



Version 8.1 Release Notes

November 3, 2022

DAT/EM Systems International
2014 Merrill Field Drive
Anchorage, Alaska 99510 USA
Phone +1 (907) 522-3681
Support Department Email: support@datem.com
Web: www.datem.com

The following changes have been made to DAT/EM products between Release 8.0 and Release 8.1. Please review these revisions made to the software and update your software to implement changes. As always, DAT/EM welcomes comments and suggestions from you, our clients, so please don't hesitate to contact our support department at support@datem.com or call us with your requests.

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Operating Systems and Microsoft Updates

DAT/EM software no longer supports 32-bit operating systems. Any reference to an OS in the remainder of this document refers to the 64-bit version of that OS only.

DAT/EM Release version 8.1 is supported on the following operating system:

- Windows 11 Professional and Enterprise.
- Windows 10 Professional and Enterprise.

Notes:

- DAT/EM generally recommends installing all Windows updates; however, if you are using nVidia 3D Vision and a Microsoft Windows 10 semi-annual channel update greater than 21H2, please check with DAT/EM to ask whether 3D Vision still works with the newer channel update. Let us test it before you do.
- DAT/EM software does not work with Windows Home Edition or LTSC (Long-Term Servicing Channel), formerly known as LTSB (Long-Term Servicing Branch).

DAT/EM Software Installation

1. DAT/EM's installation process will now place the version number so that Microsoft SCCM inventory will show it in the "Installed Software Product Version" list.
2. The installation for stand-alone MapEditor for MicroStation CONNECT has added the datsiConn.ma file and a line to load it into the mapEd.cfg file that configures MapEditor in CONNECT. Additionally, Capture for MicroStation CONNECT has the modification for its MapEditor-only .cfg file, which can be activated by the DAT/EM Administration Tools' CAD Enabler. These changes are related to detecting tentative point snaps. See more information in the "DAT/EM Capture and MapEditor for MicroStation CONNECT (64-bit versions)" section below.

(April 11, 2022)

Hardware Locks/Dongles

Install Microsoft Updates before applying lock reset programs. Network licensing should have the same Sentinel driver version on both the lock server and the local workstations running the software.

1. The Thales Sentinel driver version 7.7.1 is provided with DAT/EM version 8.1. This is an update from the one provided in the previous DAT/EM version. (2022)

Sentinel Driver on Network Lock Servers: If you have a network lock on a network server, DAT/EM strongly advises you to install Sentinel 7.7.1 on the network lock server to match the version on the DAT/EM workstations. DAT/EM provides a convenient prerequisites setup file that installs the required Microsoft C++ redistribution files and the Sentinel 7.7.1 driver:

- **Error! Hyperlink reference not valid.** https://datemsystems.com/download/Datem_PreReqs_blt_12_02_2021.exe
- This is www.datem.com > Support > Downloads > Prerequisites > "DAT/EM Prerequisites ... Sentinel 7.7.1 ..."
- Answer "Yes" to Sentinel's firewall question.
- Reboot the server after installation.

Please do not skip the update for the network lock server. The newer Sentinel driver works better, and the best communication can be expected when the Sentinel versions match.

****New Again!**** **DAT/EM Virtual Reality (VR)**

DAT/EM Virtual Reality (VR) in its previous form was discontinued, but it's now back and better than ever! It now works with Meta Quest® 2 headsets only. It is expected to work with future Meta Quest Pro and Meta Quest 3, but please check with DAT/EM for more current information when these headsets become available. (October 12, 2022)

What the new DAT/EM VR software does:

- It shows the Windows Desktop inside of VR on a virtual screen.
- It shows DAT/EM applications on that virtual screen in stereo. No other software does this properly.
- You can control Summit with the VR controllers. Point at the Summit view and use the joysticks to control (x,y,z).
- Load Terrain Projects. The points are shown in a full 3D view along with the virtual screen. You can fly around using the VR controllers.
- You can collect features on the points using superimposition or with simple drawing tools. You can point at points using a virtual wand and have the cursor automatically snap to the points. In this way, you could collect a building roof line, for example, by pointing at the corners of the building and picking.

DAT/EM software engineers are pleased with the resolution of the Meta Quest 2 headset. If you tried DAT/EM VR in years past, you may want to have another look now. We'd love to read your review sent to support@datem.com.

If you have a Meta Quest 2 headset and would like to try DAT/EM VR, contact support@datem.com for setup information.

Stereo Viewing Devices and Drivers

Please contact DAT/EM Support if you have any questions about setting up nVidia 3D Vision, buying 3D Vision-compatible monitors, or setting up any other brand of stereo monitor. There is too much information to include here.

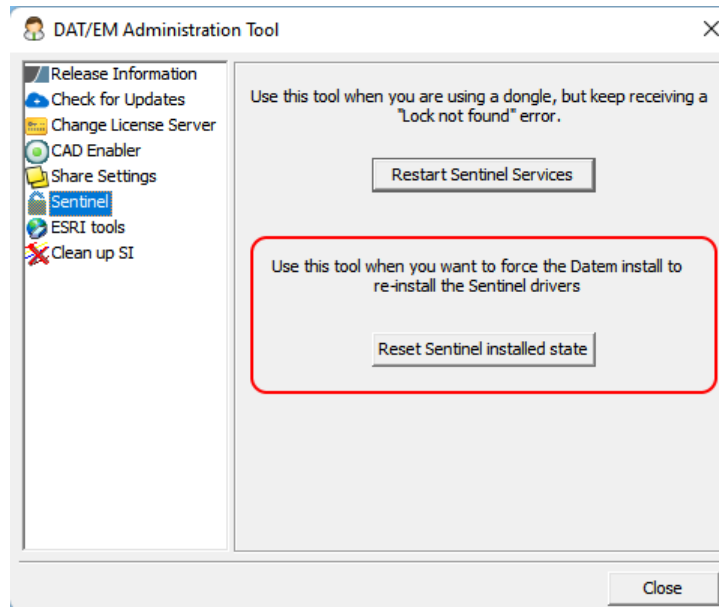
DAT/EM Administration Tool

The following changes have been made to the DAT/EM Administration Tool:

1. The **Sentinel** option has a new **Reset Sentinel installed state** button. This requires administrator privileges since it modifies the registry at the Software level.

The button function clears DAT/EM's registry key that stores the last Sentinel version and installation date. This key is used to prevent multiple runs of DAT/EM Setup or DAT/EM Prerequisites ("Setup") from launching multiple installations of the same Sentinel hardware lock driver version.

As an example of use, let's say you had accidentally answered "No" to modify the firewall during the Sentinel installation the first time you ran Setup. You have since used Windows Add/Remove Programs to remove the Sentinel Protection Installer, and now you want Setup to relaunch the Sentinel installation. Windows Add/Remove Programs will not change DAT/EM's registry key, so if you don't use this new button, Setup will continue to avoid reinstalling Sentinel. Use the button first, then relaunch Setup (either DAT/EM version Setup or Prerequisites) to activate Sentinel installation. (June 27, 2022)



New **Reset Sentinel installed state** button to allow multiple installations of the same Sentinel driver version

Point, Image, and Vector File Formats (Affecting Multiple DAT/EM Applications)

DAT/EM applications read a variety of file formats that contain points, images, and vectors. The code is shared among several DAT/EM applications, so when one can read a certain format, others can, too. The following changes have been made to the list of supported formats:

1. “Adobe Deflate” image compression is now supported in Summit and Image Creator. (October 19, 2021)
2. The **.cog** file extension is added to image extension list shown in various image browse dialogs. Previously, the .cog format was technically supported, but the browse dialogs did not display them for easy selection. (June 2022)

Image Formats (*.smti;*.tif;*.tiff;*.tjp;*.cog;*.jp;*.ecw;*.sid;*.ntf;*.nsf;*.pix;*.jp2;*.j2k;*.si;*.sjs;*.til;*.mrf;*.jpg)

.cog file extension is added to the image extension list in various browse dialogs

3. We received a TIF DEM file made by Safe Software FME Workbench. The file contained a data type that was previously unsupported in DAT/EM image readers. This format is now supported. (August 25, 2022)
4. The Blue Marble vector file translation library has been updated. Previously, it would often crash on reading MicroStation .dgn files, for example, in Summit’s DAT/EM Drawing Objects or Ortho+Mosaic’s vector file input dialog. The files that crashed previously now import correctly. (October 29, 2021)
5. DAT/EM applications did not correctly handle LAS/LAZ files if they contained additional information in the “Minimum PDRF Size” field in the point format, which is now allowed in LAS/LAZ format. This is any custom information that a third-party vendor wants to write to the LAS/LAZ along with the standard defined point format. This additional information may exist in some TerraScan output files. Now DAT/EM will read the points from the files correctly; however, if DAT/EM rewrites the file, such as with LandScape or Point Translator, the additional third-party information will not be carried forward to DAT/EM’s output files. (July 12, 2022)

DAT/EM Keypad

No changes have been made to the DAT/EM Keypad products, except for new keywords mentioned in the particular product sections below.

Coordinate Transformations and Elevation Database

There have been no changes to the elevation database installation file built in 2015 found here:

<http://datemsystems.com/download/SetupElevationModels%20blt%2003%2015%202015.exe>. If you already installed that file with previous DAT/EM versions, you do not need to reinstall it. Any changes have been added to the DAT/EM setup installation, so that you do not need a new, separate Elevation Database file.

There are newer files and changes, but they are all included in the main DAT/EM software installation:

1. A newer version of the Blue Marble coordinate conversion code library is incorporated. (Nov. 10, 2021)

DAT/EM Stereo Viewer

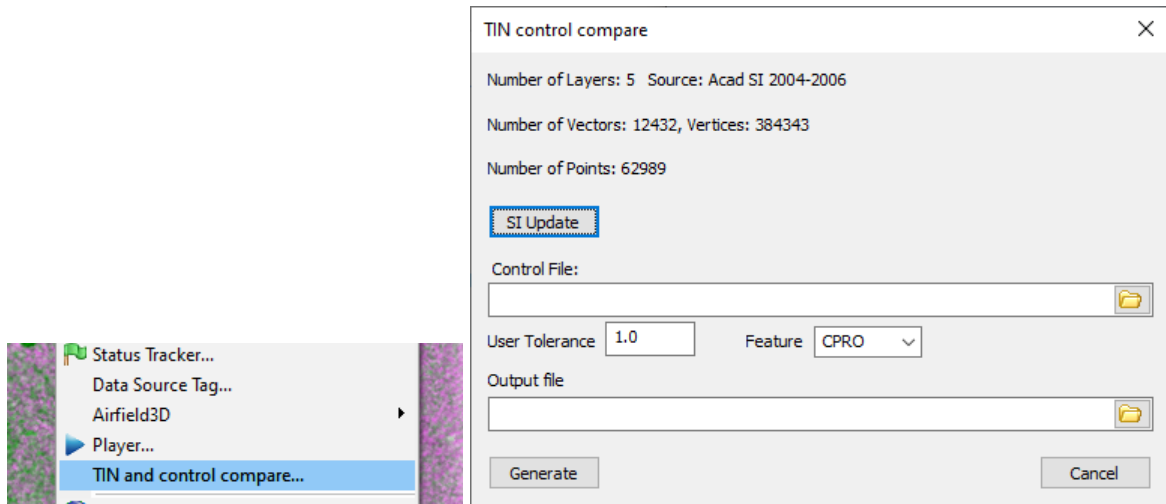
The DAT/EM Stereo Viewer was added in DAT/EM version 7.6. For instructions on how to use the Stereo Viewer, please see the *Stereo Viewer Operation Manual* available from www.datem.com > Support > Downloads > Manuals > Stereo Viewer. There have been no specific changes to the DAT/EM Stereo Viewer for v.8.1; however, any of the general image file format changes listed above may apply to it.

Summit Evolution

The following changes have been made to Summit Evolution (Summit) and the applications that are provided with it.

General Summit Evolution Subjects

1. **TIN and control compare** is a new tool on Summit's **Tools** menu. It is used to create an NSSDA (U.S. National Standard for Spatial Data Accuracy) report. It creates a TIN surface from the objects currently in superimposition (SI), calculates the distances between the surface and the control points in a DAT/EM control (.con) file, and outputs the distances into an NSSDA-style report. (August 23, 2021)



The tool uses the objects currently in superimposition (SI) as the CAD objects. It takes a Summit control file (.con) as control point input.

To use:

- a) Adjust SI to show those objects that should be considered as data for the TIN.

Remember that it *must* be showing in SI in order to be used, and everything in SI is used.

- Polylines or “linework” in SI are used as breaklines.
- Points are used as ground elevation points.
- AutoCAD Blocks and MicroStation Cells are broken down into vector components to display in SI, so be aware that every vector of the block/cell is treated as ground elevation input. That is, if the block/cell is a large circle, it will be treated as a large, circular, flat area along the circle. If the block/cell does not have a point or vector in the center of it, another object on top could override the elevation at the block/cell insertion point. If necessary, use a version or copy of the block/cell that is represented by a point object or is sized quite small.

Do not display ground control blocks/cells/points that were placed automatically at the ground control coordinates. If they are part of the TIN, they will create zero distance between the surface and every control location, because they are at exactly the same coordinates. They will produce an artificially perfect (and incorrect!) report.

Do not display layers that contain off-the-ground objects such as building rooftops or boundaries.


Turn off SI Clipping in the SI source and turn off any layers/levels that do not define ground elevations:

- In MicroStation, use **SI SETTINGS** to uncheck **Clip** and uncheck **Show all levels in SI**. Then turn off the levels that do not define ground elevations.
 - In AutoCAD, use **SI SETTINGS** to uncheck **Clip SI** and check on those object types that should be considered as input for the TIN generation. Freeze or turn off any layers that do not define ground elevations.
 - In ArcMap, use **DAT/EM Systems Options > SI > uncheck Clip SI**. Then uncheck any non-ground layers in the Table of Contents.
 - In Global Mapper, select SI Settings from the DAT/EM toolbar and uncheck **Clip**.
- b) Locate or prepare a control .con file. If it is to be a different control file than the .con that’s already attached to the Summit project, then use **Summit > Edit > Control** (Control Editor) to import a control list using the Control Import Wizard. The .con file can be, but is not required to be attached to the current Summit project.
- c) Start **Summit > Tools > TIN and control compare**.
- d) Use the **SI Update** button. This redraws SI to make sure it is current. Review the number of objects reports that appear in the dialog to make sure there is something in SI.
- e) Browse for the .con file, make settings, and set the name and location of the output file (report).
- f) Select **Generate** to make the report.

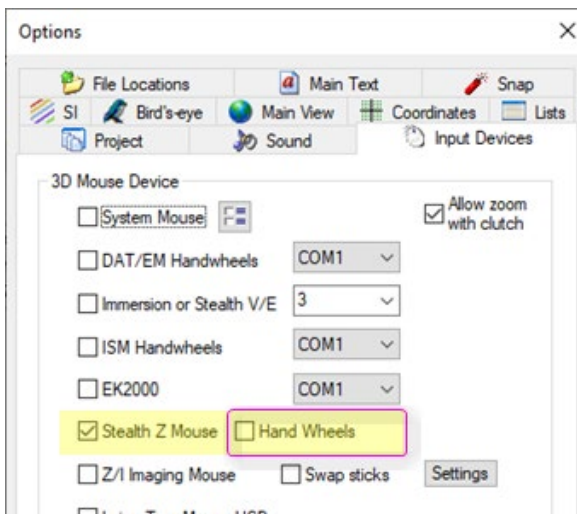
2. Summit Evolution was not properly linking the codex for Adobe Deflate compression. Images with this compression type would appear completely black. This is fixed. (October 19, 2021)

3. Summit's **Tools > Measurements** dialog had some incorrect text labels. It has the following changes: (January 4, 2022)

“Altitude” is now “Angle to XY plane”
 “Slope” is now “Slope in XY plane”
 Length XY is now “Length 2D”
 “Distance XY” is now “Distance 2D”
 “Num points” is now “Number of Points”

Measurements	
Item	Value
Azimuth	152°05'38.42"
Angle to XY Plane	19°12'50.59"
Slope in XY Plane	-1.888
Length 2D	78.190
Length 3D	82.802
Z Change	27.250
% Grade	34.851
Number of Points	3
Area	4339.891
Distance 2D	187.324
Distance 3D	188.070
Reset <input type="checkbox"/> Show Polyline 	

4. **Summit > Imagery > Epipolar Generation** has a substitute method to generate epipolar images for aerial projects and some other stereo project types. It now uses a polynomial fit of the 2D original pixels to epipolar. (Satellite RPC epipolar generation has not changed.) (Approximately February 1, 2022)
5. When Capture for MicroStation performed a “Move to Tentative” point that was picked outside the current model, it would change models in Summit, even if **Summit > Tools > Options > Project > “Automatically load next model”** was off. Now it will respect Summit's setting and keep the current model open if necessary. (July 18, 2022)
6. There is slightly modified communication for the Stealth Z tabletop mouse a new checkbox in **Summit > Tools > Options > Input Devices > Hand Wheels** for legacy Stealth-brand handwheels. Uncheck the setting for tabletop Stealth Z models. Check on the setting for Stealth handwheels. Both the tabletop Z and Stealth handwheels need **Stealth Z Mouse** checked on. The new checkbox is off by default; Stealth handwheels users will need to check on the setting after installing version 8.1. (August 31, 2022)

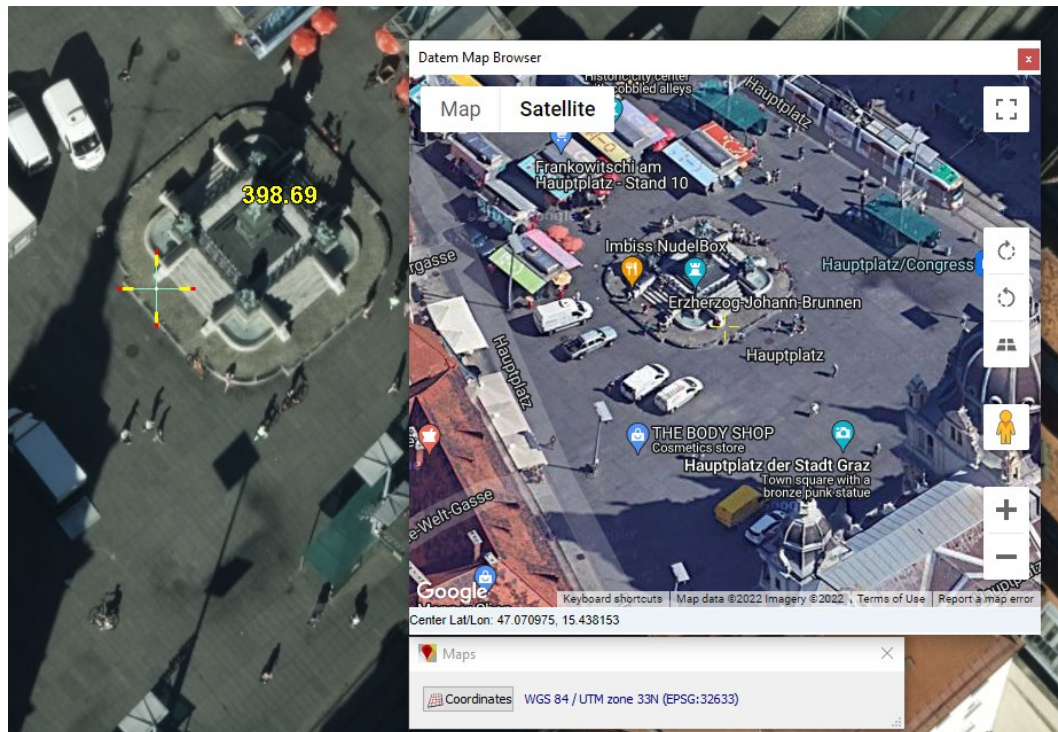


New checkbox: Uncheck for tabletop Z models (shown), check for Stealth-brand handwheels

7. **Summit > Tools > Google Maps** has been replaced by a “new Google Maps tool”, which uses the newest CEF (Chromium Embedded Framework) version. There will no longer be a message about an unsupported browser. The “old Google Maps tool” stopped working in early 2022. This was due to a change by Google, so can’t be fixed in any older DAT/EM version. The first beta that contains the new tool is v.8.1 beta dated 22 March 2022. (March 21 and 29, 2022)

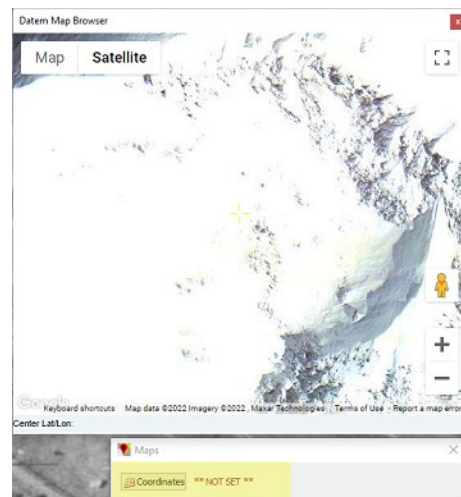
DAT/EM software installation will now place several subfolders and files in a new folder called “C:\Program Files\Datem Software\CEF”.

The new version works similarly to the way it did before, except now it has two windows instead of one. One window has the Google Maps view and the other has the coordinate system currently representing the Summit Ground coordinates, which is needed to translate back into WGS84 for Google Maps. If the input coordinate system is set in **Summit > Orientation > Coordinate Conversion**, or the output system when a coordinate conversion is active, it will match automatically to that system. If it isn’t set yet, then you may use the **Coordinates** button in the second **Maps** window to set it.



The new Google Maps tool has two windows, **Datem Map Browser** and **Maps**.

If the **Datem Map Browser** shows the final ascent to Denali in the Alaska Range, first move the Summit cursor a little. If the mountain remains, it means the coordinate system is not set. You may use either the **Coordinates** button in the smaller **Maps** window or **Summit > Orientation > Coordinate Conversion** to set the input system represented by the ground coordinates in the Summit project.



