# CGen 24.04 Release Candidate

## "Installation" Instructions

This **CGen v24.04 Release Candidate** will co-exist with CGen v24.01 so that you can switch between versions.  To install and run this release candidate extract the zip contents into a location or empty folder, browse to that folder and run the **CGen.exe**.

**Please note**: CGen CXF files saved with CGen v24.04 **will not open** with CGen v24.01.  If you open an existing CXF file in v24.04 the software will offer an option to back up the existing file prior opening it in v24.04.

## List of Changes

### New Style - Style 1M.
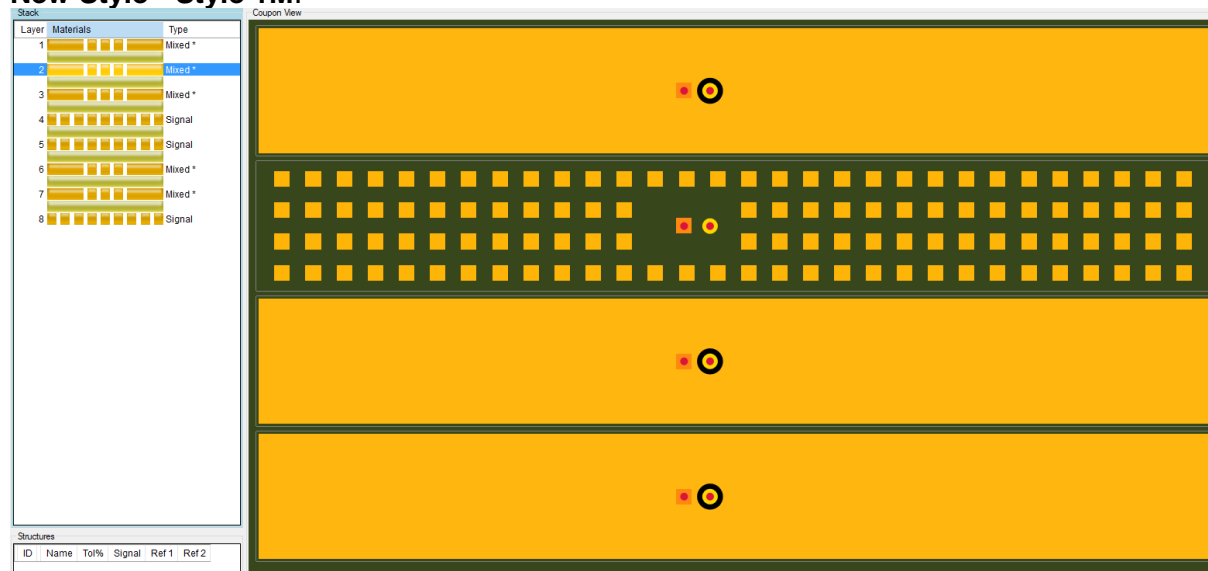


Supports true mixed layers.  The idea is that each structure is its own mini-coupon. Where a structure's layer configuration is 'frozen' and 'isolated' from the layer configuration of other structures.

