




Release Notes

Tecplot 360 EX 2017 R1

Tecplot, Inc.
Bellevue, WA
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Additional Resources

In addition to these Release Notes and HTML Help, Tecplot 360 includes access to these manuals (and an online forum) to help you explore all of Tecplot 360's functionality.

- [Getting Started Manual](#) Your introduction to Tecplot 360 EX includes a tutorial that will help you learn your way around the product
- [User's Manual](#) This manual provides a complete description of working with Tecplot 360 EX features.
- [Scripting Guide](#) This guide provides Macro and Python command syntax and information on working with Macro and Python files and commands.
- [Quick Reference Guide](#) This guide provides syntax for zone header files, macro variables, keyboard shortcuts, and more.
- [Data Format Guide](#) This guide provides information on outputting simulator data to Tecplot file format.
- [Installation Guide](#) These instructions give a detailed description of how to install Tecplot 360 on your machine.
- [Tecplot Talk](#) A user-supported forum discussing Tecplot products, macros, scripting, TecIO and more. Visit www.tecplottalk.com for details.

My Tecplot

My Tecplot is Tecplot's one-stop portal that allows you to download software, manage your license keys, and more. Visit it at <http://www.tecplot.com/my/>.

Welcome to Tecplot 360 EX 2017 R1!

Tecplot 360 EX 2017 R1 is our biggest release since the initial Tecplot 360 EX release back in 2014, packed with many new features, improvements, and fixes. First and foremost is TecPLUS, which brings you access to three new software components along with free updates to Tecplot 360 EX—but there are plenty of other enhancements as well!

Introducing TecPLUS

As of January 1, 2017, TecPLUS replaces Tecplot's Software Maintenance Service (SMS). With TecPLUS, you get all the benefits of SMS, including:

- No-charge upgrades to Tecplot 360 EX during your subscription period
- Unlimited technical support
- One free hour of online training per year


Additionally, an active TecPLUS subscription gives you access to the following components, boosting your Tecplot 360 EX license to a whole new level of value:

- **Tecplot Chorus**

Our simulation analytics tool for engineers who need to analyze large numbers of cases. Previously, Chorus included Tecplot 360 EX to view individual cases' data files; we've flipped that, and now offer every Tecplot 360 EX user access to this powerful product.

- **PyTecplot**

Tecplot and the Python programming language are together again, and the combo is better than ever before! PyTecplot works with your system's installed Python and with popular Python modules like NumPy,

SciPy, and Jupyter. PyTecplot features an easy-to-use object-oriented  approach to working with your data and plots inside Tecplot 360 EX.

- **Tecplot SZL Server**

When your data is too big to move around comfortably, you can install this lightweight server on most Linux hosts to quickly and securely access your remote data.

Your basic Tecplot 360 EX license is perpetual: even if your TecPLUS subscription expires, you will still be licensed to run any version of Tecplot 360 EX released while your subscription was active—forever.¹ However, your access to these additional software components (Tecplot Chorus, PyTecplot, and Tecplot SZL Server) ends when your TecPLUS subscription expires.



All Tecplot 360 EX users will receive a new license key annually. If you currently have a Tecplot 360 EX license with active SMS, you will soon receive a new license key to activate your TecPLUS features.

What Else Is New In Tecplot 360 EX 2017 R1

We didn't stop there! We have also added the following features in Tecplot 360 EX.

- **Variable Combining**

Variable combining (available in pre-EX Tecplot 360) has returned in an even easier-to-use form.

When loading multiple files in supported  formats (either all at once, or by appending),  will have the opportunity to tell Tecplot 360 EX which, if any, of the variables in these files have the same meaning by combining them.

1. While your license is perpetual, we cannot guarantee compatibility of today's Tecplot products with future systems.

Besides a new dialog that lets you combine variables interactively, you can create a variable alias file and combine pre-defined variables with a single click.

- **Set Slice Orientation By Selecting Three Points**

You can set the orientation of a slice either by entering the coordinates of three points on the desired cutting plane or by interactively probing the three points.

