The *Independent* Solution Provider for Smart Digital Transformation

What's New in v25

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v25.1

New Features

CM4D Template Performance

With the introduction of the HOOPS 3D Engine in v25.0 there were some cases where large templates with many views experienced a performance decrease. In order to improve the template performance, all Views in a document are treated as a 'snapshot' or a static image until the view is manipulated in some way (zoomed, rotated etc.). This eliminates unnecessary rendering of models and feature markers. Views retain the single-click behavior in that unlocked views can be selected to be moved on the sheet and the right-click context menu can be accessed the same way as before. There are still options in the Document Setup dialog for selecting a Resolution and manually updating the views for an entire document at once instead of an as-needed basis.

This change has altered the previous "View Snapshot" functionality. Snapshot mode is not enabled/disabled in a document, rather it has become an integrated part of view functionality which supports full modification of views and automatic regeneration of snapshots whenever necessary to improve processing speed of CAD models.

Results Database Reloaded

The Results database and supporting services have been optimized to support faster reporting and scalable data transfer between the Results and CM4D databases. Stability and performance has been improved by eliminating the use of the Message Queue (MSMQ) to communicate between clients and the server database. The Results Sender and Results Loader services use NServicebus with SQL Transport. The queue tables are created in the Site database. The initial transport for NServiceBus is SQL Server but other transports like Azure Storage Queues will be added in the future, in order to support a local CM4D implementation and a cloud Results database.

In addition to performance/stability improvements, we have also enhanced the Results database by adding support for more CM4D data to be made available in the Results database.

- ▶ Constructed Features
- ▶ Tolerance 2
- ▶ Reasonable Evaluation
- ▶ Causes – Masked Data and Comments

New Results Services

The CM4D Results Services are now two services called Results Sender and Results Loader. The Results Services are installed on Servers only, not on Client systems. CM4D creates entries in the table ResultsExportCommandQueue in the Site database. Results Sender then reads the entries from the Command Queue, gets the data from the CM4D database(s) and creates messages on NServiceBus for the Results Loader service. The Results Loader service processes the messages and updates the Results database.

Database Utilities

Creating and updating databases for CM4D can be a challenge, so we have provided four tools to make this database maintenance easier. Instead of locating the scripts and running each script individually on each database and in the right order, you can simply run each tool and select an action.

1. **CM4D Site Utility** – Run all necessary scripts on an empty Site database or upgrade a Site to either v24 or v25. Connection information is obtained from the CM4D.4ds file (via DbConnect).
2. **CM4D Datasource Utility** – Run all necessary scripts on an empty CM4D Datasource database or upgrade a CM4D Datasource to either v24 or v25. Connection information is obtained from the connection string entered in the utility command window.
3. **CM4D Results Utility** (*formerly 'DbMigrator'*) – Create an entirely new Results database, create the tables for an empty database or upgrade from a previous version. In cases of upgrading, the tool automatically detects the existing database tables and adds or changes tables as needed. Connection information is obtained from the Site database (via SiteManager).
4. **GUID Replacer** – The GUIDS for the CM4D databses must be unique. This can be a problem when a database is copied (e.g., via backup/restore) and added as another datasource to the Site database. In instances where this occurs, you may end up with duplicate GUIDs in the CM4D databases. The GUID Replacer tool may be used to reassign all GUIDs in the CM4D database in order to ensure uniqueness. This utility should only be used when necessary and by the appropriate personnel.

Export Data – Updated DMIS Formatting

The export data option previously called 'Volvo DMIS' is now referred to as 'DMIS Statement' has been updated to take into consideration changes to the DMIS formatting definitions. In addition, a new section has been added to the Cm4d.ini file with options for further customizing or updating formatting for the DMIS Statement export format. See the help documentation for details on how to use this new configuration.

Events Coverage Removed

Event Coverage has been removed from the DataSet Event Properties option for external event notifications. The options for 'by cell' or 'by row' are no longer available, and all events are considered the same as the previous coverage 'by DataSet'. Now all events will send a single notification when any data is triggered by the DataSet. This has been done in order to prevent a huge number or email notifications to clutter up the mail server and because by cell/row has proved to be an unnecessary refinement for outgoing events.