Terrain Project Tools (except Point Cloud)

8. Terrain Projects and Terrain Project-related subjects (except Point Cloud) have the following changes. Note: Point Cloud application items are in the next section of this document.

- a. The Terrain Project generator tool correctly applies the compression setting. Previously, the compressed .vrlr might not be readable. (2022)

Point Cloud Application

9. Point Cloud has the following changes:

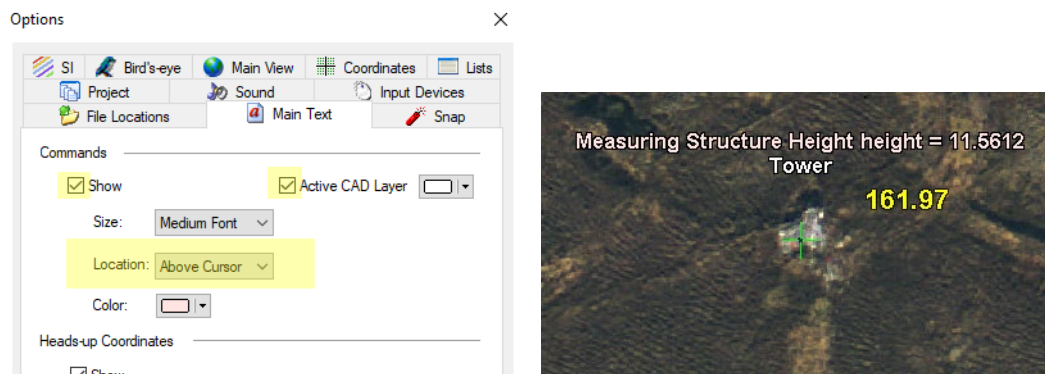
- a. The **Mesh View** tool has been removed pending review of its code rights. (July 2022)

Superimposition

10. Superimposition (SI) has the following changes:

Additional CAD/GIS-specific SI changes may appear the particular Capture sections.

- a. The SI CAD command and messages line and active layer display have a new option to display above the cursor. Select **Summit > Tools > Options > Main Text > Location > Above Cursor**: (November 29, 2021)



*Additional **Above Cursor** setting for the CAD commands/messages and active layer*

- b. SI line patterning of patterned CAD/GIS lines previously patterned lines well if they were in the Y direction on screen (Summit view), but not if they changed in X. This is fixed so that patterns will look good in 3D overall. (January 10, 2022)

Aerial Projects (traditional and UAS)

11. Aerial projects (traditional and UAS) have the following changes:

- a. In aerial projects, **Summit > Orientation > Import Matrix Exterior > ORI** file could return “nan” (Not a Number) for some angle conversions. This was related to trigonometry functions that require input values between 1 and -1, but due to computer rounding methods expressed in the ORI file values, were given input values such as 1.000000000567, which is slightly outside the limits. Such values will now be forced to be within the limits to avoid placing “nan” in the exterior orientation angles. (November 3, 2021)

Satellite RPC Projects

12. Satellite RPC projects have the following changes:

- a. **Add Multiple** in the satellite RPC Project Edit dialog is fixed. Previously, it would not find any images in a folder tree, so that **Add** (single) had to be used multiple times instead. Now **Add Multiple** can find all image and RPC pairs in the folder tree you specify. (September 19, 2022)

Button Manager

13. Button Manager (used by both Summit and LandScape) has the following changes:

- a. In a Button Manager **User Cad** button, a semi-colon ; character will now pass through to CAD unchanged. Previously, it would be replaced by a return character. This change is important to be able to send multiple commands to MicroStation in the same string; MicroStation uses ; to separate multiple commands on its command line. For example, to set the level, weight, color, and line code, and to start the AUTOARC command, this **User CAD** button string would work equally from the MicroStation Key-In Browser or a **User Cad** button in the Button Manager being use with Capture for MicroStation: (May 23, 2022)

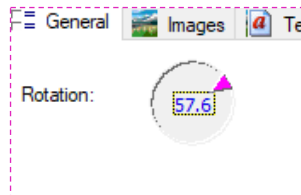
lv=tree;wt=ByLevel;co=ByLevel;lc=ByLevel;autoarc

The ; after the final command is optional. Note that the string of multiple commands still requires **{RET}** to separate the commands when set on the DAT/EM Keypad.

Project Viewer / Ortho+Mosaic

14. Project Viewer / Ortho+Mosaic has the following changes:

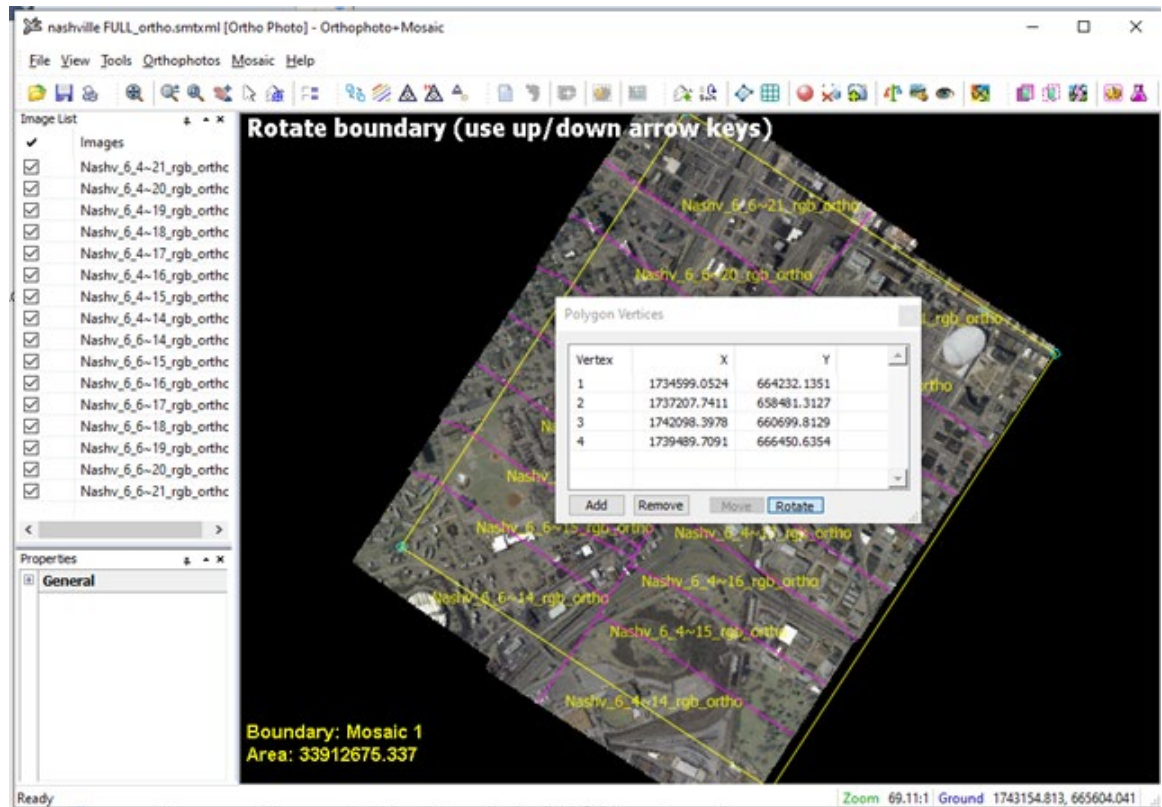
- a. Ortho+Mosaic's **Options > General** tab > **Rotation** setting now allows rotations in tenths. Previously it was in whole degree units. (August 30, 2022)



- b. Ortho+Mosaic Polygon Vertices dialog that edits existing boundaries has new **Rotate** and **Move** buttons. To use: (August 30, 2021)

- Click on the boundary to edit. Make sure the vertices are marked, which indicates it is selected. The **Polygon Vertices** dialog will appear.
- If you intend to rotate the boundary and wish to rotate it about any vertex other than vertex 1, select the rotation origin vertex number in the list. If no selection is made, it will use vertex 1.
- Select either the **Rotate** or **Move** button, depending on which tool you'd like to use.
- Use the up and down arrow keys on the keyboard to adjust the rotation/position. If rotating, it will rotate about the selected rotation origin vertex or vertex 1, if no selection was made.
- To choose a different rotation origin vertex, first select the **Rotate** button again to toggle off the rotation tool. Then select the new rotation origin vertex from the **Vertex** list. Finally, select **Rotate** again to reactivate the rotation tool using the newly selected origin vertex. (The rotation origin vertex may not be changed while the tool is active.)
- To stop using **Rotate** and start **Move** (or vice versa), click on the active tool's button again to toggle it off, then select the other tool's button.

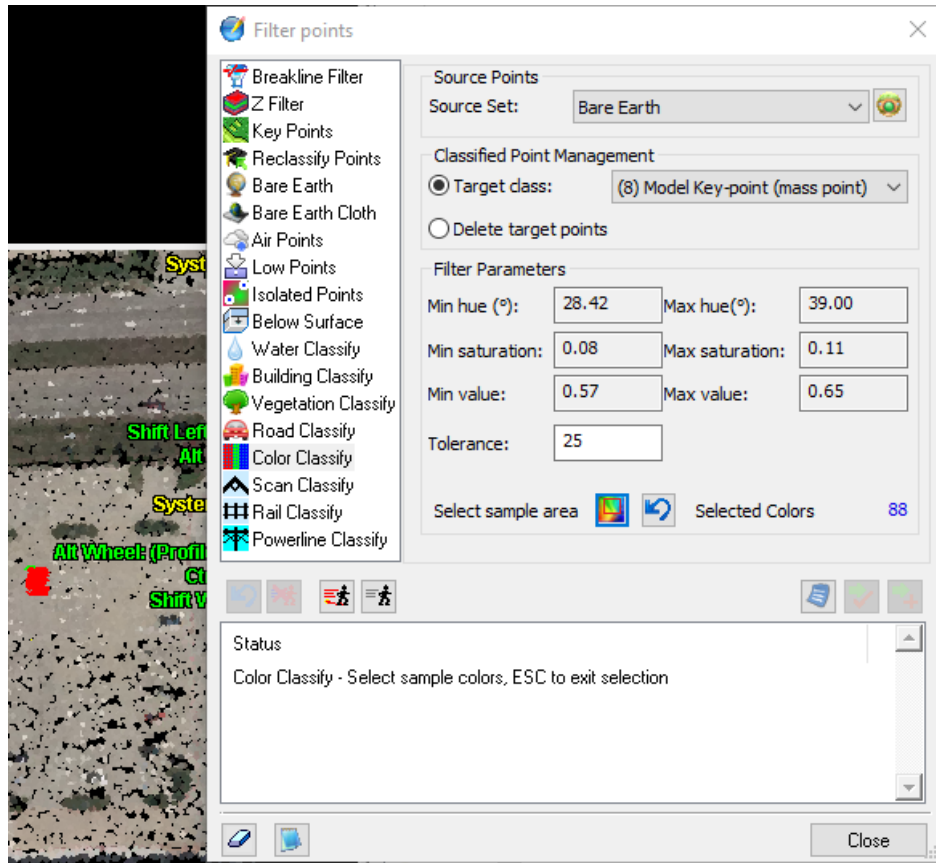
- To stop rotating/moving and finish, select the “x” button to close the **Polygon Vertices** dialog.



LandScape


LandScape has the following changes:


1. The **Color Classify** tool has been replaced with an improved version. The filter is still located in the same place in the Filter Points tool list: (December 14-16, 2021)



- **Description:** The Color Classify filter classifies points based on point colors selected by the user.
- **Input Values:** The **Source Set** selection set identifies points that will be handed in to the filter as potential candidates for classification.

The **Target Class** will be assigned to points that meet the filter criteria. Another option is to delete those points, but that is rarely used.

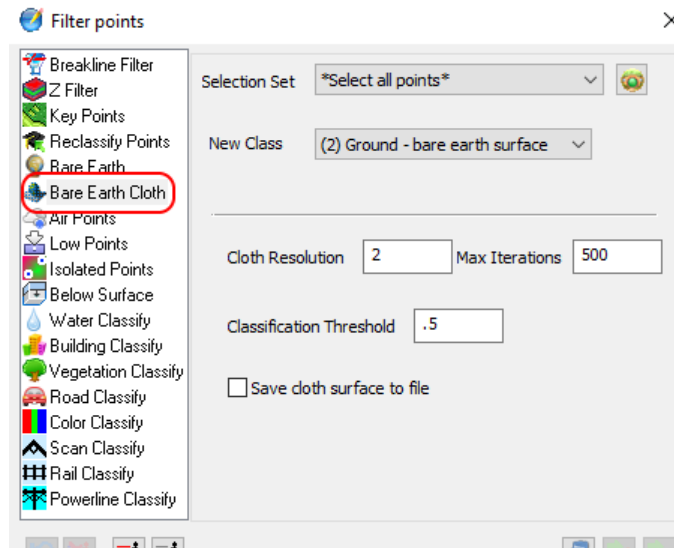
The  button is used to interactively select sample colors that the filter will attempt to match. It acts as a toggle. Pick once to begin selection, a second time to stop selection. When colors are selected the **Hue**, **Saturation**, and **Value** data fields will be filled in to give an idea of the colors selected. The **Status** area will contain prompts.

The  button may be used to clear the selected colors.

The **Tolerance** value allows the filter to include colors that are similar to those selected in the group of point colors to be reclassified. The higher the **Tolerance** value, the wider the range of matching colors. If **Tolerance** is set to 0 then only points with colors that exactly match a selected color will be modified.


- **Notes:** 1) The colors must be built into the points file format and not added by loading an orthophoto image into LandScape. LAS formats 2 and 3 as well as BIN all support embedding color in the points. 2) The selected colors will be stored for the next run, but there is limit of storing 2047 colors.

2. **Bare Earth Cloth** is a new bare earth filter tool. It identifies bare earth points by simulating draping a cloth over the point cloud and comparing the elevation of the cloth to the points in the cloud. It is based on the 2016 paper “An easy to use Airborne LiDAR Data Filtering Method Based on Cloth Simulation” by Wuming Zhang, Jianbo Qi, Peng Wan, Ongtao Wang, Donghui Xie, Xiaoyan Wang, and Guangjian Yan. It is much easier to use, faster, and produces better results than the original **Bare Earth** filter, which is still included with LandScape. (March 1, 2022)

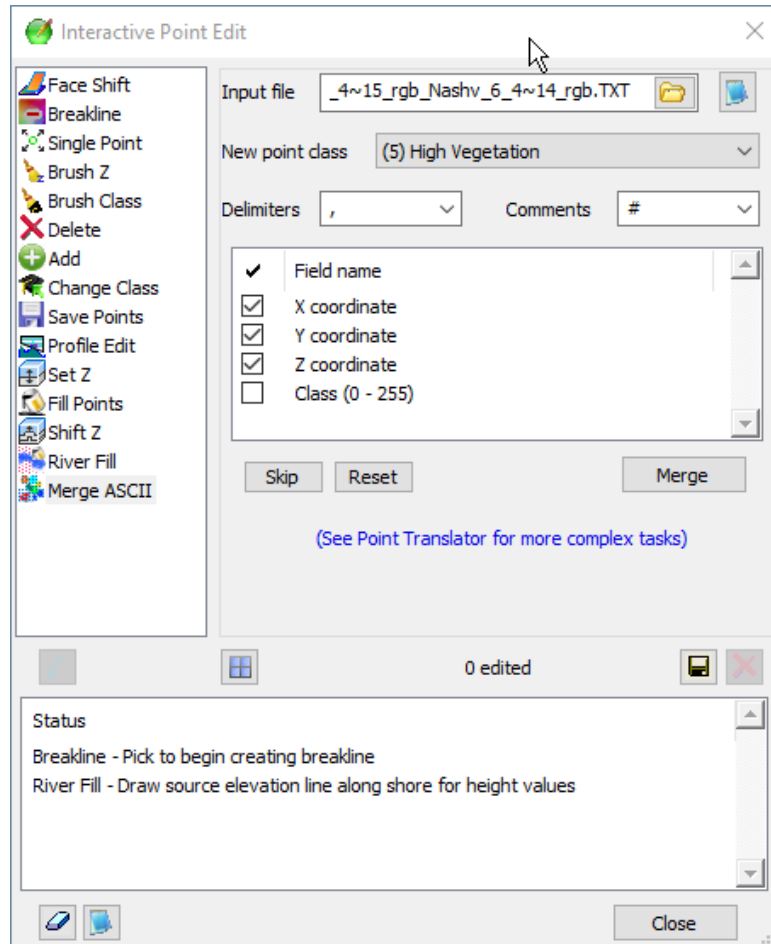


Settings for the *new Bare Earth Cloth* filter

Bare Earth Cloth settings are as follows:

- The **Selection Set** identifies points that will be used as input for both the Cloth surface and the target points.
- **New Class** identifies the new class of points identified as bare earth.
- **Cloth Resolution** is the size of the grid that will be used to create the cloth. Each file's surface will be broken down into **Cloth Resolution**-sized areas with a point in each area. This setting is sensitive to the density of the original file. If the **Cloth Resolution** is too small, then Bare Earth points may be found on the tops of large buildings. If it is less than the density of the points in the file, then cloth creation may fail. If this setting is too large, then points near vertical changes, such as walls, will be missed. A reasonable rule of thumb is set it to the square root of the density or higher.
- **Preview**  may be used to try different settings on the data set.
- **Max Iterations** identifies that maximum number of times the cloth surface will be adjusted attempting to fit it to the surface. During the adjusting process, cloth points that have not yet penetrated the original surface are adjusted up and down based on the height of their neighboring cloth points until they have found a point below the surface of the original surface. At that point their elevation is locked and will not be further adjusted. If **Max Iterations** is exceeded, then the filtering attempt has failed, in which case you may review the **Cloth Resolution** relative to the point density.
- **Classification Threshold** is the maximum vertical distance a surface point may be away from the cloth to be considered bare earth. It is not used in the creation of the cloth surface. The **Save cloth surface to file** setting may be used to save the cloth surface as a .las file. The new file will be in the same folder as the original file and have the same name with *_cloth.las* on the end. If a file with the same name already exists, it will be deleted. (March 1, 2022)


3. **Merge ASCII** is a new Interactive Point Edit tool. It imports points from an ASCII (text) file into one or more files in the active project. (March 15, 2022)

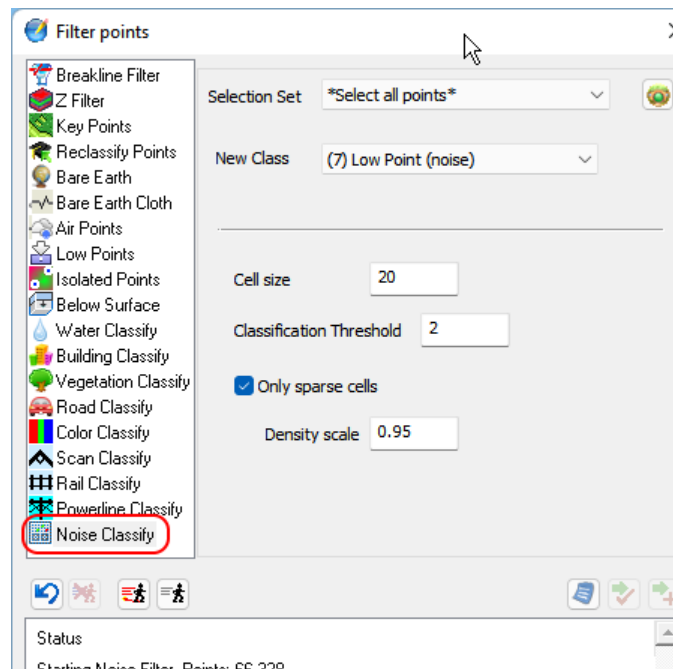


*New LandScape Interactive Point Edit **Merge ASCII** tool*

To use Merge ASCII:

- For this command to work, the LandScape project must already contain a points file (such as a .las file) in the same coordinate space as the points in the ASCII file.
- The input file must be ASCII text, but may have any file name extension. Default extensions are .txt and .csv.
- With the exception of any comment lines, the file must have one point record per line.
- Each point record in the ASCII file must have **X**, **Y**, and **Z** values.
- A **Class** value may be included, but is optional.
- **Delimiters** is set to the character that separates fields in the record line.
- **Comments** is set to a character that indicates a comment line. If this character is found at the beginning of a line, the line will be ignored.
- Drag and drop **Field Name** values to reorder the format list to match the order of information in the ASCII file records. Note that **X**, **Y**, and **Z** must exist and must be checked, but may be in any order that matches the order in the ASCII file. **Class** is optional and is checked and ordered only if it is included in the record.

- One or more unused columns may be skipped using the **Skip** button.
 - The **Reset** button may be used to reset the format to default values.
 - As with all Interactive Editing tools, the changes must be saved using the save  button.
 - The **Merge** button imports the points into the project. Each point will be added to the current project file with the nearest center point.
 - Troubleshooting: If no points are added, verify that the coordinate system of the points in the ASCII file matches the one used in the LandScape points file(s). Verify the format settings against the ASCII input file. The number of non-skipped fields must match.
4. **Noise Classify** is a new tool. It is more useful for image correlation point than for points acquired by lidar. It is designed to clean up image correlation data in areas where the correlation is likely to fail, such as on water and snow areas. Such areas usually have few points, and some of those points may have very different elevation values. The **Noise Classify** filter uses those features to identify points in those areas with extreme elevation changes. It may also be used to identify outliers in otherwise smooth surfaces.

