



# WHAT IS NEW IN ENERPLOT V1.1.0

*Since Enerplot v.1.0.0*

Date: May 9, 2023

To display “What’s New” documents for other MHI products, please refer [here](#).

## New Features

The following are brand new functionalities in Enerplot v1.1:

### Support for New Import File Types (#7210, #7475, #7787)

A handful of new file types are now supported for import into the Enerplot environment:

- EMTDC Binary Output (\*.psout) Files: A brand new EMTDC output file format (\*.psout) is included with the PSCAD V5 release. A proprietary design, this new format is binary, which ensures a much smaller storage footprint, as well as faster data access.
- PSLF: Enerplot now supports the import of PSLF (\*.acf and \*.chf) files.
- DCLFL: Output (\*.ana) files from the MHI product, DC Line Fault Locator are now supported.

### EMTDC \*.infx File Format Support Deprecated (#9002, #8835)

Support for the EMTDC output information file (\*.infx) has been deprecated in Enerplot v1.1. \*.infx files can no longer be loaded as datasets, however existing workspaces with these datasets already loaded will still function properly. Please instead use the equivalent EMTDC output information file (\*.inf) to import EMTDC output data.

### Parameter Grid Pane (#8457)

The *Parameter Grid* pane provides a convenient means to display the various properties of a canvas objects in Enerplot. More importantly, it enables the ability to modify multiple property values in multiple objects, simultaneously. Simply right click on an object and select *View Parameter Grid...* to invoke this pane.

The parameter grid is supported for the following objects:

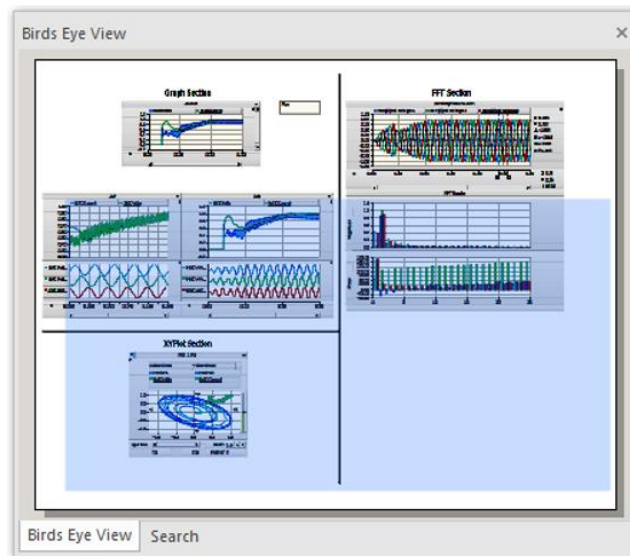
- Books, Sheets and Data Sets.
- Standard Graph Frames, FFT Graph Frames and XY Plot Frames.
- Curve Properties.
- Sticky Notes, Captions and Dividers.

## Offline Plotting & Analysis

Parameter Grid								
Graph Frame Settings								
	Caption (title)	Show Markers (markers)	Auto Pan X-Axis Enabled (pan_enable)	Auto Pan X-Axis (%) (pan_amount)	Title (xtitle)	Minimum (xmin)	Maximum (xmax)	G (k)
▶ 920113599	2_SampRates.cfg	Hide	Disable	75 [%]	x	0	1	Al
2075018624	infx	Hide	Disable	75 [%]	x	0	0.25575	Al
256747126	csv	Hide	Disable	75 [%]	x	0	0.3	M
1136775505	infx	Hide	Disable	75 [%]	x	0.08	0.18	Al

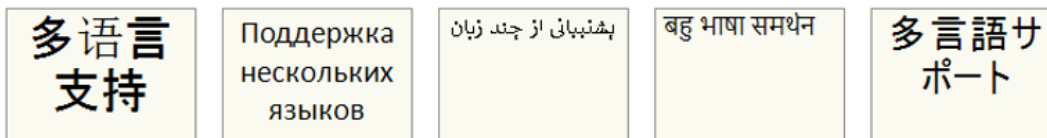
### Bird's Eye View (#8457)

A *Bird's Eye View* navigation pane provides an overview of the entire sheet and indicates what is currently in view with a blue box. This tool may be used to easily zoom and navigate, and is particularly helpful when working with very large sheets.



### Multiple Language Support in Sticky Notes (Unicode) (#8824)

The Enerplot code base has been updated to fully support Unicode, which enables users to use all known writing systems within sticky notes. This of course includes the Cyrillic alphabet, Chinese characters, etc. This is a very important new feature, which has been passionately requested by many of our Asian users.

