- Configuring BOM Preview and Data Sources
- Configuring the Publishing Structure

Configuring Project Information Display

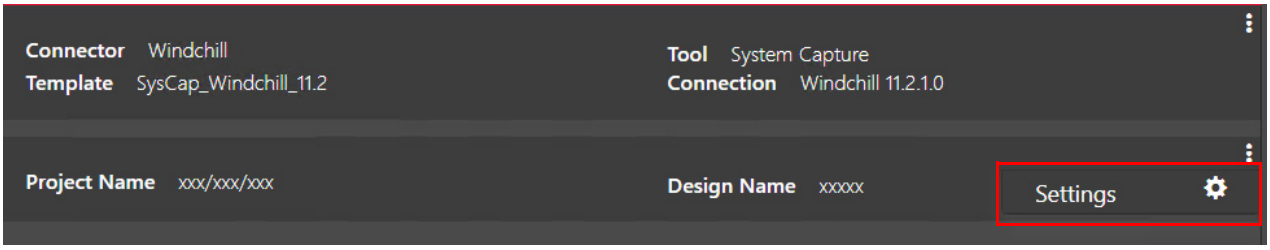
The project attributes displayed in the top panel of Publish for Manufacturing, such as the design name and location, schematic creation date and its check-in date, are derived from the `CUSTOMVAR` section of the *`site`*`.cpm` file at *`<CDS_SITE>`*.

When Publish for Manufacturing is run in user mode, both the *`site`*`.cpm` and the *`<project>`*`.cpm` are used to populate these values. The values in *`<project>`*`.cpm` are honored over those in *`site`*`.cpm`.

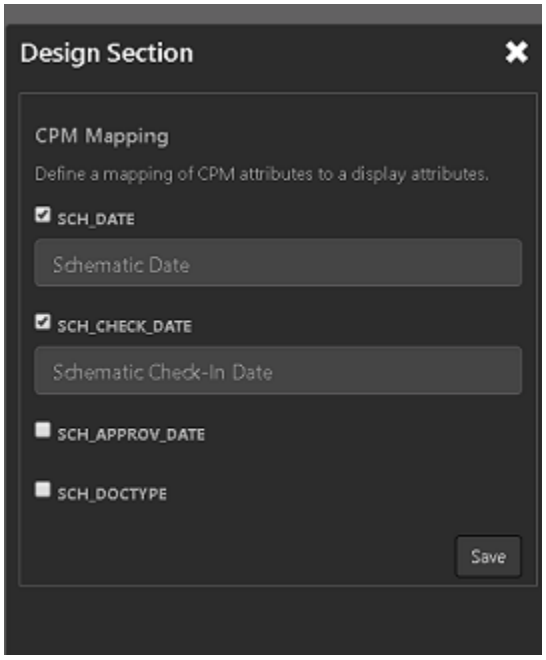
As an administrator, you can select the attributes to be displayed from this section. When a designer runs Publish for Manufacturing, the values for these variables are displayed from the *`<project>`*`.cpm` file.

To configure the project attributes that you want to display in the top panel of Publish for Manufacturing, do the following:

1. Click the vertical ellipsis icon next to *Design Name* and click *Settings*.



The *Design Section* panel is displayed.



2. Select the CPM attributes that you want displayed in the top panel and specify their respective display names.
3. Click *Save*.

Defining Common Method for Locating Layout Source

If you work with boards outside of Allegro X System Capture, you can define a method for locating your layout design in the administrator mode of the Publish for Manufacturing (PFM) application. You can then specify this layout source in the PFM utilities to specify the layout design in a simplified, consistent manner.

In addition to a local source such as `<proj>/output/<design>/physical`, you can use Pulse as the layout source. In the PFM utilities, the variable `{{LAYOUT_SOURCE}}` can be used to locate the layout design.

In Pulse, you can maintain a link between the schematic design version which generated the netlist for the layout, and the layout version from which changes were backannotated to the schematic.

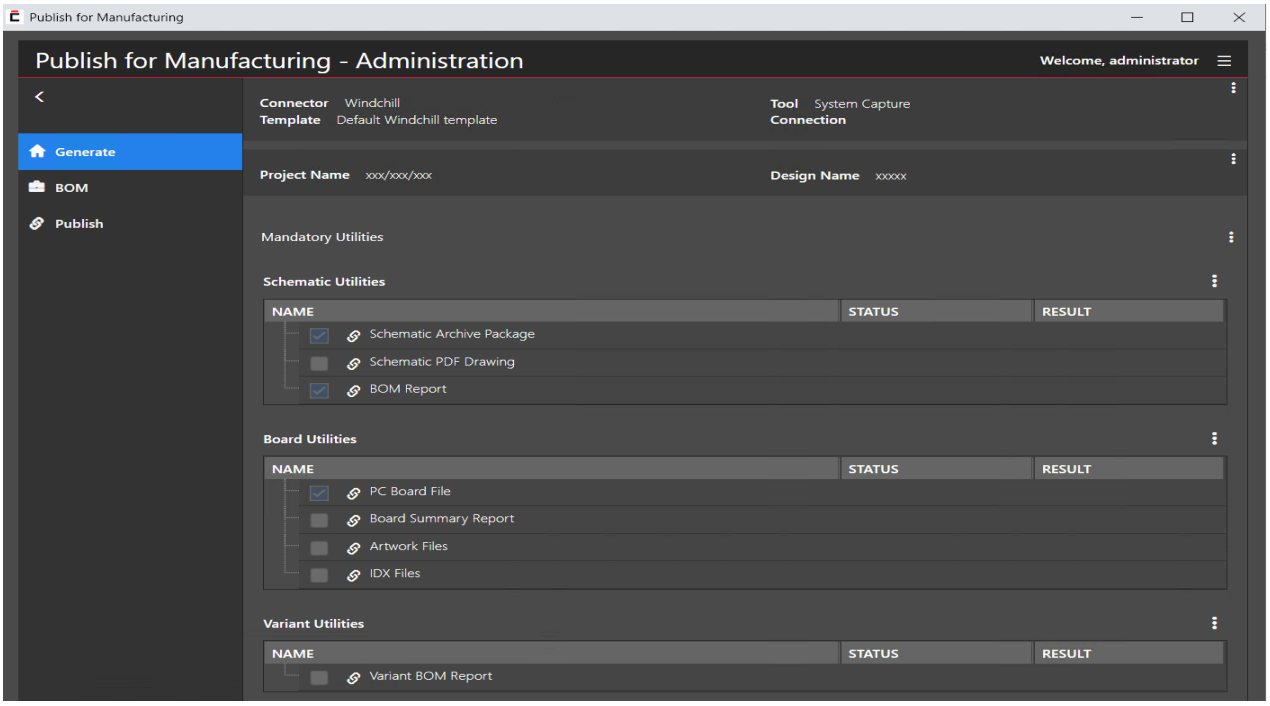
When Pulse is specified as the layout source, you can also select the layout from which derived content is to be published to the PLM system. When a designer launches PFM with

a publish template that uses Pulse as a layout source, the latest committed version of the layout is downloaded to the following project subfolder: `temp/layouts`. All utilities specifying the `{{LAYOUT_SOURCE}}` variable use this layout design when generating outputs.

To define a common method for locating the layout source, do the following:

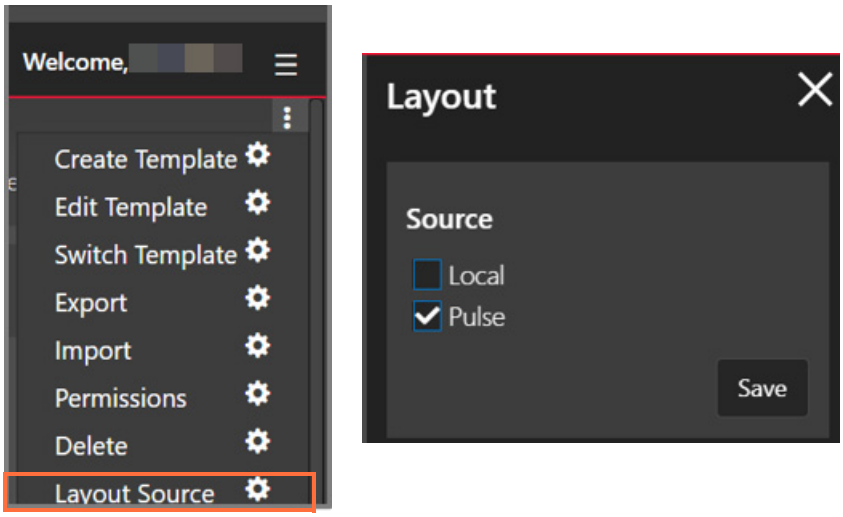
1. Launch the Publish for Manufacturing user interface.
2. Log in to the Pulse platform.
3. Select the required template from the *Select Template* drop-down list.

   The Publish for Manufacturing user interface for administrators is displayed.



4. Click the vertical ellipsis icon on the top right of the screen under the user name.

5. Select *Layout Source*.



6. In the *Layout* dialog box, select one or both of the following:

   - *Local*

     If you select *Local,* specify the path to the folder with the layout file. The following is an example using PFM and CPM variables:
     `(%RELEASE_AREA%\$CPM(CANVAS|physical_folder)\$CPM(CUSTOMVAR|BRD_NUMBER).brd`

   - *Pulse*

     If you select *Pulse*, no further configuration is required.

7. Click *Save*.

Related Topics

Launching Publish for Manufacturing Administrator Interface

Publish for Manufacturing Variables

Associating Schematic and Layout Versions

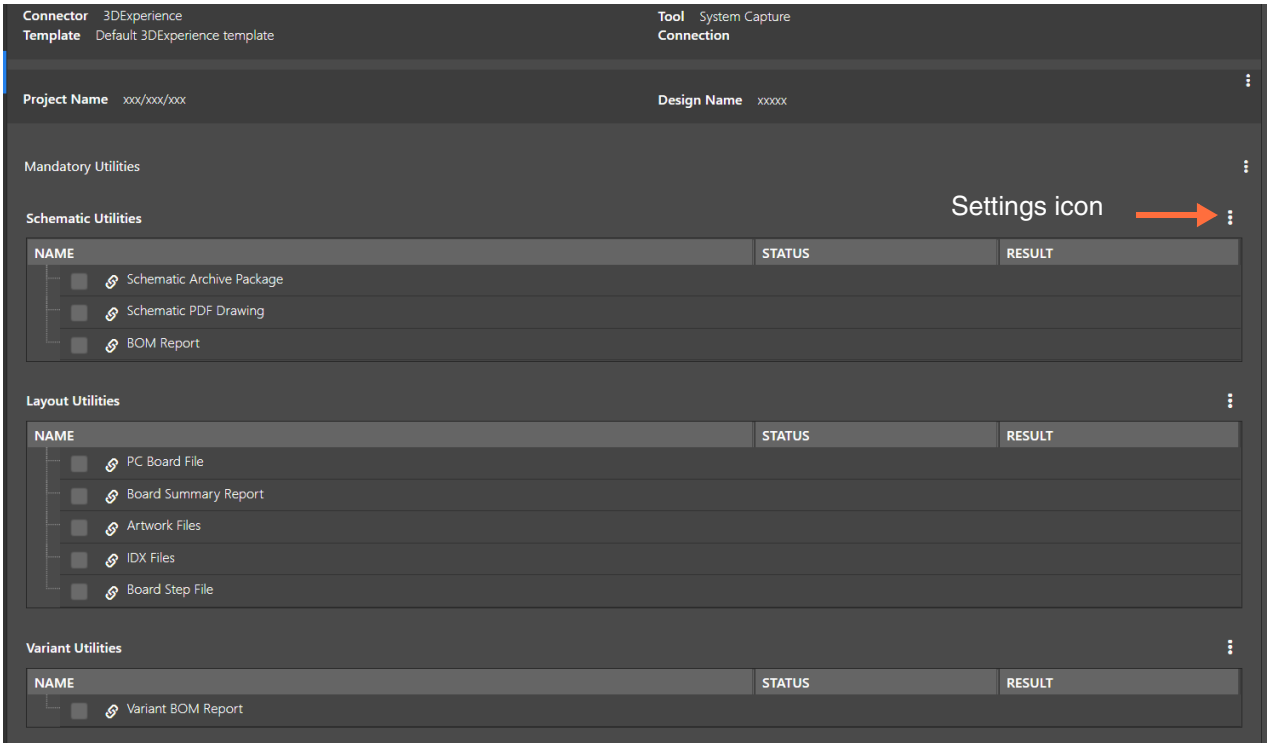
Configuring Publishing Utilities

Publish for Manufacturing has a predefined list of utilities—schematic, board, and variant—which are typically part of a release package. You can remove some or add more to this list based on your company's release requirements.

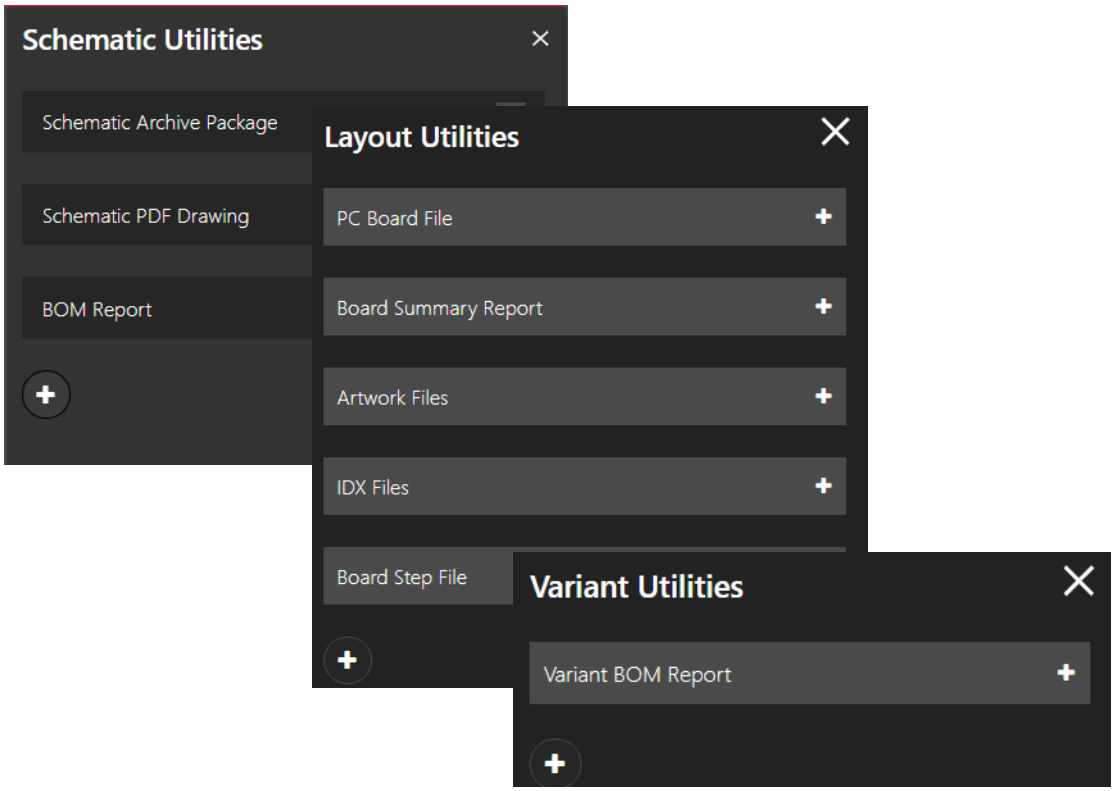
Adding Utilities

To add a new utility or change an existing one, do the following:

1. To add or modify a utility, click the vertical ellipsis *Settings* icon next to *Schematic Utilities, Layout Utilities,* or *Variant Utilities*.



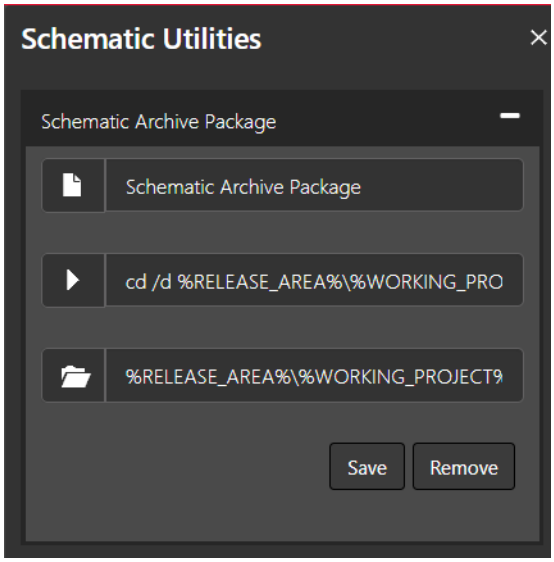
The relevant panel is displayed, depending on the option you choose.



2. To modify an existing utility, click the plus button next to the utility name to view and modify the following:

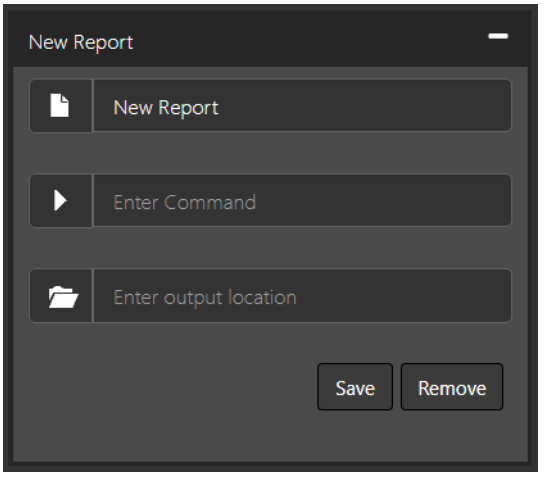
- ❑ Name of the utility that is displayed in the *Name* column
- ❑ Command, with arguments, to generate the content. This normally includes the path to the output file. This field can be left blank if you want Publish for Manufacturing to locate the output file path rather than generate it.

- Name of the output file that is generated as an attachment along with the path



3. Click the plus button at the bottom of the panel to add a new utility for the following:

- To run one of your scripts
- To run a program; this can be a Cadence or third-party utility
- Locate an existing file



a. Specify a name for the utility.

b. Enter the command to be used to generate the document.

If this utility should only locate a document that has been generated outside of PFM, you can move to the next step. The *Enter Command* field does not have to be specified.

These commands can be from the Cadence installation as well as internal and or external scripts or programs. Variables can be used to provide flexibility during runtime. System variables from your environment, project location variables, and or CPM directives can all be used to locate commands and arguments for commands, and included in output file names. Following are some examples of commands using project location variables:

- `mkdir %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\artwork & cd /d %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\artwork & artwork %RELEASE_AREA%\%WORKING_PROJECT%\$CPM(CANVAS|physical_folder)\$readFile(master.tag) & cdszip -r9j %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\artwork.zip *.art`
- `mkdir %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp & bomhdl -proj %CPM_PATH% -nographic -sda -o %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\BOM.rpt`

where:

- `CPM_PATH` - The path to the cpm file
- `WORKING_PROJECT` - The active project
- `RELEASE_AREA` - The full path to the project
- `WORKING_DESIGN` - The name of the root of the active design
- You can also use `WORKING_CPM` to refer to the name of the CPM file without the `.cpm` extension. For example, `my_design.cpm` resolves to `my_design`.

Examples

Here are some examples using CPM directives. You can leverage variables from the `START_CANVAS`, `START_GLOBAL`, and `START_CUSTOMVAR` sections of the CPM file.