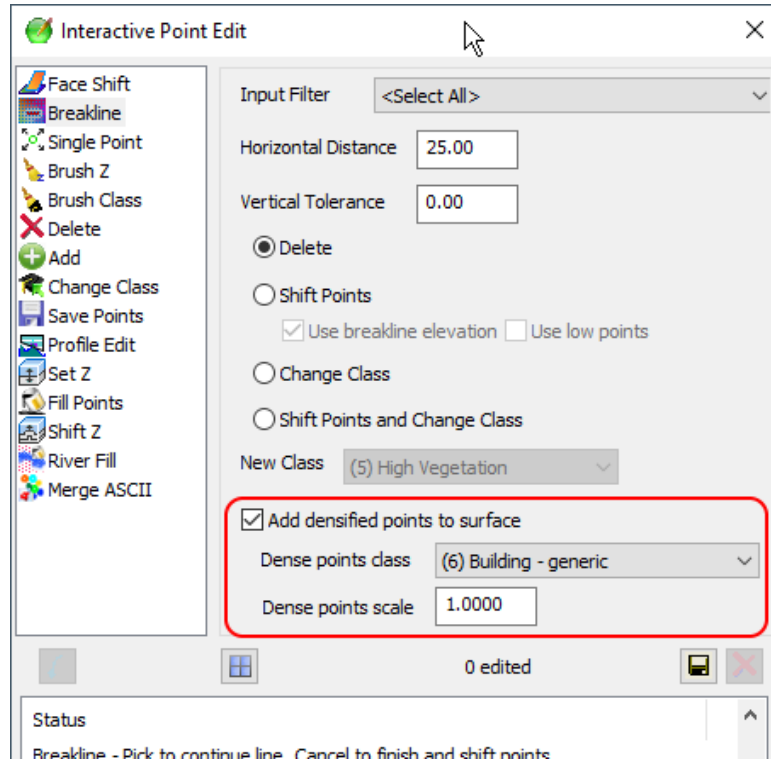


*New **Noise Classify** tool for autocorrelated data*

The settings are as follows:

- **Cell size:** The area to be filtered is broken into rectangular **Cell Size** areas. The mean(average) and median elevation values are calculated for the cell and the elevation of each point is compared to these values. **Cell size** will depend on the project.
- **Classification Threshold:** Any point with an elevation greater than the **Classification Threshold** from the cell's mean or median values is reclassified to the **New Class** setting. It may be set to 0 to classify all points found in sparse areas.
- **Only sparse cells:** If this is turned on, then only areas with a density less than **Density scale** (see below), the density of the overall area, will be checked. It is on by default.
- **Density scale:** This value is used to scale the overall area's density before the density comparison is performed. It should be between 0.01 and 1.0. Smaller values would include more areas to be checked for classification. Larger areas would include fewer values.

5. **Add densified points to surface** has been added to Interactive Edit Breakline. It creates new points by densifying the breaklines and adding the new points to the open points file with the nearest center point. It also saves the densification to the vector file that contains the breaklines. An example of use is to densify breaklines along the tops of retaining walls, add the new retaining wall points to the surface set, and use the surface set later as input for contour generation. (March 23, 2022)



To use **Add densified points to surface**,

- In the Interactive **Breakline** tool, check on **Add densified points to surface**.
 - Choose a **Dense points class** to receive the new points.
 - Set **Dense points scale** to control the density of the new points. The default density is one fourth of the project point density. This is normally approximately double the point density along a line. For more points, set the value less than 1.0. The smaller the value, the more points will be inserted. Values greater than 1.0 generate fewer points.
 - The vector file (source of the breaklines) will be saved with point edits. If untitled, a prompt for a new filename will be given.
6. The (original) **Bare Earth** tool could cause a crash in some error cases. This is fixed. (August 22, 2021)
 7. Vectors loaded from vector files and displayed in LandScape could flicker. This is fixed. (November 1, 2021)
 8. The **Breakline Filter** command working on a selection set involving vector boundaries could delete all points. This is fixed. (November 10, 2021)
 9. The Interactive Point Edit dialog has a faster way to load its child dialogs, which are the dialogs for the individual tools. In the past, both dialogs could take up to 1.5 minutes (on a DAT/EM development machine) to launch, depending on the system state. The slowdown was related to building all of the child windows at one time. The new method is to only create one child dialog when the user chooses that specific tool. It may take the child dialog approximately 10 seconds to appear if the system is operating slowly, but that is still much improved. (March 15, 2022)

DAT/EM Capture for ArcGIS - ArcMap

This version is compatible with ArcGIS ArcMap 10.0 (service pack 4), 10.1 (service pack 1), 10.2.x through 10.8.x with release dates up to October 2022. Please ask DAT/EM Support about ArcMap service packs released after October 2022.

This version may be compatible with ArcGIS 9.1, 9.2, 9.3 (service pack 1), 9.3.1(service pack 2). BE ADVISED: Testing no longer occurs for DAT/EM Capture with ArcGIS 9.x. It still installs for it and no code has been removed, so you may use 9.x as long as it continues to work for you. Any issues will not be corrected. ArcGIS 9.x support may be dropped completely in a future release.

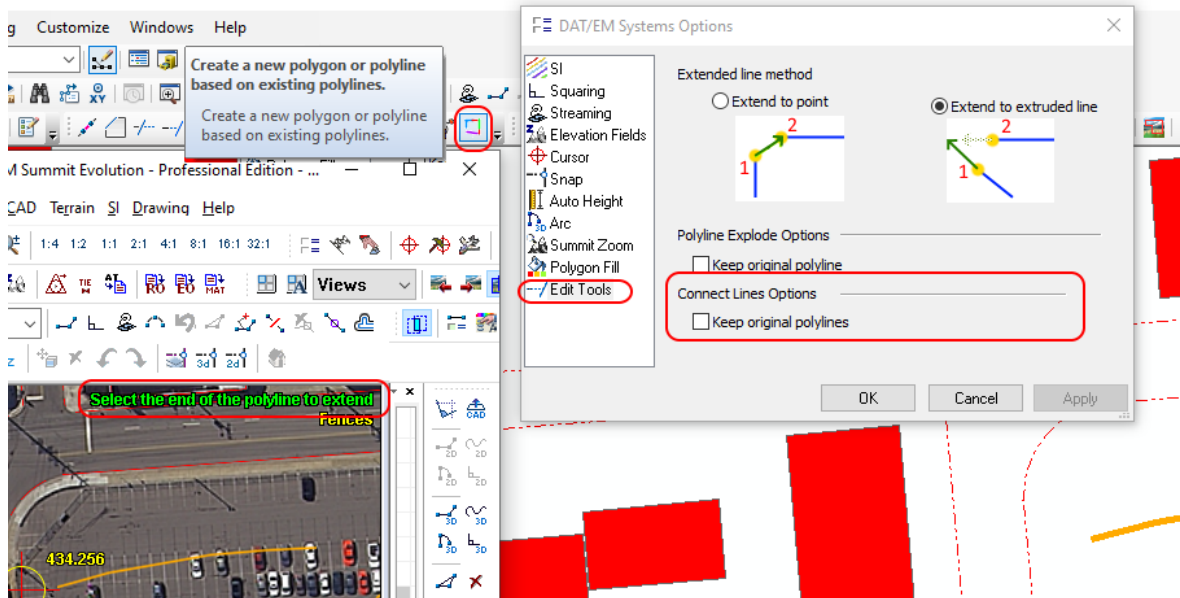
DAT/EM Capture for ArcGIS has the following changes:

Capture for ArcGIS (ArcMap)

1. **Connect Lines** is a new tool used to connect one or more polylines to create a new polyline or polygon, depending on the target layer selected. If the target layer contains fields with the same name as the source layer, the contents of the fields will be copied to the new feature. The copy will take place in order of selection, so if all objects contain the same field name, then the object selected last's value will be the value stored in the new feature. (August 23, 2021)

The keyword to use on the DAT/EM Keypad or a Button Manager button is: **ConnectLines**

On the **DAT/EM Systems Options > Edit Tools** page, select whether to keep the original polylines.



Missing the new toolbar icon? Ask support@datem.com for help. We know a trick to get it to show up!

To use:

- a) Start editing.
- b) Verify that the lines you want to connect are already 3D snapped to each other's endpoints.
- c) Set **DAT/EM Systems Options > Edit Tools > Keep original polylines** as shown above.
- d) Select a target layer.
- e) Select the **Connect Lines** tool shown above or start it with the **ConnectLines** keyword.
- f) Select the end of the first polyline you would like to connect.
- g) Select the start of the next line to connect. The tool will drive Summit to the end of that line.
- h) Continue selecting the start of any additional lines to connect. A line may only be selected once.
- i) Cancel after the last selection. The new polyline or polygon will be made. The original polylines will be deleted only if the **Keep original polylines** setting was unchecked.

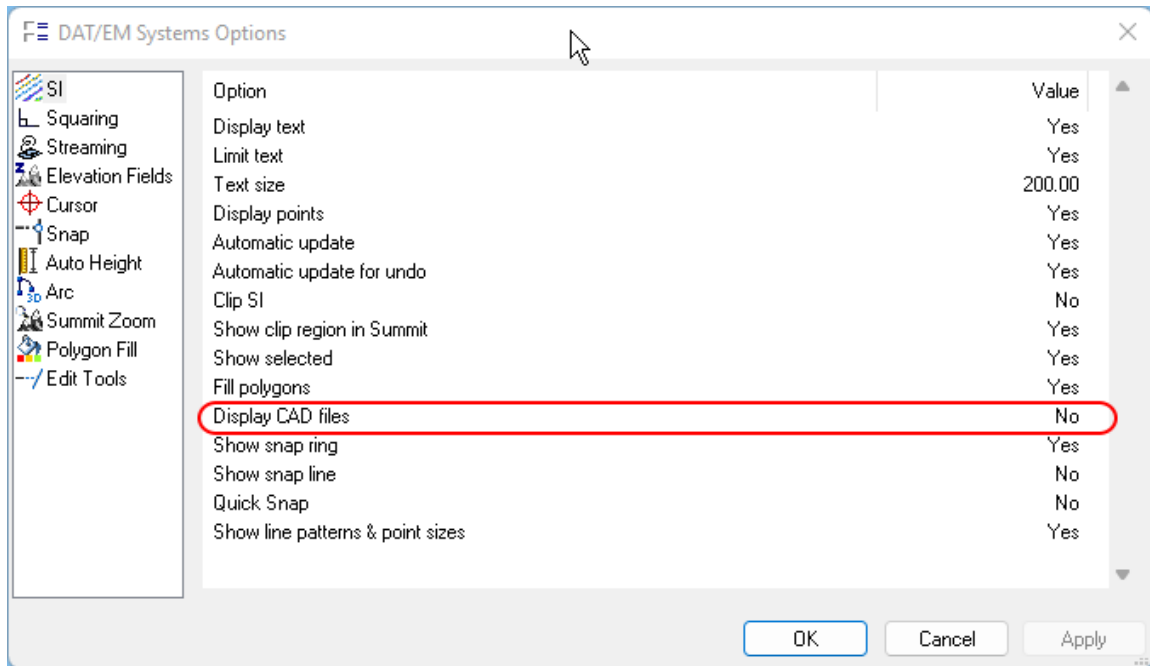
2. The **FeatureShift** keywords were not working from the DAT/EM Keypad or buttons. These are fixed. (October 11, 2021)
3. The **Target** keyword to set a feature class subtype in preparation for drawing was not working if another subtype of the same feature class was already active. For example, if these two Keypad keys were used in order (without a different feature class being set in between): . (November 2, 2021)

Target FeatureClass:**Subtype1** CreateNewFeatureTask draw PointToPoint

Target FeatureClass:**Subtype2** CreateNewFeatureTask draw PointToPoint

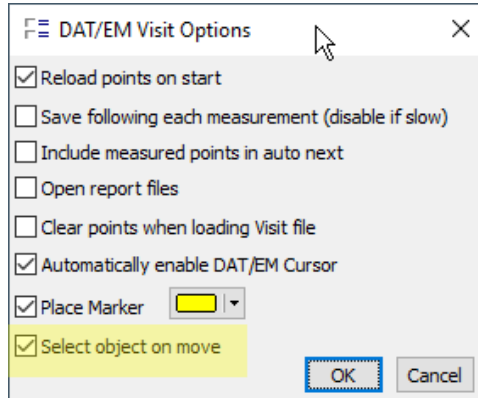
...and drawing started, it would still be drawing on **Subtype1**. This is fixed

4. There is a new **Display CAD files** setting in the ArcMap-side DAT/EM Systems Options dialog > SI settings page. When on, it will send ArcMap's CAD reference files, such as referenced DWGs, into superimposition. It is off by default. (September 7, 2022)

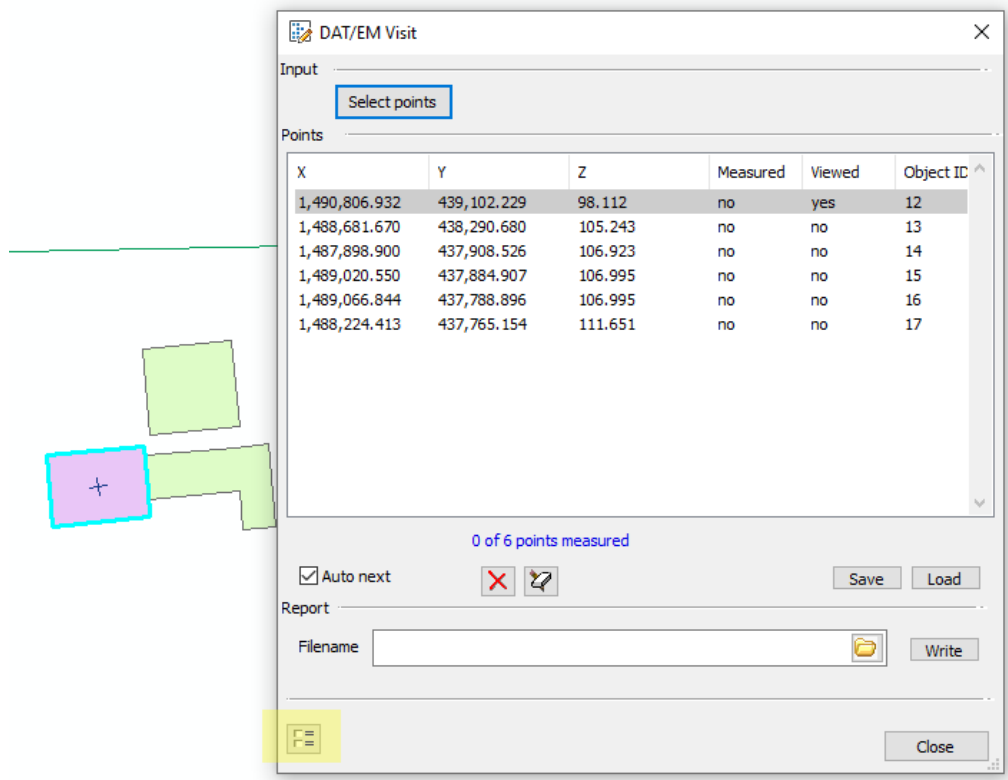


5. The **Visit tool** for ArcMap has the following enhancements:

- a. **Previous** and **Next** keywords will move the highlight to the next or previous list item in Visit. Note that **Next** also works in Airfield3D to move to a next obstacle in an obstruction area; the same keyword now works to move to the next Visit item. **Previous** is new. (2022)
- b. **Visit** has a new user option to **Select objects on move**. Check this on if you intend to edit the visited object. It will select the object at the move location, so that it is ready to receive the edit. Hint: It is possible to run Visit and Field Update at the same time; this automatic selection makes it easy to “Apply” immediately in Field Update after Visit moves to the object. (March 2, 2022)

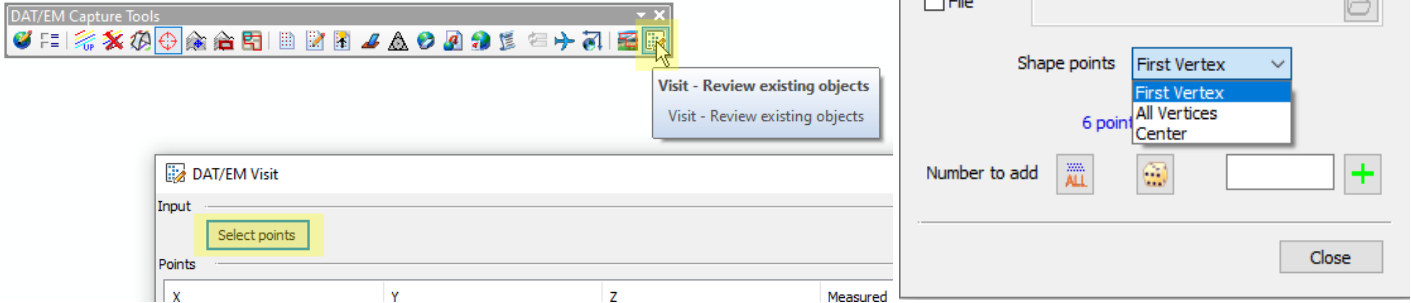


*Visit's **Select objects on move** option*



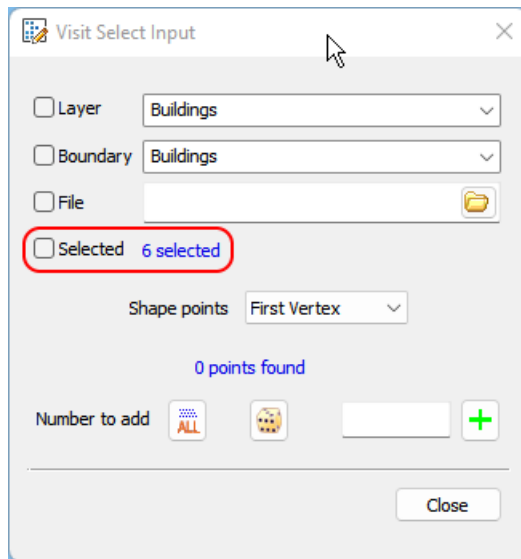
Location of Visit's Options button (yellow highlight) and object selected on move (cyan highlight)

- c. **Visit** has a new option to move to the center (center of gravity) of an object. Previous options to visit only the first vertex or every vertex are still present, but their checkbox has been changed to **Shape points** options. The settings are found in the Visit Select Input dialog. (October 28, 2021)



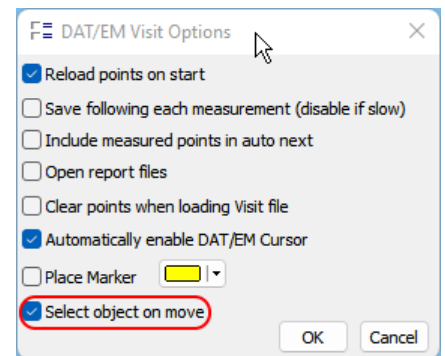
Visit's new **Center** option, with choices moved to **Shape points**

- d. **Visit** has a new option to move to a list made up from ArcMap's currently selected object(s). Before using this option, select one or more objects in ArcMap. When **Visit** starts and shows its **Visit Select Input** dialog, the number of selected objects will be displayed next to the new **Selected** option. To use it, check on the option and then select the **Number to Add > All** button. (May 17, 2022)



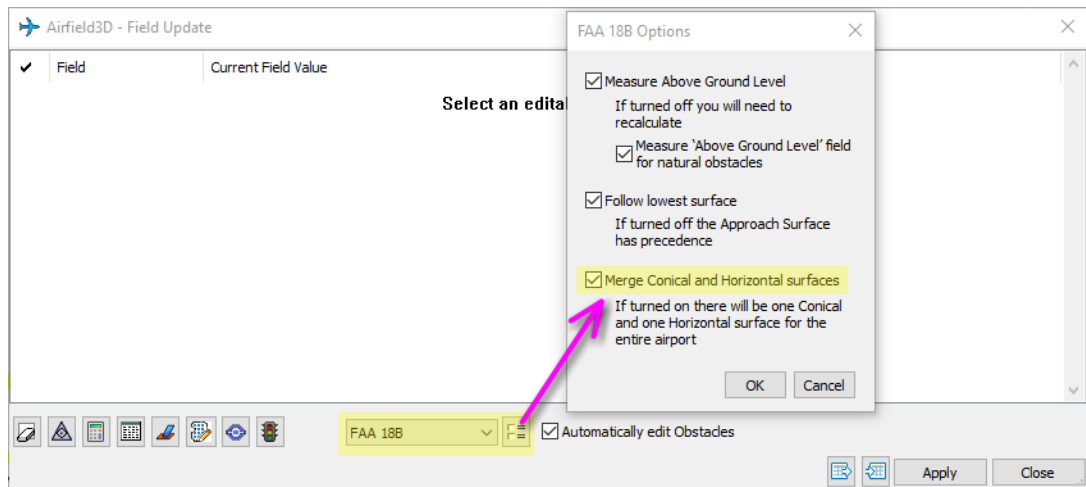
New **Selected** option in Visit for ArcMap

Note that this option can interact with the new **Select object on move** setting shown in item 5.a on page 19 above. If **Select object on move** is on when using the **Selected** option, the **Visit** list will remain intact for the originally selected objects, but the original selection will clear when it moves to an entry in the list and selects the object at that location. If you want to retain the original selection instead, turn off **Select object on move**.

