Executive summary:

- The new CADMATIC Web API allows connecting CADMATIC products and PDM/PLM systems and transferring project data through an integration software.
- Outfitting and 3D Plant Design features improved support for VDI and integrated Development Environment for creating CADMATIC scripts among other additions.
- In P&IDs modules import and export object attributes using the DEXPI standard was added.
- Hull Applications sport numerous additions for basic, detailed and production design stages and updates for NAPA interface, XML export and PDMS export.
- Improved usability for users and administrators for Information Management products.

Web API for P&IDs, 3D Plant Design and Outfitting

CADMATIC Web API enables transferring project data between CADMATIC products and Product Lifecycle Management (PLM) or Product Data Management (PDM) systems and eliminates a gap in information flow between these systems. It makes project data more coherent and reduces repetitive work. CADMATIC Web API brings all project related data closer to CADMATIC designers and thus ensures that the design quality is on the agreed level and data is easy to find, and in some cases, may make estimating the costs of changes to the design easier.

CADMATIC Web API supports reading, creating and updating documents, part attribute data, objects with a position ID and attributes, and document metadata, and fetching document publication files.

CADMATIC Web API is a REST API that enables users to create interfaces from 3rd party systems, for example an ERP or PLM/PDM, to and from CADMATIC products, such as CADMATIC Outfitting and 3D Plant Design. CADMATIC Web API is used by a project-specific integration software client that can make simple HTTP requests over the network.
Benefits of CADMATIC Web API:

- CADMATIC Web API allows linking the purchasing or modelling process to the CADMATIC 3D model library.
- CADMATIC Web API enables querying objects and their attributes from a third-party system to CADMATIC design tools. This can be useful for example when a PLM system is used to generate the position IDs, manage the attribute data, or manage the work breakdown structure.
- If the product lifecycle management system contains the document name, metadata, and other attributes, they can be used directly in CADMATIC design tools. Documents with correct attributes can be created with CADMATIC Web API.

P&I Diagram
Diagram application has a new name

The application for creating and editing Process & Instrumentation diagrams has a new name, “CADMATIC P&I Diagram” or just “CADMATIC P&ID”. The functionality for designing single-line cable diagrams is still available as before, the new name simply emphasizes the main use of this module.

DEXPI support

DEXPI, which stands for Data Exchange in the Process Industry, is an open XML format that enables process-related data to be easily transferred from one software program to another. For information on which other software products support DEXPI, see https://dexpi.org/Software.html.

In the 2020T1 release, data that has been exported to the DEXPI format can be imported to COS and attached to Equipment type objects, to make the data available when viewing the objects in Plant Modeller or P&I Diagram.

DEXPI XML files can be opened for graphical browsing with Cadmatic Viewer which you can open from Plant Modeller or P&I Diagram. The graphics can also be attached as a 2D import or as a reference drawing to CADMATIC P&ID.

From P&I Diagram, objects can be exported to the DEXPI format, for example for using the data in third-party simulation software.

Creating P&ID documents via Web API

CADMATIC Web API allows P&I Diagram documents to be created with API functions. For example, when document names and document metadata are available in a Document Management System (DMS), using the API to create an empty document that has the intended name and all required metadata allows the designer to quickly start working on the actual design.

External Data Management (EDM) objects for P&IDs and 3D models

The “External Data Management” object type allows data defined in a third-party software system such as Product Data Management (PDM) or Enterprise Resource Planning (ERP) system to be imported to COS and then linked to P&I Diagram objects and 3D model objects, either manually or automatically via Position ID (if available). After this linking, the designers can easily view the EDM data of each object.

For example, product data that is maintained in a PDM system can be imported to CADMATIC COS database as EDM objects. After this step, CADMATIC designer can insert objects to P&I Diagram or 3D, or to both. This insertion creates an integration link between the CADMATIC object and the data from the external system, which allows the selected attributes to be updated via the Web API also later.
Specification-driven diagram design

In environments where the allowed valves have been defined in piping specifications, now it is also possible for the P&ID designer to select the correct valve from the specification—clicking **Spec** in the **Edit Armature Data** dialog opens the same component selector that piping designers have been using in Plant Modeller.
Longer pipeline names

P&I Diagram allows pipeline names to be 100 characters long and they can contain Unicode characters.

