Mentor®
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Personal Automated Design System Release Highlights

Software Version: PADS VX.2.3

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Introduction

This document provides a high-level summary of the PADS® VX.2.3 release. Refer to the Release Notes on Support Center for the list of specific known issues and workarounds.

This document includes a summary of the new features in this release. It also includes, if applicable, any authorization code changes required, any major installation changes, and any transitioning issues you should be aware of before installing. Additionally, any last-minute issues found in the final stages of testing are included.

Changes may be added to this document after release. Refer to the Release Highlights document on Support Center for the most up-to-date release information.

New Features Introduced in PADS VX.2.3

This is primarily a release aimed at adding new functionality and fixing customers logged defects Service Request (SR's). The following new products, features and enhancements are introduced in the PADS VX.2.3 release.

New Product Options

The **MCAD Collaborator**, which was previously a cost option, is now included at no extra cost in both PADS Standard 3D and PADS Standard Plus 3D.

Improvements to Migration

With each release, improvements and enhancements are continually being delivered for both migration within MGC flows and translations from competitive tools.

- **PADS Designer and PADS Netlist libraries to Integrated Central Library** – the removal of redundant partitions improves and significantly simplifies the migration from Netlist to Integrated projects. It now creates a single partition in PADS Library Manager for Parts, Decals, Symbols and Drawings.

PADS AMS

PCB Schematic for Simulation Setup

Significant enhancements have been made to improve the mapping of simulation details to a PCB schematic.

The mapping tool associates components in the schematic with simulation models, then stores the association details, so that future use of a mapped component within the project will be automatically linked with the desired simulation model.

There is a new wizard for improved ease of use and functionality when mapping schematic symbols to simulation data.

Data can be linked to the PCB schematic using symbol, part number, or reference designator information. Simulation models can be selected from libraries installed with PADS AMS, or PADS AMS compatible models in your own libraries or vendor libraries.

There is also a new Undo option for reversing any design changes.

LTspice® and PSpice® Integration

Integration has been added for LTspice simulator from Linear Technology® and the PSpice simulator from Cadence® Design Systems.

PADS AMS, LTspice, and PSpice share the ability to simulate standard SPICE models. But some part vendors encrypt their models for a particular simulator, which means the models will only run in the simulator for which they are encrypted.

When you need to use a model that is encrypted for LTspice or PSpice, you will now be able set up and manage your analysis using those models in the PADS AMS/PADS Designer environment.

PSpice Converter Updates & PSpice Model Support

We continue to improve and enhance PSpice model library support.

PADS AMS VX.2.3 Improvements include:

- Converter updates to better handle model syntax
- Improved simulator convergence for complex PSpice models once they are converted
- Support for additional PSpice models including:
  - Magnetic cores
  - Delay
  - Coupled inductor
  - Stimulus
  - Logic expression
  - Pin delay
  - N and O models

General Usability Updates

Improvements in this release include updates to the AMS toolbar so it works with all project types and templates, better management of Pin Order warning messages, and Shared Library refinements.

PADS Layout and Router

Dynamic Copper Healing

Over the last few releases an emphasis has been placed on improving the performance, quality of the generation, and export of manufacturing data.

For VX.2.3 Dynamic Copper Healing has been implemented in Router. This is a significant improvement in core PADS technology and delivers improved functionality, quality, stability and performance with the generation of flooded copper areas. It also addresses multiple IDEAS with a combined 600+ votes.

Default Net Class Via in Constraint Manager

You can now easily and quickly change vias on the fly using the Vias dialog box with the V modeless command or the Via Type menu popup while routing, regardless of which via might be assigned to the Net Class. Via assignment can also be modified after being placed by using the Vias Properties dialog box and selecting a different via from the list. There is no longer a need to open the Constraint Manager to make via assignment changes on the board.

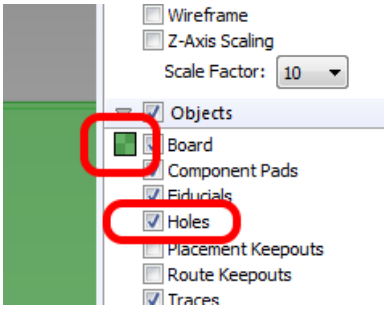
This change now more closely aligns the Integrated project functionality with the via selection/modification ease of the Netlist Projects.