Feature Specific 3D Markers

There are now unique 3D feature markers for all feature types. Previously, the feature specific types were limited to surface, hole, slot, midpoint, distance and xyz. Now the remaining feature types are represented with the addition of gap, flush, range and plane.
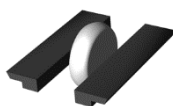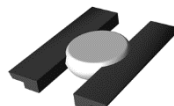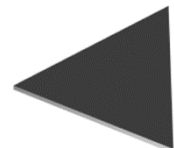
Gap	*Flush*	*Range*	*Plane*

Routine Handedness Variable

A variable has been added that will resolve the handedness of the Routine, but with a modification. In cases where there is no handedness defined for the routine. Where 'No Handedness' would typically resolve as 'Routine^?H', this variable resolves as 'Routine^BH': `~rout,hand,RH,LH,BH,BH~`

Program Fixes

APPLICATION	CORRECTED ITEM	REFERENCE
CM4D	Car Deviation data is not displayed in the Dataset.	INC21017
	The Polar feature type is missing from the Use Feature Characteristic dropdown menu in Annot Properties.	INC12691
	When creating a snapshot CM4D gets stuck on loading and does not create the snapshots.	INC27258
	The Array Sheet takes a long time to finish loading.	INC27257
	Snapshot generation fails in documents with sheets that have the % symbol in the SheetSet/Sheet labels.	
	The default Report Name value for new Managed Reports (~doc,title~) can result in Scheduler PDF reports missing (*.pdf) file extensions. *Solution: The new default value is now **~doc,label~**.*	
	The Feature Properties button is missing from the toolbar.	
	3D CAD images are slower to load than in previous versions.	INC20176
CM4D Interactive	Changing the report type after using the Keep Selected or Remove Selected options in the Feature grid prevents the Show All from restoring the hidden rows.	INC33975
DataSmith Batch	Using the option Mangle Lookup from File in the translator generates [false] error messages in the log file.	INC27474
DataUtility	Cannot edit Specification Limits (even with required privileges).	INC30008
	DataUtility crashes on initial Search with more than one DataSource that has an empty SiteRoutine table.	
Results Services	Loading data thru Results services calls procedure LoadUserIDs unreasonable number of times. This becomes a performance issue when a lot of users exist. *Solution: The changes made to the Results Services introduced in this version eliminates this issue.*	INC29007
Site Manager	Deleting a DataSource in SiteManager does not delete its SiteCodes from SiteRoutine table.	

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v25.0.21182

General Notes

▶ CM4D Db Schema: 25b

New Features

Wireframe (WYR) Image Support Re-introduced

With the introduction of the HOOPS engine in v25, support for some older image types were discontinued. However, in this version support for 3D wireframe models has been re-introduced. This includes settings for wire overrides in CM4D image properties.

#### Document Properties - Feature Marker Colors

Feature marker default colors can be set on the document properties. The color can either be set using a dropdown color picker, or the colors can be defined in the Cm4D.ini file. If these are defined in the INI file, the color values are copied into the document on creation. On existing documents, the values can be reset to values saved in the INI file. See the help documentation for details.

#### New Variables for Chart Axis Labels

In charts using a query with multiple Routines, chart axis labels show the DataSet column number when the Sample labels cannot be resolved.

New variables have been added that can be used in the axis label field that will properly resolve for multiple Routines:

▶ `~cellsamp,label~`
▶ `~cellsamp,filter,[a-z]~`
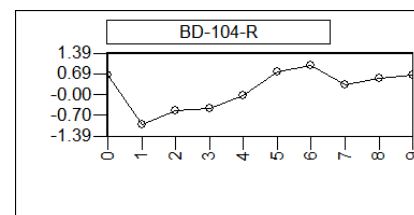
For DataSets with multiple Routines, these variables will resolve the chart axis as the Sample Label or Filter Label instead of the DataSet column number. This is best used with either a single feature or with Routines that have corresponding samples.