Note the Layers labeled *Mixed \**. This is different from the existing styles where *Mixed(S)* and *Mixed(P)* are used. *Mixed \** means that the mixed layer is modeless.  It has no state until either a structure is placed on it or a structure references it.
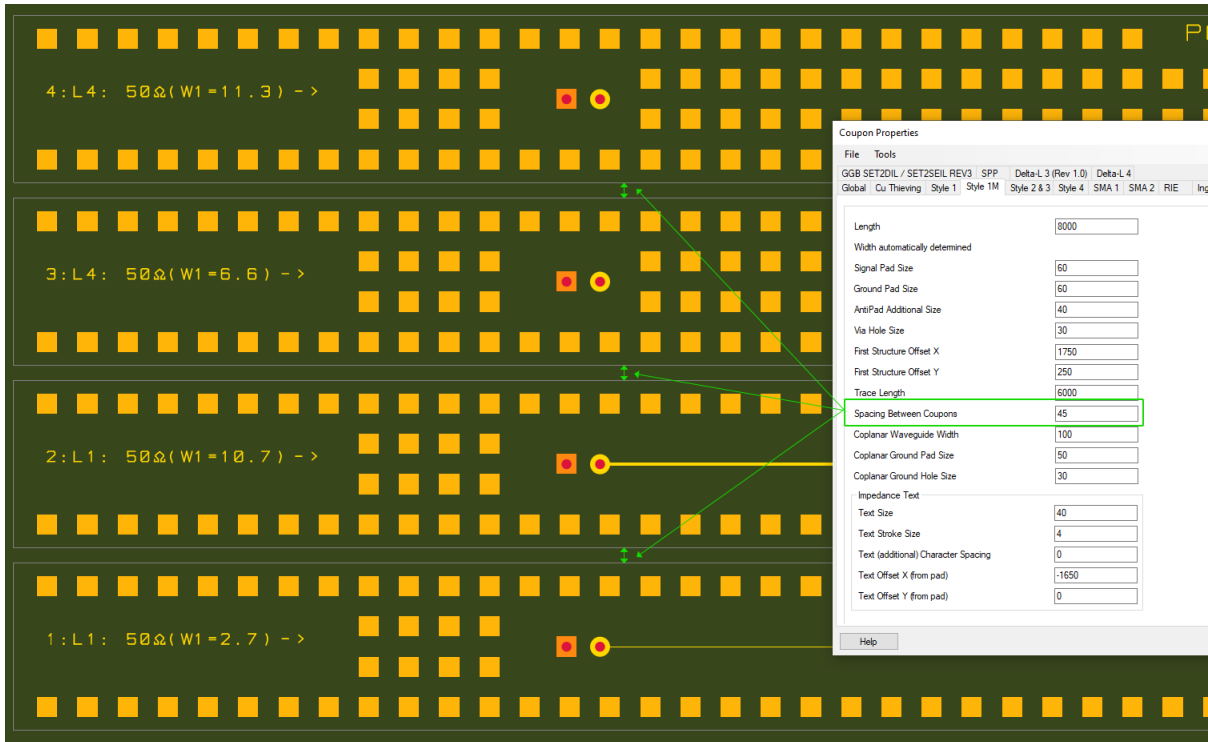
Properties are familiar.  Instead of **Spacing Between Structures**, it is **Spacing Between Coupon**s, since each structure is its own mini coupon.