- `$CPM(CANVAS|physical_folder)` – This directive enables Publish for Manufacturing to read the value of the `physical_folder` variable from the `START_CANVAS` section of the CPM file. For example, assume that the project CPM has the following:

```
START_CANVAS

design_db './logic/workshop.sdax'

last_board_file '.brd'

physical_folder ‘./output/workshop/physical’

END_CANVAS
```

- `$CPM(CUSTOMVAR|<variable>)`

  This enables Publish for Manufacturing to read the value of the custom variable from the `START_CUSTOMVAR` section of the CPM file. Assume that the project CPM includes the following section:

  ```
  START_CUSTOMVAR

  PBA_NUMBER '300-1001'

  PBA_REV 'A'

  END_CUSTOMVAR
  ```

  You can use these variables in combination with project variables. For example, for a project file located at `D:\my_designs\workshop\workshop.cpm`, the following command:

  ```
  bomhdl -

  proj %CPM_PATH% -nographic -sda -o

  %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\$CPM(CUSTOMVAR|PBA
  _NUMBER)_$CPM(CUSTOMVAR|PBA_REV)_BOM.rpt
  ```

  resolves to:

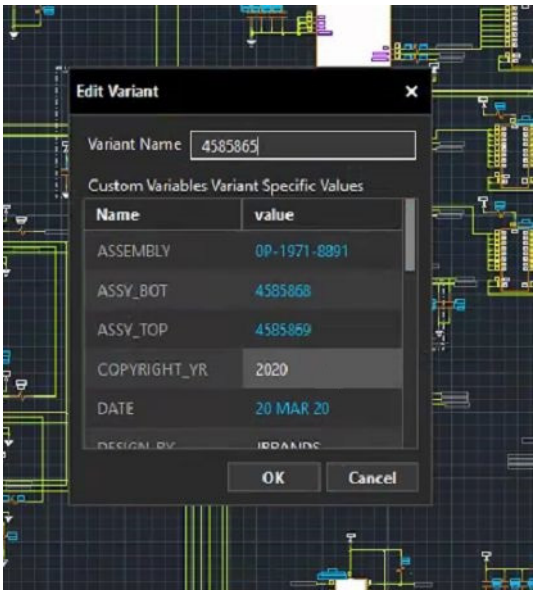
  ```
  bomhdl -

  proj D:\my_designs\workshop\workshop.cpm -nographic -sda -o

  D:\my_designs\workshop\temp\rtp\300-1001_A_BOM.rpt
  ```

- When defining variant utilities, you can use the following command:

`$VRNTNAME(<variant variable>)` where this resolves to, for example `$VRNTNAME(ASSY_TOP4585869).pdf`



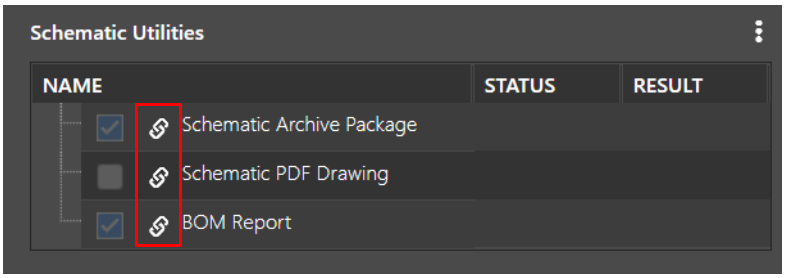
c. Specify the output file path along with the file name generated by this utility. For example:

`%RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\BOM.rpt`

For additional information on using variables, see Publish for Manufacturing Variables.

To make a newly created utility available as an option to designers, you must link the utility to an object or entry in the *Publish* tab. See Configuring the Publishing Structure for details.

The link icon between the check box and the utility name indicates that a utility has been linked to an entry in the *Publish* tab.



Related Topic

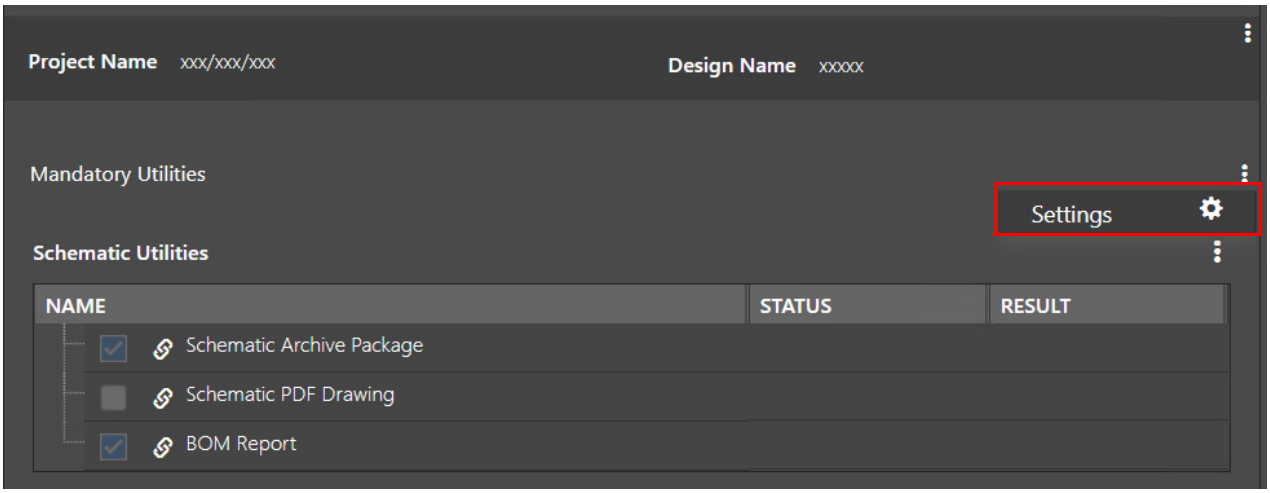
Configuring the Publishing Structure

Defining Mandatory Utilities for Publishing ECAD Data

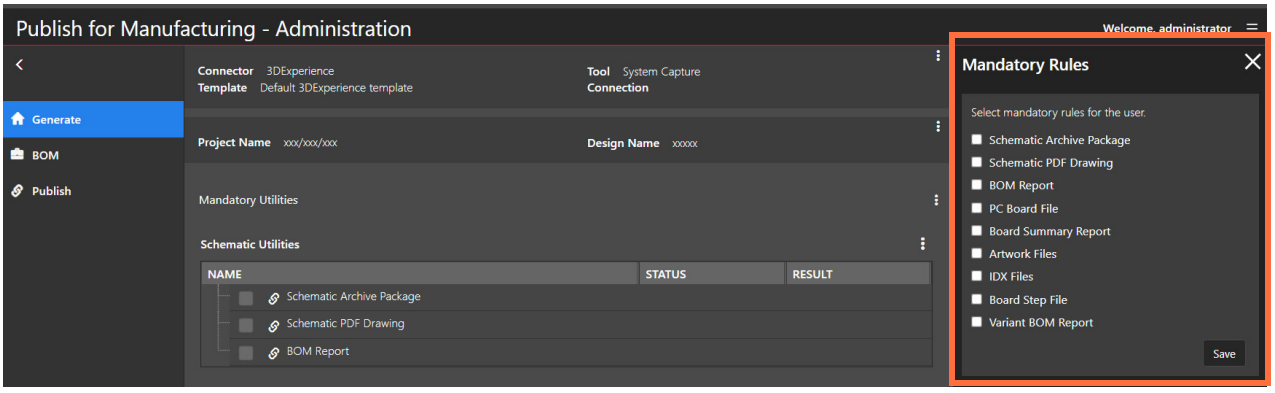
As an ECAD administrator, you can specify a set of utilities that must be run every time you publish ECAD data.

To define a utility as mandatory, do the following:

1. Click the vertical ellipsis icon next to *Mandatory Utilities* and click *Settings*.



The *Mandatory Rules* panel is displayed.



2. Select the names of the utilities you want to define as mandatory for designers.

3. Click *Save*.

Configuring BOM Preview and Data Sources

Prior to the release of a design, designers can view the Bill of Materials for the base design and all variants. BOM sources can be as follows:

- Live BOM for System Capture - All configured Live BOM attributes, including the part rule search icons, are available in the BOM preview table. You do not need to export the packager files to view this data. The latest BOM is available when you save the design project.
- CSV file - The only BOM fields are `PART NUMBER`, `QTY`, and `REFDES`. The CSV file can be used in System Capture and or DE-HDL.
- BOM-HDL for DE-HDL - Any attributes defined in `$CDS_SITE/cdssetup/rtptemplate.bom` are available in the BOM preview table. The BOM data is generated based on the latest packager files.

  By default, the `rtptemplate.bom` template file is available in: *<Cadence_installation_directory>*`/share/cdssetup`.

  You can copy the template to the following locations and modify it, if needed:

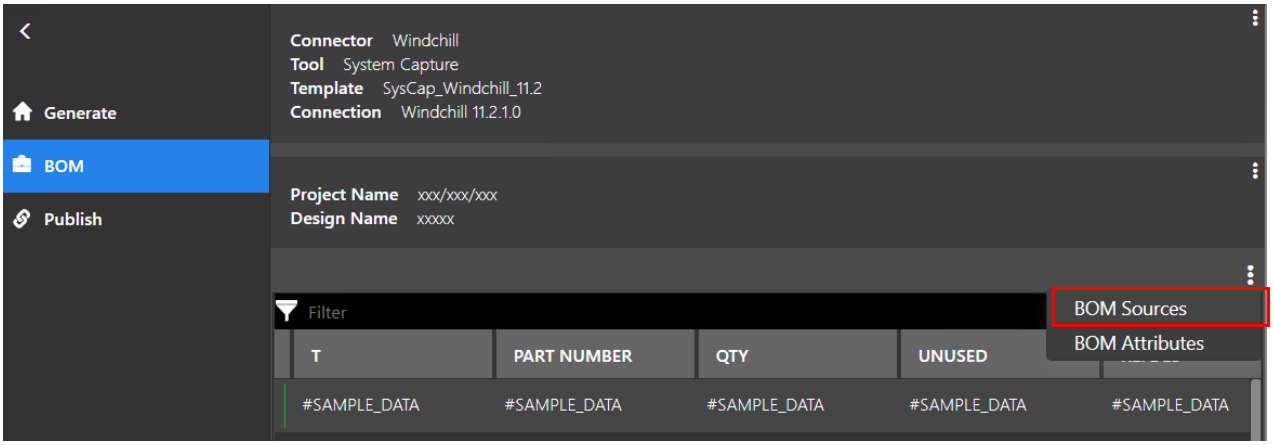
  - For non-Allegro X EDM projects: `$CDS_SITE/cdssetup`
  - For Allegro X EDM projects: *<ADW_CONF_ROOT>*`/company/site/cdssetup`

  The BOM table can also be populated with attribute values from the PLM system by selecting attributes in the *BOM Attributes* dialog box.

Specifying CSV as a BOM Source

To publish parts that are not in your Pulse-managed library, specify a CSV BOM source by doing the following:

1. Click the vertical ellipsis icon above the *Filter* field and select *BOM Sources*.

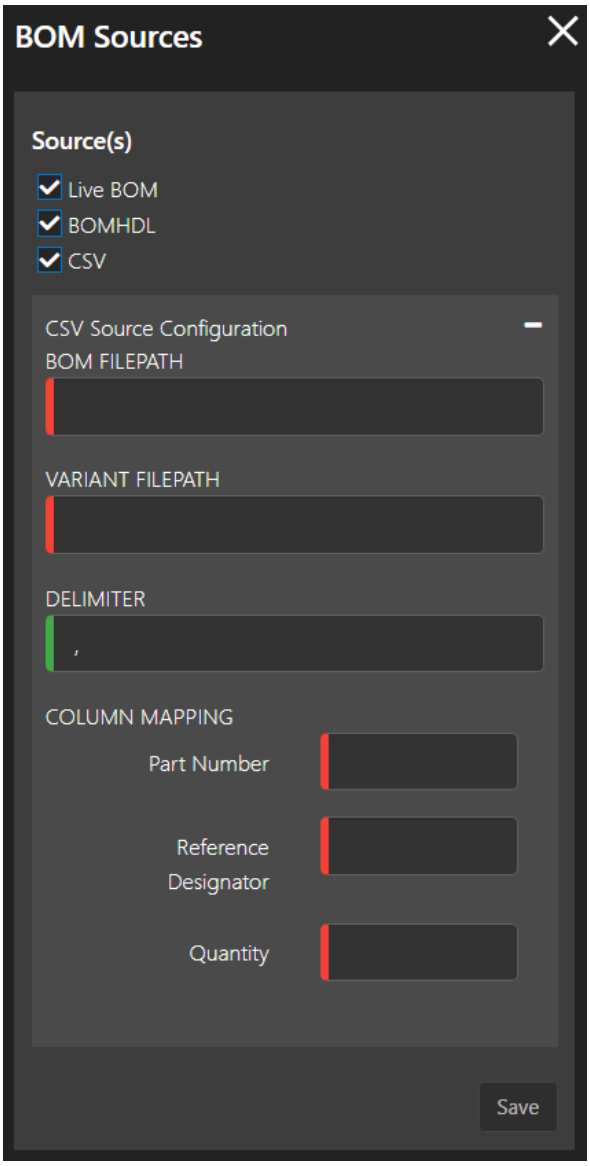


For a BOM source you need to specify the following attributes:

- *BOM FILEPATH* - Path to the `.CSV` file that includes additional parts for the base BOM.
- *VARIANT FILEPATH* - Path to the `.CSV` file that includes additional parts for the variant BOMs.

  Both *FILEPATH* attributes can include project location variables and the *VRTNAME* variable that enables the identification of variable-specific `.CSV` files.
- *DELIMITER* - Field delimiter in the `.CSV` file; the default is a comma.

- In the *COLUMN MAPPING* section, specify your `.CSV` column headers for the *Part Number*, *Reference Designator*, and *Quantity* fields.



As an example, if you have the following content in a file named `base_bom.csv` in your project folder:

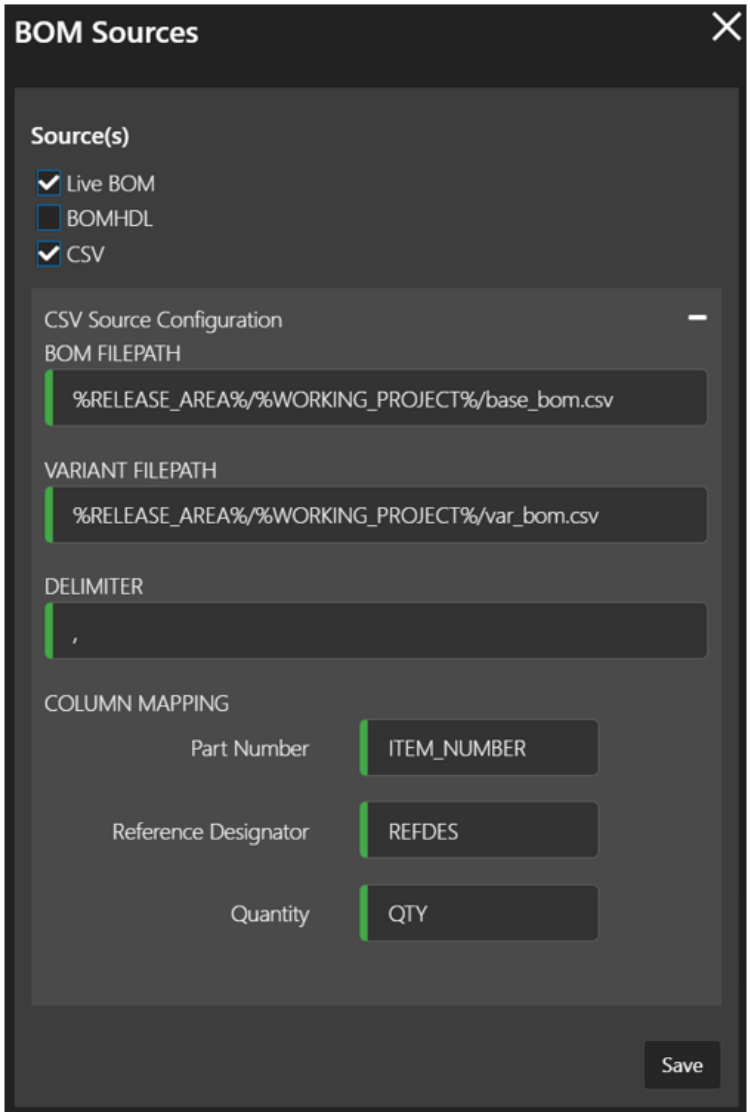
```
ITEM_NUMBER,QTY,REFDES

PN-101,2,"C1,C2"

PN-102,3,"R1,R2,R3"
```

```
PN-103,1,"U1"
```

The form values will be as follows:



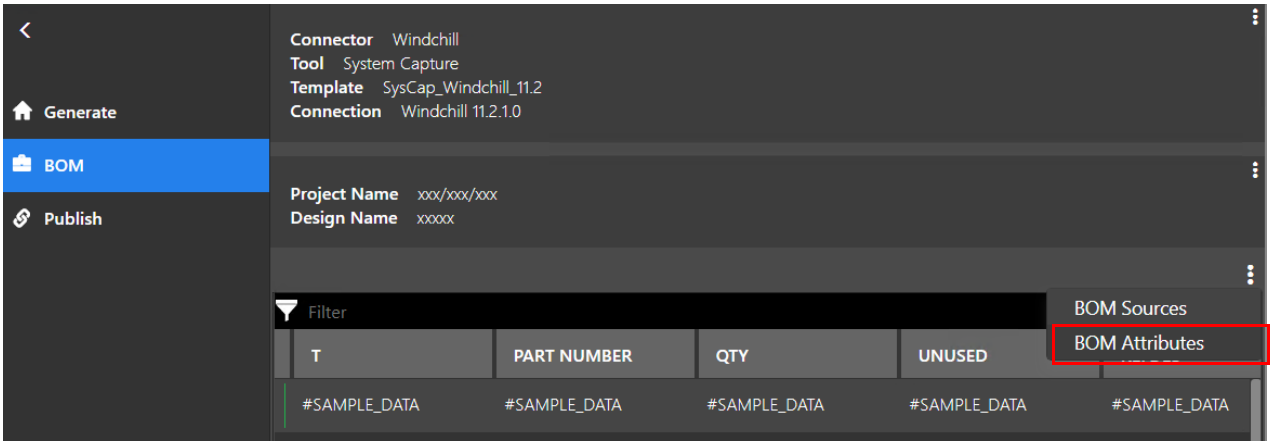
VARIANT FILEPATH is a required field in the form but the file specified is not required to be available.