`~cellsamp,label~`

`~cellsamp,filter,c~`

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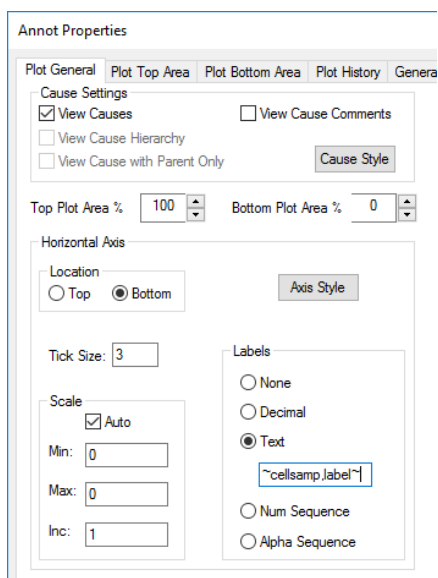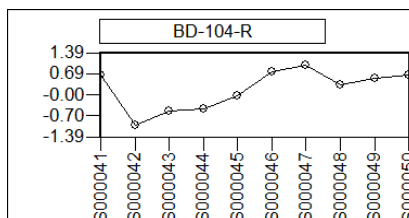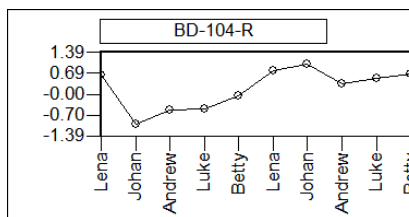
New QaDataSource API Functions

API for the DataSet DataSource 'Use Feature' option has been added with following properties for QaDataSource. See the help documentation for more details.

- ▶ UseDataSetFeature => true selects Use Feature
- ▶ DataSetFeatureLabel => set/get the Feature for a DataSet
- ▶ DataSetFeatureChr => set/get the characteristic

Program Fixes

APPLICATION	CORRECTED ITEM
CM4D	▶ **API - 2 missing functions and one broken one in the QaDataSource object.** API for the DataSet DataSource 'Use Feature' option is incomplete. For the solution, see the New QaDataSource API Functions in the Release Notes for more information.
	▶ **Car Deviation data is not displayed in DataSet.** Car Deviation data is not shown in DataSets. The data could be seen in DataUtility but not in a DataSet. There is no DataSet Sift Rule data type for Car.
	▶ **Characteristics of Features does not appear in DataStack Grid.** Characteristics of Features shown in the grid disappear after 3D Math is applied to the DataStack.
	▶ **CM4D does not show JT build in Transparency.** Transparency embedded in JT image files is not applied when the model is loaded in CM4D.
	▶ **CM4D v25 does not support WireSmith images WYR.** Support for WireSmith (WYR) images was removed in v25 with the introduction of the new HOOPS engine. However, due to customer requirements, wireframes have been re-introduced. See the Release Notes for more information.
	▶ **Constructed Feature Marker has wrong direction.** When a new distance feature was created from two reference points, the feature marker points in the opposite direction of the CAD.
	▶ **DataStack Subtract Calculation Error.** A DataStack subtracting DataSets where there are missing (NULL) values results in a NULL value, even when there should be a value from the DataSet that was not NULL.
	▶ **Distance Feature Marker visibility and color.** Depending on the location, Constructed feature markers can be difficult to differentiate from other markers. See the new 'Document Properties - Feature Marker Colors' in the Release Notes.
	▶ **Histogram Issue.** The Mean is misplaced and the bell curve is following the mean. This seems to affect histograms and has a similar problem in normality charts.
	▶ **Polar characteristics doesn't show up in Chart Annot Properties.** There is no option for polar in the drop down menu in Chart Annot Properties.
	▶ **Sample Label not displayed correctly when using Multiple Routines in Query.** In charts using a query with multiple Routines, chart axis labels show the DataSet column number when the Sample labels cannot be resolved. For the solution, see the new New Variables for Chart Axis Labels in the Release Notes.
	▶ **Snapshot generation fails.** A document with sheets containing more than one view with *.wrl files crashes when generating Snapshots. Note: the document has SheetSet and Sheet labels that include the percent (%) sign.
DataSmith	▶ **Must be in Characteristics for Header and Footer ignores case.** The instruction "Must be... do not ignore case" used in the Characteristics of the