## New Style – Style Delta-L4 (Final)
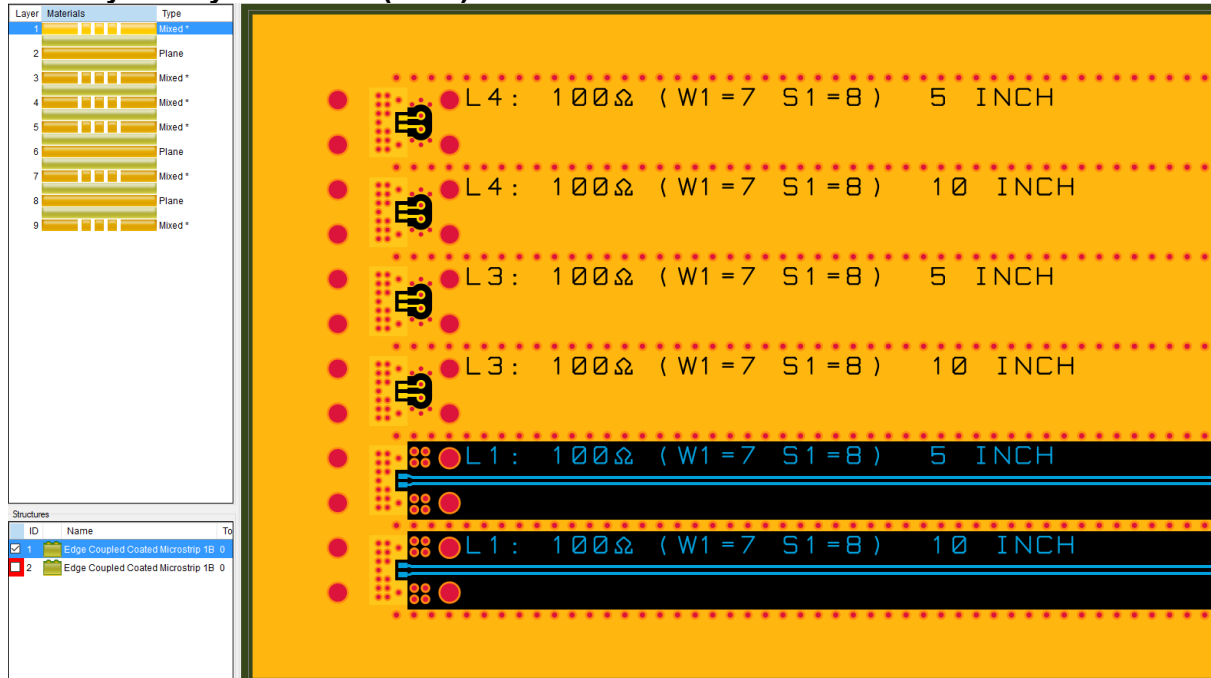


Supports true mixed layers.

Implementing Style 1M and its handling of mixed layers made this easier to do since it is very similar. Again, note the the **Mixed** * layers. According to the original spec and gerber files – each layer is just a flooded copper with cut-outs, so this style will only support Mixed layers or solid planes.

Trace Lengths for Long, Medium and Short are no longer fixed to 10 inches, 5 inches, 2 inches. They can be adjusted as follows :
**Long** between 10 to 20 inches,
**Medium** between 5 to 9.4 inches**
**Short** between 2 and 5 inches.
** (9.4 so we don't potentially have both the long and medium at the same lengths and also to leave room for the short trace (if enabled)).

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**Style Delta-L4 (Beta)**
This style is no longer recommended but will be kept for a couple of versions in case it has been used by anyone
- Improved incompatible structures messaging.
- Removed anti-pads for index holes as they are not correct for this style
- Annular rings (gnd pads) added for index holes

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**Style 2 & 3**
- Impedance Text Area improvements.
- Option added to allow user to *ignore default minimum default values* for specific properties to go down to zero. Some users have asked for this – to minimize coupon width as much as possible when there is only one structure on it.

## Higher Visibility Warning Messages

Old method was too small and not very discoverable. This one is more in your face and appears large and at the top. It will remain until the issue is resolved.
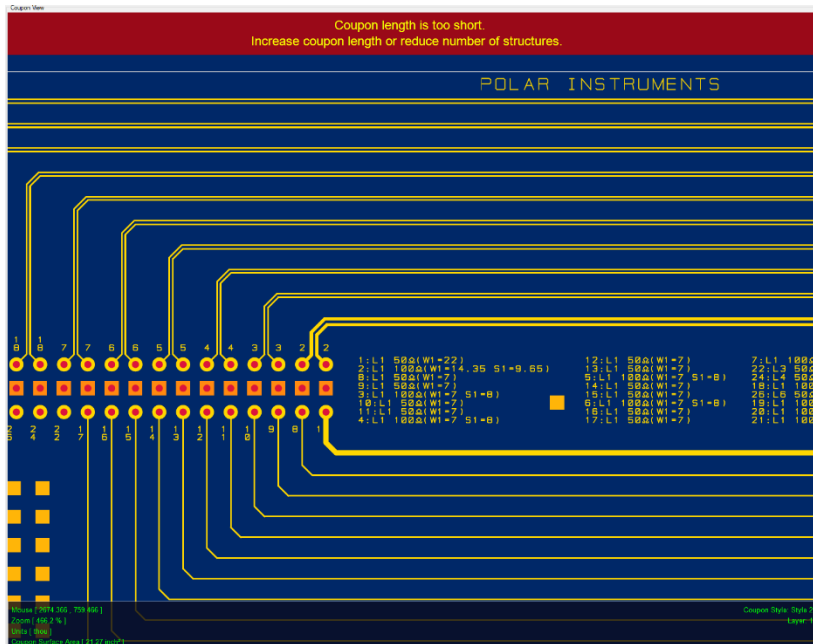