- **New Algorithm for Isosurface Generation**

The MC33 algorithm is now used for deriving iso-surfaces, providing better visual results and improved performance.

- **Batch SZL Conversion**

Tecplot 360 EX can now be used to easily batch-convert your data files to SZL format (*.szplt*) for improved interactive performance, especially over networks. This capability does not require a license, so you can use it on, for example, a solver cluster without requiring additional Tecplot 360 EX license seats.

See Section 27-5 in the [User's Manual](#) for an in-depth discussion of batch conversion.

- **TecIO Can Now Read SZL Files**

The TecIO library, which has long had the ability to write both Tecplot binary (*.plt*) and SZL (*.szplt*) files, now has the ability to read SZL files. See the [Data Format Guide](#) for more information.

- **New Transient Tutorial in Getting Started Guide**

The Tecplot 360 EX [Getting Started Guide](#) now includes a transient data tutorial involving a vertical-axis wind turbine model with 127 time steps.

- **Incorporates Tecplot Chorus 2017 R1**

Tecplot Chorus 2017 R1 has moveable columns in table views; loader descriptions for EnSight, OpenFOAM, and TRIX data files; and support for non-standard Tecplot-format filename extensions (*.dat* and *.tec*) used by some solvers.

For more information on these new features, see the Tecplot Chorus release notes.


In addition to these all-new features, you also get numerous improvements to data loading:

- There is now a loader for the TRIX file format (an XML-based unstructured file format used by Cart3D and related solvers)
- The CGNS loader now supports CGNS formats up to version 3.3. CGNS Cases containing polyhedral (NGON/NFACE) data and non-uniform meshes can now be loaded.
- The PLOT3D loader now supports continuation markers, allowing very large data sets to be loaded.
- The FLOW-3D loader now supports v11.1.2.7 files.
- The FEA loader can now load von Mises stress data from NASTRAN files. It also now correctly loads NASTRAN files containing both cell-centered and nodal variables.

Note that this latter change may cause layouts or macros to refer to the wrong variables; a warning appears when you load such files. To address the warning, re-create the layout or macro, or else update the style settings as necessary and change the `!$READDATASET` instruction in the layout or macro to include the parameter "FEALoaderVersion" "436".

- Better support for loading data and other files from Unicode file system paths. Also, all text files supported by Tecplot 360 EX (including style sheets, variable alias

files, layouts, macros, and ASCII data files) can now be read even if they include a Unicode byte order marker.

- All loaders can now open files directly from the Load Data dialog, and all have the ability to append data to your existing layout. Loaders without these capabilities (which included Ensign, Excel, HDF, and HDF5) have been upgraded to have them.
- A few data loading bugs have been fixed. The CGNS loader now reads 64-bit integers properly, allowing files written using a 64-bit version of the CGNS library to be loaded. Another CGNS loader bug that caused some IJK-indexed files to not load completely has been fixed. **The PLOT3D loader no longer overuses memory.**  Tecplot 360 EX no longer crashes when loading a nonexistent recent file from the Welcome Screen.

What Was New In Tecplot 360 EX 2016 R2

If you missed our spring 2016 release, these features are new to you!

• Simplified Data Loading

New “All Files” and “All Supported Files” options in the Load Data dialog allow you to see all your files even if they’re in different formats. When you select a file to load, Tecplot 360 EX automatically chooses the loader for you if it can, or gives you suggestions as to what loaders can load it.

We have also improved starting directory selection when opening files to make it quicker to navigate to the directory you need.

Windows users may now optionally choose an extended Load Data dialog by selecting **Options>Use Extended Load Data Dialog** (this is the standard dialog on Linux and Mac OS X). This dialog lets you choose

files from multiple directories and specify the order in which they are loaded, but may be slower with slow networks, large file systems, or invalid shortcut files.

- **3D Mouse Support**

Tecplot 360 EX now supports a 3Dconnexion 3D mouse for interactively changing the view in 3D plots, including translate, zoom, and rotate functions. Tip: assign one of the buttons on your 3D mouse to send the “o” key to make it simple to set the center of rotation.