Outfitting/3D Plant Design

Improved support for VDI

When using Plant Modeller via virtualization software such as Citrix VDI, the cursor might not move as smoothly as it does when using a normal workstation. The cursor’s behavior in virtualized environments has been improved in 2020T1.
Drawing names support the Unicode character set

In drawing names, it is now possible to use any character that is supported by the current code page, including Unicode characters and characters in the extended character set.

Longer pipeline, duct line and cable tray names

The names of pipelines, duct lines and cable trays can now be 100 characters long and contain Unicode characters. Document names for isometric drawings, duct spool drawings and pipe spool drawings can be generated from these line names.

Revised line selection tool in routing

When starting to route a pipe, air duct or cable tray, the dialog for selecting the kind of line to create has been completely revised. In the improved dialog, the column selector allows the user to choose which line properties to show in the line list. Using the displayed information, the user can sort and filter the list to quickly find the intended line.

For example, if pipeline has the attributes "Pipeline From" and "Pipeline To", and their values define the equipment the pipeline should be connected to, displaying these columns allows the user to easily search for the correct line.
Integrated Development Environment for CADMATIC scripts

The CADMATIC installation package’s folder `tools\ScriptDeveloperSuite` contains an installer for a CADMATIC script programming environment for Notepad++. This integrated development environment provides syntax highlighting, code auto-completion, code snippets, tree view of script elements, script extern reference and .bs compiling.

Manual adding of cable segments

In the Cable Router, when modifying the nodal network, it is now easy to add cable segments manually.
More relaxed licensing mechanism

The user can now open two different projects in Plant Modeller, or open Component Modeller and Plant Modeller at the same time, and only consume a single license.

Hull

General

Annotations and Dimensions

Several improvements were made regarding text placement and Unicode characters in dimensions and annotations. The position and alignment of texts on the screen and in plotting is now the same for native and windows fonts, for example.
UFO Files Created Automatically for Bent Construction

UFO files are now generated automatically for curved and bent construction items (bent profiles, bent face plates, twisted shell frames, and shell plates). There is no need to specifically enable the UFO output for these items anymore. When UFO output is enabled, the system will generate UFO files for all construction items.

CADMATIC Hull uses UFO image format files for Work BreakDown sketches of curved and bent construction items, and for showing the construction items in the 3D-Show application.

Basic Design

Bulkheads Below a Plate

When creating perpendicular plates below a plate in view, it is no longer necessary to indicate the main plate. The system automatically determines the plate relations.

The user can now define limits for the fixed border values or plate relations when creating horizontal or vertical plates.
Detailed Design
User-Defined Profile Symbols

Users can now create their own profile symbols for all standard and user-defined profiles and shell frames. The orientation of the profile symbol is vertical and to the left of the profile. The three previously existing standard profile symbols can still be used.

End Flags for User-Defined Profiles

It is now possible to show profile end flags also for user-defined profiles, not just standard profiles, by enabling the new End Flag For User Defined Profiles setting in the System Management application. End flags are shown for those profile types that have a lower type number than the set value.

Face Plate Alignment by Calculation Plane

It is now possible to choose how the face plate is aligned with the main plate when inserting the face plate by selecting the calculation plane. The calculation plane can be at the face plate base line or at the main plate center.

With some face plate end types, using the face plate base line as the calculation plane could cause a gap between the face plate and the plate. This gap can be avoided by using the plane at the main plate center as the calculation plane.
Production

Prevent Coding of Broken or Overlapping Bevels

It is now possible to set whether the coding process of a regular or shell plate is continued or stopped when the system encounters a bevel error or multiple overlapping bevels. This setting can be used to prevent generating plate cutting data when there are multiple bevels added to one relation, for example. By default, the coding process is not stopped and the DXF file is generated despite bevel errors or overlapping bevels.

New Variables for Profile End Type Files

New variables are introduced for the type files of profile end types. This makes it possible to variate the production outcome and to better accommodate to different engineering processes.