## "Add Impedance Structures" Form

- Refactored and redesigned
- Upper and Lower Reference Layers are no longer labled under SPP, now a standard parameter. since it is now useful for Style 1M / DELTA-L4
- Improved filtering of structures according to Style and layer configuration of the stack
- Improved information on Loss Parameters
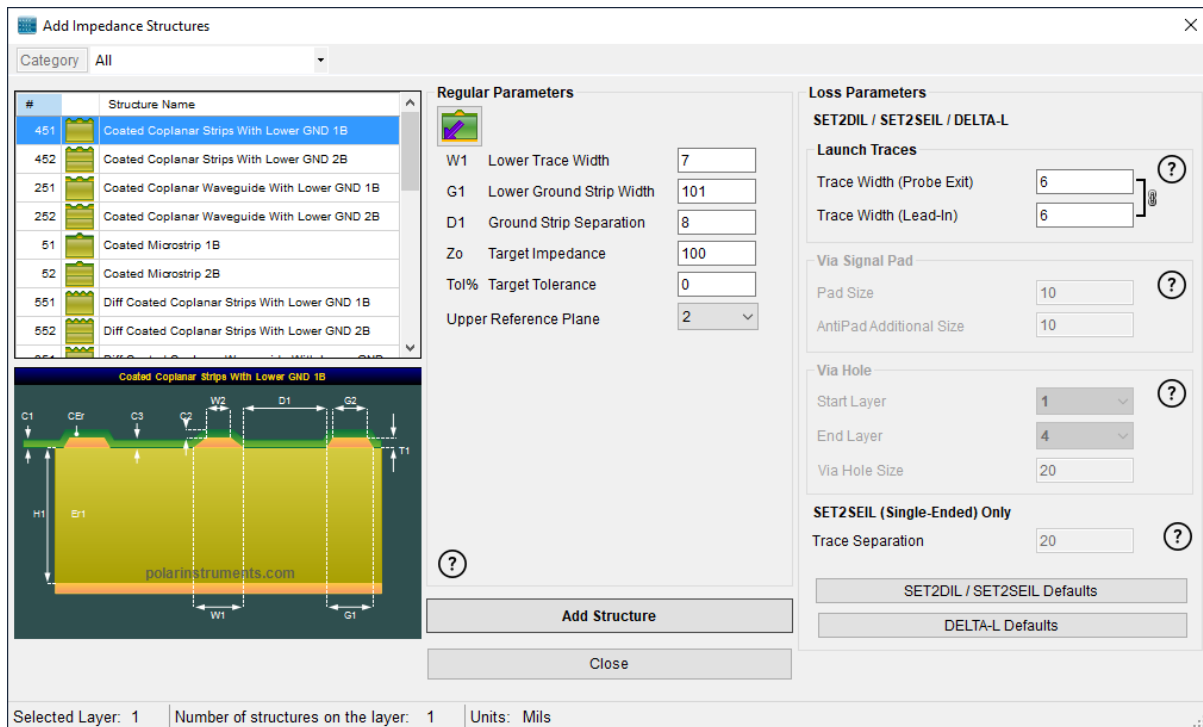
## Convenience Features (a.k.a QoL (quality-of-Life) Improvements)

- **Esc** key Shortcut to quickly close all dialog windows (except main application window)
- *Show Settings Files Location* in Tools Menu
- Shortcut to open most recently used file (**F12**)
- Quick selection and movement between stack layers using the **Up**/**Down** arrow keys (stack grid needs to have focus)
- Refresh Current Style (**F5**)
- Changing layer types no longer deletes structures.  Turning them off is now the default behaviour regardless of which type of layer is being switched to and from.
- Ability to duplicate an existing structure added to Structures Grid View context menu
- If file being opened was created with an earlier CGen , Now offers to save a backup of file before proceeding (they might be evaluating, or sharing with other users with older version of CGen)
- Validation Report now contain incompatible structures information.  before it was in a separate window after generation
- When switching styles now, it asks user if they would like any disabled structures to be re-enabled.  reason : structs that might be incompatible for one style might be okay for another, but user may wish to keeo them disabled