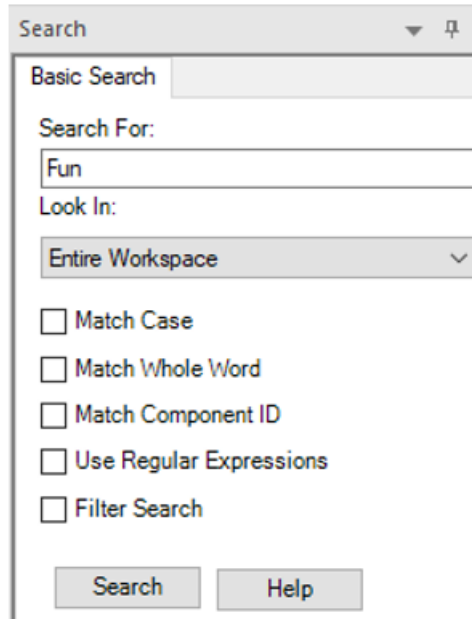


Unicode support also allows Enerplot files that are stored within folders with multi-language names, to be opened/saved.

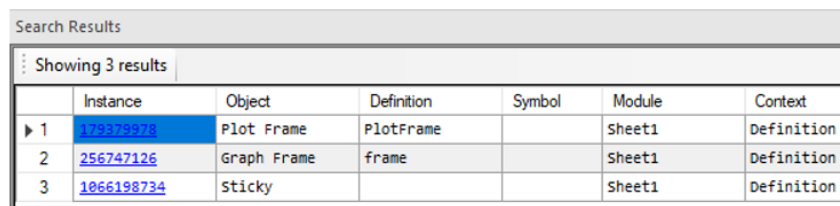
## Offline Plotting & Analysis

### Searching (#8457)

Search facilities have been added to Enerplot! Now you can search for text in a single book, or across the entire workspace. Simply enable the *Search* pane from the ribbon bar, or press *Ctrl + f* on your keyboard. When a search is preformed, the results are displayed in a *Search Results* pane, containing navigable links.



Search Pane



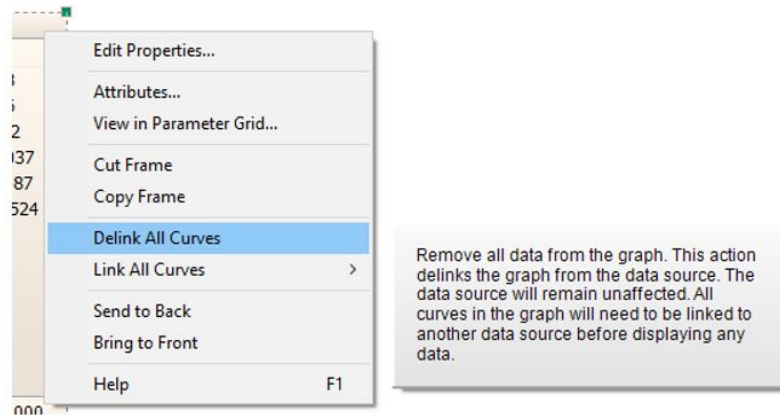
Search Results						
Showing 3 results						
	Instance	Object	Definition	Symbol	Module	Context
▶ 1	<a href="#">179379978</a>	Plot Frame	PlotFrame		Sheet1	Definition
2	<a href="#">256747126</a>	Graph Frame	frame		Sheet1	Definition
3	<a href="#">1066198734</a>	Sticky			Sheet1	Definition

Search Results Pane

## Offline Plotting & Analysis

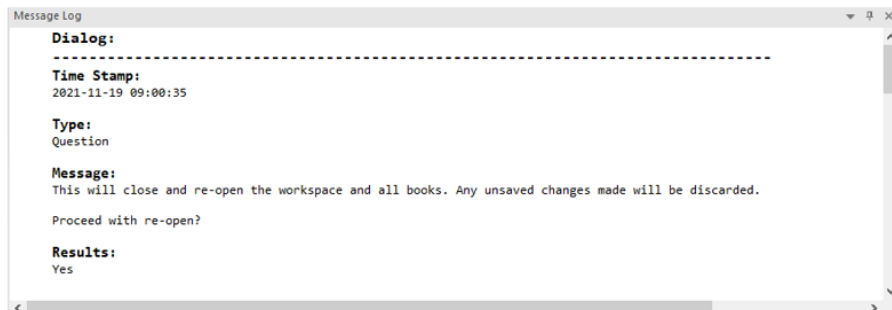
### Tooltips (#7263)

Context menu tooltips have been added to most menu functions for quick reference:



### New Message Log Pane (#8457)

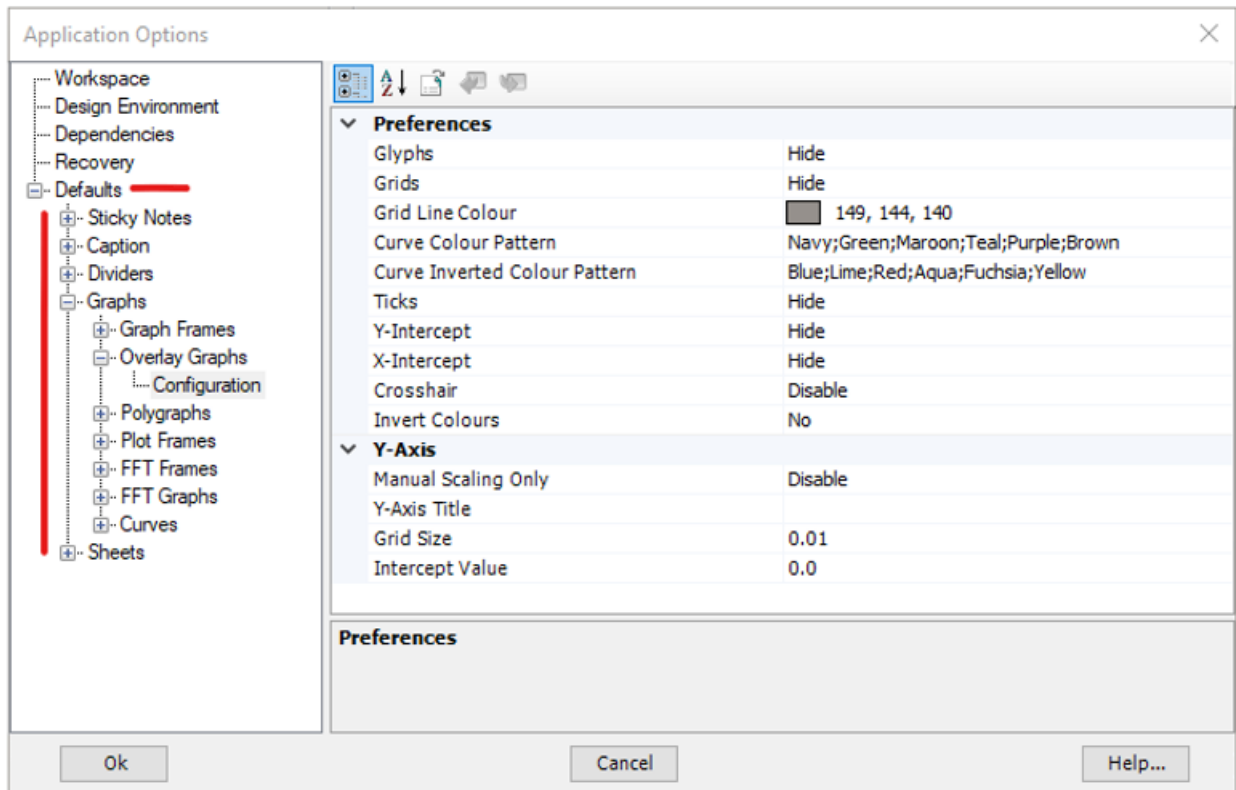
A new type of message pane is included with Enerplot called the *Message Log*. This pane simply displays all messages that have been displayed to the user during the current session.



## Offline Plotting & Analysis

### Parameter Dialog Default Settings (#9029)

The default settings of most properties/settings dialogs are now adjustable. For example, default automatic curve colouring in graphs can be adjusted to be more prominent. Default settings may be adjusted via the *Application Options* dialog:



### New Group Box Display Tool Added (#9379, 9427)

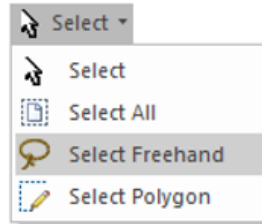
A new group box display object has been added. Similar to a sticky note, this object is optimized for use as a visual grouping tool. The group box can be adjusted for a variety of border styles and colours, as well as a coloured or transparent background.