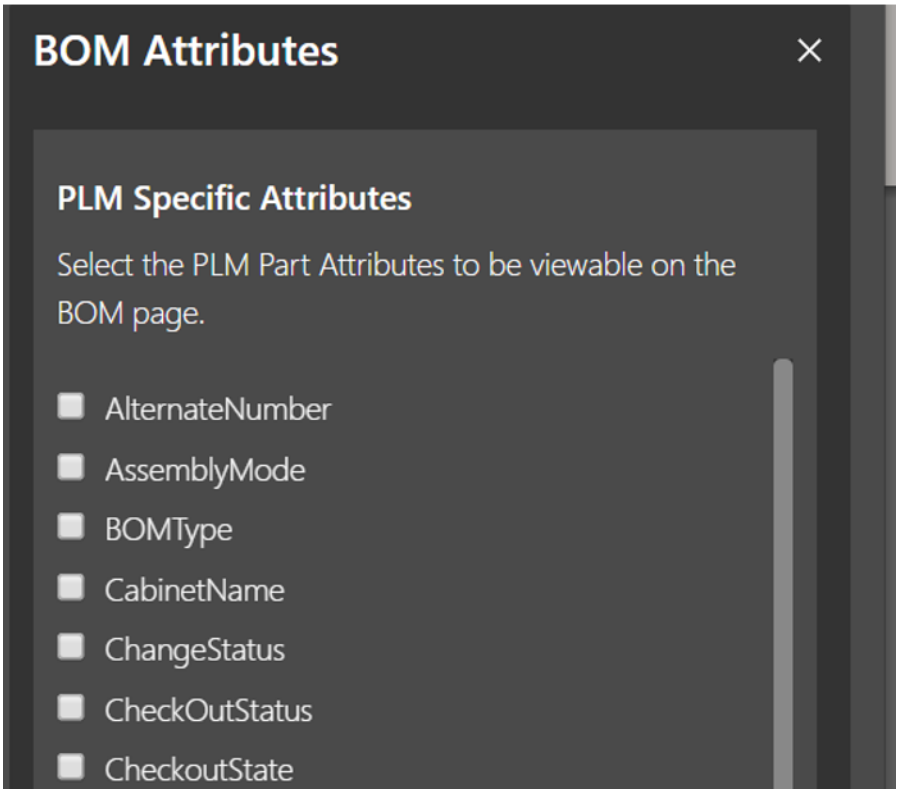
Specifying BOM Attributes

The default BOM table displays a preview of the way ECAD data is displayed to designers, and a `State` and `Version` attribute from your PLM system. This functionality is currently only supported with the Windchill, Agile, and Teamcenter connectors.

To add values from your PLM system to the BOM table, do the following:

1. Click the vertical ellipsis icon above the *Filter* field, and select *BOM Attributes*.



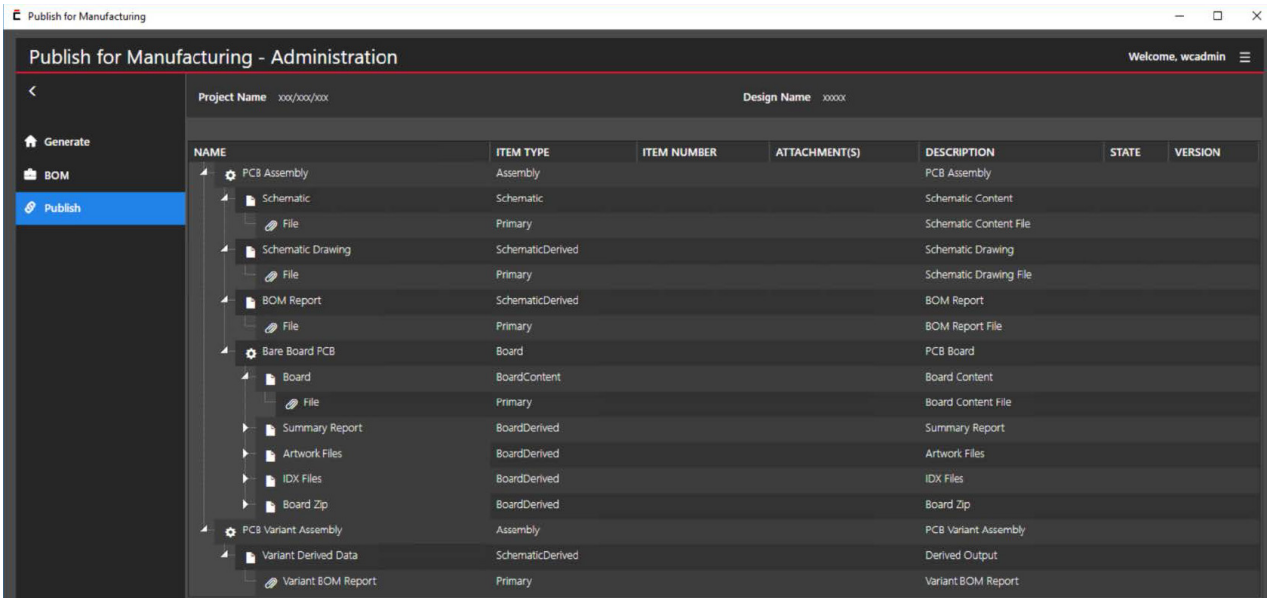


2. In the *BOM Attributes* dialog box, select the required attributes.

3. Click *Save*.

Configuring the Publishing Structure

Publish for Manufacturing displays a hierarchical view of the ECAD assembly structure, including the relationships between the various objects. In the out-of-the-box configuration, Publish for Manufacturing places the PCB Assembly at the top of the product structure.



You can configure the derived object generation, BOM display, and the product structure and object relationships so that projects can be published to PLM systems in a way that matches the current PLM product configuration.

For the Filesystem connector, the structure defined is the folder or file structure for the release package. For PLM connectors, the structure defines the document objects that are created to hold utility outputs and how those document objects are linked to part objects.

You can modify the default Publish for Manufacturing structure by, for example:

- Adding a part or document structure item
- Modifying a structure item with respect to the Name, Description, Item Number variable, and linked utilities
- Removing a structure item

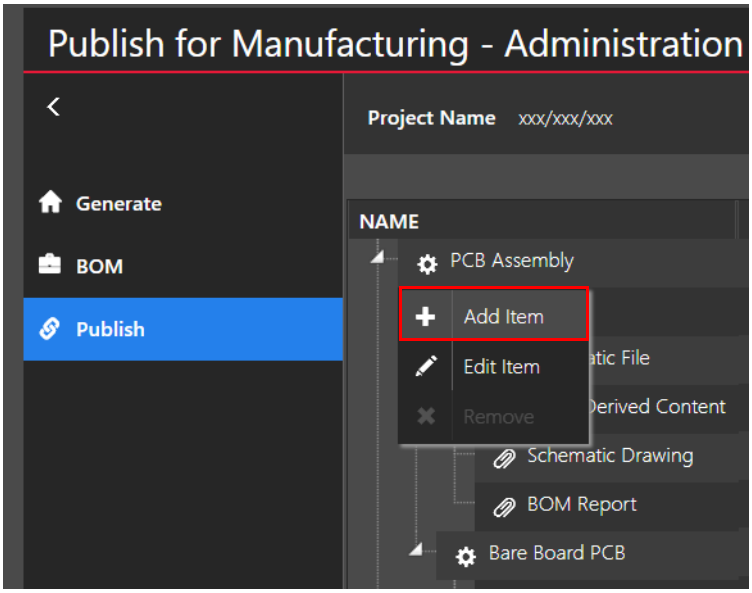
Adding a Structure Item

To add a structure item, do the following:

1. Right-click a part item, such as Bare Board PCB.

   Part items are identified by the gear icons to the right of the item name.

2. Choose *Add Item* from the pop-up menu.



The *Add Item* dialog is displayed.

3. Specify the name of the item you want to add to the structure.

   The name can be defined using a combination of characters and the `$CPM` directive to read a value from the `.cpm` file. For example, assume that *<project>*`.cpm` contains a `START_CUSTOMVAR` section with a `BRD_NAME` variable with `my_board_name` as its value.

   When you run Publish for Manufacturing to publish data, it converts `$CPM(CUSTOMVAR|BRD_NAME)-01`) and displays `my_board_name-01` in the *File Name* field.

   Note: Once the object exists in the PLM system, any change to the *Name* made in the PLM is reflected in the *Publish* page for designers when publishing data to the PLM.

4. Add a description of the item if desired.

5. You can specify a variable-based value for the Item Number.

   This is the number of the existing PLM object that will hold your ECAD data. If project variables are created or updated to reflect your PLM part or document numbers, you can specify those variables here.

For example, `$PROJECT_VAR(PCBAssemblyPartNumber)` for the System Capture template where PLM numbers are stored in Pulse or `$CPM(CUSTOMVAR|PBA_NUMBER)` for DE-HDL where PLM numbers are stored in the `.cpm` file.

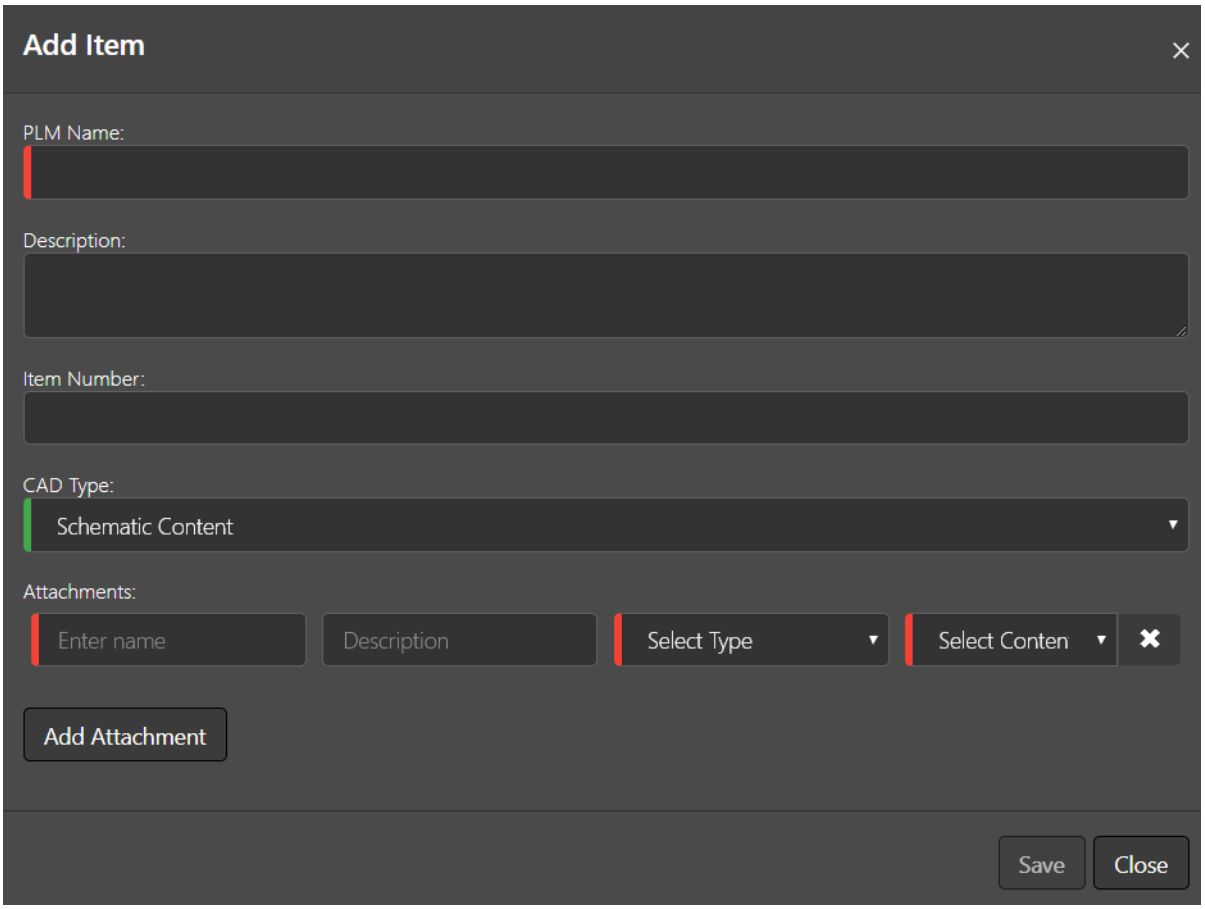
6. Select the CAD type.

   CAD Type indicates the type of document object that is created in the PLM system when data is published. The `serverConfig.json` file in the *<PULSE HOME>*`/server/data/polaris` folder contains a schema for each supported connector type. This schema defines the valid CAD types that can be added to each structure item type for a specific PLM.

   After you select a CAD Type, additional fields might be displayed based on the CAD type value. For some CAD types, you can specify a set of attachments, with which you can link utility outputs to the structure item you are adding.

   You can link utilities as attachments for specific CAD types. When you attach a utility as an attachment, an *Attachments* panel is added to the form.

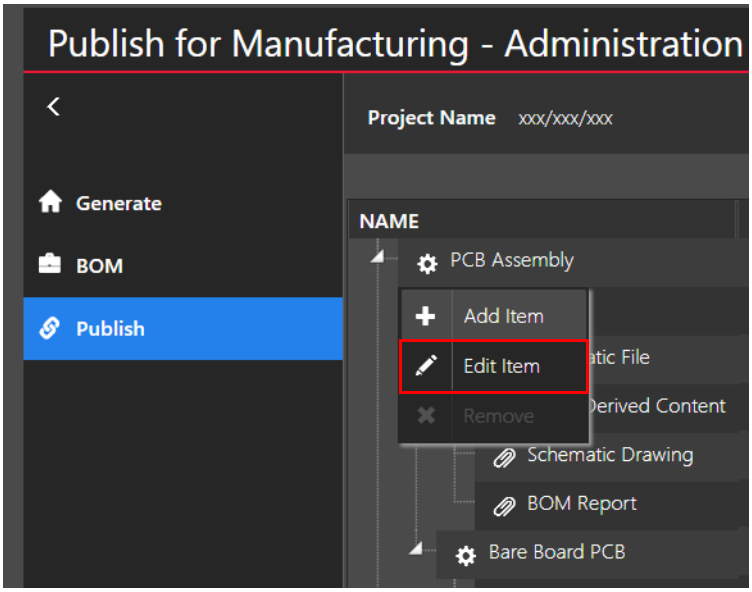
See Publish Structure Schema for Windchill and Publish Structure Schema for 3DEXPERIENCE for the supported CAD types.



7. For each attachment, specify:
   - ❑ Name - This will be displayed in the *Publish* page.
   - ❑ Description - optional; provides more details about the attachment and is displayed in the *Publish* page.
   - ❑ Type - The list is displayed based on the PLM schema.
   - ❑ Content Association - The list includes utilities that have not yet been assigned to another object.
8. Select the utility from the *Content Associated* list with which you want to associate this item, such as Schematic Archive Package, Variant BOM Report, Board Fabrication Package.

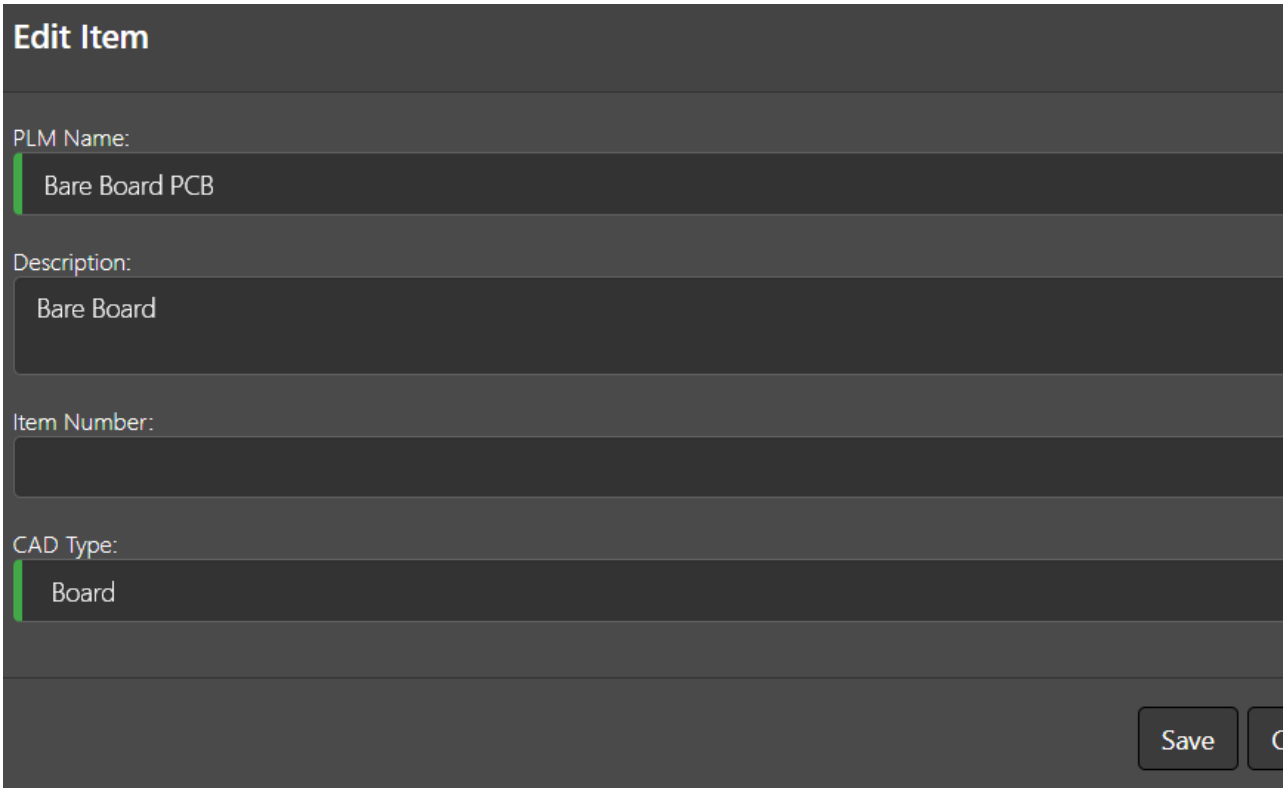
Modifying a Structure Item

1. To modify an existing item by renaming it or changing the utility or content association, do the following:
2. Right-click the item you want to modify.



3. Choose *Edit Item*.

The *Edit Item* dialog is displayed.



4. Modify the item name and its description, if needed.
5. Change the CAD type and or the content or utility association.
6. To remove an item from Publish for Manufacturing, right-click the required item and select *Remove Item*.

Configuring the Publish for Manufacturing Menu in Design Entry HDL

For designers to be able to view the Publish for Manufacturing menus in Design Entry, do one of the following:

- Add a button in Allegro X EDM Flow Manager.
- Add a menu item in Project Manager.

  For the button and the menu item, use the `rtp.bat` command.

Related Topics

- For details on customizing flows and buttons in Flow Manager, see the *Customizing Flow Steps and Buttons* section of *Allegro X EDM Flow Manager User Guide*.
- For details on adding a menu item in Project Manager, see the *Customizing the Project Manager Tools* section of *Allegro Project Manager User Guide*.

3

Publishing ECAD Data in Pulse Environment

To transfer all the required information, such as drawing and artwork files, for PCB manufacturing to your manufacturing organization or external partner, you need to publish the ECAD data to your PLM system or file system repository.

To publish the ECAD data, the following tasks are involved:

1. Launching the Publish for Manufacturing interface
2. Selecting the publish template for your ECAD data. This is a one-time task.
3. Generating and Locating Source and Derived Outputs
4. Reviewing the Bill of Materials
5. Creating Product Objects in PLM System
6. Publishing Data

Launching the Publish for Manufacturing interface

The Publish for Manufacturing interface can be launched from Allegro X System Capture and Design Entry HDL.

1. To publish ECAD content, do one of the following:
   - From System Capture, click *Tools — Publish for Manufacturing*.
   - From Design Entry HDL, do one of the following:
     - If configured by the administrator, launch Publish for Manufacturing using a menu option in Design Entry HDL or Allegro Project Manager.
     - If the flow administrator in Allegro X EDM Flow Manager has created a button for Publish for Manufacturing, use that button in Allegro X EDM Flow Manager.

2. After you launch Publish for Manufacturing, select the template to which you want to publish your ECAD data and click *OK*.

   This is a one-time task.