- **Loader Improvements**

The FEA loader has been upgraded to support data files from Abaqus 6.14 (2016), Ansys 16.2, and CFX 16.2. The General Text Loader can now be launched from the main Load Data dialog with or without a selected file, like most other loaders, and can now append to an existing data set.

- **Contour Variable Performance Improvements**

Assignment of contour variable levels is now deferred until requested instead of when the contour variable is assigned, and contour variables are not automatically assigned to contour groups that have not been used. These changes remove unnecessary requests to load data for contour variables that are not in use.

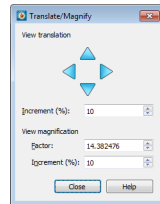
- **Vector Improvements**

Vector variables are no longer automatically assigned; instead, the Select Variables dialog asks you to choose them the first time you turn on the vector or streamtrace plot layers, or when you choose a vector-related option from the **Plot>Vector** menu. To change vector variables later, choose **Plot>Vector>Variables**.

You can adjust the appearance of vector arrowheads and add a reference vector to your plot in the new Vector Details dialog (**Plot>Vector>Details**), which also incorporates the settings from what used to be the Vector Length dialog on its Length page.

- **Translate/Magnify Dialog**

The Translate/Magnify dialog has been reintroduced with a new look and feel, including translation using the arrow keys.



- **Macro Functions for Text Objects**

A retained macro function can once again be attached to a text object in the Text Details dialog, so that the function is executed when the text is control-right-clicked. This capability had previously been implemented only for geometries in Tecplot 360 EX.

- **Export Improvements**

Image export dialogs have a more consistent layout and display the export dimensions for most formats. BMP and PostScript formats have also been restored.

- **Return of the Getting Started Manual**

New users of Tecplot 360 EX can turn to the Getting Started Manual included with the product to introduce them to frequently-used features in a real-world tutorial based on the Onera M6 wing.

- **Improved Welcome Screen Notifications**

The Welcome Screen now supports multiple notifications, so if your network license is due to expire *and* there's a new Tecplot 360 EX release, you'll know about both. In the future, we'll also use this capability to send you information about Webinars, new tutorials, and other updates from Tecplot.com.

Usage Data Collection

To help us better understand how our customers use our products and improve them further, Tecplot 360 EX includes an analytics feature that reports user activity over the Internet using the Google Analytics™ platform. This feature tells us which dialogs you use and which controls you manipulate in them. However, to protect your privacy and trade secrets, we do not see names associated with your data (such as variable, zone, or file names) or the actual values of fields in dialogs, nor do we receive any information about you or your organization's identity.

If you do not wish to participate in this program, turn off "Collect Anonymous Usage Data" in the Help menu.

We receive basic information about your operating system, product version, and license at each launch of Tecplot 360 EX, even if you have opted out of the usage data program. This information is not tied to any usage data collected.

No usage data of any kind is collected if you do not have access to the Internet or if the Google Analytics service is blocked by a firewall.

Key Features of Tecplot 360 EX

Are you making the leap from Tecplot 360 to Tecplot 360 EX? Here's what you have in store.

Launched in 2014 after more than two years of effort, Tecplot 360 EX is a substantial upgrade to previous versions of the product, with improved performance and ease of use compared to Tecplot 360 2013 and earlier.

High Performance With Large Data Sets

Tecplot 360 EX 2014's subzone data format (SZL—say "sizzle") reduces the amount of data that needs to be loaded for common operations, providing much better performance and lower memory usage for typical workflows on large data

sets, especially over networks. Using this feature requires that data files be stored in SZL format (filename extension *.szplt*).

Native Look and Feel

The user interface has been revamped using a modern UI framework (Qt) to provide a native look and feel for all supported platforms. Linux and Mac OS X users in particular should be pleased with this change, though Windows users will also see benefits.