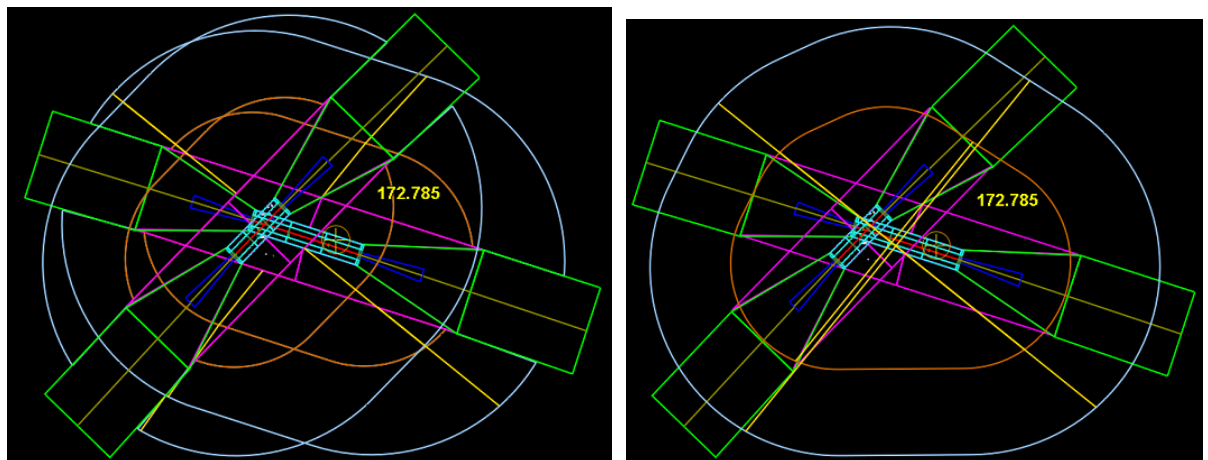


6. Airfield3D in Capture for ArcMap with Summit Professional Edition has the following changes:

- a. The tool to output the surfaces to the ObstructionIDSurface layer could make additional polygons that did not belong to the currently (correctly) displayed surface set. This is fixed. (October 7, 2021)
- b. The new "NATURAL_HIGHPOINT" spelling added in the 18b "Change 1" is now accepted as a natural feature Obstacle Type. The older "NATURAL HIGH POINT" spelling is still accepted as well for backwards compatibility with pre-Change 1 FAA documentation. (October 25, 2021)
- c. There is a new option for the 18b surfaces to merge the conical and horizontal surfaces so that there is only one merged conical and one merged horizontal per airfield. This will have a noticeable effect only when there are two or more runways. When off, there is one conical and one horizontal per runway.
(November 18, 2021. Between December 1, 2021 and February 1, 2022, if the new merge surfaces checkbox was on and the Insert Surfaces tool was used, it would make a Conical surface polygon with an extra Horizontal surface polygon as an interior ring; this was fixed February 1, 2022 to be included in any beta February 2, 2022 or later.)



New Merge Conical and Horizontal surfaces setting for the FAA 18B surfaces only



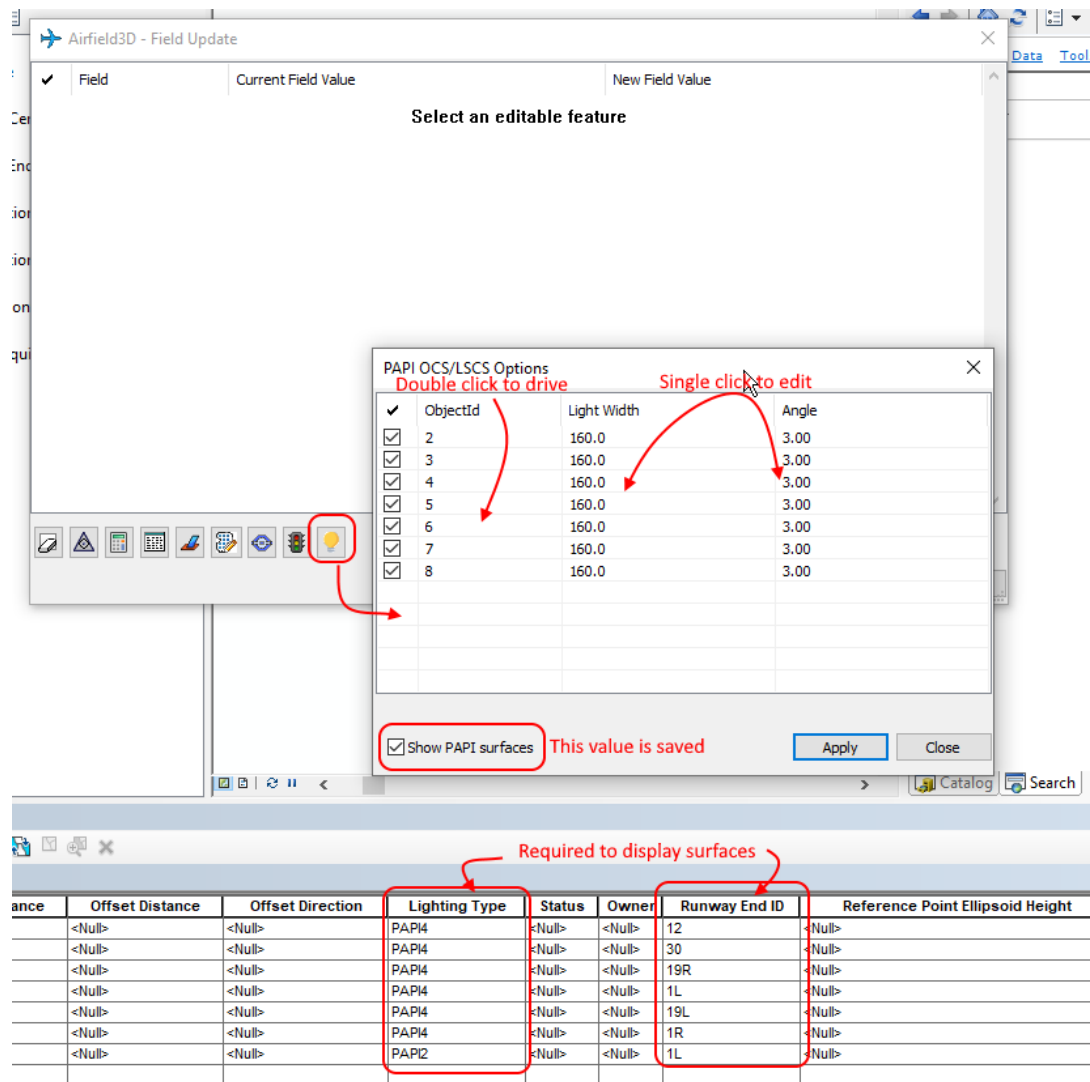
Merge Conical and Horizontal surfaces off (left) and on (right)

Note! These merged surfaces will be duplicated for each runway written to the ObstructionIDSurface layer; the user will need to remove the duplicates. Select and delete the additional copy or copies. Fixing this would require changing the entire architecture of Airfield3D, which we do not plan to do. The user will need to delete duplicates in trade for having this new merge setting.


Further Discussion on Merged Surfaces: One Airfield3D client asked for this option to satisfy his customer and to match another competing software's setting. Another client reacted to it saying, "I had

this discussion 12 years ago with the FAA and Mark Howard at the NGS. I was told quite explicitly that these surfaces should never be merged. FAR77 specs indicate the horizontal/conical surfaces should be merged, but never 18B.” For the moment, our advice would be to be very sure you want the surfaces merged before setting the option on and to know exactly why you want them merged. Please send your opinions and comments to support@datem.com.

- d. There is a new tool to build the Light Signal Clearance Surface (LSCS) Surfaces. These are based on FAA documents such as: Advisory Circular 150-5340-30J https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentnumber/150_5340-30, Engineering Brief number 95 https://www.faa.gov/airports/engineering/engineering_briefs/media/eb-95-papi-vgsi.pdf, (January 24, 2022. The January 24, 2022 version had the surface direction backwards, there was an error in the slope in the second half of the surface, and it did not offer to export the light surfaces to the ObstructionIDSurface layer. Fixes for these problems are dated January 28 and February 1, 2022. Any beta February 1 [02_01_2022] or later contains the fixes. Testing on the February 1, 2022 beta showed a problem with the Surface Insert tool, which is being fixed the same day, with fixes expected to be included in any beta dated February 2, 2022 or later. The PAPI Obstacle Clearance Surface OCS will be added at a later date.)



PAPI OCS/LSCS Options dialog with ArcMap Attributes


Using the APAPI OCS/LSCS Options Dialog: The PAPI **OCS**/LSCS Options dialog is launched using the  button from the **Airfield3D** dialog on the ArcMap side. **Note: OCS surfaces are not implemented. If you need them, please contact DAT/EM Support.**

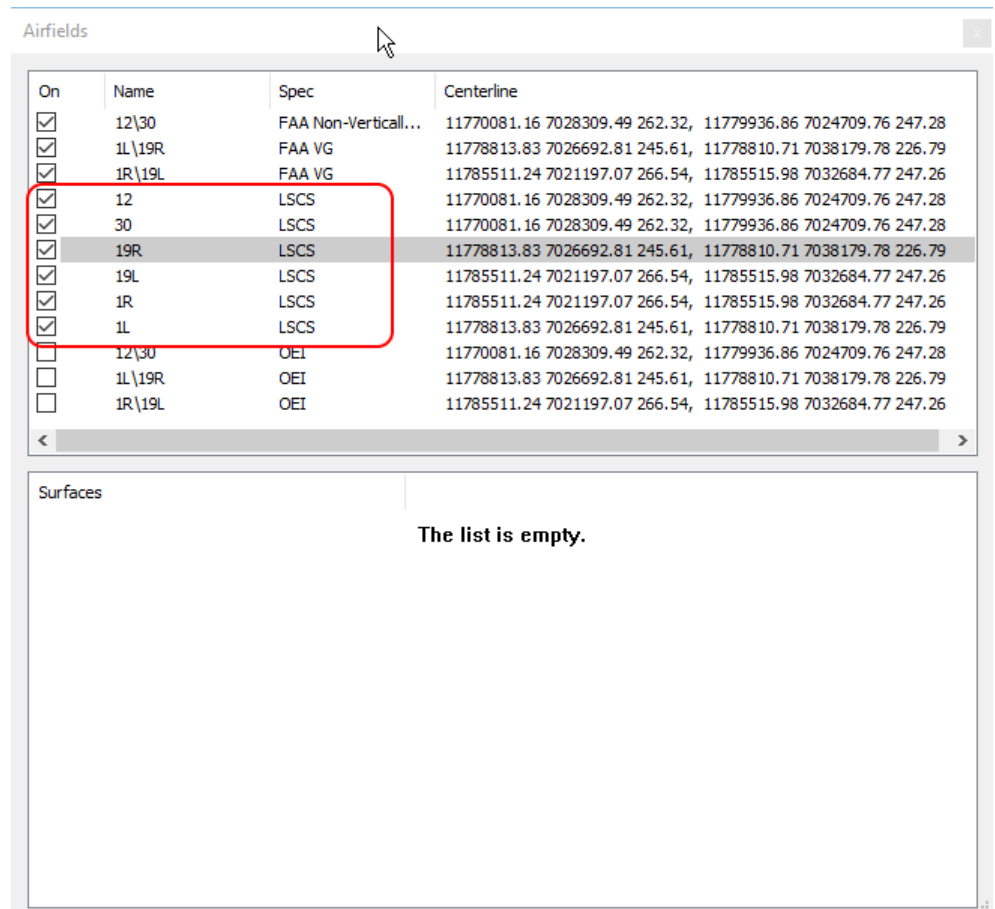
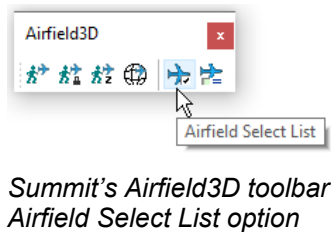
The dialog displays points found on the **NavaidEquipment** layer with the **Lighting Type** attribute set to either **PAPI2**, or **PAPI4**. The points are matched to their corresponding runway centerlines using the **Runway End ID** attribute.

There are two ways to control the visibility of the PAPI LSCS surfaces on the ArcMap side. The list contains a checkbox that may be used to turn off individual LSCS surfaces. The **Show PAPI surfaces** checkbox may be used to turn off all LSCS surfaces. It is also the only setting that is saved between Airfield dialog launches. **Light Width** and **Angle** settings are reset to default values when the Airfield3D dialog is closed.

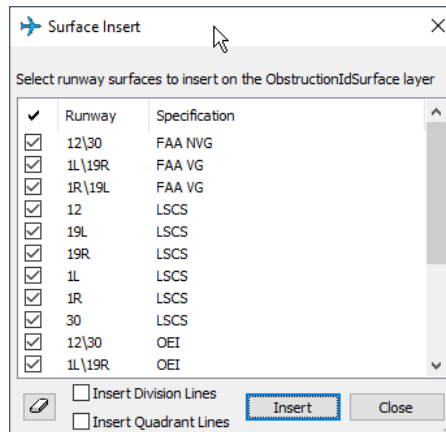
You may drive to an individual point by double clicking in the **ObjectId** column. The **Light width** column controls the width of the light bar which is centered on the **NavaidEquipment** point and perpendicular to the centerline. The **Angle** column controls the surface angle. Click in either of these columns to edit their values. Changes to all settings may be applied using the **Apply** button.

A single runway centerline may have multiple light bars on either side of the runway.

The Summit **Airfields** dialog may be launched using the **Airfields Select List**  button on the **Airfield3D** toolbar (Summit side). The OCS/LSCS surfaces will contain **LSCS** in the **Spec** column and their corresponding runway end in the **Name** column. They may be turned on and off using checkboxes in the **On** column.



Summit-side Airfields Dialog

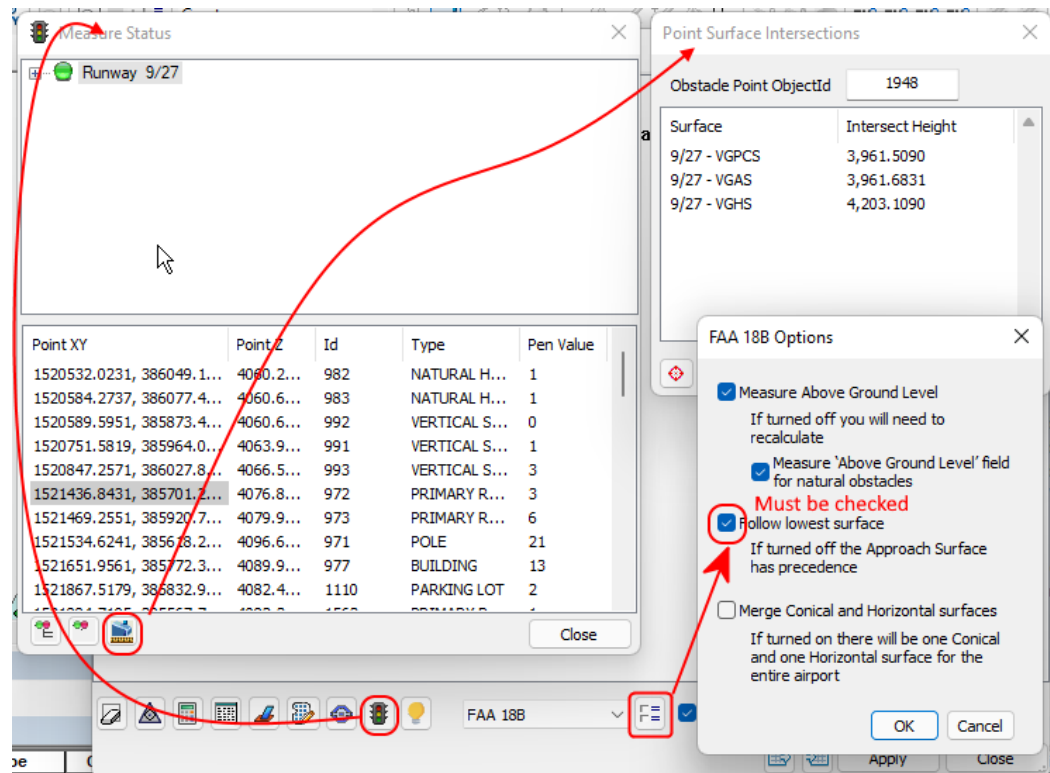


Airfield3D Surface Insert tool showing new LSCS surface options



- e. **Point Surface Intersections** is a new option offered in the **Measure Status** tool. It displays all the surfaces that a point intersects as well as the elevation of each surface at the point. It is designed to help understand reporting for points that exist in ambiguous areas where there are multiple surfaces at the same (x,y) location. Since reporting is done on only one surface and depends on the current setting for **Follow lowest surface** at the time of the report, it can help answer questions about why a point was not reported on the higher or lower surface. (April 14, 2022)

To use:

- Check on **Follow lowest surface** in the **FAA 18B Options**. It is only available when is setting is on.
- Start the **Measure Status** tool. Choose runway and surface display as desired.



New Point Surface Intersections tool to help understand points that exist in multiple surfaces

- Use the  button in the lower left edge of the **Measure Status** dialog.
 - Point selection options: There are two ways to display a point in the Point Surface Intersections dialog: Double click on a point in the **Measure Status** dialog or key in the obstacle's object Id (Identifier) to the **Obstacle Point ObjectId** field.
 - The surfaces and their intersection heights populate automatically. View the results.
 - Drive options: Press the  button to drive Summit to the measured point. Double click on a surface in the list to drive Summit to the same point using the elevation of the surface.
- f. Previously, using Airfield3D to apply field values to a non-Obstacle object could sometimes corrupt the layer of the object. There is now more error checking to prevent this. Note that Airfield3D is designed to update the fields for objects on the Obstacle layer. For objects on all other layers, use the Field Update tool instead. (March 4, 2022)

DAT/EM Capture for ArcGIS – ArcGIS Pro (Beta)

DAT/EM Capture for ArcGIS Pro is compatible with versions:

- **ArcGIS Pro versions 2.3 through 2.9.3..**
- **The API no longer needs to be present on the hardware lock for Capture for ArcGIS Pro. If you have Capture for ArcGIS ArcMap and want to try Capture for ArcGIS Pro, use the DAT/EM CAD Enabler (standalone or located in the DAT/EM Administration Tool) to activate the extension for ArcGIS Pro.**
- **Note: If you have ArcGIS Pro v.3.0, ask support@datem.com for the first v.8.2 beta that is compatible with it. Extensions built for ArcGIS Pro 2.x (as is the DAT/EM v.8.1 extension) will not work with ArcGIS Pro 3.0.**

DAT/EM Capture for ArcGIS Pro has the following changes:

1. There is a new "Capture for ArcGIS Pro User's Guide" document that matches DAT/EM Version 8.0 and 8.1. It was released after the 8.0 release. It is posted on the DAT/EM website. (December 8, 2021)
2. The compatible version list has been expanded to include ArcGIS Pro versions 2.3 through 2.9.3. (January 19, 2022, July 2022)

DAT/EM Capture and MapEditor for AutoCAD

DAT/EM Capture and MapEditor for AutoCAD are compatible with the following AutoCAD versions:

- **32-bit AutoCAD 2004-2008 versions with the latest service packs, as long as you can get them to install on your 64-bit operating system (OS).** DAT/EM no longer tests on 32-bit OS, so these must be running on 64-bit OS. DAT/EM is not responsible for helping to install a 32-bit version of AutoCAD on a 64-bit OS and cannot guarantee that this will succeed.
- **64-bit AutoCAD 2009-2023 versions with the latest service packs. Exception: 64-bit AutoCAD 2008 is not supported.**

When referring to a year/version number in the lists above, it includes "plain" AutoCAD, Civil3D, and Map3D. It does not include AutoCAD LT, which is a 2D product, and therefore will never work with a 3D cursor.

Reminders: Install all available AutoCAD service packs and updates before installing DAT/EM software. Before installing DAT/EM software, run each version of AutoCAD and make sure its license is active. Do this for each version *whether or not you intend to use every version with DAT/EM Capture*.

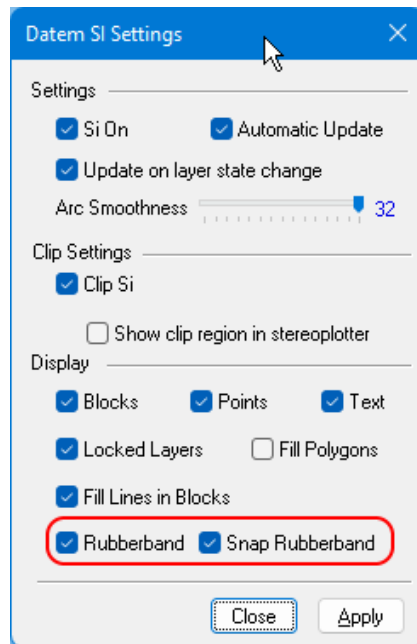
DAT/EM software will install for multiple AutoCAD products of different year numbers on the same computer; however, it will only install for one of multiple same-year versions that Autodesk installs in different "\Program Files\Autodesk" folders. In more recent versions, they install to the same folder, so this is no longer a problem. For older versions, they are in separate folders. For example, DAT/EM Capture will not install for both AutoCAD 2017 and AutoCAD Civil3D 2017 at the same time, because they are both the same year and installed in different folders. In the case of multiple same-year versions installed in separate folders, only one of them will receive the DAT/EM files at installation. We don't know which one until after Autodesk installation. To activate DAT/EM Capture and/or MapEditor in all of them, the AutoCAD \datem folder and the DAT/EM wintab driver file may be copied from the one that received the files to the other same-year versions. Contact DAT/EM Support for instructions.

DAT/EM Capture and MapEditor for AutoCAD have the following changes:

1. AutoCAD 2023 is added to the compatible version list. It uses the same binaries and menus as for AutoCAD 2021 and 2022, so the installation into the AutoCAD 2023 folder is the only thing that has changed. (March 29, 2022)
2. The DAT/EM installation process for AutoCAD 2022 (all types of this year version) placed the “Wintab” digitizer file in the correct folder as **Wintab64_2021.dll**, but failed to rename it to **Wintab32.dll** so it could be used. This is fixed in the installation for v.8.1. (September 4, 2021)

Note: Workstations that installed v.8.0 or early v.8.1 betas for AutoCAD 2022 and attempted to configure the Wintab digitizer will need to force AutoCAD to reset the digitizer for the correct file. Once AutoCAD 2022 is set to the Wintab digitizer, but can’t find the correctly named Wintab32.dll file, it does not automatically recover proper operation when the file can be located. To force it to reload the new v.8.1 Wintab32.dll file, do this:

- Install v.8.1 or higher dated 5 September 2021 or later.
 - Open AutoCAD 2022 (any type of that year version).
 - Start OPTIONS > **System** tab.
 - Set **Current Pointing Device** to “**Current System Pointing Device**”.
 - Close and reopen AutoCAD 2022. *Do not skip this step. It must open without the Wintab set.*
 - Return to OPTIONS > **System** tab. Set **Current Pointing Device** to “**Wintab Compatible Digitizer...**” and “**Digitizer and mouse**”. This will force AutoCAD to search for and load Wintab32.dll.
 - Verify that OPTIONS > **Files** tab > **Support File Search Path** still contains the two required DAT/EM folders, usually “**C:\Program Files\Autodesk\AutoCAD 2022\datem**” and “**C:\Program Files\Autodesk\AutoCAD 2022\datem\bmp**”. (These do not need to be changed for this process, but it’s a good idea to make sure you set them previously and they are still there.)
3. **SI Settings** has two new rubber band settings: (August 10, 2022)



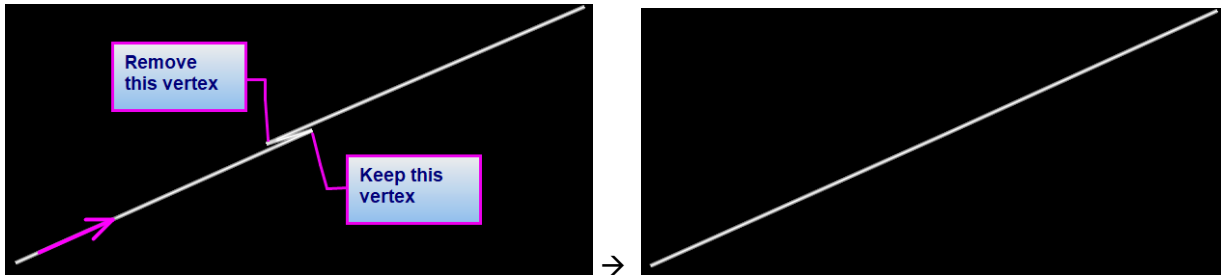
Rubber band – When on, this is the superimposed rubber band that goes from the most recently digitized point to the Summit cursor location during drawing.