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	Header/Footer is ignoring case. It is working correctly for Header and Footer instructions, just not the Characteristics within the header/footer. ▶ **Perceptron Translator Issue.** This appears to effect anyone who has a Perceptron type machine with more than ~250 characteristics, depending on the length of the feature names. DataSmith puts a carriage return/line feed in about character 4100. This prevents the use of the ~ord~/~rep~ method for reading excel/csv and txt files. ▶ **DataSmith crashes while processing Data file.** A specific customer data file causes a crash in DataSmith during processing.
EventSmith SMTP	▶ **Not all email events arrive when Dynamic Managed Document with Dynamic Query is used with multiple Routines.** This fix only applies to EventSmith SMTP that is installed with CM4D Server 24+, not the legacy EventSmith deprecated in v24. Note: the legacy ES is only available as a separate install and should only be used if there is a specific reason not to use the built-in ES-SMTP.
Site Manager	▶ **The *.xlsx generated by the Site manager Export users function does not match the Site manager content.** When there are users not assigned to a group, only the last created user without a group is generated into the exported excel file.

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v25.0.20136

General Notes

- ▶ Site Db Schema: 25b
- ▶ CM4D Db Schema: 25a
- ▶ TLS 1.2

CM4D Roadmap

Interested in the CM4D development roadmap? Visit: https://cm4d.roadmap.ats-global.com/

New Features

Improved 3D Visualization Technology

CM4D has had 3D visualization since its inception in 1991. Over the years, we have had four generations of 3D visualization built into the product.

HOOPS Engine

The next generation of technology provides state-of-the-art 3D viewing and interaction capabilities. The initial implementation includes functionality such as:

- ▶ Improved visualization quality
- ▶ Improved tool set
- ▶ Direct import of CAD model

Supported File Types

▶ ACIS	▶ PDF	▶ CATIA V6 / 3DExperience
▶ AutoCAD - 2D 2	▶ PRC	▶ Creo - Pro/E
▶ AutoCAD - 3D 2	▶ Revit	▶ I-deas
▶ Autodesk 3DS	▶ Rhino3D	▶ IFC
▶ Autodesk DWF	▶ Solid Edge	▶ IGES
▶ Autodesk Inventor	▶ SolidWorks	▶ JT
▶ CATIA V4	▶ STEP	▶ Parasolid
▶ CATIA V5	▶ STEP/XML	▶ PDF
▶ CATIA V6 / 3DExperience	▶ Stereo Lithography (STL)	▶ PRC
▶ COLLADA	▶ U3D	▶ Rhino3D
▶ Creo - Pro/E	▶ VDA-FS	▶ Solid Edge
▶ FBX	▶ VRML	▶ SolidWorks
▶ GL Transmission Format	▶ Wavefront OBJ	▶ STEP
▶ I-deas	▶ FORMAT	▶ Stereo Lithography (STL)
▶ IFC	▶ ACIS	▶ U3D
▶ IGES	▶ Autodesk Inventor	▶ Unigraphics - NX
▶ JT	▶ CATIA V4	▶ VDA-FS
▶ NX - Unigraphics	▶ CATIA V5	▶ VRML
▶ Parasolid	▶ CATIA V5	

> ⚠ CM4D image formats XGL and WYR are no longer supported.

Cutting Planes

The 3D HOOPS engine has built-in interactive cutting plane support and automatically generates "capping geometry" for closed meshes. It also supports aggregating cutting planes into sectioning planes to slice through and cut-out parts of a model.