The high points include:

- Dockable sidebars that can be attached in flexible ways to the main workspace, or even be positioned outside the workspace (e.g. on another screen)
- Right-click context menus and pop-up toolbars
- A more flexible toolbar with redesigned icons
- Sidebars for managing frames, pages, and macros and viewing probe results
- Redesigned Zone Style, Mapping Style, and Load Data dialogs, and smaller improvements to many others
- On Mac OS X, an X window server is no longer required to run Tecplot 360 EX since it is now a native Mac application

Finding Familiar Features

Some commonly-used features are now available in a more convenient way than in Tecplot 360 2013 and earlier. For example, instead of using options on the Frame menu to change the order of frames, the new Frames sidebar provides this functionality (you can also right-click the frame border). Similarly, page management, which once required running macros provided in the Quick Macro Panel, can now be performed in the Pages sidebar.

The Paper Setup dialog, formerly found in the **Options** menu, is now in the **File** menu.

To copy an image of the plot to the clipboard for pasting into another application, simply select the frame using the mouse and choose **Copy** from the Edit menu. There is no separate **Copy Plot to Clipboard** menu command. Similarly, to delete a frame, select it and press the Delete key on your keyboard.

Many features can now be found in the context menu. Right-clicking almost any object in the Tecplot 360 workspace gives you quick access to commonly-used settings and actions that apply to that kind of object. These functions are not always available in other ways. For example, the Write Curve Points to File option, which used to be available through the Curve Information dialog found on the **Data** menu, is now accessed by right-clicking the actual curve in the workspace. Additionally, context toolbars are available for many situations, largely replacing the old Quick Edit dialog.

Omitted Features

For most users, the Tecplot 360 EX feature set approaches parity with the last legacy (non-EX) release of Tecplot 360, Tecplot 360 2013. Most of the remaining omitted features are used infrequently, if at all, by the vast majority of customers.

Most omitted features are supported via the Tecplot macro language, even if there is no user interface for the feature. Tecplot 360 EX fully supports loading layouts and macros that use these features. Therefore, a possible workaround for workflows that rely on an omitted feature is to record the operation in Tecplot 360 2013 R1 (or any older version) as a macro and play it back in Tecplot 360 EX, or to write the macro from scratch. You can add these macros to the Quick Macro panel for easy access.

Other omitted features include:

- 2D rotation, coordinate transform, and shifting of pseudo-cell-centered data
- Depth blanking
- Surface clipping using slices
- The Quick Edit dialog (it won't be returning; see the new right-click context menus and toolbars)
- Image export in X3D, Sun Raster (RAS) and X-Window Bitmap (XBM) formats
- Animation export in Flash Video (FLV) format (SWF remains supported)
- Creation of HTML files for Web publication
- The add-ons Circle Stream, Code Generator, Compare XY Maps, Create Finite Element Sub-Zone, Distribution Plots, Export DXF, Extrude, Prism Grid, Sort, Statistics Calculator, Tecplot GUI Builder, Tetra Grid, and View Binary
- Curve-fitting add-ons ("extended curve fit") and power fit options
- Some options for changing the view and arranging the draw order of on-screen objects, though all these functions can be accomplished using available features
- The Group Select, Select All, Polar Drawing Options, Reference Scatter Symbol, and Print Preview dialogs
- The Journal and Sharing pages of the Data Set Information dialog
- The Constraint page of the Slice Details dialog, which allows a slice to be constrained by a bounding box
- Creation of 1-D line zones and zone creation by entering values

Third-party add-ons built for use with Tecplot 360 2013 or earlier are not compatible with Tecplot 360 EX. We intend to release an ADK (Add-On Developer's Kit) in 2017, although

we are unable to commit to a specific release date at this time. To request early access to add-on migration information, contact support@tecplot.com.

Macro Compatibility Note

Macros and layouts created with previous versions of Tecplot 360 that create calculate-on-demand variables may not execute correctly in Tecplot 360 EX due to a change to the default value for the Connect Adjacent Zones setting in the Geometry and Boundaries dialog (on the **Analyze** menu).