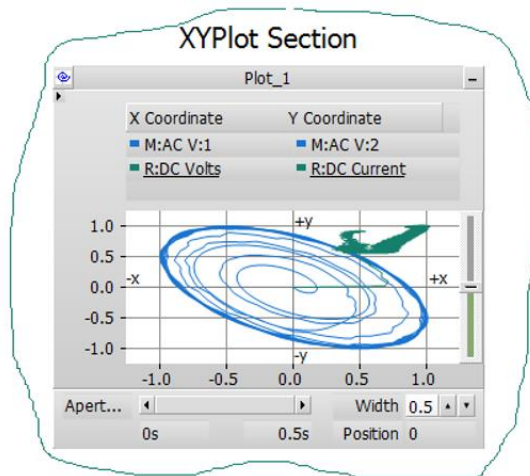
## Offline Plotting & Analysis

### Freehand and Polygon Selector Tools (#8457)

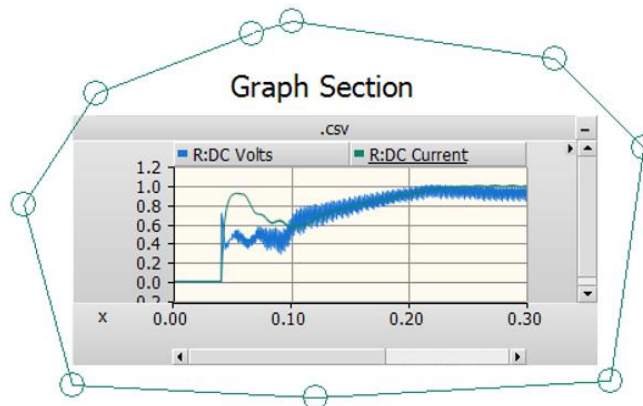
Two new selection tools have been added to the ribbon control bar:



The freehand selector allows you to encompass a group of sheet objects in a freehand circle, similar to a 'lasso'.



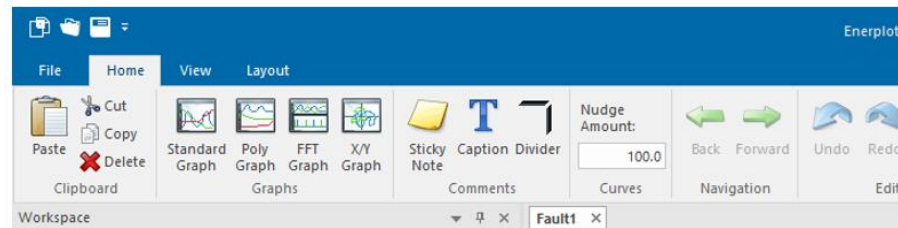
The other is a Point selector, where the components are encompassed with a polygon, or collection of points:



## Offline Plotting & Analysis

### New Look (#8455)

Enerplot now sports a new look, more similar to PSCAD, PRSIM and other MHI software products.



### Miscellaneous Niceties (#8457, #9149, #9237)

Here are some other more trivial niceties that have been added to the software:

- Reopen Book: A context menu command to reopen a book has been added.
- Continuous Zoom: Zoom in and out dynamically with mouse wheel, using the pointer as a centering point.
- Multiple Select: Books, Sheets, Scripts, Datasets and Records are now multiple selectable for performing masse operations, such as deleting multiple sheets.
- Environment Medic: The Environment Medic utility may now be launched from within Enerplot. This utility is used to help with installation issues, with emphasis on the Python setup.

## Functionality Deficiency Fixes

Based on feedback from users around the globe, many features and functionalities have been modified, and in some cases, completely redesigned:

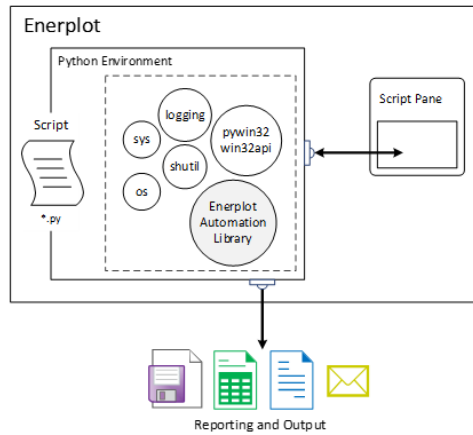
### 'Under the Hood' Improvements (#7464, #7434, #7720, #8757, #8799, #7392, #8437)

A great deal of effort went into cleaning up and making the inner functionality of Enerplot faster and more efficient.

- Improved overall code architecture.
- Lazy (or quick) loading of datasets has been streamlined and vastly improved for speed.
- Data import in general is refactored for increased speed, efficiency and stability. Loading immense datasets now requires significantly less memory, and load speed has vastly improved.
- The Enerplot application is now much more efficient in terms of memory handling. It no longer uses large amounts of memory following repeated operations.