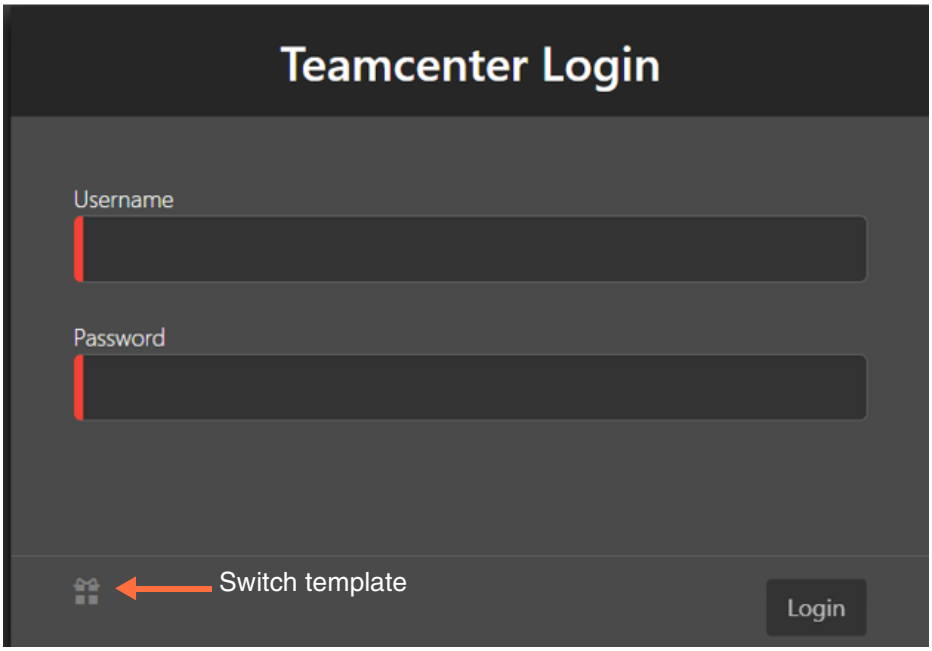
   If you selected a template configured for a connector other than file system, you are prompted to provide login credentials for the PLM system to which you want to publish your ECAD data.

3. Specify the user credentials for the connector you have selected and click *OK*.

   The utilities configured by the ECAD administrator to carry out publishing-related tasks are displayed. The PLM application associated with this template is displayed as a header in the Login form.

   The template selection is stored with the project metadada and the next time you launch Publish for Manufacturing, you are not prompted for the credentials again. If required,

you can switch to a different template when logging in to Publish for Manufacturing or within the PFM application.

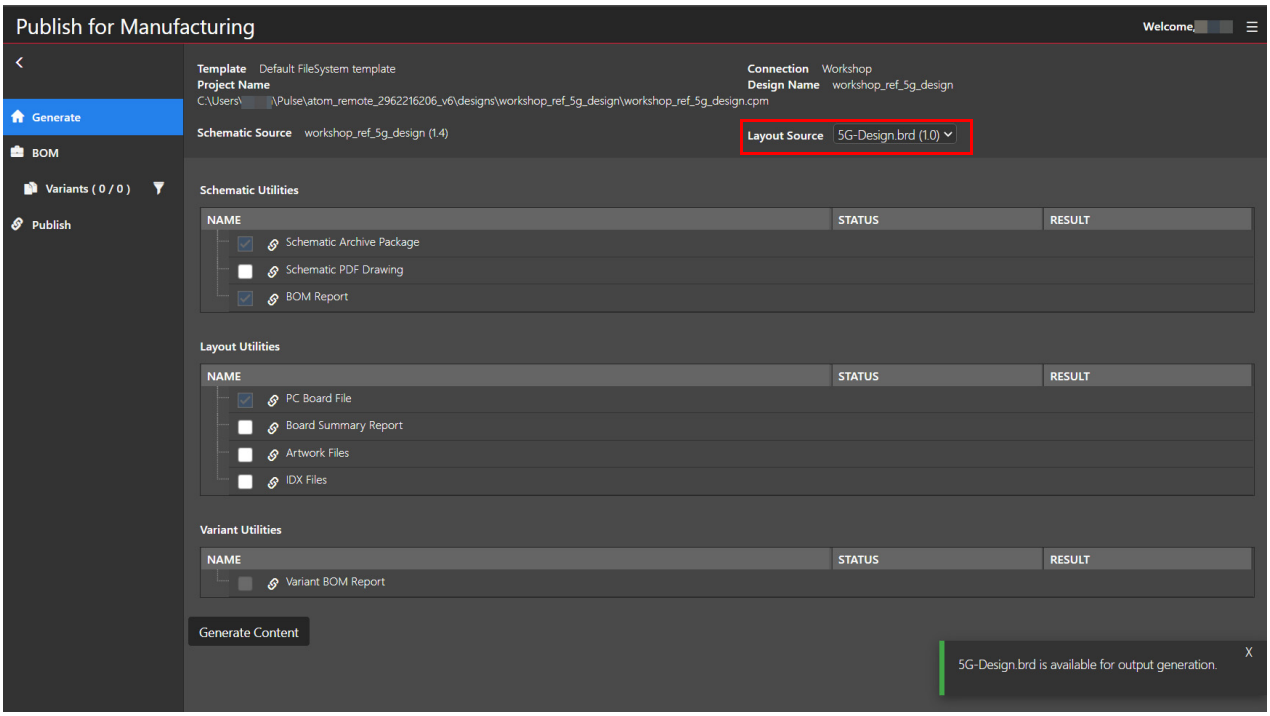


Generating and Locating Source and Derived Outputs

To generate derived content, do the following:

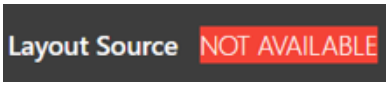
1. Review the *Layout Source* value in the header.

If the publish template defined Pulse as the *Layout Source*, and you have linked layouts, *Layout Source* displays all the layouts.



2. Select the layout database from which derived content is to be generated.

   If you have no linked layouts for a design, PFM displays the following status:

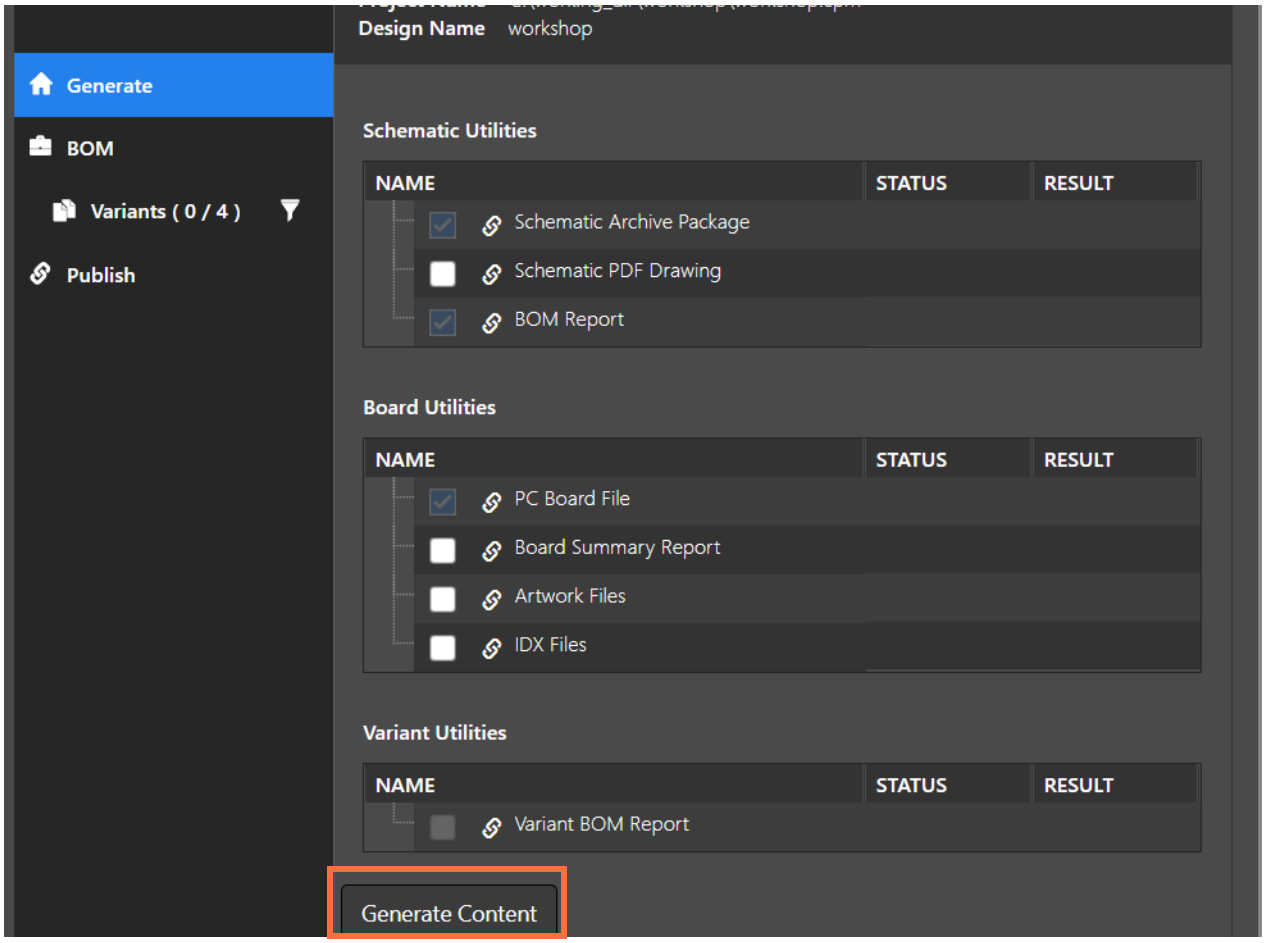
   If the publish template defined a local path as the layout source, you will see that the path resolves to a board file in the header.

   Before publishing data for the first time, you must specify the PLM Part numbers for the assembly, board, and any variant assemblies. These objects must be created in the PLM system.

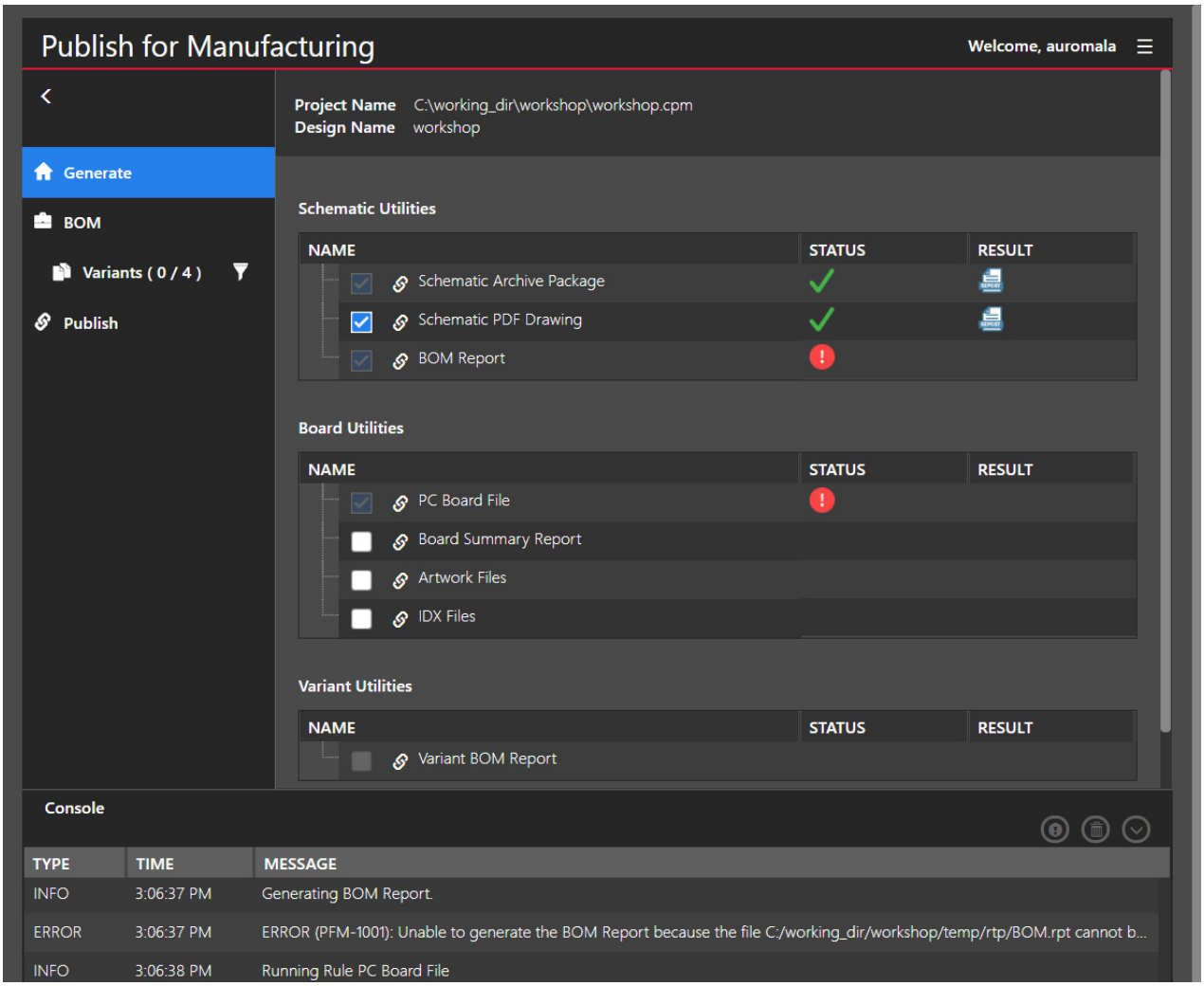
3. Select the required utilities and click the *Generate Content* button.

   Some boxes might already be selected if they have been set as mandatory in the publish template. You cannot deselect these check boxes.

Note: For Schematic PDF Drawings, you must have a postscript to PDF converter.



4. To view any log messages in the Console window, use the up arrow button at the bottom-right of the Publish for Manufacturing dialog.



Check the results of the content generation by clicking the icon in the *Result* column. This opens a dialog to save the generated content created by the utility.

Note: If any content could not be generated, a red exclamation icon is shown in the status column for that content. More information about the source of the failure can be found in the Console window.

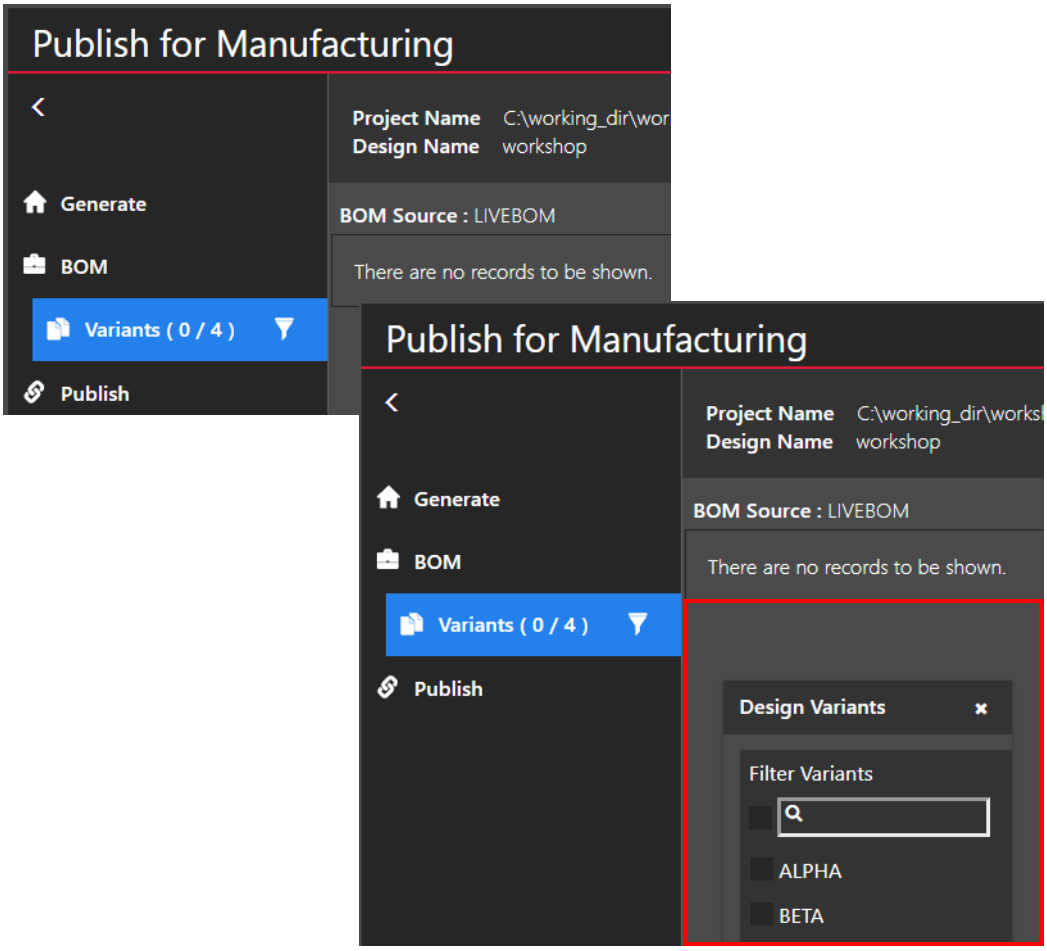
Related Topics

- Associating Schematic and Layout Versions
- Creating Product Objects in PLM System

Reviewing the Bill of Materials

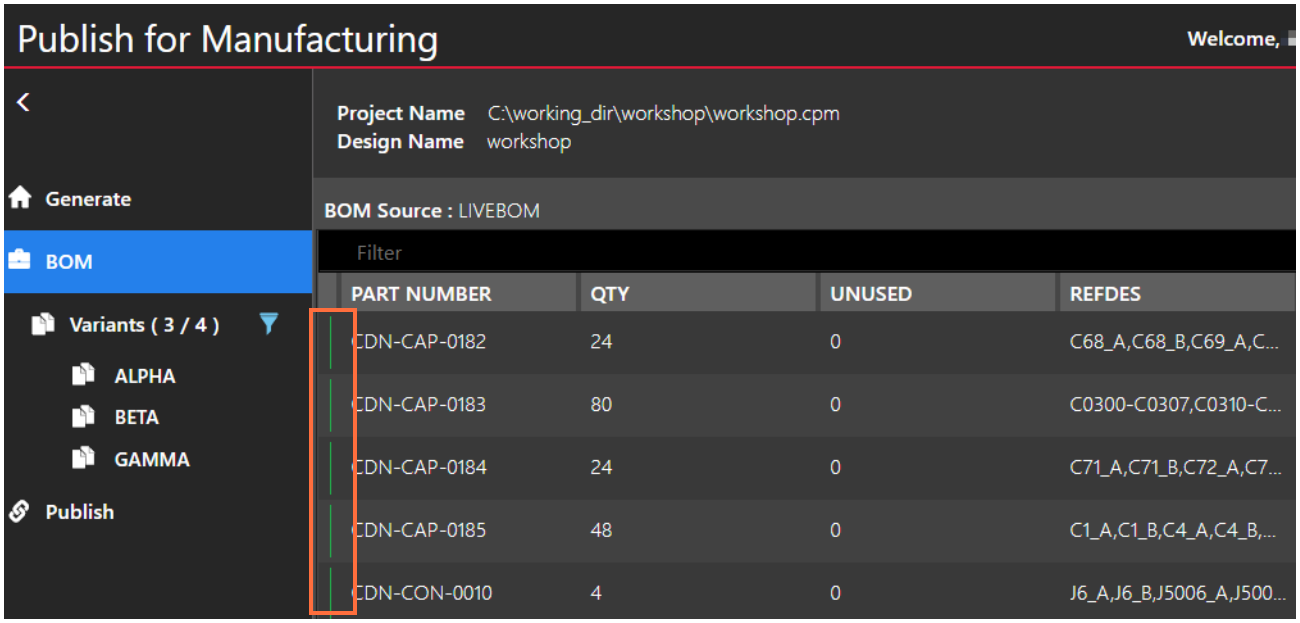
You can view the base BOM and variant BOM generated by the ECAD design application before publishing data.