This can be corrected by re-recording the macro in Tecplot 360 EX or by editing the SetGeometryAndBoundaries command in the macro or layout to explicitly specify ConnectZones rather than relying on the default value:

```

$!EXTENDEDCOMMAND
COMMANDPROCESSORID = 'CFDAnalyzer4'
COMMAND = 'SetGeometryAndBoundaries
Axisymmetric=\ 'F\ ' SymmetryVar=\ 'Y\ '
SymmetryValue=0 ConnectZones=\ 'F\ '
NodeTolerance=1e-006 DefaultBC=\ 'Extrapolated\ '

```

Remote Display

Tecplot 360 EX with active TecPLUS subscription now supports the Tecplot SZL Server, a lightweight Linux server component that lets you access your data more easily from remote servers. If you are currently using remote display to access remote data, you may find Tecplot SZL Server to be the better solution.

Linux systems can use X Windows to display Tecplot 360 on a separate system from the one on which Tecplot 360 is actually running. Your X display software must support the GLX OpenGL Extensions, or you must have the graphics rendered by the host CPU using the Mesa software renderer (tec360 -mesa).

Linux remote users may find performance better using remote desktop software instead of X. In our tests, the [HP](#)

[Remote Graphics Software](#) was generally the most performant such solution when either system was Linux-based. If both systems are Windows-based, [ThinAnywhere](#) is a plug-in that can improve the remote performance of 3D applications over slow networks. We cannot, however, guarantee compatibility or provide support for either of these products.

On Windows systems, you can use the included Remote Desktop Connection, which transmits the entire user interface to a remote computer. This allows the rendering to be performed in hardware on the host computer and the results transmitted across the network. On server versions of Windows, more than one simultaneous session of this type can be supported. Similar options are also available for Linux systems as an alternative to X.

On Mac OS X, use the Screen Sharing feature, which can be enabled in the Sharing control panel (or a third-party equivalent such as Vine Server, which may provide better performance in some situations), and a VNC client, such as Chicken of the VNC. This supports a single user at a time.

Remote desktop software is generally not suitable for situations in which multiple remote users need to run GUI applications such as Tecplot 360 EX on the host system at the same time. In these situations, X on Linux is generally the preferred solution (though the clients can be other platforms).

Crash Reporting

Please help us make Tecplot 360 EX better by submitting a crash report to us in the event that the application terminates unexpectedly.

On Windows, Tecplot 360 EX creates a crash dump file. You will receive a message indicating that a crash dump file has been created. Click **Yes** in this dialog to open the folder where the file is created. You can then e-mail the most recent

.dmp file in this folder, along with a description of what you were trying to do, to support@tecplot.com.

On other platforms, no crash dump file is created. However, we urge you to send us a report anyway with as much detail as you can remember.

If you have a moment and a desire to be extra helpful, please re-open Tecplot 360 EX and choose **Enable Diagnostic Logging** in the **Help** menu. Then redo the steps you took to cause the crash. Tecplot 360 EX will record your actions as a macro file. If you are able to reproduce the crash, send the resulting *.mcr* file to us (along with the *.dmp* file if you use Windows). On non-Windows platforms, you can find the *.mcr* file in `/usr/tmp/tecplot_${USER}/tpa_diagnostics`.

Crash dumps and diagnostic macros are stored in a temporary folder and will be eventually be deleted by the system. There is no need to delete them manually.

Graphics Drivers

For best results, please make sure that you are using the latest graphics drivers compatible with your hardware and operating system. These can be obtained from your graphics adapter vendor's Web site. Old versions may have issues with Tecplot 360 EX, especially with larger data sets.

- **NVIDIA:** <http://www.nvidia.com/Download/index.aspx>
- **ATI:** <http://support.amd.com/en-us/download>
- **Intel:** <https://downloadcenter.intel.com/Default.aspx>

Platform-Specific Notes

The following table outlines the support for various platform-specific features in Tecplot 360 EX 2017 R1.

	Linux	Mac OS X	Windows
FLOW3D loader	✓		✓
ABAQUS loader			✓
Excel Loader			✓
Tecplot Chorus	✓		✓
Tecplot SZL Server ^a	✓		

a. The SZL Server runs only on Linux, but Tecplot 360 EX running on any platform can connect to the server as a client

Refer to the remainder of this section for issues specific to your operating system.

Windows

Your account must have administrator rights on your computer to install Tecplot 360 EX, or else right-click the installer and choose “Run as Administrator.”