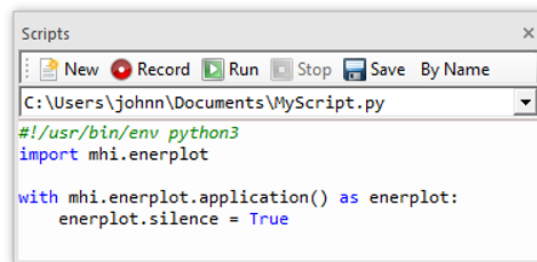
### Automation: Embedded Python Scripting With Recording Upgrade (#8454)

Automation of the Enerplot application, utilizing custom-made Python language scripts, was first introduced in v1.0. It includes commands to launch the software, load and run simulations, change parameters, and analyse data, among many others. In v1.1, the automation interface has been updated to our latest design, which is the same one used in other MHI, Ltd. products, such as PSCAD.



Embedded Python Automation Interface, in Enerplot v1.1

Users can continue to maintain their scripts from within Enerplot, using the upgraded Script pane, from which custom scripts may be recorded, edited or launched.



Script Pane



## Offline Plotting &amp; Analysis

**Python Scripting Enhancements (#7432, #7501, #8755, #9279)**

New functionalities have been added to the Enerplot Python automation library, and hence allow for a wider range of recording capabilities. Some of these include:

- Generate a new record from a modified curve.
- Save a modified dataset.
- Sheet canvas settings, such as grid, orientation and size have been given more obvious functionality for easy changeability in the script.

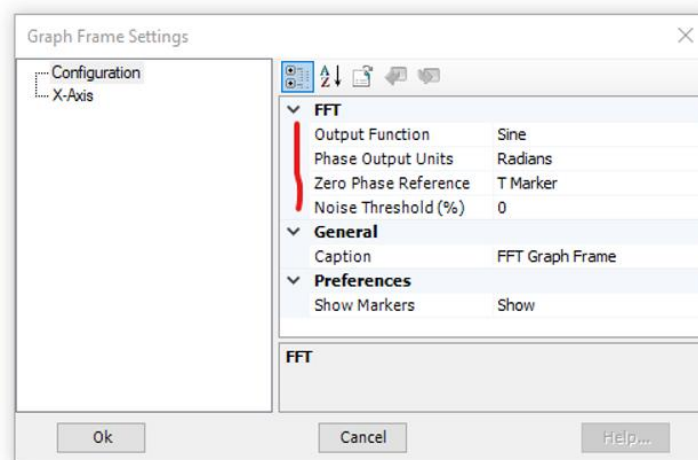
```
sheet = book.sheet("Sheet1")
sheet.grid = True
sheet.orientation = "Portrait"
sheet.size = "B/A3"
```

- Book header, title and footer have been given more obvious functionality for easy changeability in the script.
- Python script record now properly records X/O marker movements.
- Printing of book sheets directly from python script is now possible.

**FFT Enhancements (#8820, #8818, #7769, #8983, #8987, #764)**

The FFT function in Enerplot has been enhanced to provide more accurate results, as well as some additional display options.

- All non-uniform plot step waveforms are now interpolated onto a fixed plot step grid, prior to being analyzed by the FFT. This ensures the accuracy of all magnitude and phase angle quantities when analyzing records with a variable plot step.
- New options have been added to control the output phase display in the *FFT Graph Frame*. Added are phase output units (degrees or radians) and phase output reference (sine or cosine).



## Offline Plotting & Analysis

- The time reference for the FFT phase angle calculation may now be specified. The choices are:
  - Time 0.0
  - Start of the FFT window
  - Custom time
- In an attempt to reduce display noise, users can now control whether or not to display the phase angle, based on a given noise threshold.

### Record Wizard Enhancements (#7381, #7382, #9018)

Several new math functions have been added to the record wizard function list. New math functions added:

- **rms\_a(curve, T)**: Single-phase, analog RMS function.
- **rms\_d(curve, Freq [, N])**: Single-phase, digital RMS function.
- **time**: ddd
- **Floor(record [,digits])**: Allows specification of floor integer.
- **Round(record [,digits])**: Allows specification of rounding integer.
- **Ceil(record [,digits])**: Allows specification of ceiling integer.
- **Ln**: Natural logarithm.
- **2<sup>x</sup>**
- **e<sup>(x-1)</sup>**
- **Log<sub>2</sub>**
- **Ln(1+x)**
- **$\sqrt[3]{x}$** : Cube root.
- **$\sqrt{x^2 + y^2}$** : Hypotenuse function.
- **atan2(y, x)**: Two-argument arctangent.
- **sinh, cosh, tanh, sinh<sup>-1</sup>, cosh<sup>-1</sup>, tanh<sup>-1</sup>**: Hyperbolic functions.
- **erf, erfc**: Error and complimentary error functions.
- **LGamma**: Natural logarithm of the absolute value of the Gamma function.
- **TGamma**: Gamma function.