X & Y   **X Inverted**   **X Inverted & Y**   **X Inverted & Y + Toggle Quadrants**
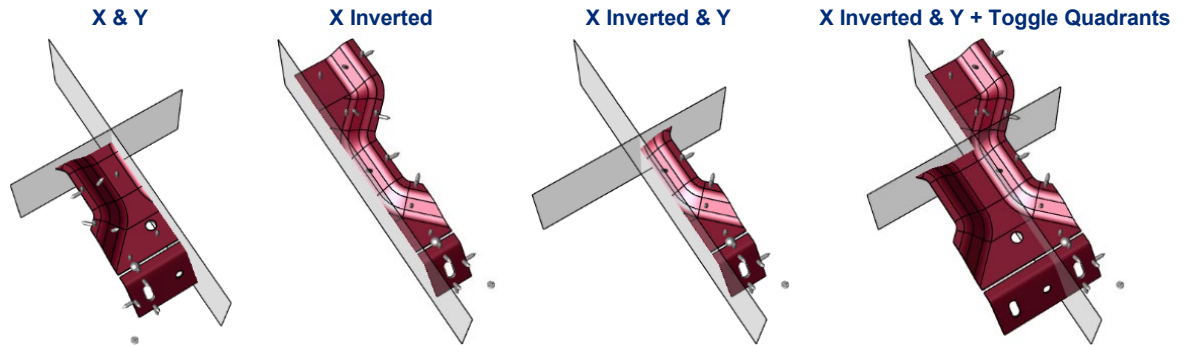
Display Modes

Display Modes are different ways that CM4D can draw the model in a View. Switching the display mode is an easy way to turn off visibility of faces and lines for the whole model, make Feature markers more prominent or to provide a result suitable for hardcopy or screenshots.