Snap Rubber band – When on, this is the superimposed rubber band that goes from Summit cursor location to any potential snap locations during drawing. It will appear when AutoCAD’s Osnap is on and you are drawing an object within snapping range of another object.

New Rubber band and Snap Rubber band settings

4. **DATDRAW** for AutoCAD is disabled. This command was added several years ago to try to mimic a similar tool in Capture for MicroStation; however, it never worked very well in the AutoCAD environment. We decided to discontinue it. If you used this command and miss it, please contact DAT/EM Support. (March 29, 2022)

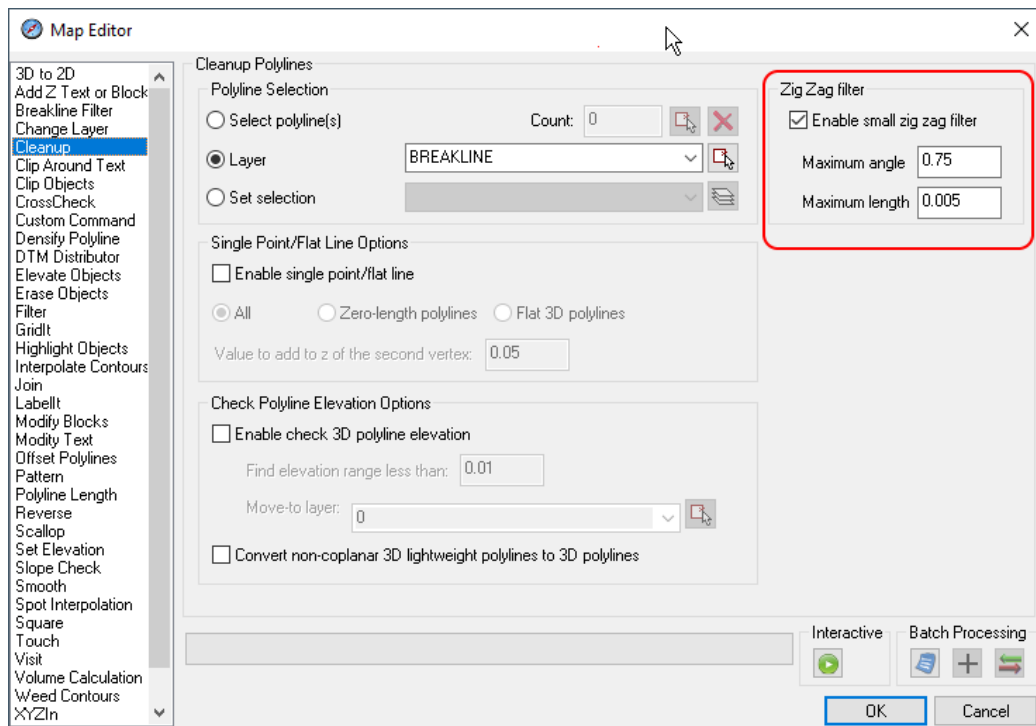
5. MapEditor **Cleanup** has a new **Zig Zag Filter** option. A customer sent a file that had tiny 0.001-unit long segments that switched back and forth at or almost at 180 degrees along what should have been one straight segment. The **Zig Zag Filter** can detect such tiny segments by their angle to the adjoining segments (projected in the xy plane) and segment length and remove the second point. (March 28, 2022)



Before (left) and after (right) MapEditor Cleanup's new Zig Zag filter

Settings and recommendations for the Zig Zag filter:

- In some files, it may help to run MapEditor **Filter**'s duplicate vertex removal first. If the tiny zig zag has a duplicate vertex at either end of the zig zag, it could prevent Cleanup from finding the zig zag, or it might leave a zig zag to the remaining duplicate vertex.
- The **Maximum angle** setting is in degrees. So, for example, a setting of 0.75 is less than a degree.
- **Maximum length** is set so that no segment is removed that is longer than this setting (in ground units).
- **Maximum length** is checked before **Maximum angle**, since the check is faster.
- Running the **Zig Zag filter** twice might find additional zig zags.



Zig Zag filter settings should be made after investigating the length and angle of the zig zag problems in your file

6. **EDITLINE** has new **3DVertexShift** (“3”) and **2DVertexShift** (“2”) options. **3DVertexShift** asks you to pick an existing vertex in the polyline and move it in (x,y,z). **2DVertexShift** moves it in (x,y) only. **2DVertexShift** was really only added for completeness, because normal dragging and dropping in AutoCAD will move the vertex in 2D already. The new EDITLINE options work well with the Summit stereoplotter cursor, which provides good 3D input. (April 22, 2022)

Note that **3DVertexShift** will change the elevation of an entire 2D polyline if used on it; it does not change the 2D polyline into a 3D polyline. Please let DAT/EM Support know if you want this to work differently on a 2D polyline.

To use:

- If Summit is not running and you plan to use the system mouse in the AutoCAD view to do a 3D vertex move, you must first use the AutoCAD ELEV command and key in the desired vertex elevation. If Summit is running and you will use Summit to pick, this is not necessary.
 - Start EDITLINE.
 - At any time that the main EDITLINE prompt is active, key in **3** to move the vertex in (x,y,z) if it is a 3D polyline, **3** to move the (x,y) of the vertex and the (z) of the entire polyline if it is a 2D polyline, or **2** to move the vertex in (x,y) for any polyline.
 - Follow the prompts to pick the original polyline vertex and the destination location.
 - The prompt will repeat so that you can move more vertices.
 - When finished moving vertices, submit **<Escape>** on the keyboard or a **Cancel** button in Summit’s Button Manager buttons. This will return the command to the main EDITLINE prompt. A second **<Escape>** or **Cancel** will end the EDITLINE command.
7. **PSQR** and **PSQR2D** can now toggle their close setting with a new **Auto close toggle** option on their command line. Previously, this setting was only available in the SETUP dialog, and it had no key-in equivalent. Since it is now on the command line, it can be controlled from the keyboard (**A** key) or from **A{RET}** on the Keypad or a Button Manager button while PSQR/PSQR2D is running. The new prompts are as follows: (March 29, 2022)

Command: **PSQR3D** Square From point/**Auto close toggle**[ON]/Xy tol/Z tol/Plotter z[ON]:

Command: **PSQR2D** Square From point/Xy tol/**Auto close toggle** [ON]:

The following dialog shows the older location of the PSQR/PSQR2D close setting, which is still available and may be used as a default:

The screenshot shows the 'DAT/EM Capture Settings' dialog box. The 'PSQR3D and PSQR2D' section is highlighted in yellow. Within this section, the 'Automatically Close' checkbox is checked. Other settings visible include 'Map Scale and units' (Units: English (1 inch = x feet), Map Scale: 1" = 20'), 'Blocks and Text' (Block rotation angle: 0.00, Block scale factor: 0.7500000, Text scale factor: 0.7500000), 'Line patterning command defaults' (Pattern distance factor: 1.0000000, Planimetric patterning checked), 'CAPT3D and CAPT2D' (Contour interval: 2.0000000, Curvature angle: 3.00, XY distance: 5.0, Z distance: 5.0), and 'AUTOARC3D/ARC3D/DATDRAW Arc Stroking' (Stroke arcs by maximum distance of 0.5 ground units per segment, Stroke arcs by number per projected circle: 60).

*SETUP's default setting for PSQR/PSQR2D **Automatically Close**, which is now also accessible from the PSQR/PSQR2D Command lines*

DAT/EM Capture and MapEditor for MicroStation CONNECT (64-bit versions)

This section applies to Capture and MapEditor for 64-bit MicroStation CONNECT Editions (CONNECT). DAT/EM software installs for the following CONNECT versions:

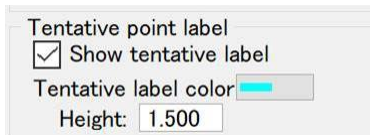
- **MicroStation CONNECT Edition Updates 14-17.** Note: Although it will install for earlier updates, Bentley's 3D offsetting function wasn't fixed until Update 14, so we recommend 14 and higher. "Update" numbers vary for the other products listed below. It is best if they are from a version concurrent with the DAT/EM release date.
- **OpenRoads Designer (ORD) CONNECT Edition**
- **OpenCities Map CONNECT Edition**
- **OpenCities Map Enterprise CONNECT Edition**

Certain earlier CONNECT versions may work with DAT/EM software, but are no longer supported. For higher versions and update numbers released after the DAT/EM release or software build date, contact DAT/EM Support for information.

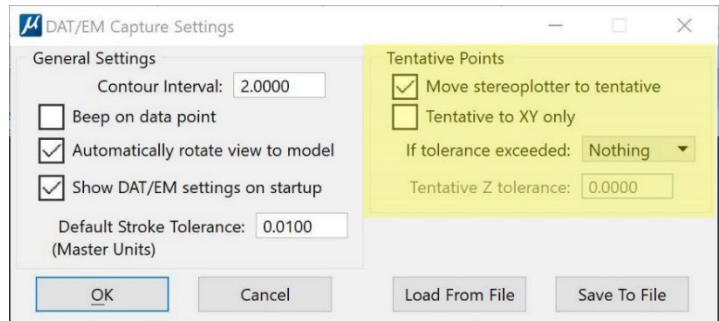
Starting March 24, 2020, DAT/EM software will install for CONNECT version values greater than 100000000 and less than 109900000 with a **ProgramPath** anywhere under the **Software\Bentley\Installed_Products** key in the registry. If your CONNECT version has a number older than this, we suggest updating it. Despite installing old versions, we do not guarantee Capture and MapEditor will work with them if CONNECT itself has bugs in functions that the DAT/EM applications access. In that case, please update the CONNECT version and then reinstall DAT/EM software.

DAT/EM Capture and MapEditor for 64-bit MicroStation versions have the following changes:

1. Tentative point snap detection, marking tentative points in superimposition, and moving to tentative points are now working fully in 64-bit MicroStation ("CONNECT"). Changes are as follows: (Multiple dates in 2022)
 - a. Tentative snaps are now successfully detected in the MicroStation view. This enables them to be marked in superimposition and set behaviors to be activated upon a tentative point selection in MicroStation.
 - b. Acceptable tentative point snap selections may originate in either the Summit view using a Summit cursor Button Manager button set to **Generic CAD=Tentative** or in the MicroStation view by clicking the right and left system mouse buttons at the same time.
 - c. The **Move stereoplottter to tentative** setting (keyin: TENTATIVE MOVE <ON/OFF>) (shown in the DATEM SETTINGS graphic below) is now active. Previously, the setting could be checked on in the dialog, but Summit did not move.
 - d. Tentative points that are not snapped to an existing element will now be marked in superimposition. (January 11, 2022)
 - e. Previously, there were two sets of tentative point mark and label color options for superimposition. They were left over from an old workaround for 32-bit MicroStation XM, which was not necessary in CONNECT. The second label/mark and its mark settings were removed from DATEM SETTINGS; however, the tentative point *behavior* settings remain in DATEM SETTINGS:

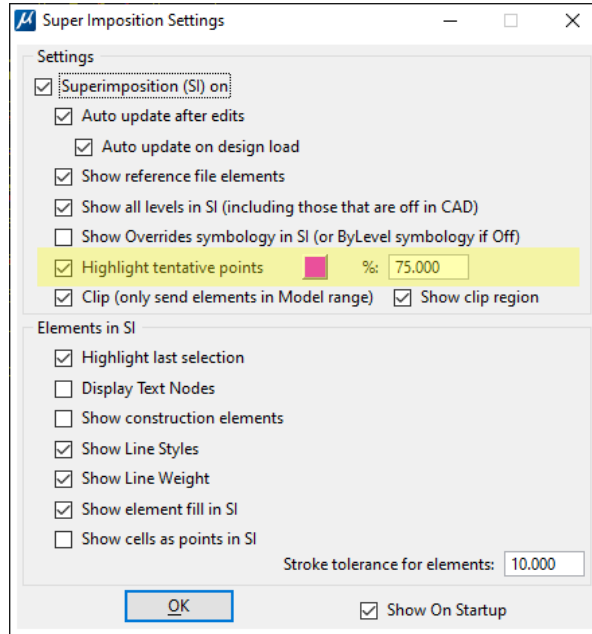


These previous tentative label/mark options have been removed from DATEM SETTINGS



Tentative point behavior settings remain in DATEM SETTINGS

Tentative label/mark settings for superimposition are now located only in SI SETTINGS:

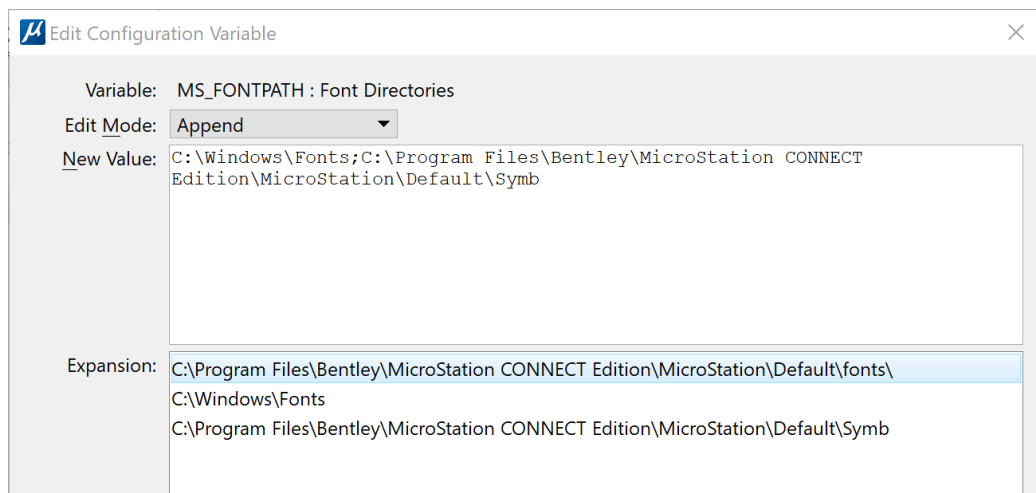


Tentative point label/mark settings are located in SI SETTINGS

2. Fixes for reference file use are as follows:
 - a. Previously MicroStation CONNECT would fail to refresh its reference file graphics after any view pan or zoom synchronization initiated by Summit. The reference file graphics would disappear from the MicroStation view, and subsequently from any refreshed superimposition (SI) view. DAT/EM Capture now forces a MicroStation view refresh after any automatic panning and zooming. (November 4, 2021)
 - b. Previously, there were Summit SI display problems when the main file and reference file had different global origins. Such reference files now display in the correct location in superimposition. (March 4, 2022)
 - c. Previously, there were problems when a DAT/EM command was told to scan for objects in (missing) reference files, such as checking on MECLIP's "Include reference elements" setting when there is a missing reference file. DAT/EM software now skips references to files that are not available. (August 30, 2022)
3. DAT/EM implemented workarounds to avoid a MicroStation CONNECT crash when clipping an element that has not yet been written to the design. All DAT/EM commands that use clipping (including, but not limited to INTERP, MEVOLUME, JOINIT, ZLABEL, MECLIP, MEPATTERN, and CHANGEATTRIBUTES INTERIOR) now use a utility safe clip that checks whether an element descriptor has been written to the design, write it if not, and delete the element after the clip. Because this was unacceptably slow for mass editing, a more optimized clip was used for some commands, such as SHEETCUTTER. (November 5, 2021)
4. MapEditor-only installations in v.8.0 were loading the MapEditorConn.ma file correctly, but this did not in turn load the required CommonConn.ma ("Common") file. Common will now load automatically. In addition, there are added diagnostics. A failure to load Common correctly will show a window giving a diagnostic code to discuss with DAT/EM Support. (January 19, 2022)
5. Rubber banding in Summit's superimposition (SI) had several issues, which are now fixed. PLACE SMARTLINE now has an SI rubber band, for example, but the rubber band is improved for many other commands as well. Hint: If you find that MicroStation's PLACE LSTRING STREAM is too slow with its proper rubber banding, use DATDRAW STREAM or BKTRACK instead. (February 7, 2022 and July 7, 2022)

6. Superimposition (SI) of the in-progress linework and the SI rubber band could be lost or drawn incorrectly if the Summit model changed automatically while drawing with commands such as AUTOARC or DATDRAW AUTOARC. A new automatic refresh solves this problem. (August 9, 2022)
7. DAT/EM tools that write to the open CONNECT DGN file, such as Summit > File > Export > Export Model Bounds and DAT/EM Contour Creator, would disable proper operation of superimposition (SI) refresh in the MicroStation SI client. This is fixed. (February 14-15, 2022)
8. Large batch edits that were interrupted, such as XYZIN giving a “File not Found” message, could turn off superimposition (SI) refresh for performance purposes, but would not fully reactivate it after the interruption. Now SI is fully reactivated at the proper times. (February 14, 2022)
9. A collection of commands that create text and include font settings were updated to try to find missing fonts. They check for the existence of a named font in the MicroStation path (MS_FONTPATH) and add the found definition, if needed. Previously, the default font (STANDARD) would often be used instead of the set font name. On closer inspection, we found that font definitions could not be easily resolved. TRUE TYPE and SHX fonts were often unresolved, while MicroStation fonts seemed to resolve correctly most of the time. Commands affected include ZLABLE(s), GRIDIT, LD CP, MEVOLUME, and maybe more. (March 28, 2022)

While working on this, we discovered that MS_FONTPATH set on the development machine did not include all of the commonly used fonts. This is highly likely to happen on individual installations as well. Based on the following Bentley article, we added the following paths to the MS_FONTPATH variable to get access to the common font definitions: https://communities.bentley.com/products/microstation/w/microstation_wiki/14552/missing-font

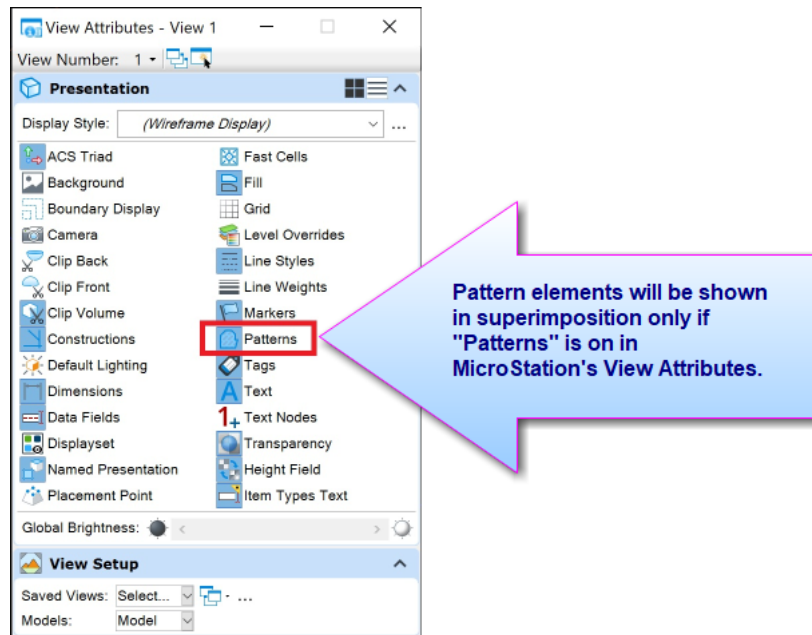


Adding these paths worked for us, but you will have to decide whether your organization wants to do this.

DAT/EM has no plans to modify MS_FONTPATH automatically. It is usually done at an administrative level based on organizational standards. We're mentioning it, in case you have trouble with missing fonts and want to check this variable's setting for your organization.

10. Miscellaneous MapEditor fixes for operating on a parameter (PAR) file: (April 25, 2022)
 - a. Fixed a problem where the comment toggle was not being applied to the current run.
 - b. Fixed log file formatting errors (Unicode aesthetic issues).
 - c. Fixed random memory corruption during linkage handling. Heap space was randomly corrupted while trying to preserve pre-existing linkages. Isolated the problem to `mdlElement_appendAttributes(destination, length, attributeData)`. DAT/EM is preserving the linkages, but had to rework the code to get around the memory corruption that was occurring in the Bentley MicroStation 64-bit API. Fixed in 8.1 with the caveat that it would be best to ask customers to verify the linkages are correctly preserved. Email support@datem.com if you have comments.