## Offline Plotting & Analysis

### Smart Paste (#7209, #7489, #7424, #9156)

Cut/copy and paste just got a whole lot smarter in Enerplot. Now when an object is copied, a great deal more information is stored on the Windows clipboard, so that when it comes time to paste, an intelligent decision can be made, depending on the context of the where the object is being pasted. This can save click steps in many areas:

- *Copy as Bitmap/Metafile* functions have been removed. Now, simply copy and use the destination application (ex, Microsoft Word) to control how it is pasted.
- *Add as Curve* functions have been replaced with a simply copy. The record can be pasted as a curve inside a graph or pasted as new graph frame with the curve if pasted on a blank part of a sheet. When copying multiple records, a paste action will by default place all curves within a single graph (same as **multiple record select + Ctrl + left mouse drag**). If a single curve per graph is preferred, use **multiple record select + Shift + left mouse drag**.
- Records created using the Record Wizard may now be directly copied and pasted between datasets (via copy/paste context menus or hotkey equivalents).



### Dynamic Data View Pane (#8845)

The *Data View* pane now dynamically responds to the current context. For example:

- Click on a single curve, only data specific to that curve is displayed.
- Click on a graph, the data for all curves in the graph is displayed.
- Click on a graph frame, the data for all curves in all graphs in that frame is displayed.

### Folder Group Functionality (#8939)

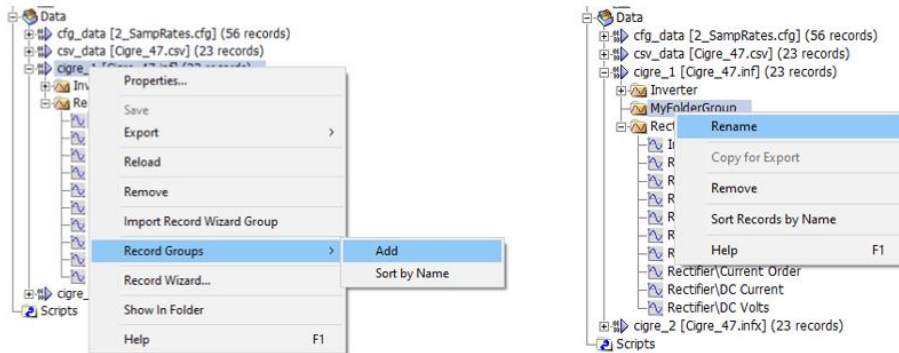
Although the basic functionality of folder groups still works as it did in v1.0.0, under the hood there are significant changes to it for this release. As a result, the way in which the user interfaces to folder groups has fundamentally changed. Folder group creation and organization is now accomplished via the editing of record properties.

As such:

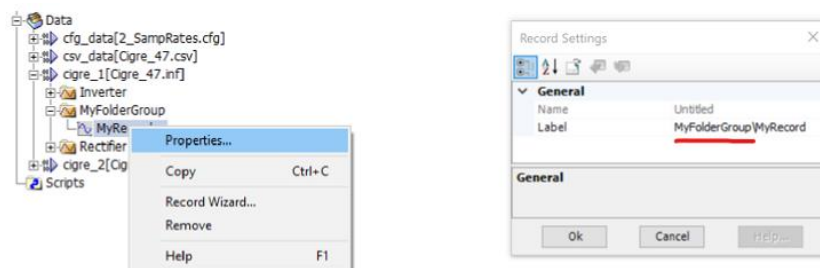
- New folder groups are no longer created via the dataset context menu.
- User-defined folder groups existing in v1.0.0 workspaces, will need to be re-constructed manually in v1.1.0, following import of the older workspace. The records within the v1.0.0 folder groups will appear back in their original positions within the dataset. This does not affect the linking of these records to any graphs.

## Offline Plotting & Analysis

- Records generated by the record wizard are no longer automatically inserted within a 'Record Wizard Output' folder group.