1. To view the variant BOMs, click the icon next to *Variants.*
2. Filter the variants whose BOMs you want to view.



3. Click the BOM or any variant in the *Variant* tab to view the BOM or variant BOM.

The green vertical bar in the left column of the BOM pane signifies that Publish for Manufacturing has found the equivalent part in the PLM system. A red bar indicates that the part cannot be found in the PLM system.



PFM only publishes parts with a green bar.

If the board is available in the location as specified by the *Layout Source* in the PFM template, the placement information is displayed as well.

COMPPACKAGE	Footprint instantiated on the layout
SYMXMICRONS	Location of component in Microns
SYMYMICRONS	Location of component in microns
SYMROTATIONDEGREES	Component rotation
SYMMIRROR	Top-side place value is false, and the bottom placement is true.

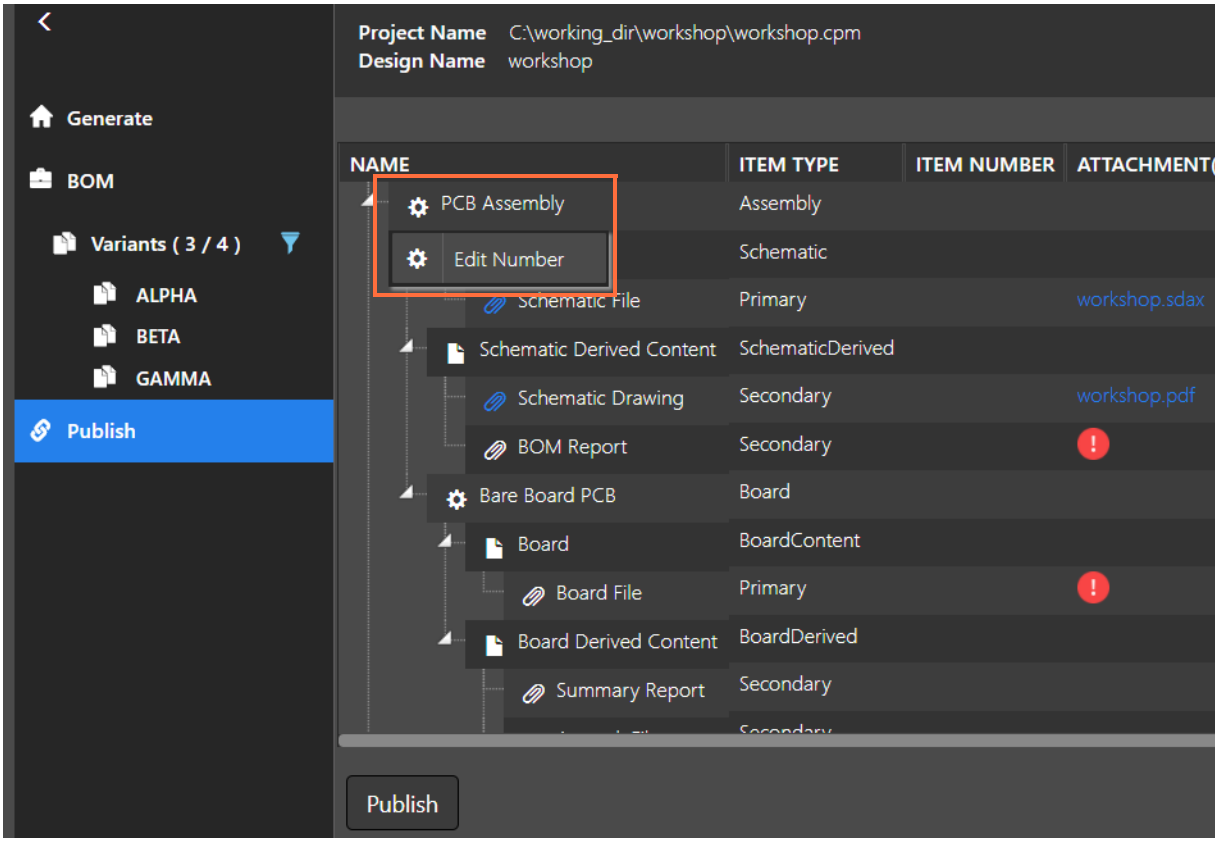
Publishing Data

Before publishing data, ensure that you review the BOM publish actions and the PLM item numbers.

To publish data, do the following:

1. To publish content, specify the top-level ECAD assembly part or item number in the *Publish* tab.
2. To specify the assembly part number, right-click the top-level part in the *Name* column.
3. Click *Edit Number*.

   This part number might be prefilled if the administrator added a project variable to the Item Number value when configuring Publish for Manufacturing.



   For the file system connector, these numbers are represented as folders in your release package.

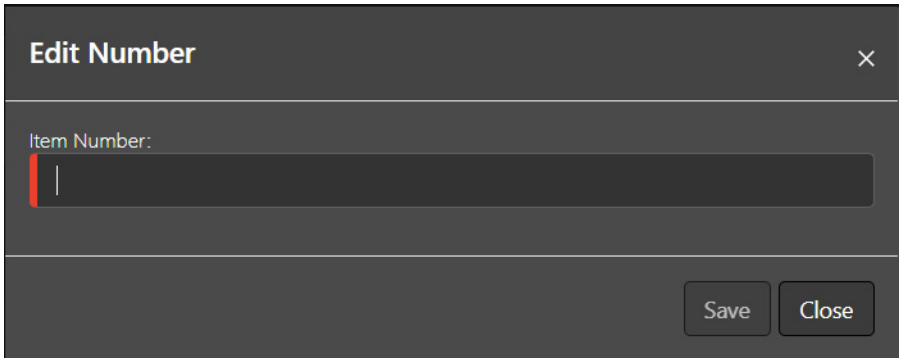
   Structure item numbers for the main assembly, bare board, and variant assemblies need to be created in the PLM application.

4. Specify the structure item numbers for the main assembly, bare board, and variant assemblies by right-clicking the required item.

   The *Edit Number* dialog box is displayed.

   You can search for an existing PLM part number if you work with 3DEXPERIENCE.

See Searching for Assembly or Board Numbers for more details.



5. In the Edit Number dialog, specify the number and click *Save*.

   For PLM connectors, this value is validated against your PLM system. If the number does not exist in the PLM system, a message is displayed and the field is cleared.

6. Deselect the BOM box for the main assembly and or any variant if you want to publish only attachments and not the BOM data.

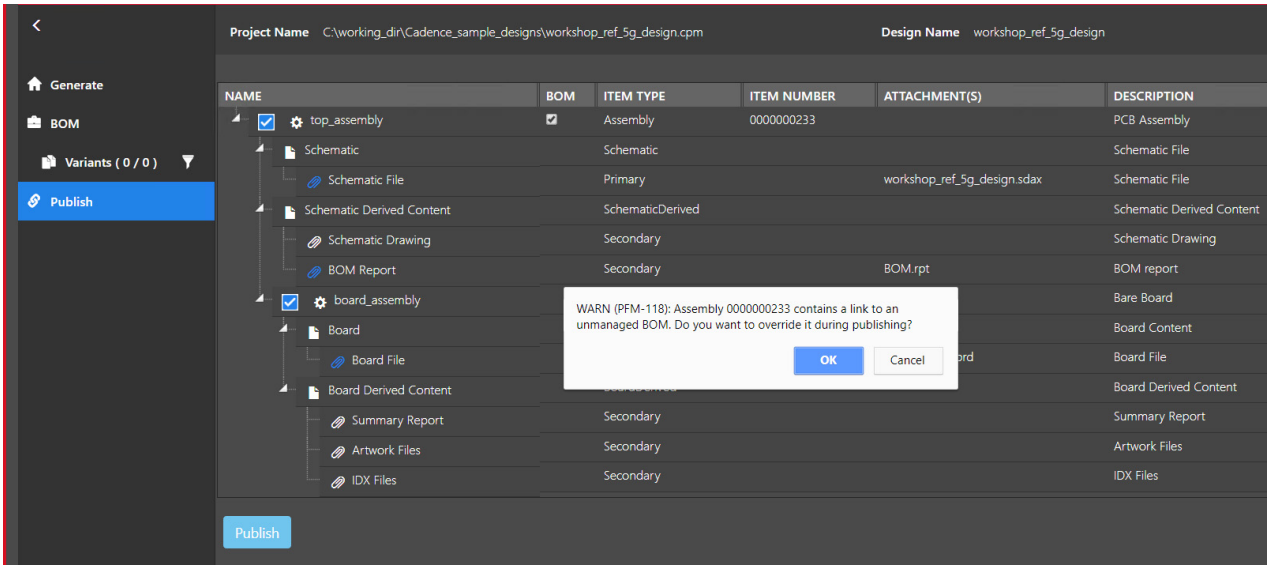
   This check box is selected by default and initiates a BOM publish action.

7. After you add or edit the part numbers, click the *Publish* button to push the generated content to the PLM system.

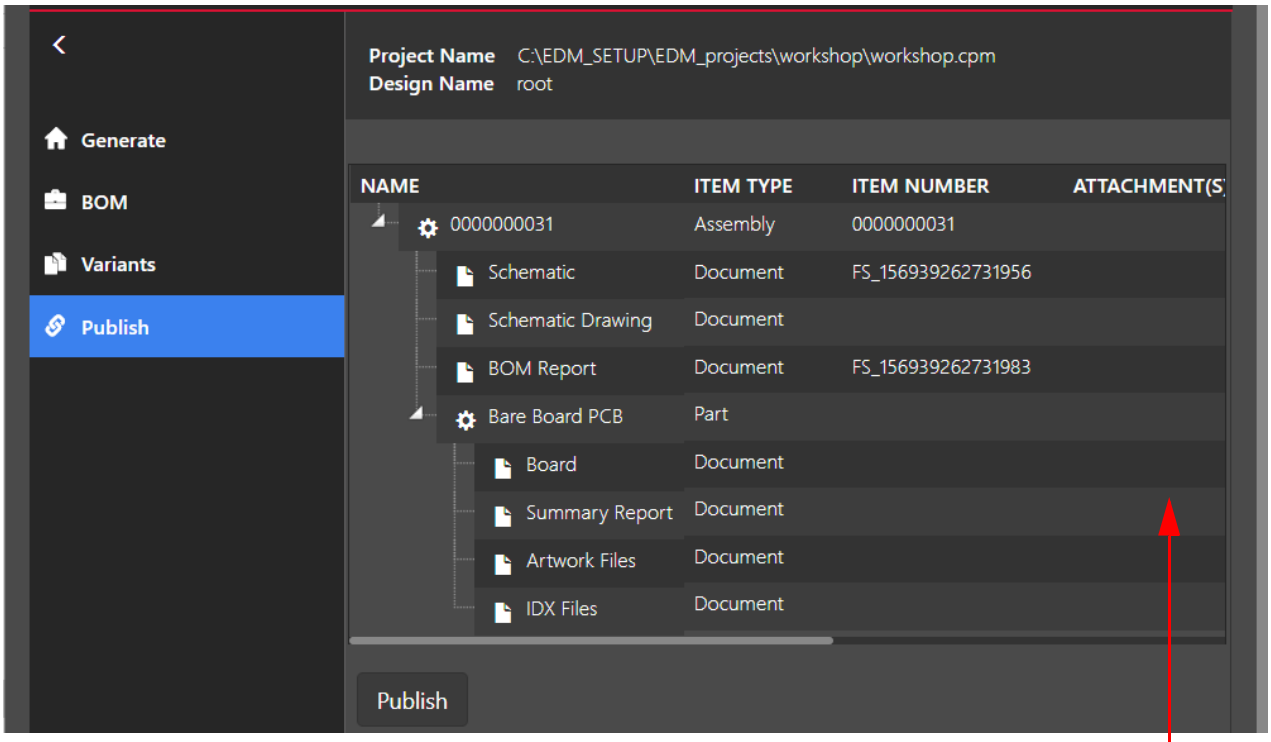
   If you are publishing to an existing Windchill assembly structure that has not yet been updated by Cadence, a warning is displayed. If you proceed, the BOM will be managed by Publish for Manufacturing.

   Note: The option whether to have your BOM managed by Publish for Manufacturing is only supported for Windchill. For all other connectors, Publish by Manufacturing by

default manages the BOM.

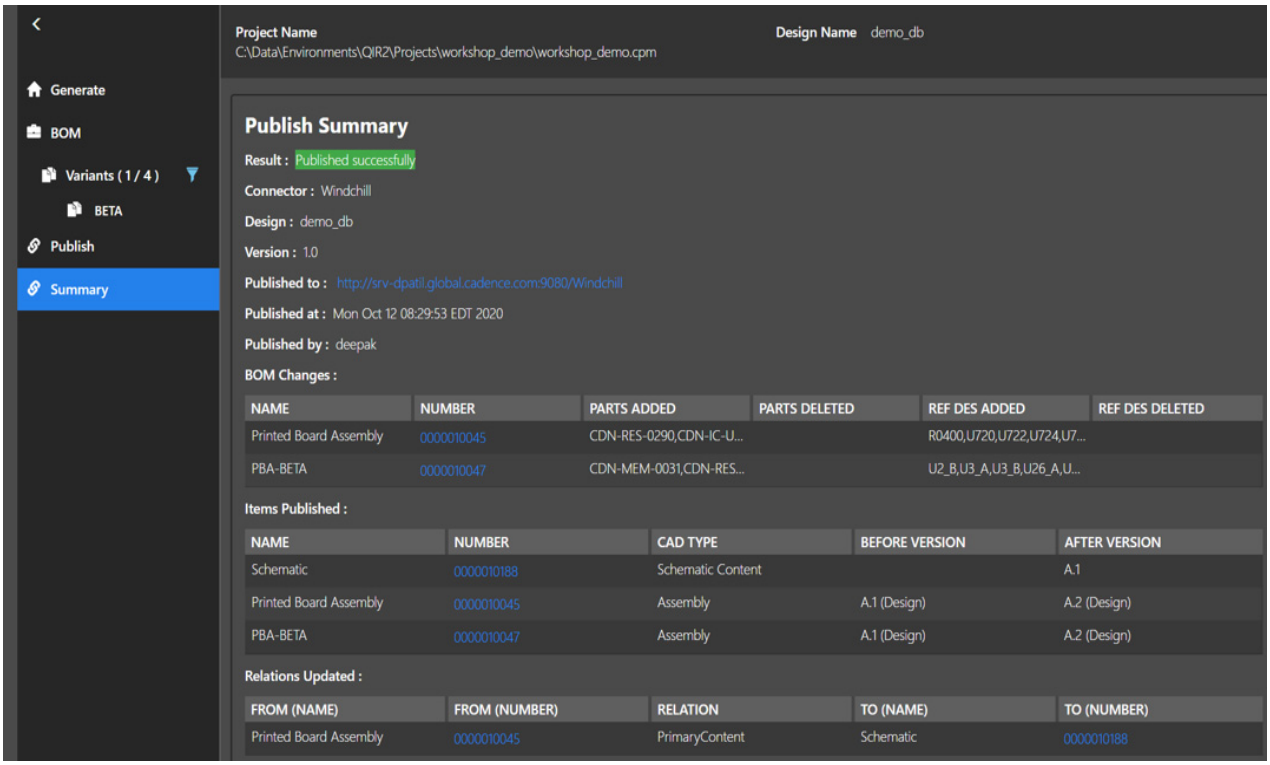


The content is published and a summary is displayed.

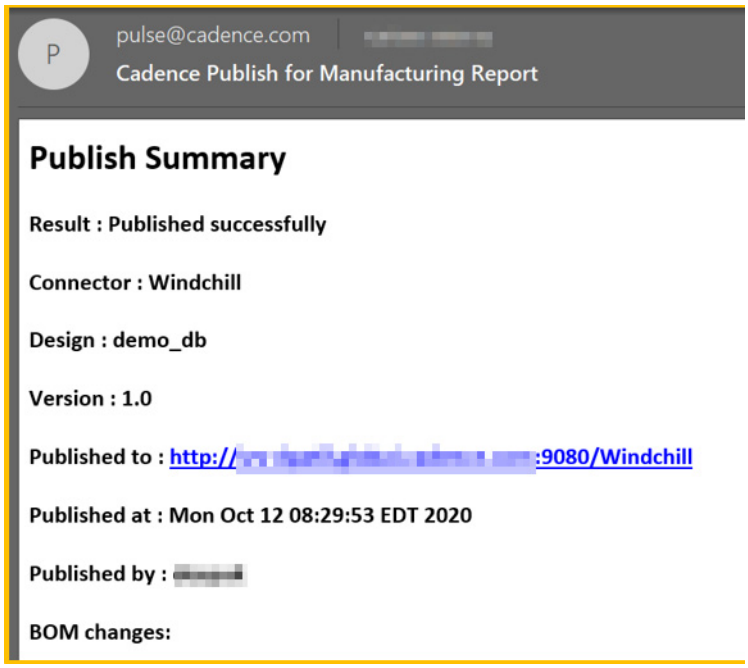


After Publish for Manufacturing successfully publishes the content, the *Attachment(s)* column is cleared.

If this is a first time publish, this page includes item numbers for the PLM document object or file system folders that were created as part of the publish operation.



Designers are also notified by email when the ECAD data is successfully published and provides a summary of the changes made.



4

Publishing ECAD Data in OrCAD X Environment

Designers developing printed circuit boards in the OrCAD X environment can use the Publish for Manufacturing (PFM) application to publish BOM and fabrication data to the 3DExperience PLM to support prototype and production builds.

Each user environment must include a PFM template to guide the publish process.

A PFM template defines the utilities needed to generate the required derived data as well as the PLM structure to which that data will be uploaded. By simplifying this publish operation, you can share design artifacts throughout the design process. This enables early access to Bill of Materials for procurement planning and supply chain risk analysis, assembly document for review outside of the design teams, and a complete data set for manufacturing.

Prerequisites

The Cadence installation must be at the 22.10.005 release level or greater. Integration with Publish for Manufacturing is only supported with the OrCAD X Professional Capture product.

PLM Support Matrix

The following PLM applications are supported with respect to publishing BOM and derived data from OrCAD X to the PLM system.

PLM VENDOR	PLM TOOL	PLM VERSION (Minimum)
Dassault Systems	3DExperience - CLOUD	23x BASE

Publish for Manufacturing Administration

To publish design data to 3DExperience, you need to first complete the following administration tasks for 3DEXperience PLM and Publish for Manufacturing configuration:

- Create a User Agent in 3DExperience. This enables an SSO-like experience for user authentication to 3DExperience. This must be done by a 3DExperience user with administrative privilege. There should be one User Agent for each OrCAD X user that needs to publish data to 3DExperience. Creating a User Agent in 3DExperience
- Create a managed connection to facilitate authentication from OrCAD X to 3DExperience CLOUD. See Creating a Managed Connection for 3DEXPERIENCE Connector for details.
- Create a publish template with a managed connection. This is needed to create a new publish template based on the out-of-the-box configuration. See Creating a Template.
- Configure a publish template. The template summarizes functionality to extend the out-of-the-box configuration as needed. A publish template defines a set of utilities to generate documentation and a PLM structure to which data is published. See Configuring Publish Templates and Publish for Manufacturing Variables.