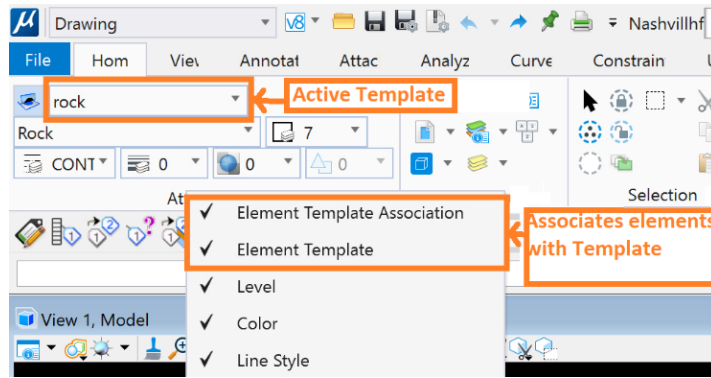
11. Summit's SI Layer Manager could be missing the names of empty (that is, no objects drawn in them) .dgnlib-referenced levels that were displayed in the MicroStation Level Manager. CONNECT fails to report an event when such empty levels are added to the MicroStation environment. The levels are reported if they contain elements or you draw an element into the level. DAT/EM added a workaround to force a complete refresh of all level names from levels that also show up in the Level Manager. (August 10, 2022)
12. There could be mysterious superimposition lines connecting points as they were edited in MicroStation. The lines did not appear in the MicroStation view. For example, if you moved three points, the points would then be connected by segments in the superimposition view. This is fixed. (August 2-4, 2022)
13. Pattern elements will be shown in superimposition only if **Patterns** is on in MicroStation's View Attributes. This applies to both 32- and 64-bit MicroStation versions. (July 6, 2022)



14. Template reference linkages based on template locks have been added to: (July 29, 2022)
 - AUTOARC2D (and all subcommands except DRAWBREAK ON)
 - AUTOARC (and all subcommands except DRAWBREAK ON)

Note: AUTOARC and AUTOARC2D SNAPPED <subcommands> will follow template configuration settings for newly digitized elements but will not alter settings on broken (snapped-to) elements.
 - BKTRACK (and all subcommands)
 - CHANGEATTRIBUTES. See details for this command in item 23 on page 35 below.
 - CPLINE
 - DATDRAW (and all subcommands)
 - LINESLOPE (and all subcommands) (optional text, line and cell linkages)
 - MEASUREHEIGHT (and all subcommands) (optional text and cell linkages)
 - MECPLINE
 - PSQR (and all subcommands)

Background Information on template linkages and future plans: MicroStation's ACTIVE ELEMENT TEMPLATE and ELEMENT TEMPLATE ASSOCIATION LOCK commands determine whether templates are applied to newly created elements. No additional settings have been added to the DAT/EM command set implementing the template-setting functionality, since MicroStation already does this.



The Element Template setting can be set interactively as shown in the graphic above or with the keyins: TEMPLATE ACTIVE <template> and LOCK TEMPLATEASSOCIATION ON. The former defines the active template and the latter specifies that affected elements will be linked to the template. The advantage is that template changes can be easily applied to linked elements.

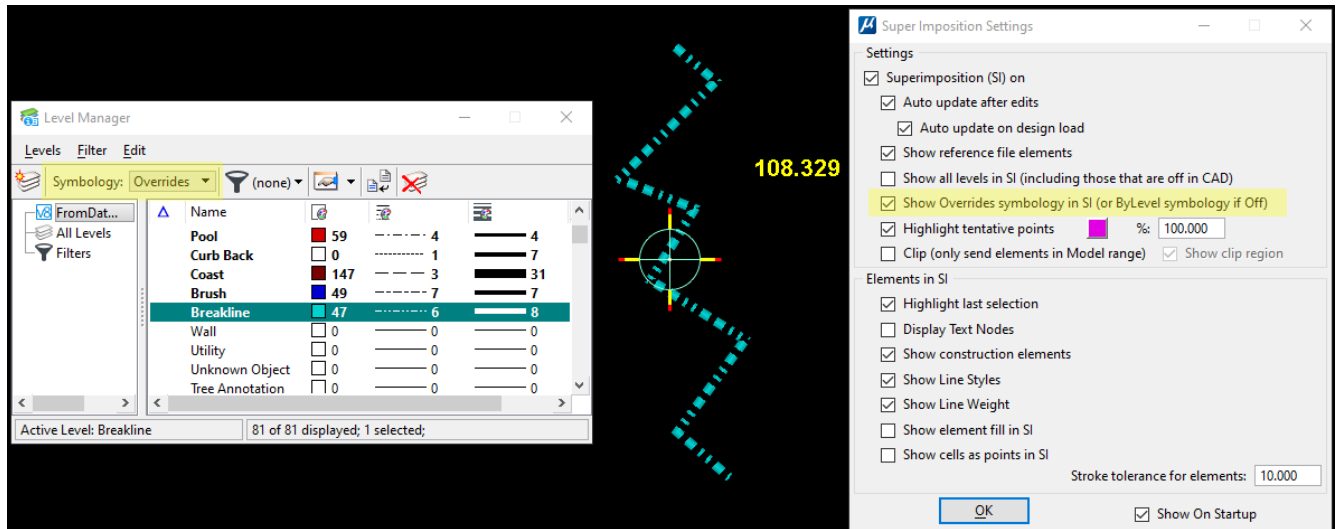
Bentley removed the legacy template API, and the new CONNECT API doesn't handle broken chains; therefore, strings that are broken (for example at intersections such as with AUTOARC_DRAWBREAK_ON) will not have template links, despite the template lock setting. This can be addressed with command recoding, but not at this time (not for version 8.1).

DAT/EM may expand the use of template settings future versions. We need user feedback to know in which commands you need this functionality. Please contact DAT/EM Support at support@datem.com if you have requests regarding template linkages.

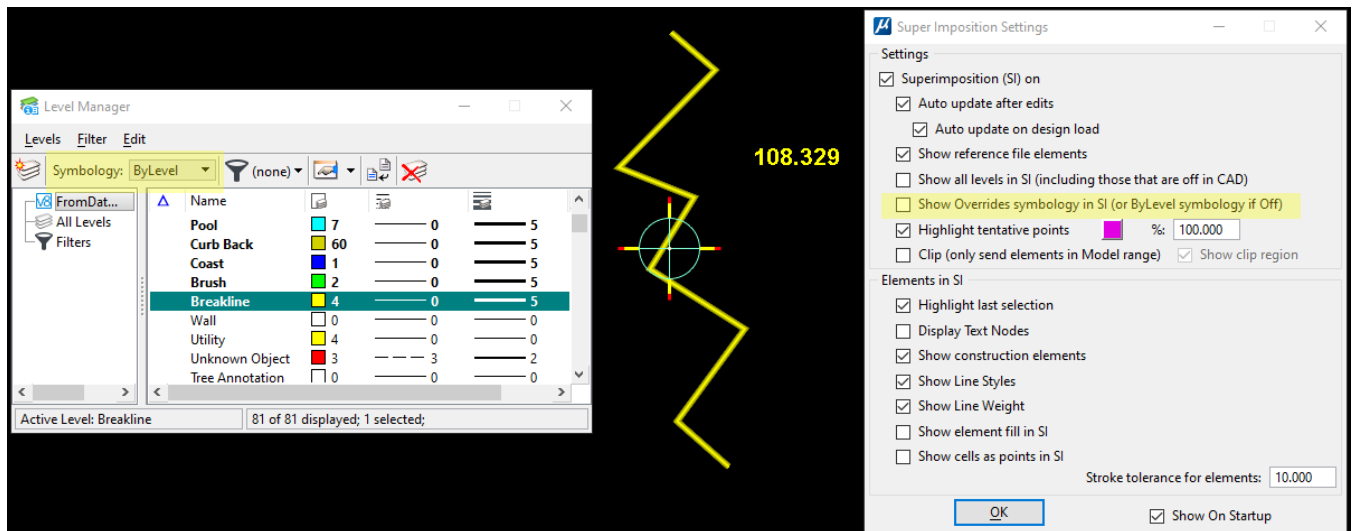
15. Error diagnostics throughout the software have been corrected for Unicode compliance. For example, before corrections, one error messages might have shown, "Cannot read set [@&#) @ % \$ & from registry."
16. DAT/EM shape-creation and related commands now avoid making consecutive double vertices in a shape. A shape with double vertices cannot always be used to create a fence in 64-bit MicroStation. DAT/EM's fix ensures that DAT/EM commands create shapes that can be used for fence creation. Affected commands are: (August 18, 2022)

CHANGEATTRIBUTES	JOINIT	MEPATTERN
CROSSCHECK	LCLOSE	MEVOLUME
FACESHIFT	MECHANGEATTRIBUTESINTERIOR	SHEETCUTTER
INTERP	MECLIP	XYZOUT

17. MicroStation Level Manager's "Level Overrides" symbology was working for color only in superimposition when activated with the **SI SETTINGS > Show overrides symbology in SI** setting. Now it is working for color, weight, and line code overrides in both 32- and 64-bit MicroStation. (September 16, 2022)



Level overrides shown in Level Manager (left), superimposition (center), and SI SETTINGS (right)



ByLevel settings shown in Level Manager (left), superimposition (center), and SI SETTINGS (right)

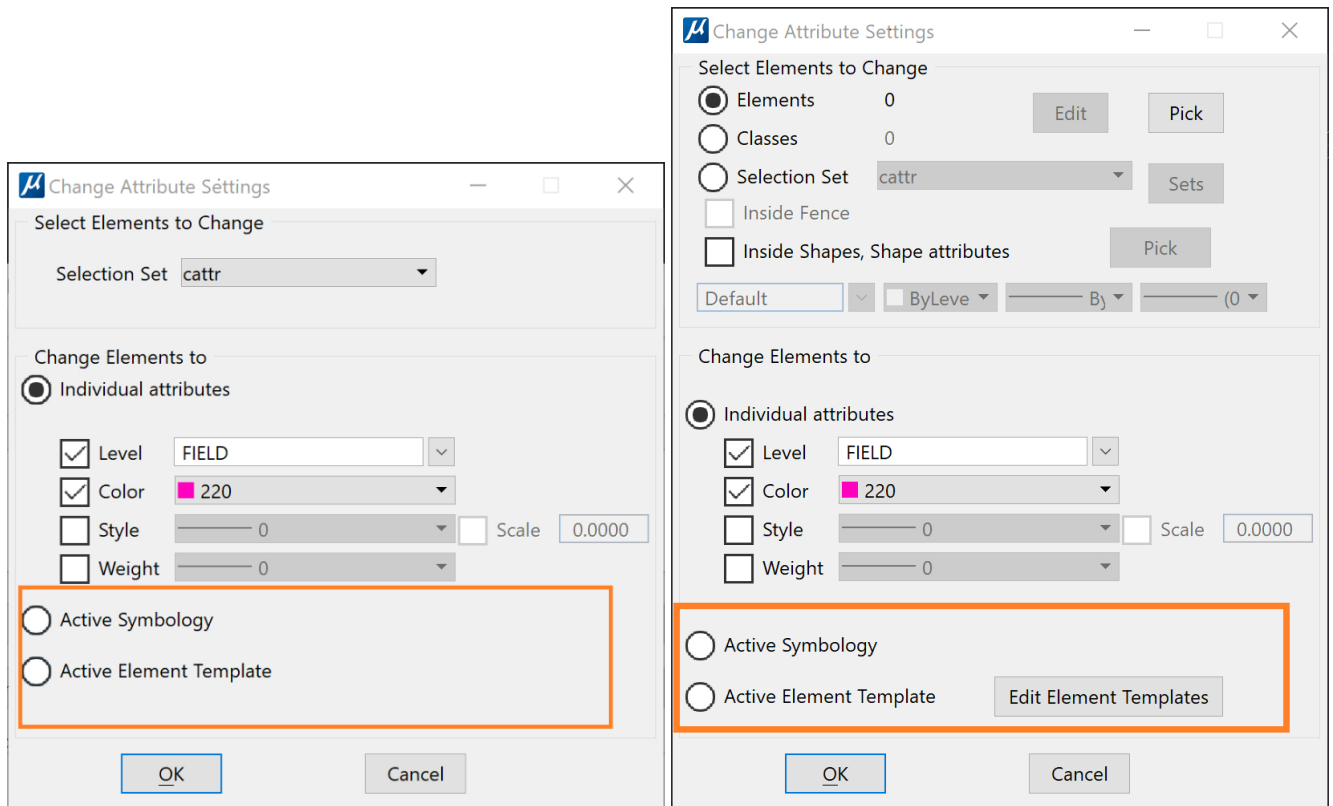
18. 3DOFFSET and ROAD would not offset a single-segment line. This is fixed. (January 5, 2022)
19. AUTOARC2D and AUTOARC <all subcommands except DRAWBREAK ON> will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)
20. BKTRACK STREAM has code simplification, added error handling, and corrections to its complex dynamics code. Previously, it could crash on digitizing the first point of the second element, after successfully finishing the first element. (June 16 and October 27, 2022)
21. BREAKLINEFILTER, BUILDINGFRAME, and XYZOUT have a fix for reporting missing selection set names. Previously, when the software encountered a selection set name that didn't exist on the current workstation, the message contained unreadable characters. (September 3, 2021)

22. Clip (MECLIP) has the following changes:

- a. MECLIP followed by Change Attributes Interior (MECHANGEINTERIOR) in a MapEditor parameter file would cause a “ghost fence” that would not go away and superimposition (SI) refresh would no longer work. Change Attributes Interior had two problems: 1) A timing problem could result in SI being turned off and not being turned back on, and 2) The temporary fence created for calculation was not being cleared. This is fixed. (November 23, 2021)
- b. There was a dialog error in setting the boundary set. This is fixed in 32- and 64-bit versions. (August 30, 2022)
- c. There was a race condition from how MECLIP interfaced to the MapEditor picker library. This is fixed. (August 30, 2022)
- d. MECLIP with **Include reference elements as boundaries** checked on could “access” a CONNECT bug in handling missing reference files. Now it avoids the problem. (Bentley is ultimately responsible for fixing the bug in CONNECT.) (August 30, 2022)

23. CHANGEATTRIBUTES now supports active template links for the semi-interactive and the MapEditor batch version of the command.

- **Individual attributes:** This is the default setting with configurable level, color, style, and weight settings, which were previously available.
- **Active Symbology** changes selected elements to the current active symbology settings. It does not link a template to the selected elements, regardless of the current locks.
- **Active Element Template** links the current active element template to selected elements and sets elements to active symbology. This is done regardless of lock settings (tentative) but an error will be raised if an active template has not been specified.



New active symbology and active element template options in Change Attributes

Hint: To set the active template and/or level and attributes symbology inside a MapEditor parameter file before running the Change Attributes command, use the Parameter File Editor's **Generic Keyin** command to set the template in the active settings. For example, these key-ins could make the settings:

Lv=<level> note: "Level Names with spaces need quotation marks around the level"

co=<color name or number>

Lc=<line code style name or number>

wt=<weight number>

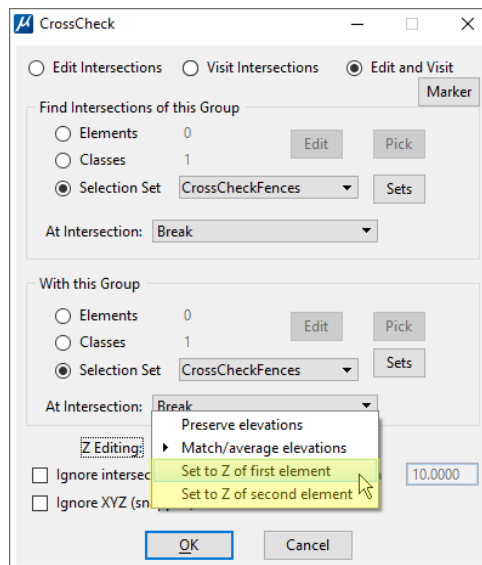
template active <template name\with any category separators\like this>

Follow the active attributes and/or template setting with the Change Attributes command that uses the now-active settings.

24. CPLINE will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)

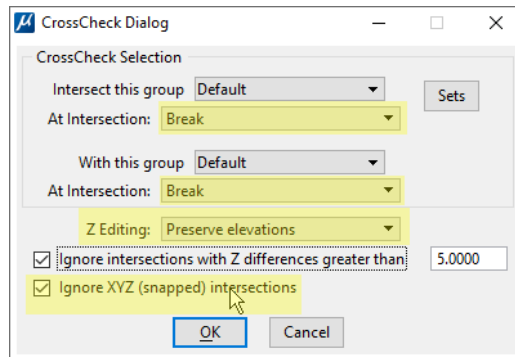
25. CROSSCHECK has the following changes:

- a. CROSSCHECK's marker options would revert to "temporary marker" after setting another option. The setting is now retained for the next appearance of the dialog. (September 21, 2021)
- b. CROSSCHECK has added options for what to do at found intersections. All options: (September 22, 2021)
 - **Preserve elevations** – Keeps any 2D intersections intact at the objects' original elevations.
 - **Match/average elevations** – Sets the intersection (nodes or broken endpoints) to the average of the original elevations of the two elements at the intersection.
 - **(New!) Set to Z of first element** – Sets the node or endpoints of the element from the second selection set (lower selection set in the dialog) to the elevation of the element from the first selection set (upper selection set in the dialog) at the intersection. Does not change the elevation of the element from the first selection set.
 - **(New!) Set to Z of second element** – Sets the node or endpoints of the element from the first selection set (upper selection set in the dialog) to the elevation of the element from the second selection set (lower selection set in the dialog) at the intersection. Does not change the elevation of the element from the second selection set.



New CrossCheck options for intersection elevation editing

- c. CROSSCHECK in the MapEditor Parameter File Editor (batch) commands was missing some settings that the semi-interactive CROSSCHECK version of the dialog offered. The batch options now match the key-in dialog options. Additions include: (September 28, 2021)
- **No Change** options are added to both set groups.
 - **Break** and **Add vertex** radio buttons in both groups have been turned into an option block containing the following options: **Break**, **Add vertex without breaking**, and **No Change**.
 - An option to not edit intersections based on how large their Z difference is, an option to skip snapped intersections, and the new **Set Z of first element** and **Set Z of second element** options shown above. The numbers are mapped the same as before for the first two options, providing backward compatibility. Users will not need to modify their PAR files unless they wish to make use of the new "No Change" option.

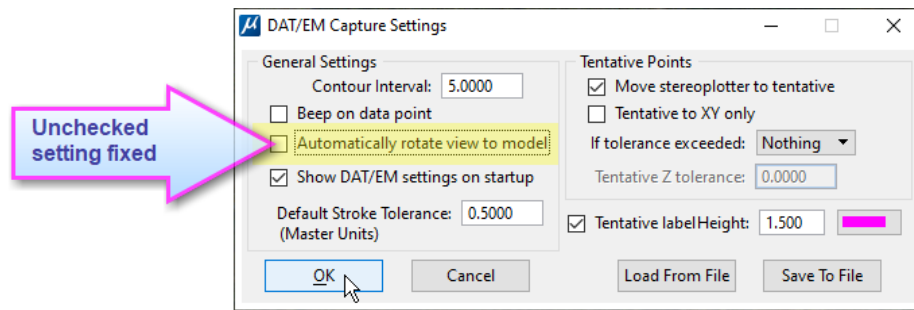


Highlights show areas of change in the CrossCheck batch dialog

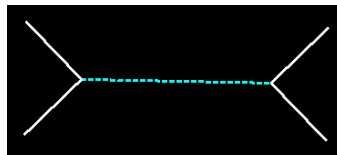
Important! You may need to edit old PAR files! Since there are more options in batch now, you may need to edit any CROSSCHECK instances in existing PAR parameter files. The numbers for pre-existing settings are mapped the same as before, providing backward compatibility; however, the new options will be missing from old files and will be run as default settings if they are not found in the PAR file.