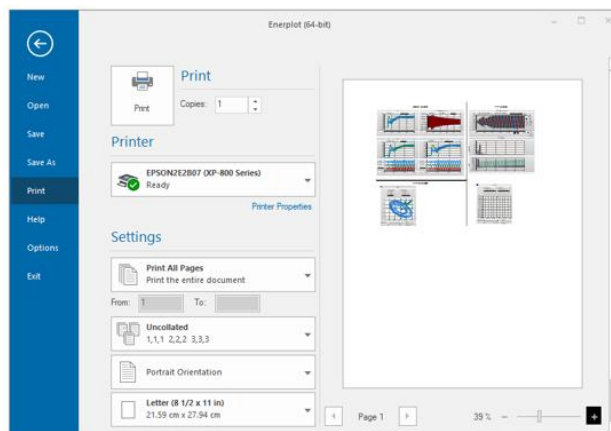
Folder Groups in v1.0.0



Folder Groups in v1.1.0

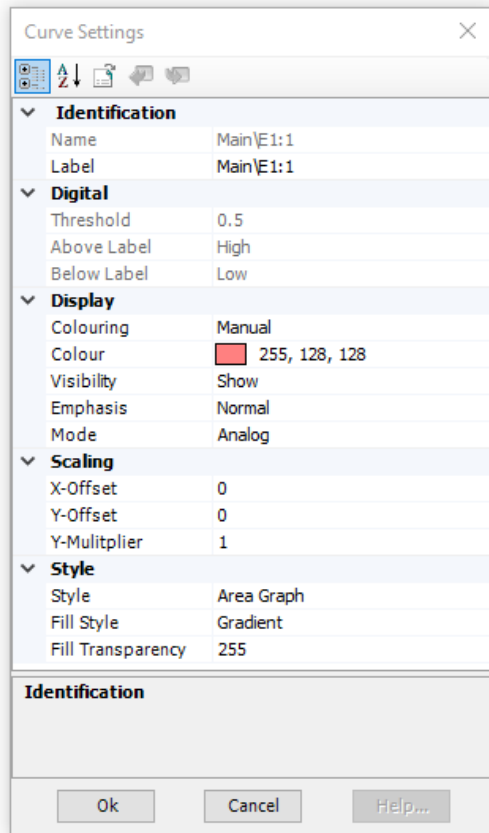
## Printing Facilities Upgraded (#7280, #7315)

The printing facilities in Enerplot have been upgraded to a more modern architecture. This upgrade has rectified a handful of print-related issues.

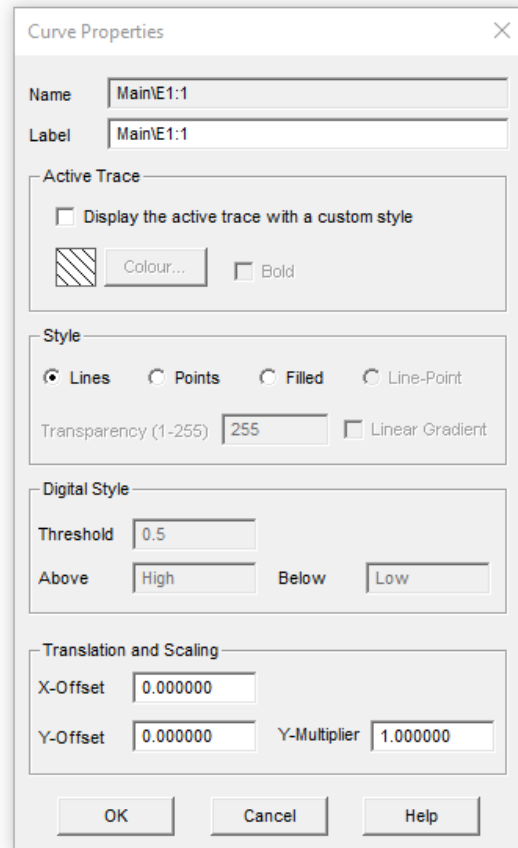


### Curve Settings Dialog Upgraded (#8473)

The curve settings dialog has been updated to the new XML form style, consistent with all other dialogs.



New



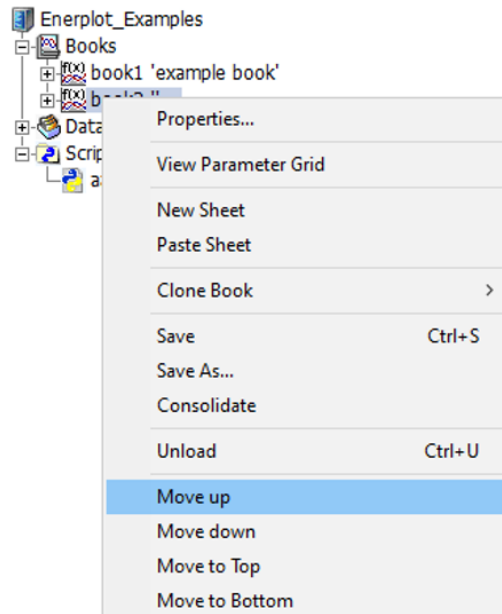
Old

This update enables curve properties to be included when using the *Parameter Grid* feature.

## Offline Plotting & Analysis

### Books Can Be Moved (#8667)

If there are multiple books existing the workspace, users now have the ability reorder them by moving a book up or down the list.



## Bug Fixes

The following is a list of bugs that were discovered and fixed since the latest, previously released product.