By applying the new variables in the type files, extra length can automatically be added to profiles, and the shape of the end type can be changed based on the profile type. This can be done for drawings, 3D presentation, DXF and sketch generation, or icon generation.

Profile Coding with the Code Block Function

Similar to composite profiles and shell frames, most non-composite profiles, pillars, and shell frames cutting data can now be created using the Code block option in the Create Production Information function. This coding method will include the bevels in the process.

The user can define which profile types and sizes are coded this way in the codeprofiles.dat file in the project’s norms. The normal profiles sketch DXF interface will be used for other profile types and sizes.
Adding Holes in Lugs

It is now possible to add a hole to a lug. This is done by adding hole lines to the lug type file. Holes added like this will be present in drawings and plate cutting data (lug DXF), and visible in Hull Viewer.

Weld Lines in WBD Sketch

Weld lines can now be included in Work BreakDown 3D sketches. The `calcweldinfo.cmd` macro must be copied from the default norms to the weld folder of the project norms to enable this. The users should modify the macro to suit their needs. The new **Show weld lines** option in the Work BreakDown 3D function then becomes available to include weld lines in the sketch.
The system calculates the total weights and lengths and presents them in a table, as defined in the macro.

The weld lines can be labeled with the standard **Weld Labeling** function.

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**Interfaces**

**Upgraded NAPA Steel Import**

The Import NAPA Steel function in CADMATIC Hull 2020T1 has been upgraded to use NAPA API v2019.1, also known as the Napa Object Model. The upgrade brings along 64-bit computing, scalability, and better maintainability in the future. The import functionality is compatible with the current NAPA Designer software, as well as the classic NAPA Steel. A separate Hull NAPA Steel Interface license is required for this function.
In this version shell plates cannot be imported. CADMATIC Hull supports non-planar plates in the form of shell plates only. In NAPA Steel you can create non-planar plates also as decks, for example. They will not be imported in this version. Also corrugated bulkheads and reductions that are not part of the plate contour will not be imported in this version.

There are also small changes in the user interface.

**Shell Plates in PDMS Export**

Shell plates are now included in polyhedron format in the PDMS export. With this improvement, all construction including the PDMS EBOM are included in the export.
Export 3D Hull Data in XML

There is a new 3D XML export option available for exporting 3D geometric data along with some part properties. This export option is only available when a separate Hull Logistics to XML Export license has been acquired for it.

The IGES/SAT/STEP function in the Export menu has been renamed to 3D Hull Data, and the new 3D XML option is located there, along with the previously existing options. The previously existing XML function for exporting logistical data by report has been renamed to Logistics to XML.

Updated PI Revision Check

The XML data file generated by the PI Revision Check function has been updated to be compliant with the latest NESTIX specifications. This makes it possible to import the data file to the latest NESTIX version.

Information Management (eShare, eBrowser, eGo)

Improved usability in eShare administrator’s user interface

There are several improvements to eShare administrator’s user interface. For example, the administrator can rearrange lists, such as maps, status values, and managed document types by dragging and dropping to get a better overview of the values. Configuring attribute combinations has been improved.
**Refined permission control**

Markups and smart points can now be handled only if the user has appropriate permissions. The eShare administrator can define which user groups are allowed to see, create, modify and delete markups and smart points. Users can edit the markups and smart points in eShare, eBrowser, and eGo.

The eShare administrator can also specify which user groups can change the state of specific status tracking.

**Users can define new values for status tracking on fly**

Users can now enter new status tracking values. This helps users to create groups based on objects and name them freely. This can be used, for example, to define work packages. If the eShare administrator has enabled creating new status tracking values, users can enter new values both in eShare and eGo.

**Clip box is stored in scene**

When the user saves a scene in eBrowser, eShare’s 3D viewer or eGo, the state of the clip box is now stored to the scene, and if the clipping was active, also the coordinates and extents of the clip box are stored. When the user returns to the scene, the 3D viewer shows the scene with the clip box.
It is possible to create multiple scenes, and each scene can have a clip box.