After you complete the administration and configuration tasks, you can:

- Create assembly and board items. See Creating Product Objects in PLM System for details.
- Publish BOM and derived data to 3DExperience assembly and board items

Creating a User Agent in 3DExperience

The OrCAD X connector for 3DExperience uses the Openness Agent to run a web service. To create an agent, you must have the following elevated privileges in 3DExperience:

- The Enterprise Integration Architect (PFI) role
- You must be the administrator of the tenant.

If you do not have these privileges, contact your PLM administrator who will create the User Agent and provide you the agent ID and password so that you can create a publish template with a managed connection.

The openness agent is an object managed by the 3DEXPERIENCE service named Credential Lifecycle Management (CLM). To create a new agent for the current platform instance, two pieces of information are required:

- An agent name
- The username of a person with a 3DEXPERIENCE platform account

After an agent is created, CLM displays the agent credentials:

- An internal name (agent ID)
- A password (agent password)

  The password must be copied and provided to the OrCAD X users.

Important

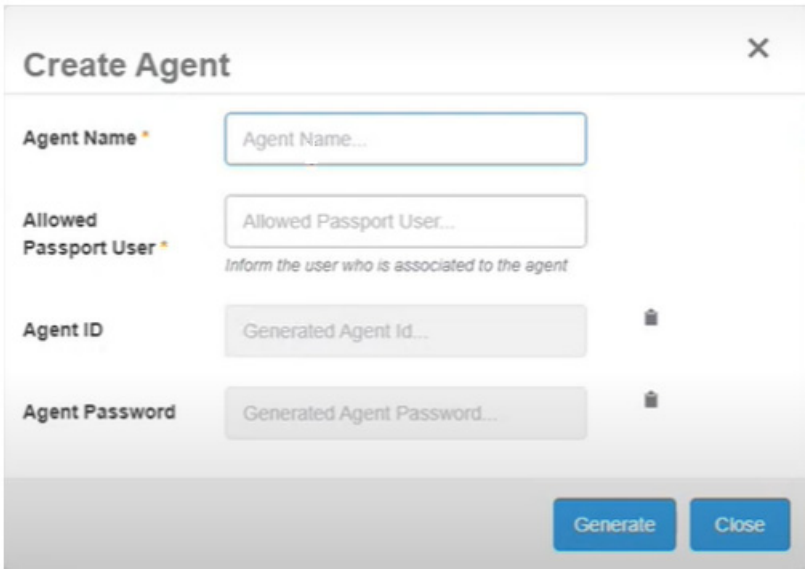
Once you close the creation form, you cannot view the password again.

Do the following to create the User Agent.json file:

1. Log in to the 3DEXPERIENCE platform as the administrator of a tenant.

   You can also access the *Agent Management* application in the Compass.
2. In the *Agent Manager* tab, click the plus icon.

   A Create Agent dialog box is displayed.



3. Fill in the fields.

   Agent Name must be a character string. *Allowed Passport User* must belong to the tenant and must be a member.
4. Click *Generate*.

   Agent ID and *Agent Password* are generated. You can copy and paste the generated ID and password if you need to save the generated values. You must send this Agent ID

and Password to OrCAD X users to enable them to create a managed connection for this tenant.

5. Close the dialog box.

   Note: Once you close the dialog box, there is no way to retrieve the generated ID and Password.

   For additional details of 3DExperience User Agents, refer to the *Managing Agents* section of the 3DExperience documentation.

Creating a Publish Template with a Managed Connection

You need to create a managed connection definition in the OrCAD X environment for each 3DExperience instance to which you will publish data. This might include a *Test* and *Production* instance of the PLM system.

The administration client of Publish for Manufacturing enables you to create and edit your publish templates. You can:

- Create a new publish template based on the out-of-the-box defaults.
- Edit an existing publish template.
- Export and import a publish template if you want to share your template with other users.
- Delete custom templates.

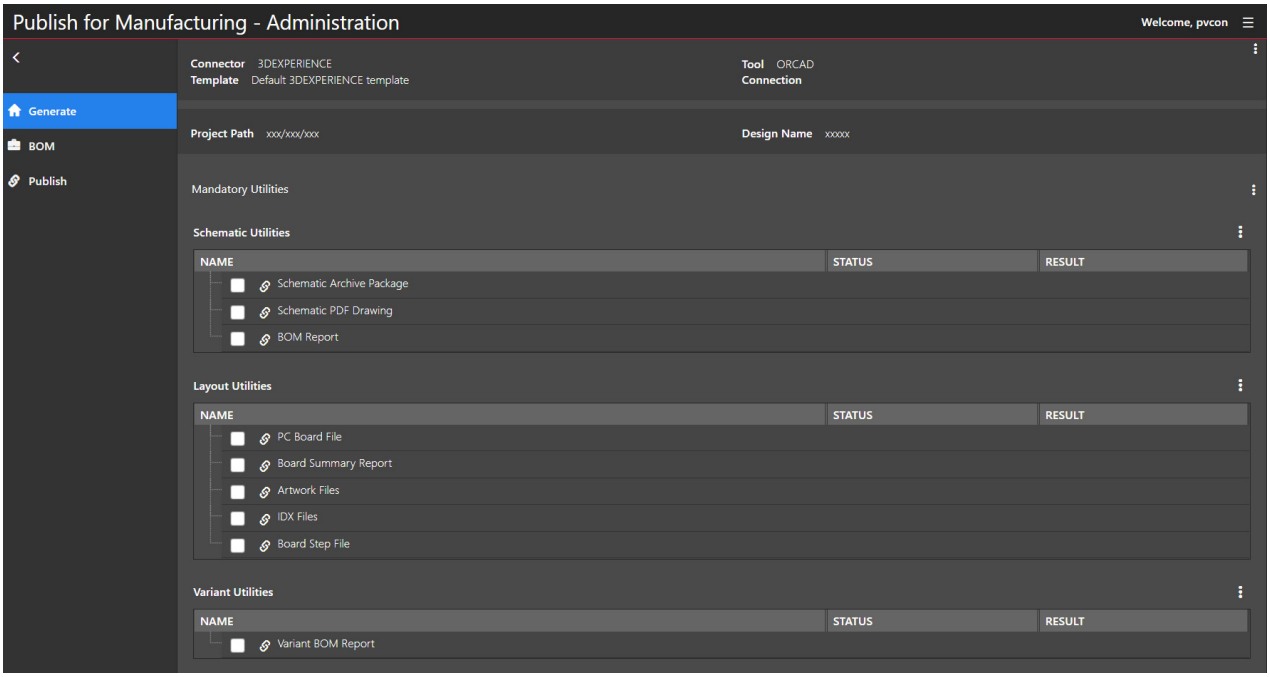
  You cannot delete default templates.
- Specify a location for your board file.

➡ To launch the administration client, navigate to:

<Cadence_installation_directory>`/tools/bin` and type the following at a command prompt: `rtp -admin -orcad -lite`

You are prompted to select a template for editing. To create your first template, just click *OK*.

The Publish for Manufacturing Administration interface is displayed.



This interface is similar to the interface used when publishing data to the PLM system. The *Administration* string in the title bar indicates that you are using the administration client.

To access the web page for creating a managed connection, you need to create your first template.

Related Topics

Publish for Manufacturing Administration User Interface

Creating a Template

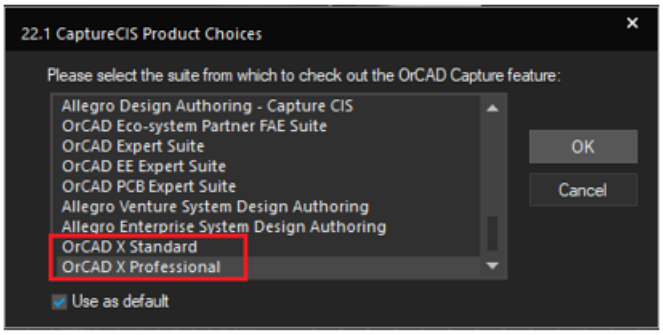
Configuring Publish Templates

Publish for Manufacturing Variables

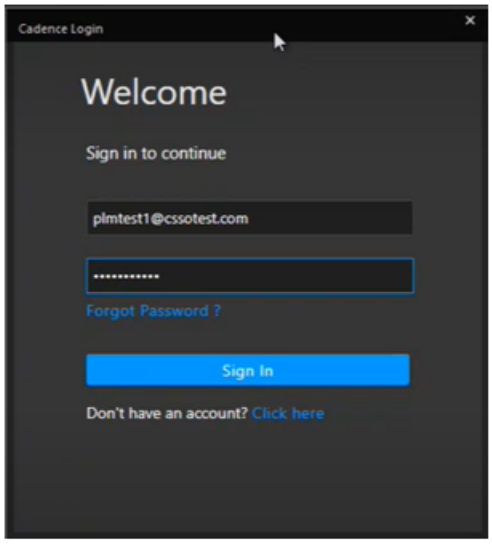
Publishing Data to the PLM system

To publish design data to 3DExperience, do the following:

1. Launch the Capture application with one of the OrCAD X product choices.



2. Authenticate to the OrCAD X platform with your username and password.

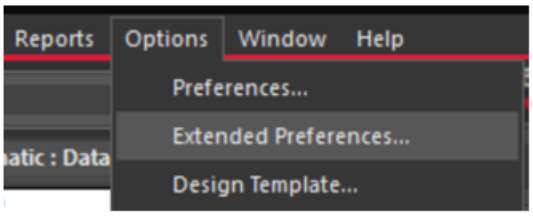


3. Open a design project for which you are ready to publish data to the PLM system.

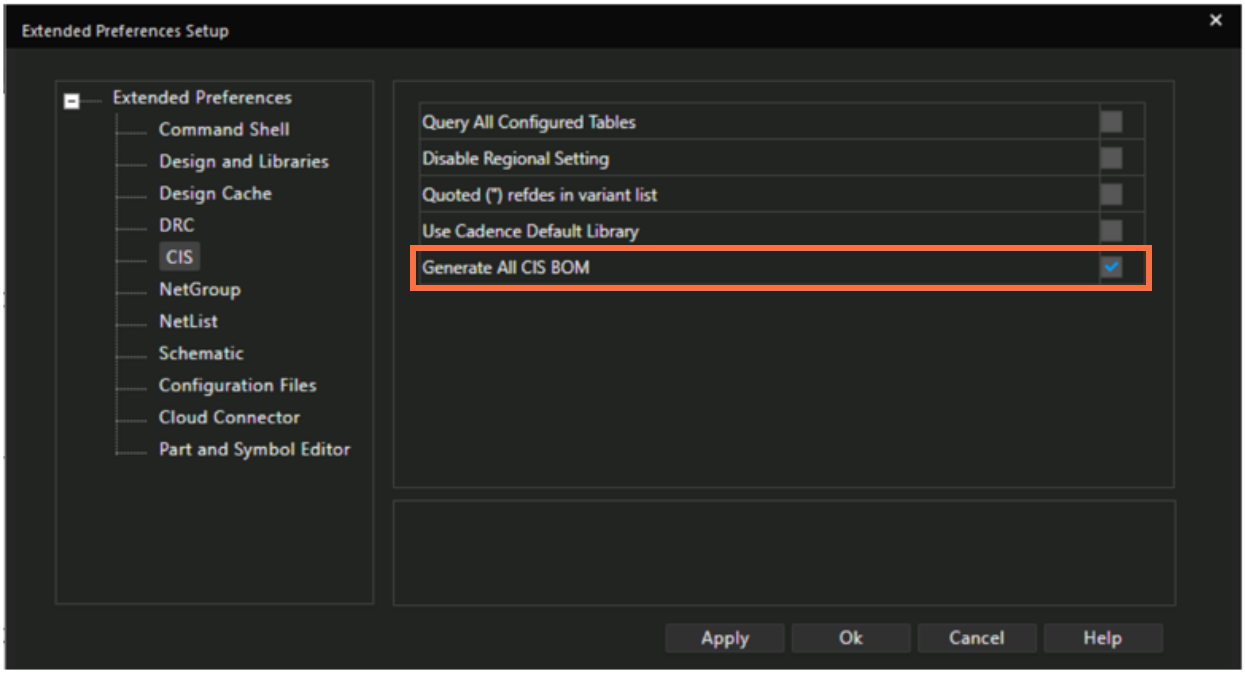
Generating CIS BOM and Variant Report

If you have defined assembly variants in your design and want to publish variant-specific BOM data to 3DExperience, you must first generate a variant BOM report.

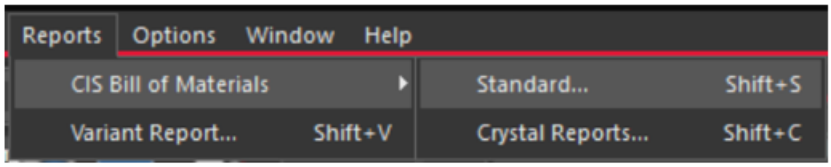
1. From the *Options* menu, select *Extended Preferences*.



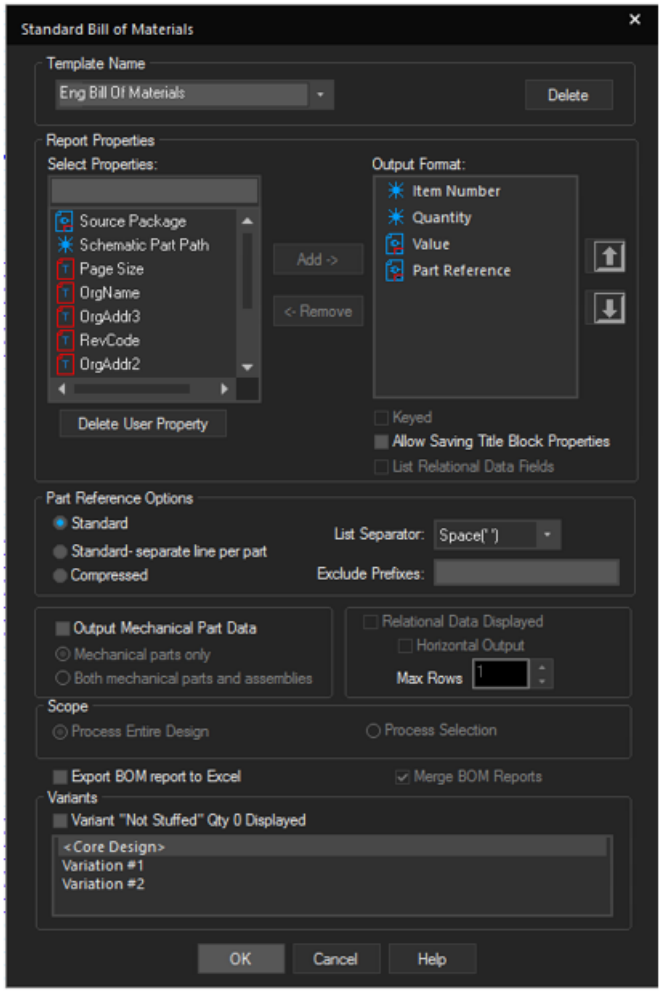
2. In the *Extended Preferences Setup* dialog box, highlight *CIS* from the Extended Preferences tree on the left.



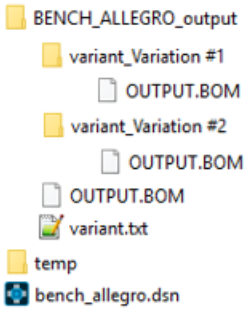
3. Check the box to the right of *Generate All CIS BOM*.
4. Click *OK* to set the preference and close the dialog box.
5. From the *Reports — CIS Bill of Materials* menu, select *Standard*.



6. From the Standard Bill of Materials dialog box, click *OK* to generate the BOM reports for the base design of each variant.



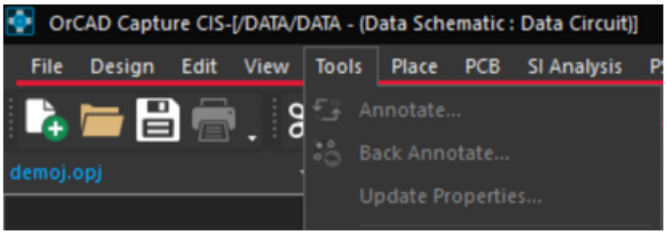
This data is downloaded to the `<dsn name>_OUTPUT` folder created at the same level as the `.dsn` file. There is an `OUTPUT.BOM` for the base design and each variant. The out-of-the-box configuration of PFM reads the content of this folder.

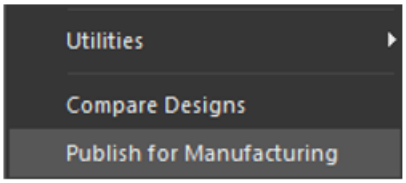


Launching Publish for Manufacturing

To publish BOM and derived data to the PLM system for the first time, do the following:

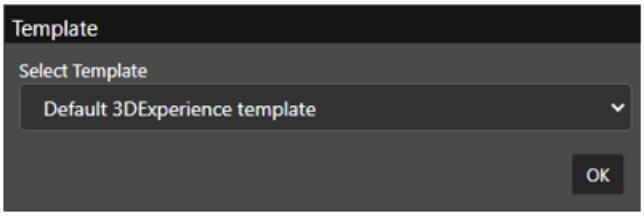
1. From the top-level *Tools* menu, select Publish for Manufacturing to launch the PFM application.





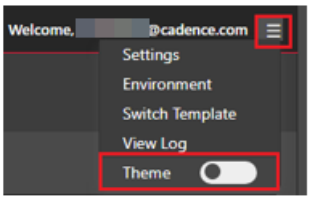
You are automatically authenticated to the 3DExperience platform based on the User Agent specified as part of creating the managed connection.

2. When prompted to select a publish template, choose one from the list and click *OK*.



   This template selection is stored in a `.pfm` file at the same level as the `.dsn` file. You are not prompted again for this project. Within PFM, there is the option to change a template.

3. Use the *Theme* toggle to change from the light to a dark backgrounding as desired.



4. Review the Bill of Materials and publish the ECAD data.

Related Topic

Reviewing the Bill of Materials

Publishing Data

5

Appendix

This section provides information that is not essential to work with Publish for Manufacturing but that you might need to know.

Publish for Manufacturing Administration User Interface

A quick overview of the user interface is as follows:

The top pane indicates the:

- Type of connector. For example, 3DEXPERIENCE
- Authoring tool, such as OrCAD Capture
- Template you are currently editing
- Managed connection linked to this template

The left side panel includes three nodes specific to a configuration task. Clicking each node updates the display in the center pane.

- *Generate*: Define or update a set of utilities to generate and/or locate design documentation.
- *BOM*: Use the *Hide*, *Show*, *Order* columns for the BOM preview.
- *Publish*: Define a structure indicating the target PLM part and document objects for each of your design documents.