1. Special (accented or international) characters in the input data file folder path no longer block loading of the file (#7708).
2. **Using the Python properties() function on a Curve object no longer causes a crash (#7733).**
3. X-axis changes no longer are reverted when clicking on the aperture scroll bar, following adjustment via the graph properties (#7568).
4. Zooming to x-axis extents will now properly zoom to the entire domain, in the specific case where the first time is not the minimum, or the last time is not the maximum (#7701).
5. XY plot curve legend colours are now consistent. Previously, the y-axis curve was always coloured blue (#7745).
6. Sticky note colour and opacity settings now function properly (#7319).
7. An original dataset file is no longer modified if a new record is created in that dataset via Python script (#7836).

## Offline Plotting & Analysis

8. Graph frame x-axis properties are now properly saved with the associated book (#8360).
9. A Python script, which loads a workspace with a plot and channel, no longer causes the channel displayed in the plot to start loading in the background (#8477).
10. **Enerplot will no longer crash when recording, if the user attempts to load datasets from two or more files (#8556).**
11. **Enerplot will no longer experience out of memory errors when importing immense data files (#8757).**
12. **Fixed a crash that could occur when using a Python copy command of a component this not currently in view (#8715).**
13. **Enerplot will no longer crash, if expected records are not present on load of dataset (#8841).**
14. Links to general and automation scripting web help now properly point their respective web addresses (7356).
15. The curve flyby windows have been reduced in size considerably, and redundant or easily inferred information has been removed (including the path to the dataset) (#7693).
16. Fixed all problems related to inconsistent font sizes in various viewing panes and miscellaneous frame sizing issues, resulting when increasing the Windows screen resolution (#8930).
17. **Corrupt or invalid data is no longer converted to a 0.0 value when importing a file as a dataset. Now, Enerplot converts invalid data to 'NaN', which persists in the data thereafter. The user is warned with a popup message that bad data is detected when adding the associated curve to a graph (#7372).**
18. The Open | Examples folder now always navigates to the examples folder, regardless of the *Folder Access Tracking* application option setting (#8687).
19. All references to auto-pan have been removed from the graph frame properties (#7407).
20. If a workspace tree element is selected and then another element is right-clicked, the original selected element is now properly deselected (#7368).
21. Navigation and panning is much smoother due to some optimizations added in terms of refreshing curve display (#8943).
22. Hotkeys (x, y, r, e) now function properly when the graph frame is under selection (as opposed to a single graph) (#8356).
23. Very small multipliers entered for a curve (say 1e-8), no longer get rounded to zero (#8730).
24. 'Y' shortcut key no longer zooms all graphs in a graph panel (just the selected graph) (#8844).
25. Improved data view pane column headers to be more readable (#8997).
26. Fixed incorrect message displayed when attempting to add more than three curves to the FFT graph (#8821).

## Offline Plotting & Analysis

27. Fixed garbled messages that can appear from the record wizard (#8999).
28. The workspace consolidator now supports and includes python script files (#7838).
29. Book name is now properly reflected upon open into the workspace, if that book file had been copied and renamed first in file explorer (#8662).
30. **Application no longer crashes upon attempting to drag and drop a curve with associated with an invalid record (#8989).**
31. Record order is now properly preserved when adding several via drag and drop to the canvas (#8252).
32. Ctrl + left click now properly adds graph frames to a selection, and Ctrl + left mouse drag select now properly adds components to the selection (#8252).
33. Automatic graph zoom now considers the x and y-axis domain of the all curves existing in the graph. Previously only the last curve was considered, which caused problems with curves possessing different time lengths (#8668).
34. Curve legend order is now properly preserved following a reordering of curves by addition and deletion (#9001).
35. Users may now specify whether a copy actions stores only bitmap, only metafile, or both formats to the clipboard (#9030).
36. Curves with set custom colours now properly respond to bold settings and vice versa (#9144).
37. Vertical grid lines on graphs now always line up with the set x-axis grid (#7702).
38. **The Copy Data to Clipboard function now works properly and consistently from the context of a graph and the context of a single curve. The data is stored in the clipboard in tab delimited format, to ensure easy migration into external programs (#9371).**
39. The x-axis frequency/delta display (when markers are enabled) now functions properly (#9367).
40. **Enerplot now supports the import of all possible formats of the PSCAD Harmonic Frequency Scanner (#9410/9411).**
41. Graph x-axis title display no longer vertically clips letters such as 'y' and 'j' (#7325).
42. Graph x-axes no longer zoom to strange defaults, instead of saved values, when loading curves sourced from very large datasets (#9581).
43. Graph x-axis minimum now supports numbers less than 0.0 (#9637).





Offline Plotting & Analysis

## Utilities

### Functionality Deficiency Fixes

1. Enerplot licensing now supports the TLS 1.2 networking protocol.