- Added more structure parameter columns to Structures Grid View
    - customizable - right-click on the column headers to reveal toggles for most of the columns that can be turned on and off
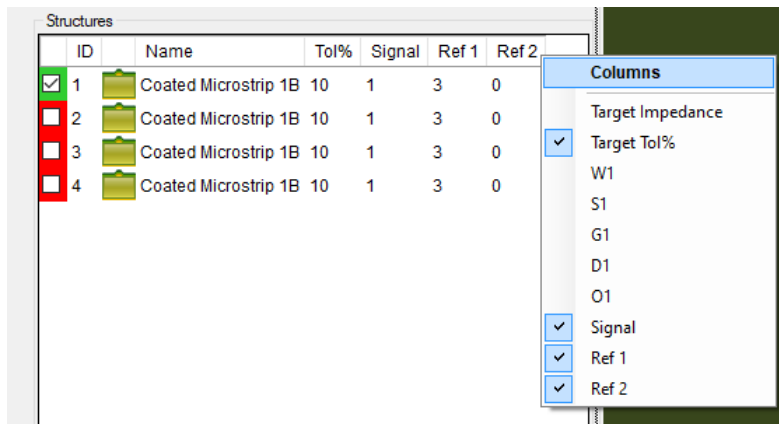
- ***Structure Validation Checker*** now has a more prominent role with improved guidance on getting the layer configurations correct (or as correct as possible) now always on top and will ***auto-update*** as corrections/mistakes are made. Information about mixed layers and reference layers can be viewed from here – more logical place than before.
- Drag and Drop CGen files into the application main window to open them.
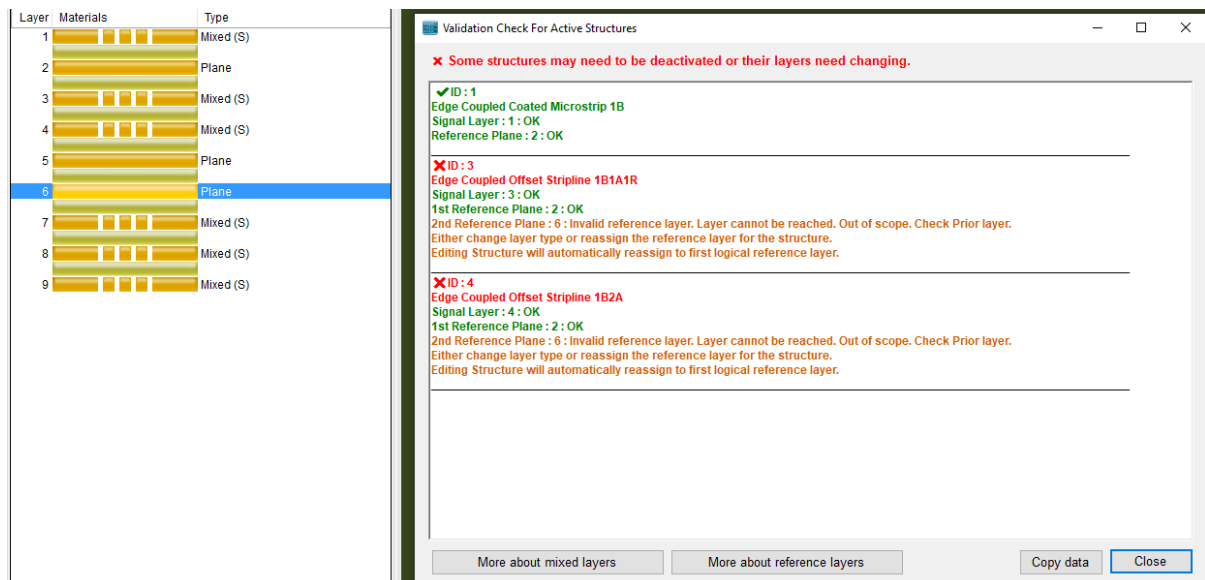