Additional Details for 3DEXPERIENCE Connector Configuration

For additional information about 3DEXPERIENCE connector configuration, see:

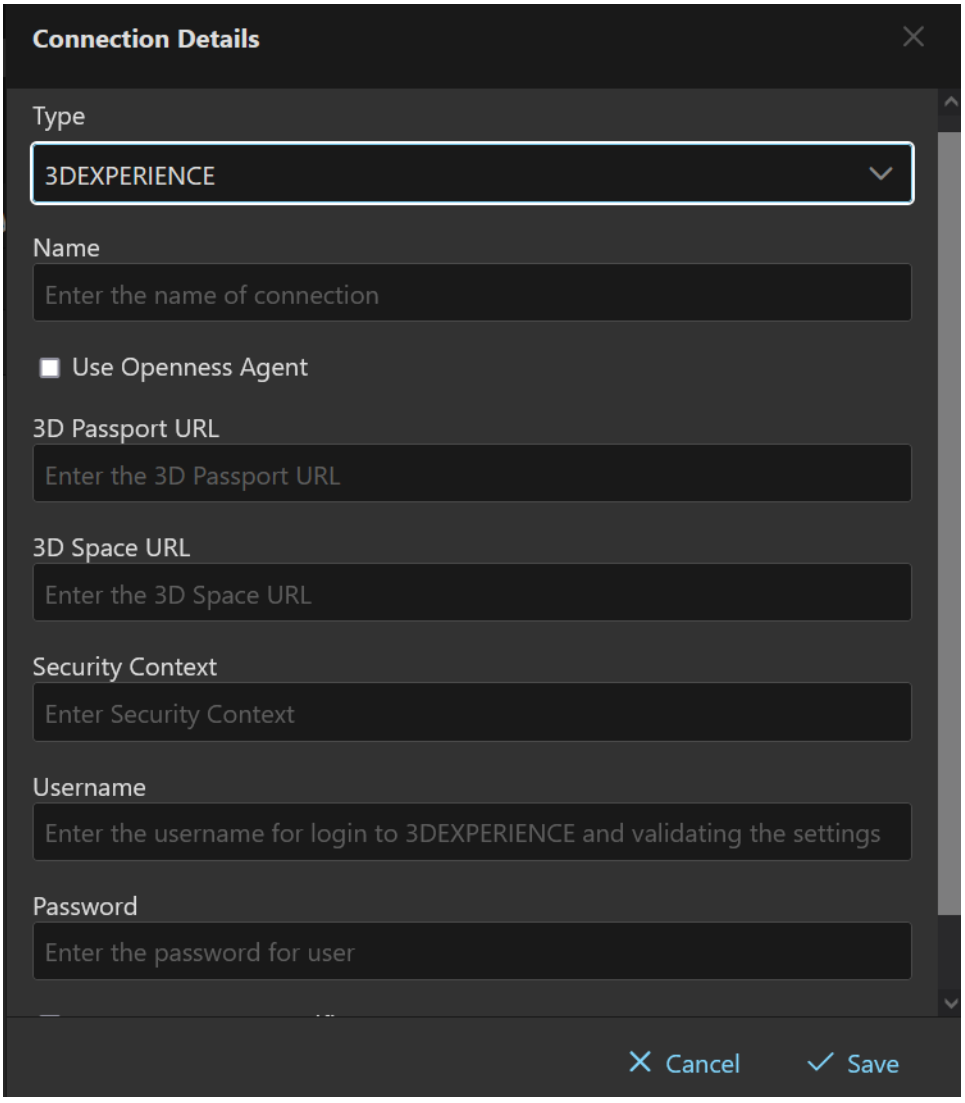
- Creating a Managed Connection for 3DEXPERIENCE Connector

- Searching for Assembly or Board Numbers
- Publish Structure Schema for 3DEXPERIENCE

Creating a Managed Connection for 3DEXPERIENCE Connector

To create a managed connection for 3DEXPERIENCE, do the following:

1. Specify the connection *Type* as 3DEXPERIENCE.



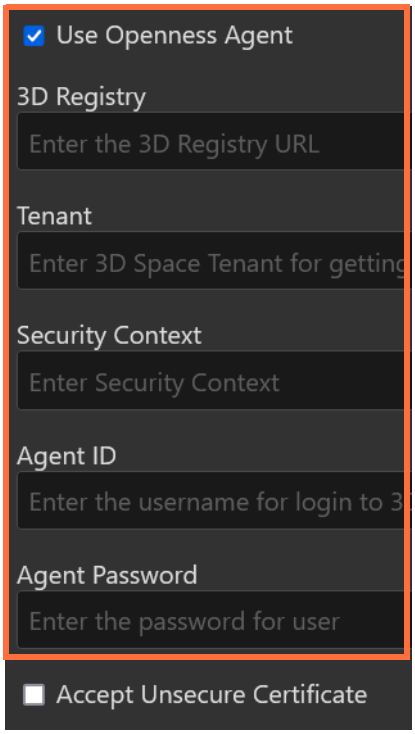
2. Specify a descriptive *Name* to identify the PLM instance, that is, the managed connection.

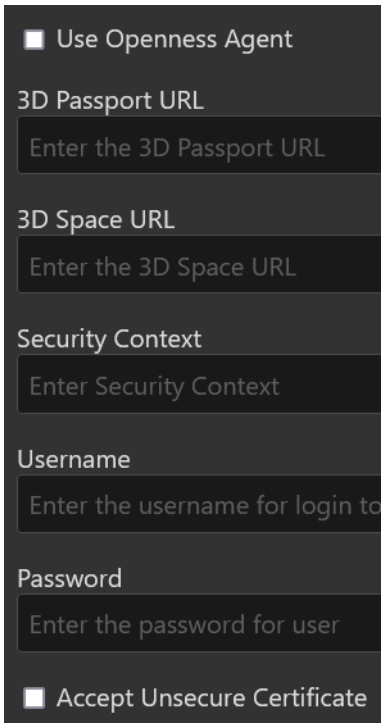
3. Do one of the following:

- ❑ If you clicked the *Managed Connection* link from the PFM Administration interface for DE-HDL or System Capture, skip to step 7.
- ❑ If you clicked the *Managed Connection* link from the PFM Administration interface for OrCAD X Capture, select the *Use Openness Agent* check box.

  The *Use Openness Agent* option is only available when you click the *Managed Connection* link from the OrCAD X PFM Administration interface. It is required to connect to a 3DEXPERIENCE multi-tenant Cloud environment.

  When *Use Openness Agent* is selected, the highlighted fields are displayed:





4. Specify the following if you select *Use Openness Agent*:

- ❑ *3D Registry* – The 3D registry URL is included in the information sent to you with your 3DEXPERIENCE CLOUD subscription.
- ❑ *Tenant* - This is part of the information sent to you with your 3DEXPERIENCE Cloud subscription.
- ❑ *Security Context* – This value should be provided by your PLM Admin. A sample value would be `"VPLMProjectLeader.Company Name.Common Space"`

- *Agent ID* and *Password* – You get these values from the PLM administrator after a User Agent has been set up for you. See Creating a User Agent in 3DExperience.

5. Specify the 3DEXPERIENCE 3D Passport URL. For example, `https://plm-server/3dpassport`.
6. Specify the 3DEXPERIENCE Space URL. For example, `https://plm-server/3dspace`.
7. In *3D Space Tenant*, specify `OnPremise` if your 3DEXPERIENCE installation is within your network or on a hosted server.

   If you are connecting to a 3DEXPERIENCE multi-tenant Cloud environment, specify the name of your tenant.
8. In *Security Context*, specify the collaboration space details to be used when this definition is used to authenticate to 3DEXPERIENCE.

   The security context affects which data is available to you in 3DEXPERIENCE and has the following format: *<role>.<organization>.<collaboration space>*. For example, "`VPLMProjectLeader.Cadence.Common Space`".
9. Specify the username and password for the PLM system to validate the connection parameters.

   These credentials are not stored and are only used to validate the connection parameters.
10. Click *Save* to validate and store the connection definition.

Searching for Assembly or Board Numbers

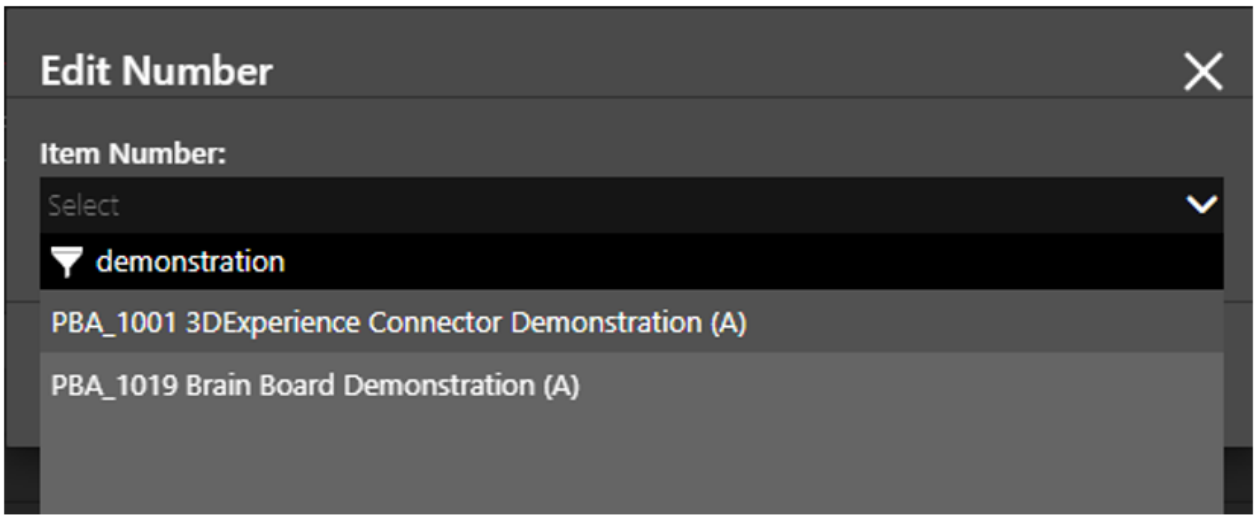
When using a publish template for the 3DEXPERIENCE PLM, you can use the *Edit Number* form in the PFM *Publish* page to search for a product object in the 3DEXPERIENCE platform. This applies to the top-level assembly, the board, and all variant assemblies.

The drop-down list in the *Edit Number* form is dynamically created when you search on the 3DEXPERIENCE platform. The list displays all physical product types, VPMReference, that have the status of `In Work`. You can further filter this list for Assembly and Board searches by editing the *<Pulse Server HOME>*`/server/data/polaris/serverConfig.json` file. If you need to update this file, contact Cadence Customer Support for assistance.

For each search result, the following PLM object metadata is displayed to help you select:

<Part Number><Title>(*<Revision>*)

When you select and save the Part Number value, it is stored in Pulse with the project metadata.

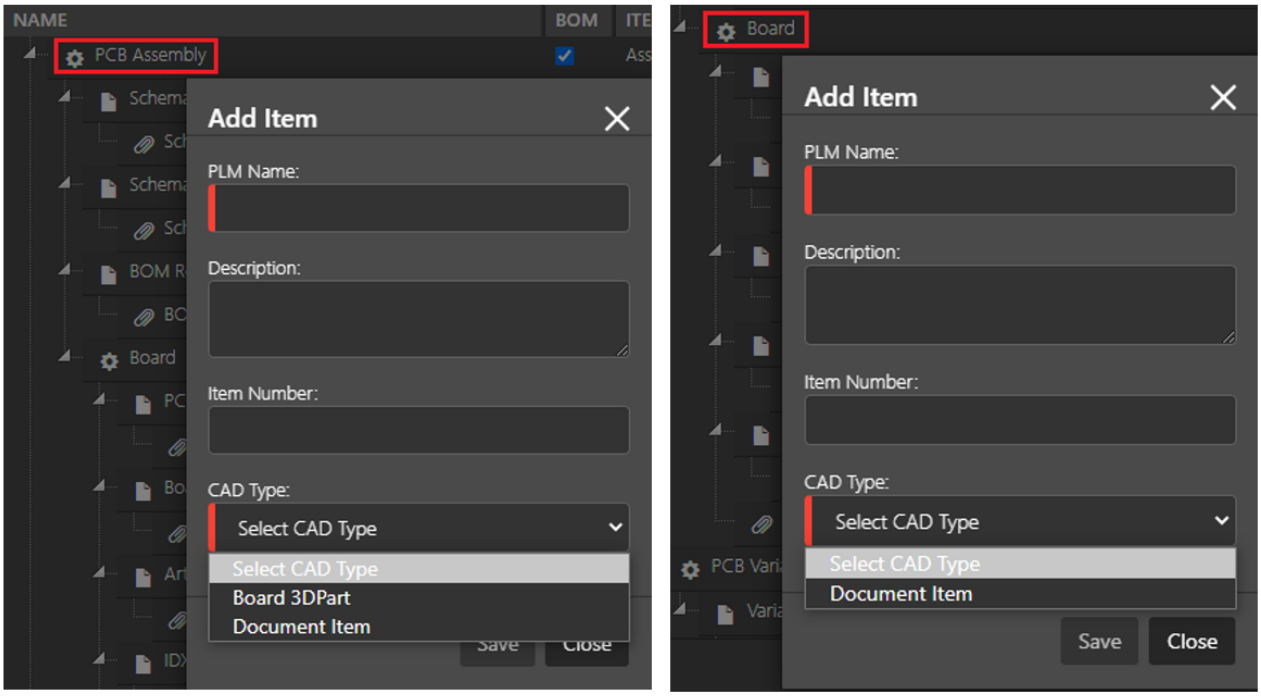


Publish Structure Schema for 3DEXPERIENCE

This table summarizes the out-of-the-box object-related schema definition used by PFM to publish data to 3DEXPERIENCE. Additional PLM types can be visible in the template by editing the `<Pulse Server HOME>/server/data/polaris/serverConfig.json` file. If you need to update this file, contact Cadence Customer Support for assistance.

PFM Item Type	PLM Type	PFM Cad Type	Add Item Options	Can have Attachments?
Assembly	Product	Assembly Item	Board 3DPart Document Item	No
Board	3DPart	Board 3DPart	Document Item	Yes
Document	Document	Document Item	None	Yes

This schema is used when options are displayed to update the publish structure.



Additional Details for Windchill Connector Configuration

With Windchill, you have an option to configure a Single Sign-on (SSO) solution when authenticating to Windchill through an OAuth Server. The configuration parameters for authentication with and without SSO enabled are different.

For additional information about Windchill connector configuration, see:

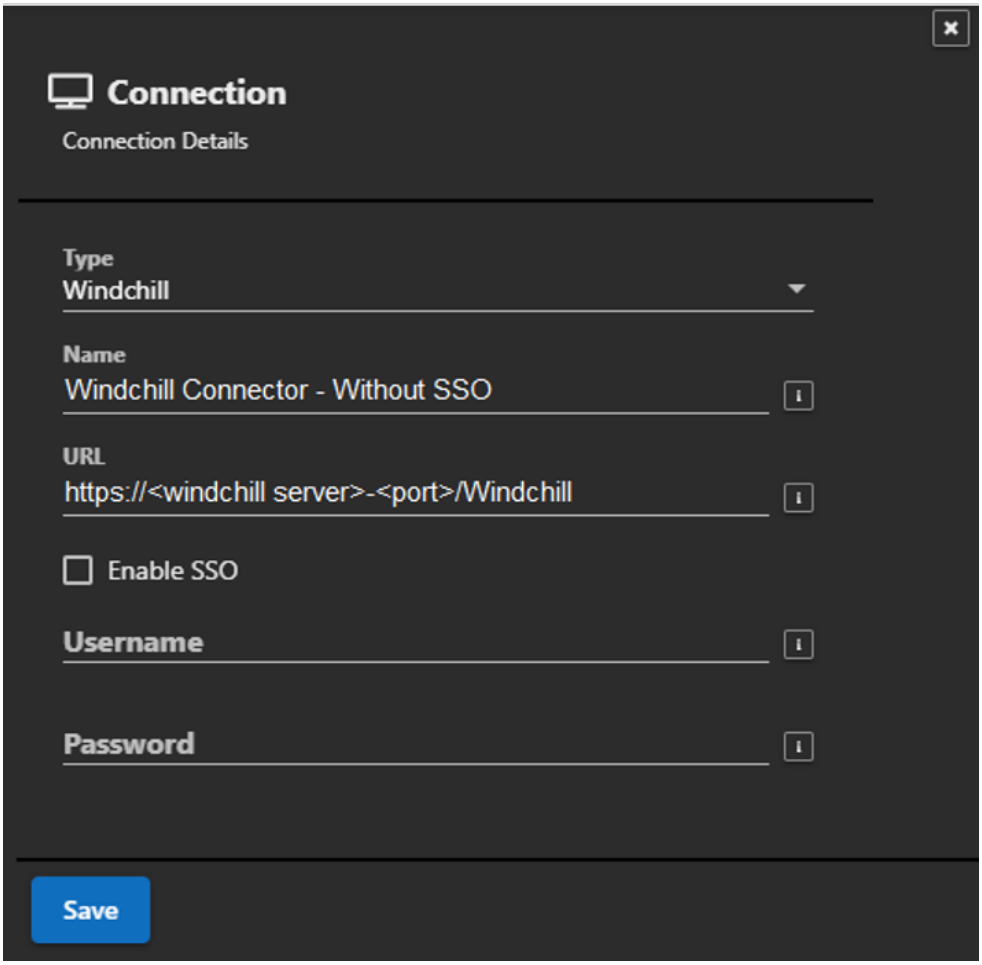
- Creating a Managed Connection for Windchill Without SSO
- Managed Connection for Windchill with SSO Enabled
- Publish Structure Schema for Windchill

Creating a Managed Connection for Windchill Without SSO

To create a managed connection for Windchill without SSO enabled, do the following:

1. Specify the connection *Type* as Windchill.
2. Specify a descriptive *Name* for the managed connection.

3. Specify the access *URL* for the Windchill server.
4. Specify the Windchill *Username* and *Password* used to validate the connection definition.
5. Click *Save* to validation and store the connection definition.

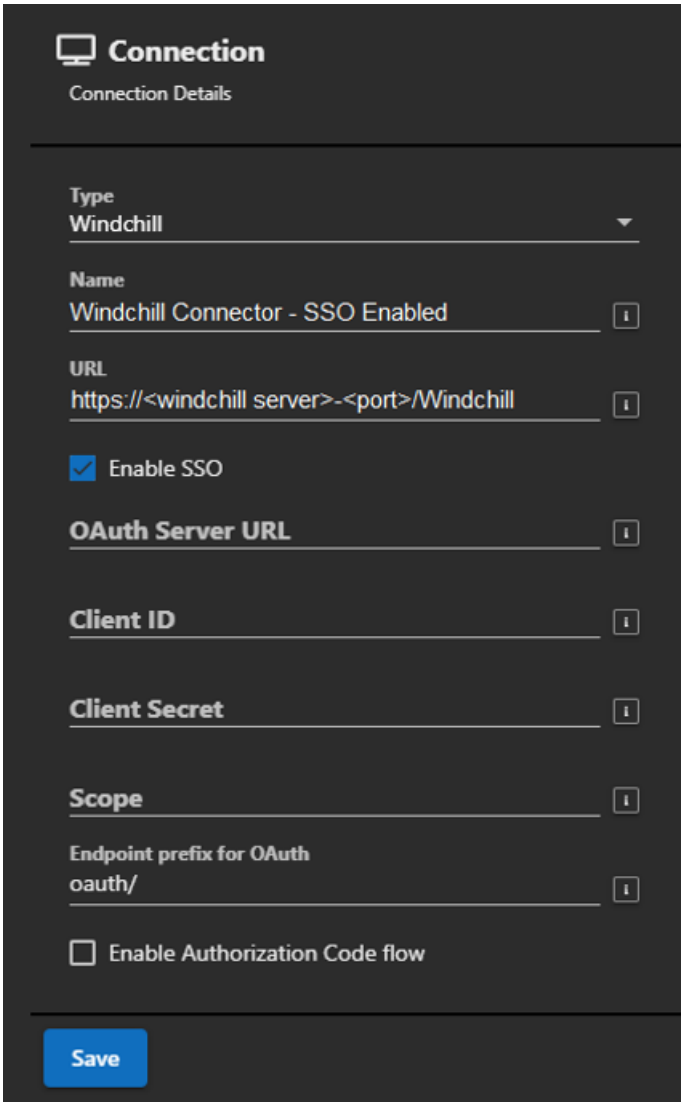


Managed Connection for Windchill with SSO Enabled

To create a managed connection for Windchill with SSO enabled, do the following:

1. Specify the connection *Type* as Windchill.
2. Specify a descriptive *Name* for the managed connection.
3. Specify the access *URL* for the Windchill server.