**Shaded with Lines**   **Shaded**   **Hidden Lines**   **X-Ray**
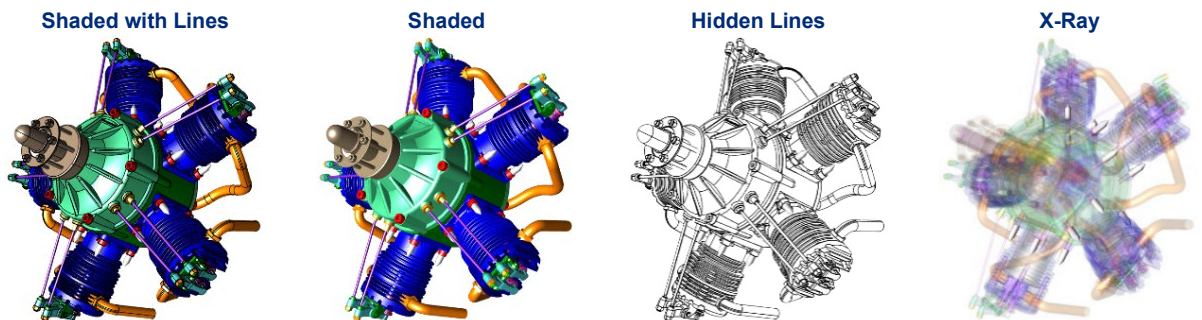
Transparency

Updated transparency settings provide a sliding scale from solid to transparent.
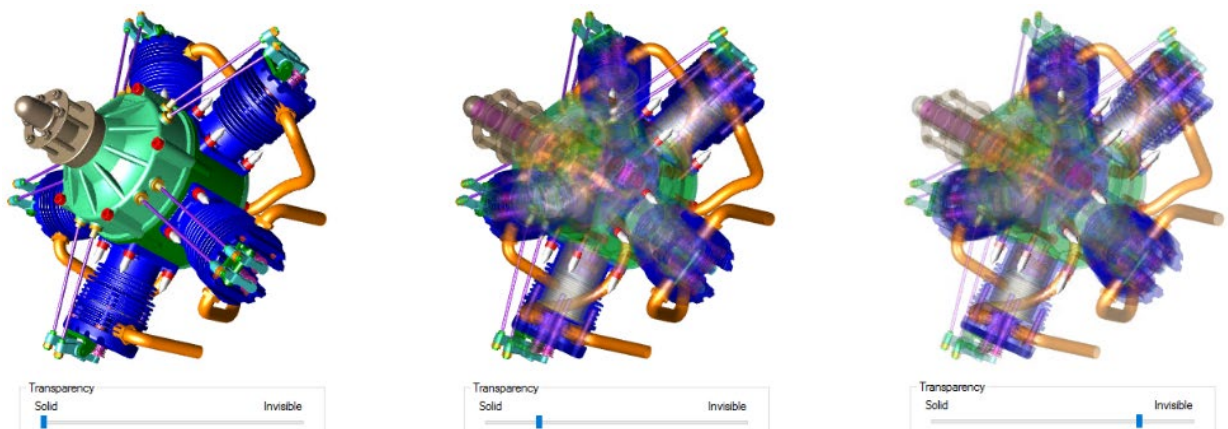
3D Feature Markers

Features with vectors have a 3D marker that is unique for the feature type. This version introduces Surface, Hole, and Slot. Constructed Features Midpoint and Distance also have a unique marker.

| Surface	Hole	Slot	Distance	Midpoint
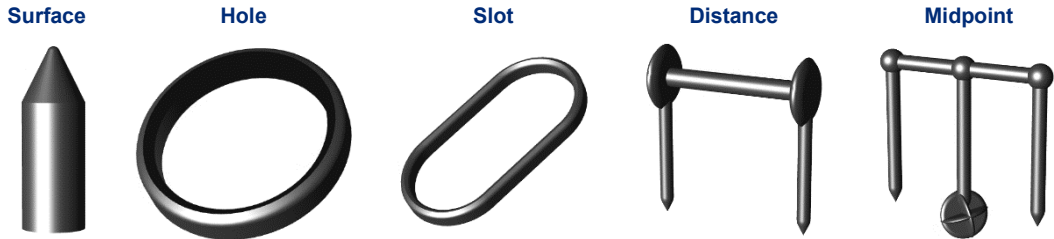
Optional Results Database

Using the Results Database is now optional. If you do not want to setup and use Results, you can disable the option at the Site database level. When the Results database is disabled, results messages will not be generated and the results services are not used.

> ⚠ Without the Results database configured you will miss out on the benefits of a high-performance repository of information available for business analysis.

> ⛔ In future versions of the product, the Results data will be a key part of the development path and a requirement for some new CM4D applications.