Linux

- **Ubuntu Linux**

With Ubuntu’s new Unity UI, minimizing Tecplot 360 EX may cause its pull-down menus to become unresponsive when the application is later restored. As a workaround, you may choose “Ubuntu Classic” or

“Ubuntu 2D” when logging in, or set your user account to use one of these as the default in the Login Screen control panel.

Tecplot 360 EX is supported only on LTS (Long Term Support) releases of Ubuntu.

- **Temporary Directory**

Tecplot 360 EX relies on being able to create temporary files in the system temporary directory. On Linux, this directory is typically `/usr/tmp` or `/var/tmp`. If your user account does not have permission to write into the system temporary directory, you can use a different directory either by setting the `TMPDIR` environment variable in your profile or by setting the `TEMPFILEPATH` in the `tecplot.cfg` file.

- **Menu Shortcuts**

Menu shortcut keys may not work if the `NUM LOCK` is on. You may set the `NUM LOCK` to turn off automatically at boot in your computer’s BIOS.

- **SELinux**

SELinux (provided with some Linux distributions) adds an extra layer of security. If you see this error message:

```
./bin/tecplot.shared: error while loading
shared libraries: ./lib/libtec.so: cannot
restore segment prot after reloc:
Permission Denied
```

Enter these two commands, replacing `/path/to/tec360/lib` with the actual path of your installed Tecplot 360 EX `lib` directory (your account needs `sudo` permission):

```
sudo chcon -c -v -R -u system_u -r object_r
-t lib_t /path/to/tec360/lib/
```

```
sudo chcon -t texrel_shlib_t /path/to/
tec360/lib/*
```

You can then run Tecplot 360 EX without disabling SELinux.

- **Remote Display Issues**

If you have a **Network** license, you can run Tecplot 360 EX on one computer and display it on a second computer (via an X server). The X server must support GLX extensions, or else you must use the `-mesa` option when launching Tecplot 360 EX to have all OpenGL rendering performed in software on the host. Working with large, complex files may benefit from the `-mesa` option (see next bullet) even if your X server supports GLX.

When displayed remotely, Tecplot 360 EX may exhibit substantially lower drawing speeds than when it is displayed locally, especially for text and geometries.

- **Mesa Rendering**

Mesa, an OpenGL-equivalent graphics library, performs 3D rendering in software. It is typically used when hardware acceleration is unavailable or when working with remote display of large data.

The Mesa version of Tecplot 360 EX is slower, especially for 3D plotting. If you must run the Mesa version and display remotely, you can speed up the rendering for XY Line and 2D plots by setting the environment variable below. On some machines, this may also improve the speed of 3D plotting that does not use translucency. (Mesa translucency performance is known to be very bad.)

```
export MESA_BACK_BUFFER=Pixmap
```

Mac OS X

- **Keyboard Shortcuts**

Previous versions of Tecplot 360 used the Control key for most keyboard shortcuts, rather than the Mac standard Command key. Tecplot 360 EX changes these shortcuts to use the Command key under Mac OS X.

Similarly, when rotating a 3D plot, you now hold down the Command key while dragging with the right mouse button.

Note that the Alt key may be called Option on some Mac keyboards.

- **Right Mouse Button**

If your Mac's mouse has only a single button, hold the Control key while clicking to access right-click functionality.

- **Middle Mouse Button**

There is no functionality in Tecplot 360 EX that *requires* a middle mouse button; however, it does provide some shortcuts. Users of single-button mice cannot emulate the middle button, but users of mice with two buttons can hold down Control while right-clicking if their mouse does not support a true middle-button click.

- **Remote Display**

As Tecplot 360 EX uses the native Mac OS X user interface on the Mac, you cannot access the application on a remote workstation using an X window server. Instead, use the Screen Sharing feature in the Sharing control panel (or a third-party equivalent such as Vine Server, which may provide better performance), and a VNC client, such as Chicken of the VNC.

Since Tecplot 360 EX is not an X application under Mac OS X, it is not possible for multiple users to run Tecplot 360 EX on a Mac OS X host remotely.

Enjoy Tecplot 360 EX 2017 R1 and master the view!