4. Select the *Enable SSO* check box.



5. In *OAuth Server URL*, specify the URL of the server that authenticates the secure delegated access of client applications, such as Allegro X System Capture, to the connector.
6. In *Client ID*, specify the public identifier for the client application.
7. In *Client Secret*, specify a secret password that is used by the OAuth client to authenticate to the authorization server.
8. In *Scope*, specify the scope of the access token, such as READ or WRITE access, issued to the client application.

9. In *Endpoint prefix for OAuth*, specify the authorization endpoint of the authentication server URL.
10. In *Vista URL*, specify the URL of the Pulse primary node, that is, the Vista server.
11. Click *Save* to save the settings.

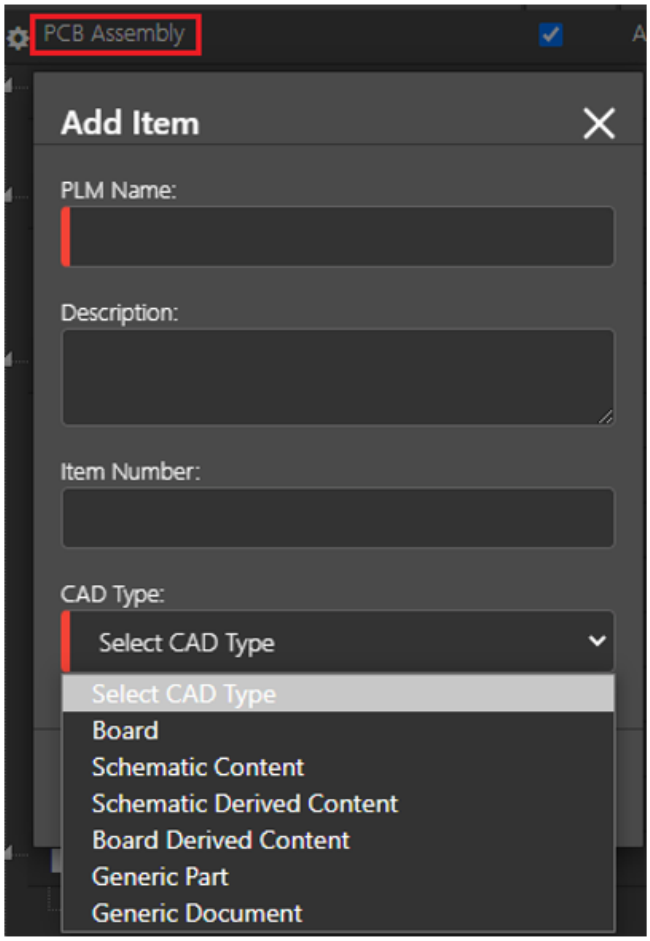
Publish Structure Schema for Windchill

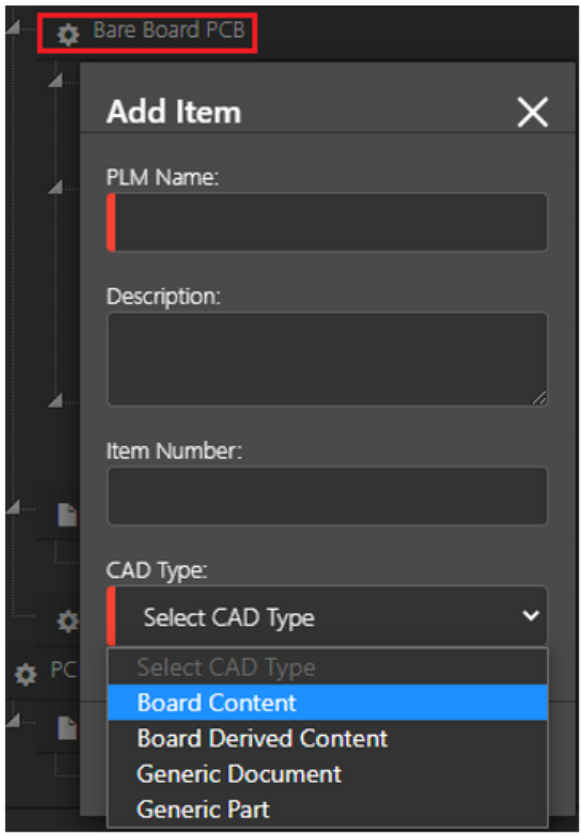
This table summarizes the object-related schema definition used by PFM to publish data to Windchill.

PFM Item Type	PLM Type	PLM Sub-Type	PFM Cad Type	Add Item Options	Can have Attachments?
Assembly	ElectricalPart		Assembly	Board Schematic SchematicDerived BoardDerived GenericPart GenericDocument	No
Board	ElectricalPart		Board	BoardContent BoardDerived GenericDocument GenericPart Windchill BoardContent	No
BoardContent	EPMDocument	ECAD - BOARD	Board Content		Yes

Schematic	EPMDocument	ECAD-SCHEMATIC	Schematic Content		Yes
BoardDerived	EPMDocument	ECAD-CONTENT	Board Derived Content		Yes
SchematicDerived	EPMDocument	ECAD-CONTENT	Schematic Derived Content		Yes
GenericPart	ElectricalPart		Generic Part	GenericDocument	No
GenericDocument	EPMDocument		Generic Document		Yes

This schema is used when presenting options for updating the Publish structure.



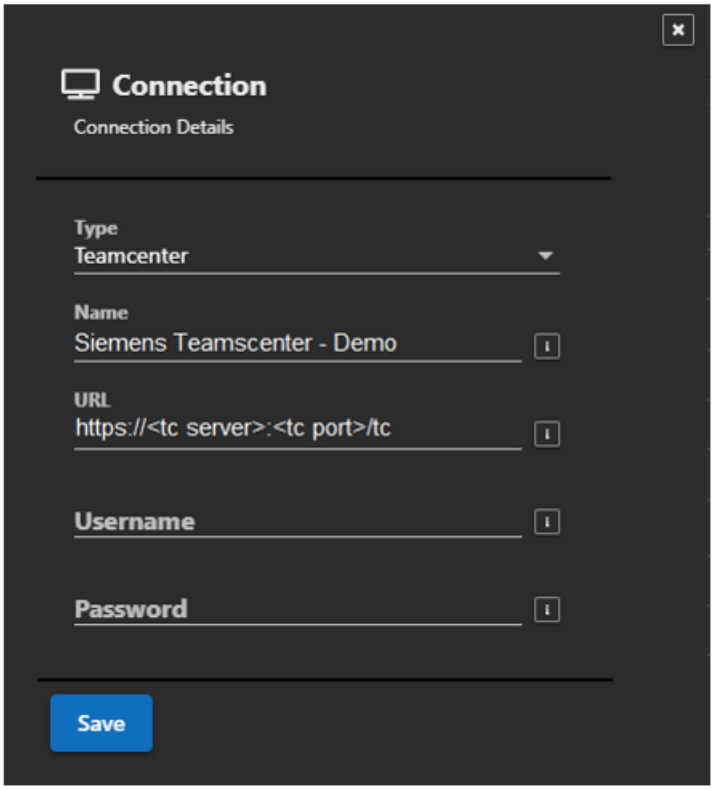


Creating a Managed Connection for Teamcenter Connector

To create a managed connection for Teamcenter, do the following:

1. Specify the connection *Type* as Teamcenter.
2. Specify a descriptive *Name* for the managed connection.
3. Specify the access *URL* for the Teamcenter server.
4. Specify the Teamcenter *Username* and *Password* used to validate the connection definition.

5. Click *Save* to validation and store the connection definition.

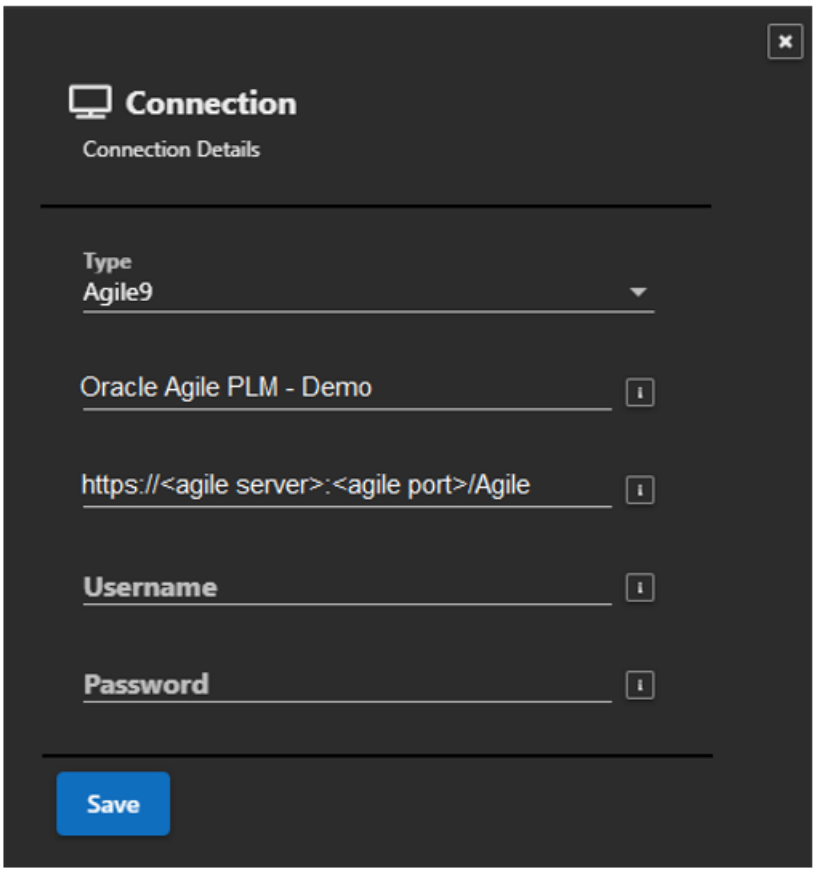


Creating a Managed Connection for Agile Connector

To create a managed connection for Agile, do the following:

1. Specify the connection *Type* as Agile9.
2. Specify a descriptive *Name* for the managed connection.
3. Specify the access *URL* for Agile server.
4. Specify the Agile *Username* and *Password* used to validate the connection definition.

5. Click *Save* to validation and store the connection definition.



Publish for Manufacturing Variables

The Publish fr Manufacturing utility uses many variables to provide flexibility during execution. System variables from your environment, project location variables, and/or CPM directives can all be used to locate commands, as arguments for commands, and included in output file names.

Following is a list of variables with a description of each:

- `CPM_PATH` - the path to the cpm file
- `WORKING_PROJECT` - the active project
- `RELEASE_AREA` - the full path to the project
- `WORKING_DESIGN` - the name of the root of the active design

- You can also use `WORKING_CPM` to refer to the name of the CPM file without the `.cpm` extension. For example, `my_design.cpm` resolves to `my_design`.
- Here are some examples using CPM directives. You can leverage variables from the `START_CANVAS`, `START_GLOBAL`, and `START_CUSTOMVAR` sections of your CPM file.
  - `$CPM(CANVAS|physical_folder)` – this enables Publish for Manufacturing to read the value of the `physical_folder` variable from the `START_CANVAS` section of the CPM file. For example, assume your project CPM has the following:

    ```
    START_CANVAS

    design_db './logic/workshop.sdax'

    last_board_file '.brd'

    physical_folder ‘./output/workshop/physical’

    END_CANVAS
    ```

  - `$CPM(CUSTOMVAR|<variable>)`

    This enables Publish for Manufacturing to read the value of the custom variable from the `START_CUSTOMVAR` section of the CPM file. For example, assume that your project CPM has the following:

    ```
    START_CUSTOMVAR

    PBA_NUMBER '300-1001'

    PBA_REV 'A'

    END_CUSTOMVAR
    ```

    You can use these variables in combination with project variables. For example, for a project file located at `D:\my_designs\workshop\workshop.cpm`, the following command:

    ```
    bomhdl -

    proj %CPM_PATH% -nographic -sda -o

    %RELEASE_AREA%\%WORKING_PROJECT%\temp\rtp\$CPM(CUSTOMVAR|PBA
    _NUMBER)_$CPM(CUSTOMVAR|PBA_REV)_BOM.rpt
    ```

    would resolve to:

    ```
    bomhdl -

    proj D:\my_designs\workshop\workshop.cpm -nographic -sda -o
    ```

```
D:\my_designs\workshop\temp\rtp\300-1001_A_BOM.rpt
```

- When defining variant utilities, you can use the following command:

  `$VRNTNAME(<variant variable>)` where this resolves to, for example `$VRNTNAME(ASSY_TOP4585869).pdf`

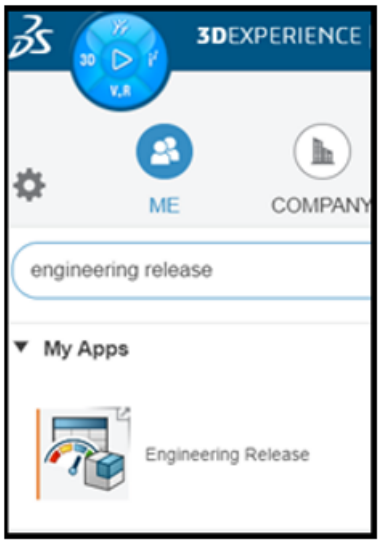
Creating Product Objects in PLM System

Before publishing your design data to the PLM system, you must create an assembly and board object in the PLM system. These objects are identified by an enterprise item number that is part of the object metadata in the PLM system and will be part of the Allegro X System Capture or OrCAD X project metadata.

Creating Assembly Object

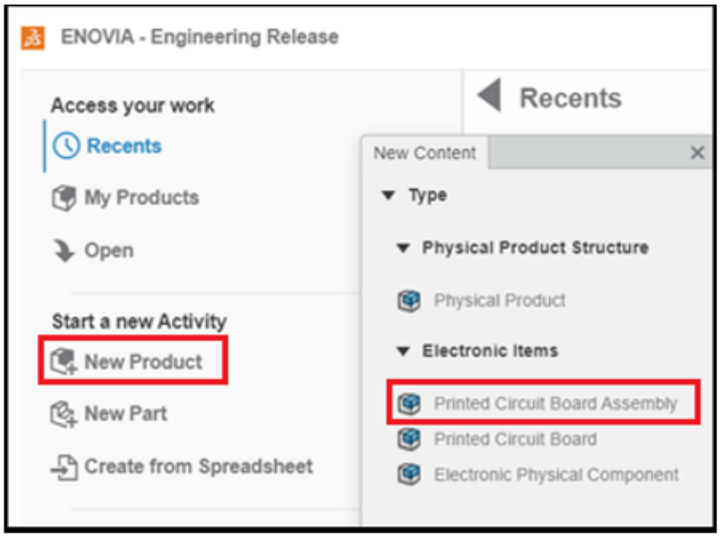
To create a PCB assembly object in 3DExperience, do the following:

1. Launch the *Engineering Release* application from the 3DEXPERIENCE Dashboard.



Use the 3DDashboard Compass to locate the Engineering Release application if it does not already exist in your 3DExperience Dashboard.

2. Click *New Product* to display the *New Content* menu options.



3. Click *Printed Circuit Board Assembly*.
4. Specify a title for the assembly and click *Create* to create the assembly object.

The new object is displayed in the Engineering Release dialog box.

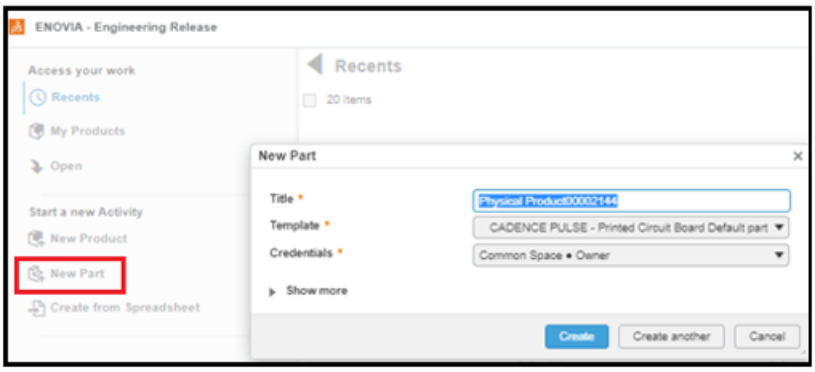
5. Click the *Enterprise Item Number* value link in the *(None)* header.

6. Specify a unique *Enterprise Item Number* value if it is not automatically populated.
7. Click *Set* to save the data.

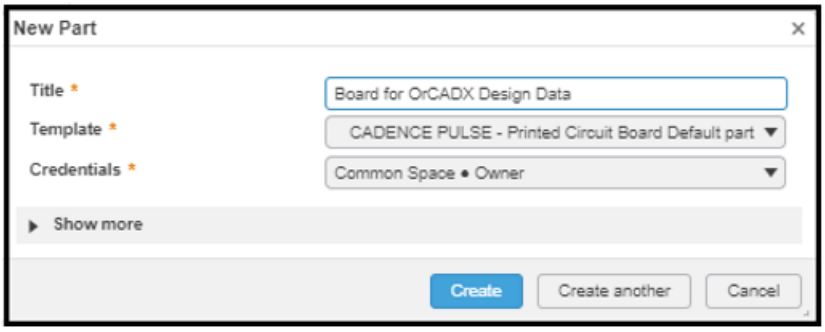
Creating Board Object

To create a board object in 3DExperience, do the following:

1. From the *Engineering Release* application, click *New Part* to display the New Part menu options.
2. Click *Printed Circuit Board*.



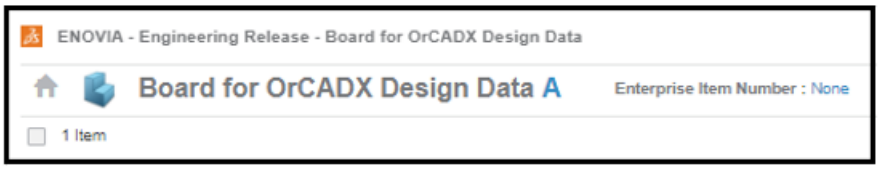
3. Specify a title for your board.
4. Select *"CADENCE PULSE – Printed Circuit Board Default part"* from the template drop-down list.



5. Click *Create* to create the board object.

   The new object is displayed in the Engineering Release dialog box.

6. Click the Enterprise Item Number value link in the *(None)* header.



7. Specify a unique *Enterprise Item Number* value if it is not automatically populated.
8. Click *Set* to save the data.

   Note: You do not need to relate or link these objects. This will be done as part of the PFM Publish task. However, make a note of these Enterprise Item Numbers as you need to specify them in the PFM application when you are ready to publish design data to 3DExperience.