- d. The Parameter File Editor display for CROSSCHECK was improved for readability. (September 28, 2021)
- e. CROSSCHECK's error handling was improved. (September 28, 2021)
- f. CROSSCHECK has a fix for a dialog setting edit in parameter (PAR) files.
26. CRBUILDING ("Copy and Rotate Building") and CRSELECTION <TRANSON\TRANSOFF\TRANSTOGGLE> have been added to 64-bit versions of MicroStation. CRBUILDING copies a shape or line string, then places the copy at a new location and rotation angle. The rotated copy retains the Z values of the original element. CRSELECTION copies currently selected elements to a new location and rotation angle allowing the user to disable/enable the display in Summit while the elements are moved. (July 2022)
27. DATDRAW commands have the following changes:
- DATDRAW PSQR superimposition rubber banding was improved.
 - DATDRAW will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)
 - DATDRAW AUTOARC has increased error checks. (August 4, 2022)

28. DATEM SETTINGS' **Automatically rotate view to model** setting was previously ignored. Now when checked on, it will prevent the MicroStation view from rotating to match the Summit model's kappa angle. (December 13, 2021)



29. When editing an existing DELETE OBJECT line in the MapEditor Parameter File Editor, it would not show the correct selection set given in the parameter file. This is fixed in both 32- and 64-bit MicroStation versions. (August 27, 2021)
30. CULVERT, CULVERT MIDLINEOFF, and CULVERT MIDLINEON have been added. The user sets an active cell, then places the endpoints of a midline (representing the ends of a culvert pipe), and it places the active cell at either end of the line. When CULVERT MIDLINEON is active, it also places the midline as an element. (February 14, 2022)



The CULVERT drawing command is now active for 64-bit MicroStation

31. DTM FENCE has the following fixes in both 32- and 64-bit MicroStation: (August 8, 2021)
- a. When moving, it would report, "Moving to x, z." This was fixed to show the y coordinate rather than z.
 - b. A legacy 32-bit memory allocation problem for storing elements within a fence was fixed so that it reflects the data type that needs to be stored. The same change was made for 32-bit versions for consistency.
32. DTM SAMPLE showed a dialog that was too small to move on screen. Now the dialog is wide enough to allow an area where the system mouse can grab it and move it. (August 24, 2021)
33. FILTER (MEFILTER) has the following changes: (August 23, 2022)
- a. In cases where the input settings were not realistic, it could have filtered a shape down to only two points, making a zero-area shape. Now it can't make a zero-area shape.
 - b. It now retains dialog settings after visiting the Selection Sets Editor from the button in the dialog.
34. ELINE commands in both 32- and 64-bit MicroStation were allowing initial selection of element types that were not supported in code. The element types that are now permitted are: Type 3 lines, type 4 line strings, type 12 complex chains, type 6 shapes, type 14 complex shapes, and type 16 arcs. Any other element types can no longer be selected for ELINE editing. (August 27, 2021)
35. Export Model Bounds (Summit > File > Export > Export Model Bounds) now correctly places the model name's text along with the model's boundary shape. In addition, it no longer disables superimposition refresh. (February 14, 2022)

36. FACESHIFT commands have the following changes:

- a. FACESHIFT OFFSETS has been added to the 64-bit platform. (June 6, 2022)
- b. FACESHIFT GRID's rubber band lines were correct in MicroStation's view, but not in superimposition. This is fixed. (January 6, 2022)

The following items affect all FACESHIFT commands:

- c. Added a range filter to the scan, so the scan no longer reads all points in the file. (April 6, 2022)
- d. Corrected a descriptor deallocation problem where a read failure might corrupt element descriptor storage. (April 6, 2022)
- e. Corrected a messaging problem where diagnostic counts were thrown on each processed point, which would overflow the MicroStation Message Center. Statistics are now displayed once after points within a polygon are processed. (April 6, 2022)
- f. Added diagnostic messaging to report algorithmic failures. These will appear in the MicroStation Message Center. (April 6, 2022)
- g. Removed unnecessary allocation/deallocation, which was not checking for failure. Added some missing error checks. (April 6, 2022)
- h. FACESHIFT often uses a function in MicroStation that determines whether a point is inside or outside a polygon and edits it based on a boresight method in the active view. Bentley's boresight method has the potential of moving the (x,y) of the point as well as the (z) when the view is rotated in 3D. Now DAT/EM makes sure the (x,y) of each point remains at the original values when the (z) is changed. (May 31, 2022)
- i. FACESHIFT POLYGON was missing occasional points due to failures in the BoresiteToSurface function. There is a new DAT/EM failover algorithm to use in FACESHIFT when Bentley MicroStation's BoresiteToSurface function experiences occasional failures in 64-bit versions. This function is meant to determine whether a point is inside a polygon. It is possible for us to detect when it has failed and send the point on to the failover algorithm. Since the failover algorithm is slower, we do not plan to use it for 100% of the points. (May 31, 2022)
- j. FACESHIFT POLYGON had some rubber banding issues that are now fixed. (June 20, 2022)
- k. FACESHIFT POLYGON would not be in the queue as the most recently run command. If you finished FACESHIFT POLYGON and then began to digitize again, it would reactivate the second-to-last-run command. This is fixed. (June 20, 2022)

37. GRIDIT, REPLACE CELL, XYZIN and the command that attaches a cell library in the Parameter File Editor previously used a now-deprecated method for finding the currently attached cell library. Users might have seen an erroneous warning, "Cell Library not Attached." This has been fixed. (October 4, 2021)

38. INTERP is now available for 64-bit versions. This command adds elevation contours (usually intermediate contours) between existing elevation contours (usually index contours). (October 5, 2021)

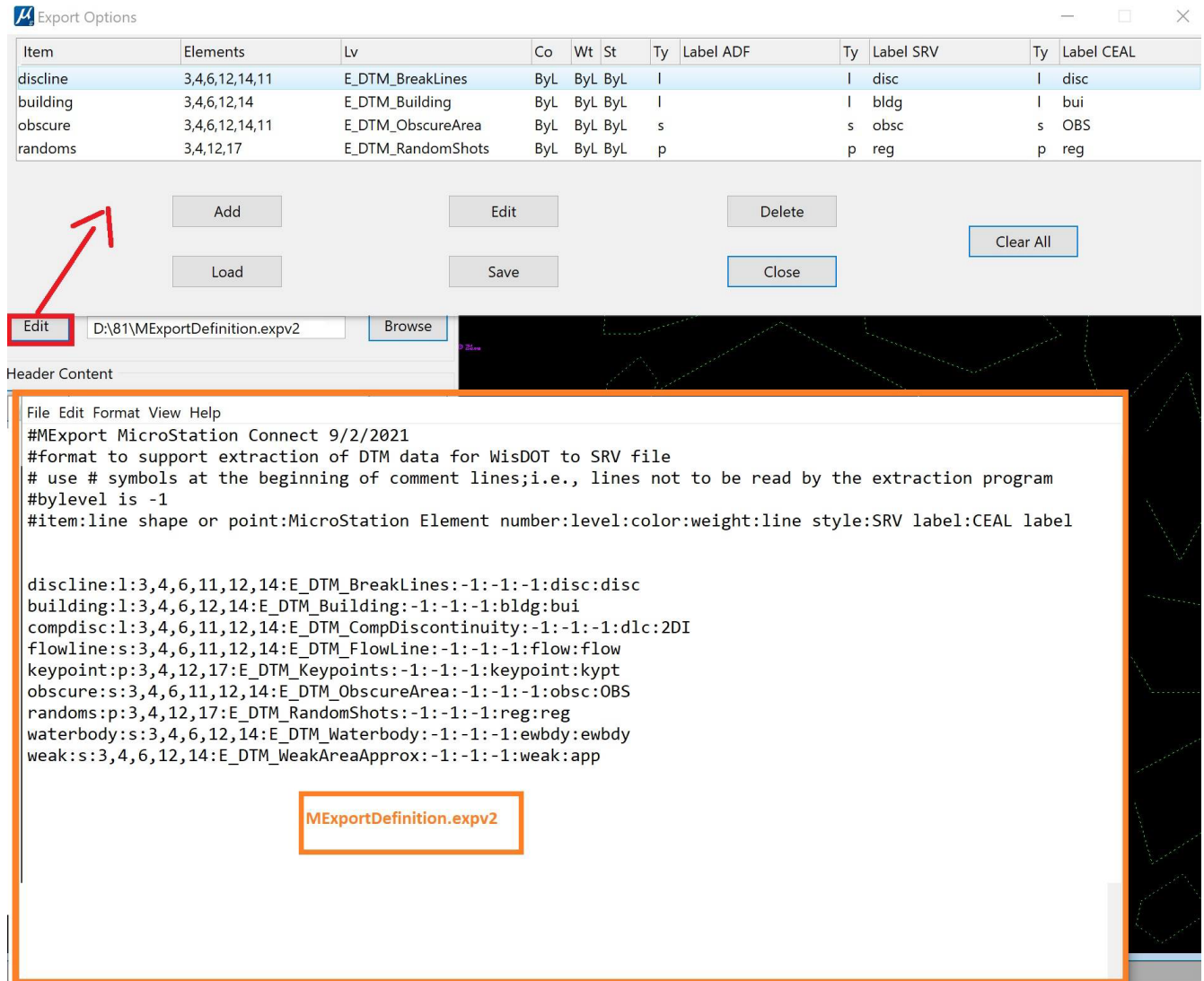
39. JOINIT has the following changes:

- a. JOINIT would join type 3 lines into a complex element consisting of one line string. This has been fixed to simplify the element into a type 4 line string. (September 1, 2021)
- b. JOINIT had some API calls that were passing a null value for the Master File ID. This used to work in earlier versions of MicroStation, but it started crashing in V8i SelectSeries 2 and higher. This is fixed for both 32- and 64-bit versions. (October 4, 2021)
- c. JOINIT has added error handling and fixed a boundary condition issue. The problem was isolated to a closing join operation performed between a regular line string and a very tiny line (.5 UOR, almost a point). Sometimes the join succeeded and the resulting shape looked fine. Other times, the operation would fail at various stages of the join. In all cases, 64-bit MicroStation storage had been corrupted. (Note: 32-bit MicroStation versions are able to handle this boundary condition.) The code is changed to skip these tiny line strings. (May 4, 2022)

40. LD CP DLG/SETTINGS has fixes for the following: (March 16, 2022)
- a. It was placing point cells on the active level and not using the level that was set in Advanced Settings (when “Use active attributes” was off).
 - b. It was placing text and cells at different sizes than the settings indicated.
 - c. Place text XYZ settings were not always saved.
41. All LINESLOPE commands (optional text, line and cell linkages) will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)
42. All MEASUREHEIGHT commands (optional text and cell linkages) will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)
43. MECLOSE “Close Line string” launched from a parameter file has the following changes:
- a. The PAR file version of MECLOSE was missing recently added settings, “Skip elements when end segments cross,” and “Close as Shape/Snap ends.” Edits might be missed due to crossing segments. Settings now match the interactive version of MECLOSE.
 - b. MECLOSE now operates on type 11 curves.
44. MECPLINE (semi-interactive batch version of CPLINE) has the following changes:
- a. MECPLINE and XYZIN would crash using the Sets button to launch and subsequently cancel or close the Selection Sets Editor. This is fixed. (October 12, 2021)
 - b. MECPLINE will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)
45. MEXPORT contains additional output choices. Output formats now include XYZOUT, VISIT, SRV, and CEAL. Both SRV and CEAL can use either existing (legacy) binary EXP configuration files or the new ASCII text EXPV2 format. EXPV2 can be edited with any text editor and viewed using the Export Options dialog. Legacy EXP files can still be edited with the MEXPORT Export Options dialog, but users are advised to move away from this format in favor of EXPV2. (September 16, 2021)

Note: EXP, EXP2, SRV, and CEAL formats are mainly used by the Wisconsin Department of Transportation (“WisDOT”) and their photogrammetry contractors. WisDOT helped develop the new EXPV2 format to replace the legacy 32-bit-only binary EXP file library that was used in MEXPORT for 32-bit MicroStation.

The **Edit** button may be used to view the contents of EXPV2 and both view and edit EXP. EXPV2 can’t be edited from the Export Options display. Use a text editor such as Windows Notepad or WordPad to edit EXPV2.



The EXPV2 format is described as follows:

- Unlike the previous EXP format, in EXPV2, the item type (line, shape, or point) is used by both the SRV and CEAL formats.
- Line format (*this is one record that has wrapped in this document; there is no line feed.*) The entry separator is a colon : character.. “(...)” is used to explain the entry and is not entered in the line. “/” is used to indicate an alternative setting and is not a character in the line.):

item:l (for line)/s (for shape)/p (for point):<permitted element type number(s) separated by commas (*):level name:color number:weight number:line style number:SRV label:CEAL label

(*) – Permitted element type numbers may include one or more of the following (separated by commas):

3 (LINE_ELM)	12 (CMPLX_STRING_ELM)
4 (LINE_STRING_ELM)	14 (CMPLX_SHAPE_ELM)
6 (SHAPE_ELM)	17 (TEXT_ELM)
11 (CURVE_ELM)	2 (CELL_HEADER_ELM)

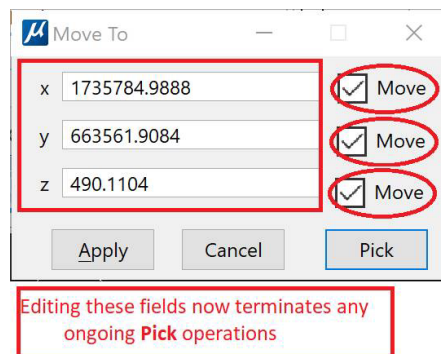
For example, a permitted element type entry of 3,4,11 would include lines, strings, and curves in the output. See example records in the graphic above.

- The text components of this line are case sensitive. Use a lower-case letter **l** for a line, lower-case **s** for a shape, lower-case **p** for a point, and match the character cases for each character in the level name to what you would see for it in the MicroStation Level Manager.
- Symbology filters:
 - **Level name** is used instead of level number.
 - **Level name** is case sensitive.
 - **Level names** must be defined in the current MicroStation file. Entries with undefined levels will not be displayed in the **Edit**-button-produced pane.
 - A list of **MicroStation element numbers** can be found here: https://communities.bentley.com/products/microstation/w/microstation_wiki/8855/element-numbers-and-types . For example, a shape is type 6, a line string is type 4, and a complex chain is type 12. Use the number only, not the element name.
 - For **color**, **weight**, and **line style**, the entry must contain either a MicroStation color/weight/style **number**, **-1** (for ByLevel), or ***** (for the “All” wildcard).
- **#** at the beginning of a line indicates a comment. The entire comment line will be ignored.

46. MVPARTIAL has been added for 64-bit MicroStation. This is used to move a specified section of a line string to a new location. The section remains connected to the original line string. (February 4, 2022)

47. MVUSER has improvements as follows: (January 13, 2022)

- a. Any changes to the MVUSER dialog parameters will terminate an ongoing Pick operation. Pick termination will occur immediately as the fields are edited.



- b. Pick mode operation is now cancelled when the dialog is closed (through Cancel or top corner X).

48. NEARESTZ could make a complex shape that contained one simple shape. This has been corrected to drop these results to a simple shape. (December 20, 2021)

49. PLACE SMARTLINE (MicroStation command) would not produce a superimposition rubber band. This is fixed. Note that PLACE SMARTLINE must be started from the MicroStation Key-in Browser or a DAT/EM method such as the DAT/EM Keypad or Summit's Custom CAD buttons to be detectable. (January 5, 2022)

50. PLOTTERSCALE <value> has been added for 64-bit MicroStation. PLOTTERSCALE sends a map scale setting to be applied in the Summit view. For example, PLOTTERSCALE 500 would adjust the Summit view so that Summit's Map Scale display in the lower right corner shows 500. (January 4, 2022)

51. PLOTTERZOOM <value> wasn't working if <value> was between 0 and 1 or 10 and above or for any non-whole number. This is fixed so that any number or decimal number over 0 may be used. (January 4, 2022)

52. PSQR will now apply template references based on the current template locks. See item 14 above. (July 29, 2022)

53. RUNPAR (to run MapEditor parameter files from a command line or dialog) has the following changes:

- a. Performance enhancements and error checks added. (March 2022, October 20, 2022)
- b. Parser corrections in 32- and 64-bit versions to allow spaces in directory and file names. (March 2022)
- c. The 64-bit version may run the parameter file ("parfile") in some betas without launching a dialog. It will be changed to launch the dialog and auto fill the file name into the parameter file list. This will make it consistent with how the 32-bit version works, as well as give the user the opportunity to set a log file and multiple .dgn files, if desired. (March 2022)
- d. Isolated a performance issue to the MicroStation mdlWorkDgn API and coded around it for runpar functionality. (March 2022)
- e. The key-in format was not clear and in some cases was not working. The key-in and its options are now as follows: (March 2022)

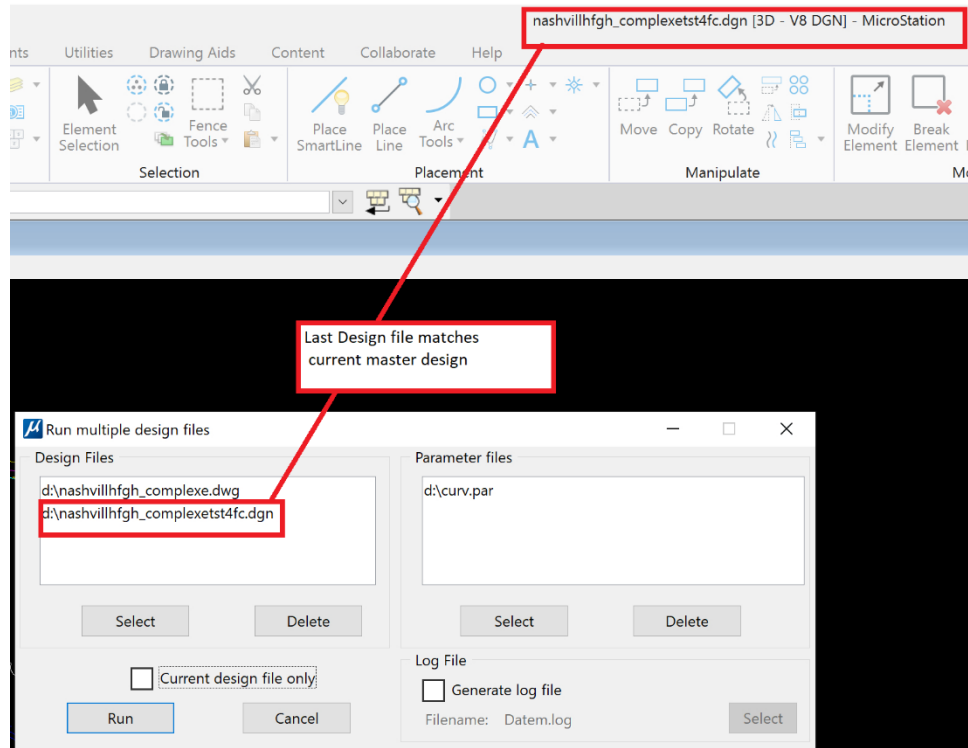
RUNPAR <<optional parfile to run immediately on current dgn> <, <optional logfile>>

- **RUNPAR** – by itself will raise a dialog populated with the most recent <parfile><dgn> pairs.
- **RUNPAR <parfile>** – will run <parfile> immediately on the current master dgn. Logging will be disabled.
- **RUNPAR <parfile>, <logfile>** – will run <parfile> immediately on the current master dgn with logging enabled and sent to <logfile>.

Example with log file: **RUNPAR C:\My PAR files\123.par, C:\My Log files\123.log**

Example without log file: **RUNPAR C:\My PAR files\123.par**

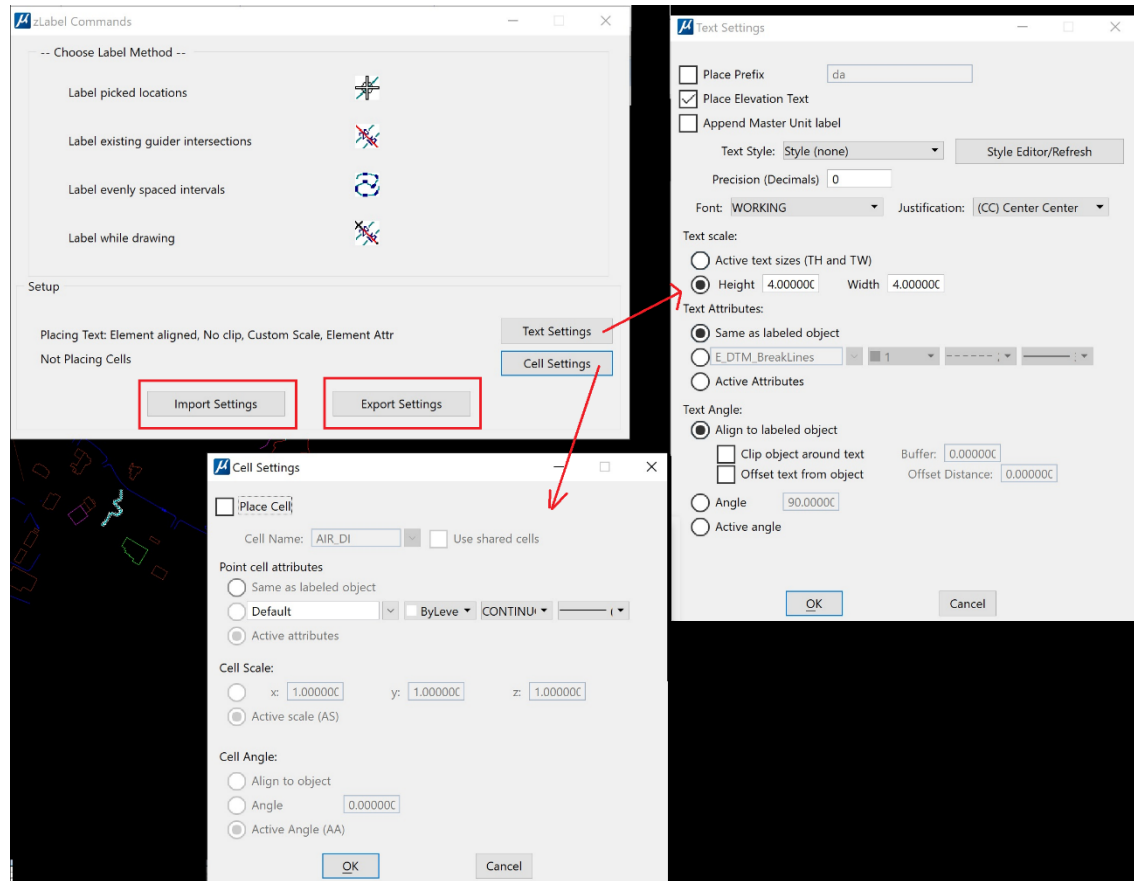
- f. The **Current design file only** checkbox now runs the parameters file(s) on the current design file. Previously it would only open the log file, if set, but would then exit without doing anything. (October 20, 2022)
- g. If the last design file in the list matched the current master file, RUNPAR would hang after completing the parameter files run. Edits on other listed design files would complete successfully, while edits on the current file would be lost when the user exited out of the hung session. This is fixed. (October 20, 2022)