## Additional Copper Colors
These were added as a debugging feature, but have been kept.
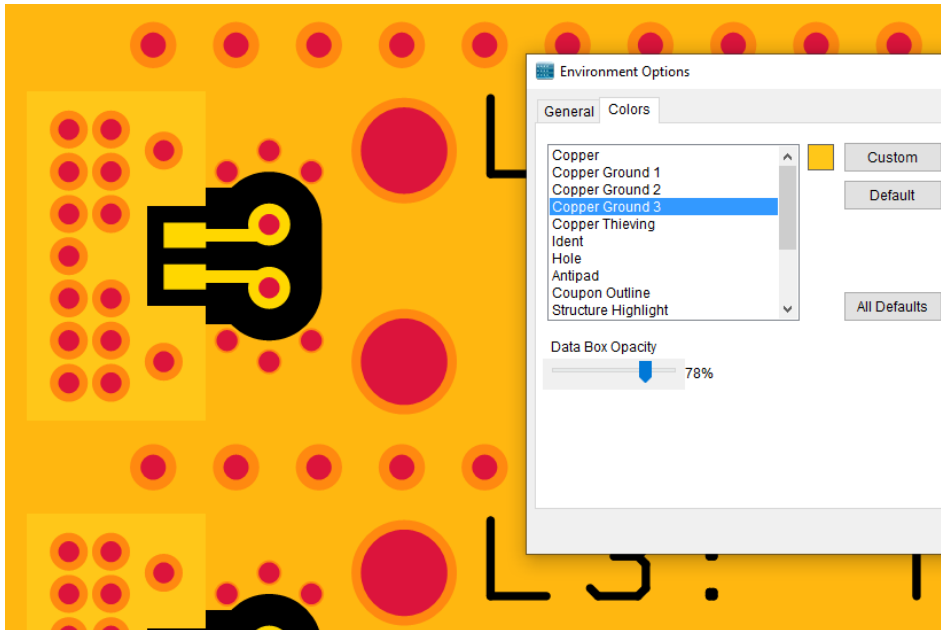
## Fixes
- Inner-Layer text refactored and improved for style 2 and 3. including bug fixes in this area
- Fixed a bug where, depending on layer configuration,  a structure's 2nd layer property (reserved for broadsides) might still contain a value if the  broadside is selected first, and then another structure is selected. i.e. the value is not being cleared.
- bug where copper thieving pads were added to mixedlayer-planes
- Improved structure filtering in the Add Impedance Structure form
- 001-00-000945 - Diff Offset Coplanar Strips error
- 001-00-000942 - Inner layer text bug on style 1
- 001-00-000944 - Didn't fix this explicitly but refactoring of style 1 code seems to have resolved this issue where coplanar copper blocks clash into each other - esp when diagonal 2pin probe is selected (single-ended (IP-XX/0.14")
- Add Impedance Structure Form : Some structures showing 2nd signal layer (broadside) when it shouldn't.
- Improved messages for when speedstack import fails (old data, unrecognised format, not text data etc)

## Misc
- Replaced ugly implementation of checking if data has changed
- Removed all references to Hatched Planes (can't be implemented)
- Suppressed annoying Ding sound whenever return key was hit in the textbox fields in coupon property form
- Removed CouponEngine._CopperThievingPadsLayer_StartIndex_ArrLst List that was used to speed up rending of theiving pads on older PCs.
- Added A message to **Probe Selection** Form - informing that SE and Diff Probe selection only applies to *Style 1* and *1M*
- GraphicsEngine as a subproject is removed.  the only file inside is now part of CouponGen project. Cursors have also been moved
- Inner-layer text now supported in **Style 1** and **1M**