Report Manager in Classic

Added a mechanism to administrate Managed Reports in CM4D. Document managers can create, modify and delete Managed Reports using CM4D Classic. This allows you to manage reports directly within the CM4D environment, rather than requiring the addition of CM4D Web.
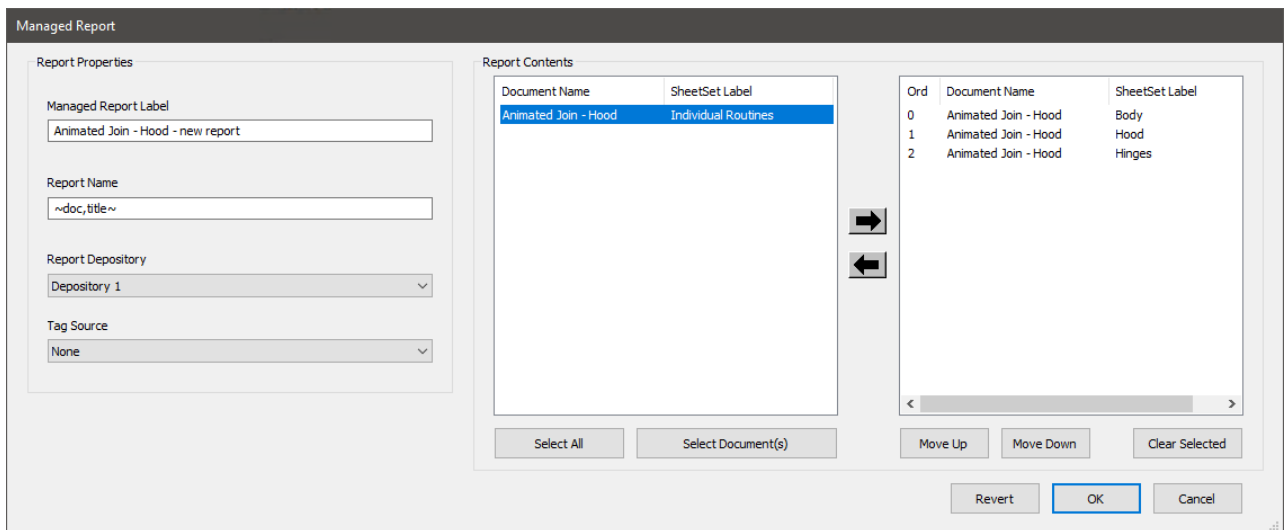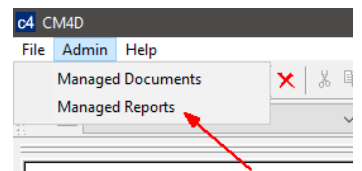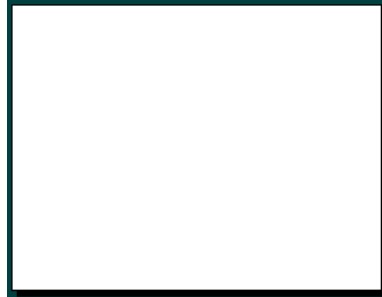
Show/Hide Sheet Border

An option has been added to the SheetSet properties to show or hide the border of a Sheet in CM4D.

Display Border Enabled

Display Border Disabled

Program Fixes

APPLICATION	CORRECTED ITEM
CM4D Classic	▶ 3D CAD View doesn't load feature markers until the template is refreshed by clicking Refresh From Database option ▶ Features are not loaded to Results Database ▶ PDF Link doesn't work in annots ▶ View Snapshots are not monitor independent
CM4D Interactive	▶ CM4Di crash when creating subroutine
DataSmith	▶ Datasmith shows 2 columns for same characteristic ▶ Datasmith document isn't saving Ignore Case for Must Be instruction
General	▶ Results not updated when Limits are deleted

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Known Issues

The following are minor known issues that you will want to be aware of. These issues will either be addressed in a subsequent patch release, or are part of an on-going investigation to develop a solution.

General

CM4D Services User

The CM4D service user running the Results Launcher Service must have the Developer privilege in Site Manager. If it does not have this privilege, jobs will fail and jobs will not process.

CM4D Classic

Print Misc > Print Metafile

- Printing a sheet using the **Print Misc > Print Metafile** menu option, the views sometimes appear to have a faint gray background.

Process Change Log Viewer

- After clicking Print to File, clicking Modify results in a crash.
  Workaround: Make sure a log entry is selected from the list before clicking Modify.

- After entering a User Defined log, the entry does not appear in the list after doing a new search.
  Workaround: Close the Log Viewer and reopen it to see the new User Defined entry.

Spectrum

The Spectrum functionality is not available in CM4D v25. This functionality is intended to be re-introduced in a future version.

CM4D Web

- CM4D Web ignores Routine Access Codes.
- Managed Documents saved with Samples selected in the Sample Load dialog cause issues when customizing a Template in Web. The saved selections will not be included in a report that is customized before submitting. Even if you add/remove the saved selections during customization, the original Samples saved as selected in the document are ignored. This use case would be considered rare, as most documents used for printing reports like this are not set up this way.
- Deleting a Managed SheetSet from a Managed Document does not remove the SheetSet from Managed Reports in CM4D Web.
  Workaround: Before deleting a Managed SheetSet, unmanaged the SheetSet, save your Managed Document, then delete the SheetSet.

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