54. Scallop (MESCALLOP) has the following changes: (September 29, 2022)
- The **Distribute remainder** option could leave one large arc between the original element's endpoints. This is fixed to restore the proper arc placement and distribution of the remainder.
 - The backup level option was creating the level, but the original element was not being written to the level. This is fixed.
 - Dialog options set before selecting an element are now retained.
55. The Selection Sets Editor has the following changes:
- The **Rename** option is now working properly to rename an existing set. (January 18, 2022)
 - The Selection Set Editor's options to edit members of the selection set list (we'll call them "cell lines") had trouble with type 2 cells, type 35 shared cells, and the "All Cells" wildcard. Sometimes the cell lines' attributes were set to "Default" and other times they were cleared, causing problems with any edits, such as deleting or editing cell lines from the list. This is fixed. (September 27 and October 12, 2022)
56. SELECTEDSETZ has been fixed to correctly handle unspecified elevation settings. The command is used in two forms: SELECTEDSETZ <value>, which worked well to set the selected object(s) to the value, and SELECTEDSETZ, which was meant to apply MicroStation's active elevation to the selected object(s). Instead of the active elevation, another value would be applied; this is now fixed. (December 21, 2021)
57. SLOPECHECK has the following changes: (January 17, 2022)
- The **Sets** button would activate the Selection Sets Editor, but the dialog would be frozen and could not return to the SLOPECHECK dialog when finished. This is fixed.
 - The dialog backup options are now saved between runs.
 - The dialog wording now indicates that VISIT can be launched.
 - The **Marker Options** are now passed successfully to VISIT, if launched.
58. SLOPEHATCH has the following improvements: (January 18, 2022)
- The "Relative active fence" option now activates properly when there is an active fence.
 - The prompt, "Short line length as % of max," was changed to, "Short line length as factor of max." There is no change to how the value was used, which was always as a factor rather than percentage. For example, entering 0.25 will make the short mark one quarter as long as the long mark.
59. Superimposition and SI UPDATE for MicroStation CONNECT have the following fixes:
- SI UPDATE no longer clears existing fence graphics from superimposition for 32- and 64-bit MicroStation versions. (August 19, 2021)
 - SI UPDATE has fixes for properly displaying shared cells. 1) Shared cells placed as a type SHAREDCELL_DEF_ELM (Type 34) were previously skipped. 2) Error translating cell symbology has been corrected. (September 20, 2021)
 - Superimposition now displays the proper override symbology for text elements.
 - When Level Overrides were set in SI SETTINGS, overrides for Line Style and Line Weight weren't displayed correctly in Summit superimposition. This has been corrected. Note: When Level Overrides is set, level symbology will be displayed in SI even if it is not displayed in MicroStation. (October 7, 2021)
60. SPOTINTERP SETTINGS' DTM Point dialog has fixes to retain settings made in the session. (February 3, 2022)
61. TENTATIVE MOVE <ON/OFF> and the same setting offered in the DATEM SETTINGS' "**Move stereoplotter to tentative**" option is now working. Summit will now move to any tentative point location as the tentative point is selected. Tentative point selection can either originate in the Summit view or the MicroStation view. See more information in item 29. on page 29 above. (January 11, 2022)

62. TENTATIVEDISPLAY has been added to match the version of this command previously available in 32-bit versions. It shows information about the current tentative point. (July 7, 2022)
63. TOUCH BATCH's **Sets** button process now properly returns to the Touch Batch dialog after the resulting Selection Sets Editor closes. (January 28, 2022)
64. VISIT's **Zoom to element extents** has been fixed. (January 31, 2022)
65. XYZIN and MECPLINE would crash using the Sets button to launch and subsequently cancel or close the Selection Sets Editor. XYZIN has a further fix to show the proper list of available selection sets in its menu. (October 12, 2021 and February 8, 2022)
66. XYZMODIFY, XYMODIFY, and ZMODIFY have added support for cells, shared cells, text, and text nodes. (November 16, 2021)
67. XYPARTIAL and XYZPARTIAL have been added for 64-bit MicroStation. XYPARTIAL replaces a section of a line string with either one straight segment or a newly digitized set of vertices. It interpolates the elevation of new vertices based on the connecting vertices on the original element. XYZPARTIAL Replaces a section of a line string with either one straight segment or a newly digitized set of vertices. The new vertices take the elevation of the stereoplotter if using the stereoplotter for selection, or MicroStation's active elevation if using the system mouse for selection. (February 4, 2022)
68. ZCHECK now raises a notification when ZCHECK has completed, but no errors were detected. (September 26, 2022)
69. ZLABEL has the following changes:
- a. The VISIT options are now enabled in ZLABEL GUIDER and ZLABEL INTERVAL. (April 11, 2022)
 - b. ZLABEL now clears any previously selected objects from the "Selected element" section of the dialog between runs of the dialog. (February 28, 2022)
 - c. Text fields from .ZLAB configuration files in CONNECT were read with an appended <CR> ("n"). This was noticeable when attempting to match entries in lists (for example, Font list). The dialog would show the first entry in the list rather than the currently selected (Font). It would run correctly unless the user saved with the first entry still set.
 - d. ZLABEL had some compatibility problems between .ZLAB configuration files made in previous 32-bit versions and imported into a 64-bit CONNECT version. To address these issues: a) the 32-bit version needed to be altered to skip unrecognized settings created from CONNECT. b) CONNECT needed to be modified to default missing parameters to match labeling behavior if run from the 32-bit version (previously, it defaulted to the most recently used parameters from the registry). c) Text Style was missing from the 64-bit .ZLAB configuration file and has now been added. (October 6, 2022)

- e. For CONNECT only, the buttons for exporting and importing ZLABEL's text and cell settings have been moved from the Text/Cell Settings dialogs to the main ZLABEL Commands dialog. (October 6, 2022)



ZLABEL's configuration Import/Export buttons are now in the ZLABEL main dialog

- f. ZLABEL was placing view independent text, so the text angle would only look good in an unrotated top view. Now it places view dependent text, so it looks good for any view rotation. (October 11, 2022)
- g. ZLABEL was placing text nodes where text-type elements were expected. This is fixed. *Note that there are still cases where text nodes might be placed, but this will be less frequent. Please let DAT/EM know if any command places a text node where you expect a text element.* (October 11, 2022)
- h. ZLABEL with **Clip object around text** checked on would not label and clip the same input element more than once. For example, if there were two guiders crossing the same input line string, only the first guider intersection would be labeled and clipped; the remaining fragments after the first clip would not be labeled. This is fixed. (October 13, 2022)

DAT/EM Capture and MapEditor for MicroStation (32-bit versions)

Changes apply to Capture for MicroStation for 32-bit MicroStation versions. DAT/EM software installs for the following 32-bit MicroStation versions:

- **MicroStation V8* and V8 2004 Edition*:** Version should be 08.05.00.34 or higher.
- **MicroStation XM*:** Version should be 08.09.04.88 or higher.
- **MicroStation V8i and V8i-based products in SelectSeries numbers 3*, 4*, and 10 (SS10 recommended).** DAT/EM software may install for SelectSeries 1 and 2 in some of the products, but those SelectSeries versions are not

recommended. The V8i and V8i-based products are V8i, Bentley Map, Map Enterprise, PowerView, Map PowerView, Power GeoPak, and PowerCivil.**

If you upgrade to a higher Select Series number, you must reinstall DAT/EM software after installing the Series upgrade.

DAT/EM will install for all supported versions of MicroStation (also including 64-bit CONNECT products) that are present on the computer at the time of the DAT/EM installation.

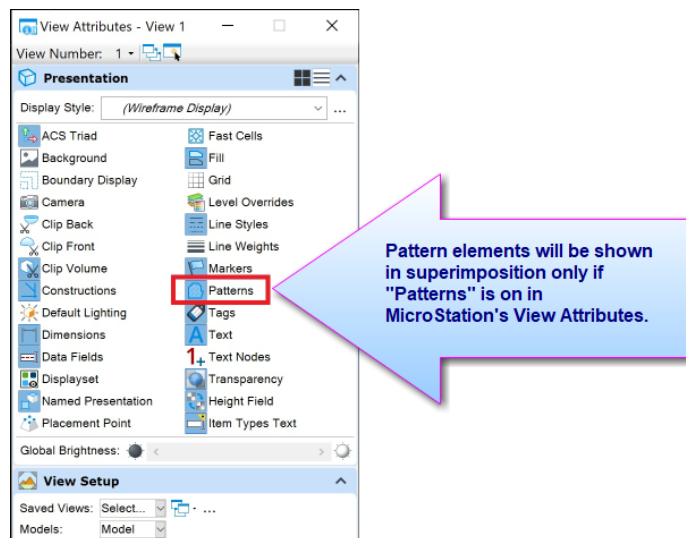
***Note about all 32-bit MicroStation versions:** Be aware of this situation! DAT/EM v.8.1 is supported on Windows 10 and 11. The only 32-bit MicroStation version that Bentley supports on Windows 10 at the time of DAT/EM v.8.1 release is V8i SelectSeries 10, and there are no 32-bit MicroStation versions officially supported on Windows 11. Therefore, DAT/EM is in the difficult position of supporting more 32-bit MicroStation versions and Operating Systems than Bentley itself supports. DAT/EM software will continue to install for MicroStation V8, V8 2004 Edition, XM, V8 SelectSeries 3-10 as long as possible; however, if Bentley stops allowing DAT/EM to license any of these versions for our development environments, then we will not be able to compile for them any longer, and we will be forced to drop support for all 32-bit MicroStation versions that Bentley won't license. Bentley encourages their users to upgrade to 64-bit MicroStation CONNECT.

****Note about Power GeoPak Select Series 3:** DAT/EM Software *installs* for Power GeoPak SS3, but has initial loading conflicts that affect the GeoPak and DAT/EM menus. Bentley offered a workaround for this issue, but DAT/EM doesn't think it's worth the time. Bentley doesn't support Power GeoPak SS3 on Windows 10 or 11, anyway.

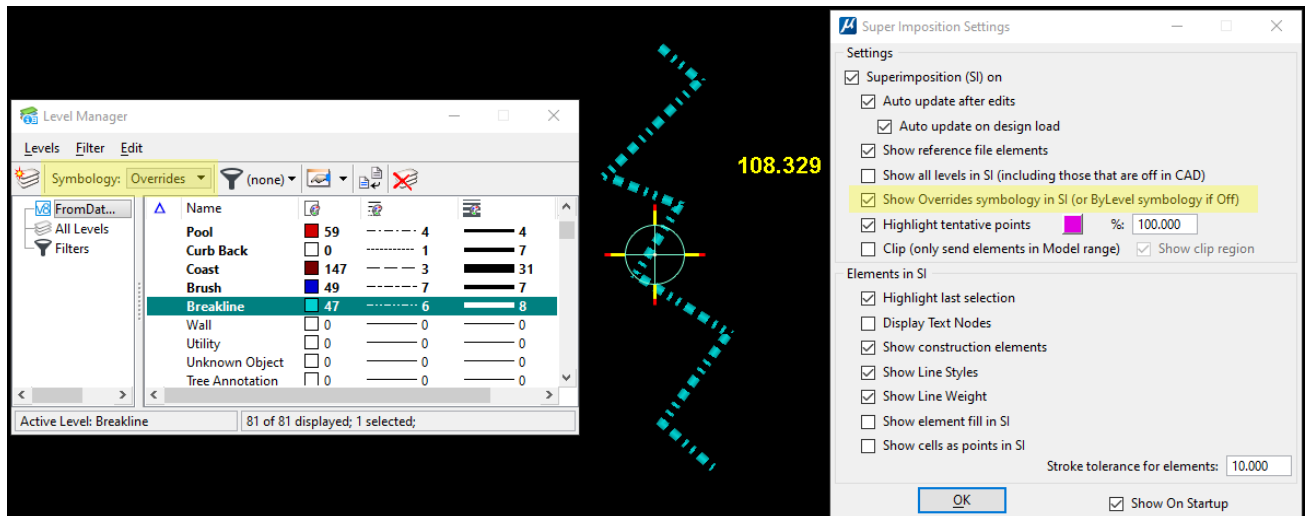
Note about Power GeoPak Select Series 4 (which actually contains SelectSeries 3 in conflict with its name): This product seems to be more successful running together with DAT/EM applications. There still could be issues. If you are installing for this product, please contact DAT/EM Support.

DAT/EM Capture and MapEditor for 32-bit MicroStation versions have the following changes:

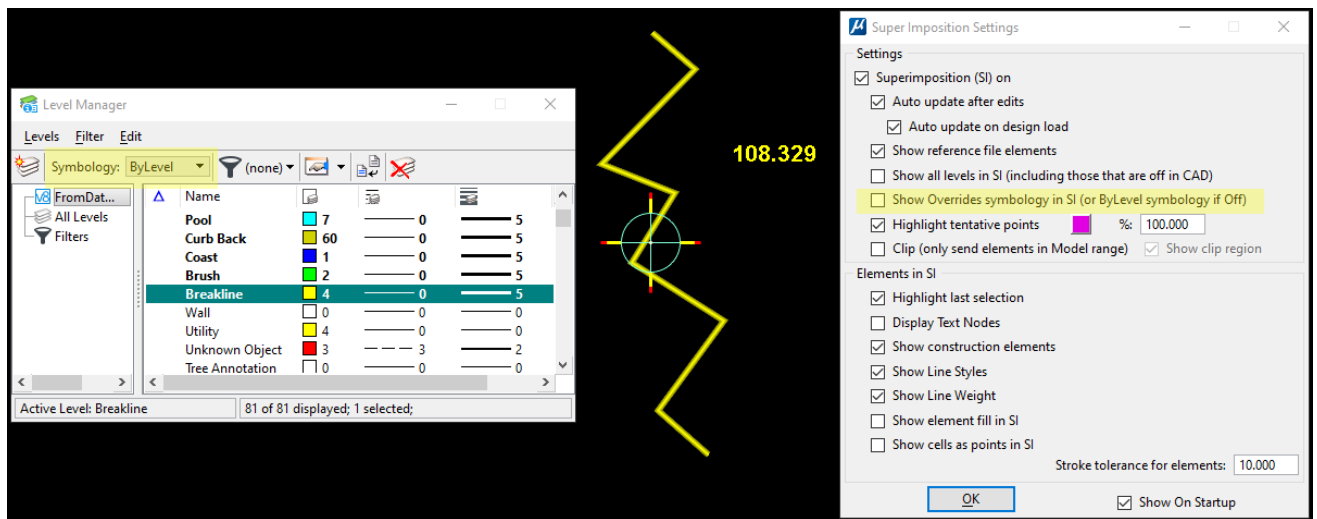
1. The legacy 32-bit API had problems handling reference files when the main file and reference file have different global origins. Note that the 64-bit (CONNECT) API also had such reference file problems, which have also been corrected. Reference files are now displayed at the correct location in superimposition. (March 4, 2022)
2. Pattern elements will now be shown in superimposition only if **Patterns** is on in MicroStation's View Attributes. This applies to both 32- and 64-bit MicroStation versions. (July 6, 2022)



3. MicroStation Level Manager's "Level Overrides" symbology was working for color only in superimposition when activated with the **SI SETTINGS > Show overrides symbology in SI** setting. Now it is working for color, weight, and line code overrides in both 32- and 64-bit MicroStation. (September 16, 2022)



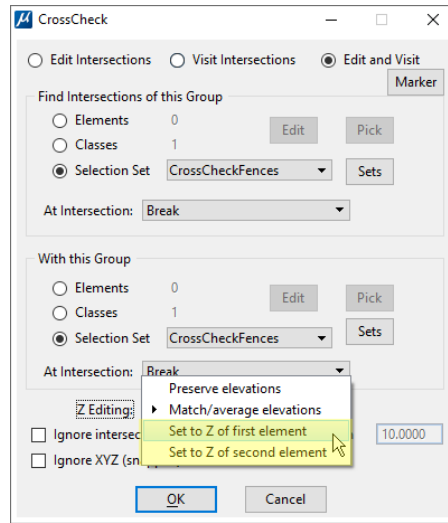
Level overrides shown in Level Manager (left), superimposition (center), and SI SETTINGS (right)



ByLevel settings shown in Level Manager (left), superimposition (center), and SI SETTINGS (right)

4. CHANGEATTRIBUTES run from a MapEditor PAR file was missing some parameters. These have been added to both 64-bit and 32-bit product versions.
5. Clip (MECLIP) had a dialog error in setting the boundary set. This is fixed in 32- and 64-bit versions. (Aug. 30, 2022)
6. CROSSCHECK for both 32- and 64-bit MicroStation versions has added options for what to do at found intersections. All options: (October 1, 2021)
 - **Preserve elevations** – Keeps any 2D intersections intact at the objects' original elevations.
 - **Match/average elevations** – Sets the intersection (nodes or broken endpoints) to the average of the original elevations of the two elements at the intersection.
 - **(New!) Set to Z of first element** – Sets the node or endpoints of the element from the second selection set (lower selection set in the dialog) to the elevation of the element from the first selection set (upper selection set in the dialog) at the intersection. Does not change the elevation of the element from the first selection set.
 - **(New!) Set to Z of second element** – Sets the node or endpoints of the element from the first selection set (upper selection set in the dialog) to the elevation of the element from the second selection set (lower selection set in the dialog) at the intersection.

selection set in the dialog) at the intersection. Does not change the elevation of the element from the second selection set.



New CrossCheck options for intersection elevation editing

7. When editing an existing DELETE OBJECT line in the MapEditor Parameter File Editor, the correct selection set in the parameter file was not displayed. This is fixed in both 32- and 64-bit MicroStation versions. (August 27, 2021)
8. DATPAN ON would no longer pan (zoom center) in some 32-bit MicroStation versions if the cursor left the area of the existing element extents in a file that had large negative coordinates and a small element extents area. This is fixed. (June 10, 2022)
9. DTM FENCE has the following fixes in both 32- and 64-bit MicroStation: (August 24, 2021)
 - a. When moving, it would report, "Moving to x, z." This was fixed to show the y coordinate rather than z.
 - b. A legacy 32-bit memory allocation problem for storing elements within a fence was fixed in 64-bit MicroStation so that it reflects the data type that needs to be stored. For consistency, the same change was made for 32-bit versions.
10. ELINE commands in both 32- and 64-bit MicroStation were allowing initial selection of element types that were not supported in code. The element types that are now permitted are: Type 3 lines, type 4 line strings, type 12 complex chains, type 6 shapes, type 14 complex shapes, and type 16 arcs. Any other element types can no longer be selected for ELINE editing. (August 27, 2021)
11. JOINIT had some API calls that were passing a null value for the Master File ID. This used to work in earlier versions of MicroStation, but it started crashing in V8i SelectSeries 2 and higher. This is fixed for both 32- and 64-bit versions. (October 4, 2021)
12. RUNPAR (to run MapEditor parameter files from a command line) has corrections to the parser in 32- and 64-bit versions to allow spaces in directory and file names. (March 1, 2022)
13. SI UPDATE is fixed so that it does not clear any existing fence graphics from superimposition for 32- and 64-bit MicroStation versions. (August 19, 2021)
14. TWOSHOT / THREESHOT: THREESHOT is now restored for 32-bit MicroStation only. THREESHOT, which is a 3-point cell placement tool that can set the x and y scales differently, was added in v.7.6, but disabled in v.8.0 due to issues with certain types of cells. We had future plans to add the 3-pick functionality to TWOSHOT instead. By customer request, we restored THREESHOT for 32-bit only and plan to keep it as-is. Sometime in the future, we plan to add the 3-pick functionality to TWOSHOT in 64-bit MicroStation.

As a side effect of restoring THREESHOT, the TWOSHOT ALIGN commands had to be disabled in 32-bit MicroStation. They are part of THREESHOT and could not be in both TWOSHOT and THREESHOT. (May 4, 2022)

15. ZLABEL had some compatibility problems between .ZLAB configuration files made in 32-bit versions and imported into a 64-bit CONNECT version. To address these issues: a) the 32-bit version needed to be altered to skip unrecognized settings created from CONNECT. b) CONNECT needed to be modified to default missing parameters to match labeling behavior if run from the 32-bit version (previously, it defaulted to the most recently used parameters from the registry). c) Text Style was missing from the 64-bit .ZLAB configuration file and has now been added. (October 6, 2022)

DAT/EM Capture for Blue Marble Global Mapper

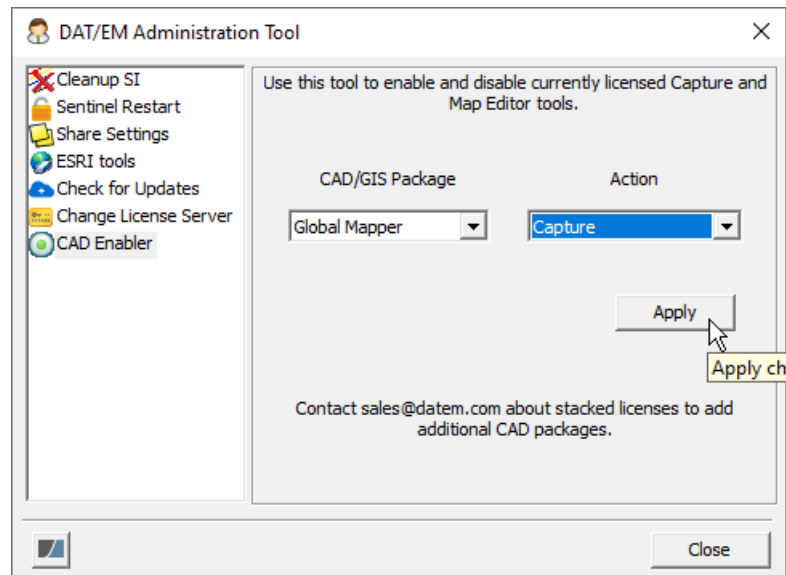
Changes apply to Capture for Global Mapper. DAT/EM Capture for Global Mapper is supported for the following Global Mapper versions:

- **17.1.2 – 24.0**, up to the time of the DAT/EM v.8.1 build “Release” date.

Notice: If you want to start using DAT/EM Capture for Global Mapper, please contact support@datem.com or your reseller for a quote for a Stacked Capture for Global Mapper. Starting in July 2020, DAT/EM installations will need a licensed Stacked Capture for Global Mapper, which will need a WriteLock to add it to an existing hardware lock.

Advice for enabling and disabling the DAT/EM Capture extension for Blue Marble Global Mapper:

DAT/EM Software installs the Global Mapper Extension, but leaves it unregistered in Global Mapper by default. To use the extension, close Global Mapper, select **Windows Start > Datem Software group > right click on DAT/EM Administration Tool > More > Run as Administrator**. Set **CAD/GIS Package=Global Mapper, Action=Capture, Apply**. Or, to disable at any time, set it to **Action=Disable, Apply**.



To register/enable or unregister/disable, use the DAT/EM Administration Tool's CAD Enabler

Alternatively, you may toggle the extension from the **Global Mapper > Help menu > License Manager**. Note that it is correct to be called “DAT/EM Capture for Global Mapper 17 n-bit”. This file is the same for 17.x and higher matching the supported versions listed above.

1. The Capture extension was verified to work with Global Mapper version 23.1. (August, 2022)
2. The Capture extension was verified to work with Global Mapper version 24.0. (September 21, 2022)

-End-