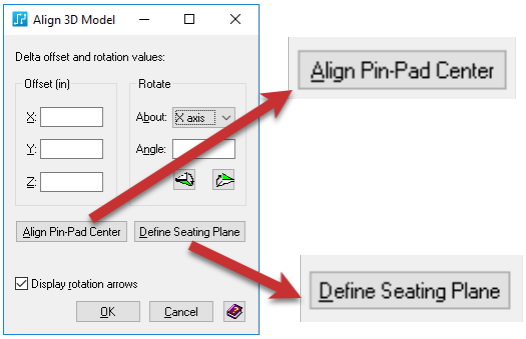
PADS 3D

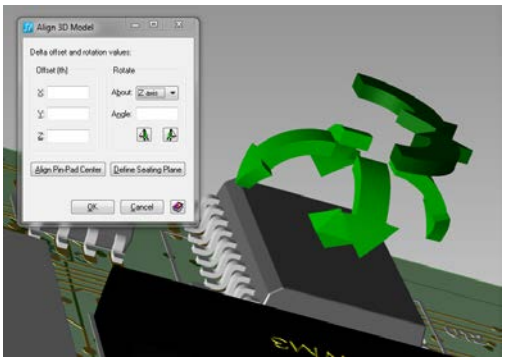
In this release we have made improvements to how 3D models can be aligned.

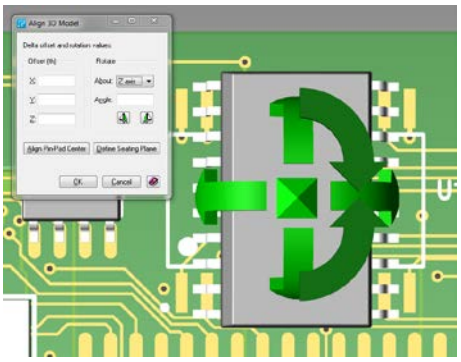
- 3D Display Control Updates
  - Independently control board color and transparency in the 3D view
  - New Hole object to show holes in vias and through-hole pins
- Rotate models across all axes with visible arrows
- Define which side of the model should touch the board using the Define Seating Plane button on the Align 3D Models dialog box.

- Center a model pin within the decal pad using the Align Pin-Pad Center button on the Align 3D Models dialog box.
- Immediate alignment directly inside the 3D view (dialog pops up automatically after importing a model to a component)









Service Requests

More than sixty Customer Service Requests have been addressed, with a focus on verification checks:

- Unable to modify the trace width when a via at SMD exists
- Only default via or Default Net Class via set in Constraint Manager is possible to be used
- False, inconsistent clearance errors when Keepouts included in Clearance checking and zoom levels change
- Get erroneous Body to Body errors when a Keepout covers the components
- Issues related to Verify Clearance Check
- Certain zoom levels show extra clearance violations
- Color by Net selection does not show drawn copper polygons in the designated color when printing in CAM

- CAM output, bottom assembly document will not "Plot Window", generates "file i/o error on temporary work files"

Individual Defect Tracking System (DTS) numbers are listed in the Release Notes.

PADS Layout and Router IDEAS

The following IDEAS have been addressed:

- D129 – Copper Pour/Split Planes in PADS Router (441 votes)
- D207 – Realtime redraw when creating and editing copper plane areas (165 votes)
- D13125 – Add Automatic Copper Fill/Dynamic copper (84 votes)

PADS Logic

PADS Logic has been added back to the main PADS release media to simplify the download and installation process.

PADS (DX) Designer

Below is a list of ease-of-use improvements and new functionality.

Display Control

Enhancements to new display control introduced in VX.2.3.

- Options expanded and re-organized – Pin Type Arrows, Ripper Index, Rulers, Notes
- Show Pin Type Arrows for hierarchical blocks only (IDEA – D15026)
- Slider Control for ‘Selection Highlight’ (IDEA – D15802)
- Support “~” character in names (IDEA – D12887)
    - Option to use ^ as over-bar character instead of ~
- Cross-probing
    - Zoom to fit
    - Zoom to pin
    - Zoom level control

Part Replace

Improvements to pin mapping dialog:

- Enhancements following VX.2 Beta & VX.2.1 feedback
- Improved user visualization
- Support for multiple symbols

Improvements to property mapping dialog:

- Your choice of mapping overrides is saved
  - Library only
  - Schematic wins
  - Library wins
- Mapping scheme is used on next invocation

Miscellaneous Enhancements

Improved Search configurations:

- Column chooser
- Hide ‘Group’ bar
- Prevent selection of unsupported data sources
- Selection boxes (Excel-like) in filters
- Settings to follow corporate WDIR
  - Settings moved to DxDesigner.xml file
- Support ‘Dashed’ lines for unplaced parts in Variant Manager

IDEAS

The following additional IDEAS have also been addressed:

- D2668 – Dxf in or Paste special in symbol editor for logo support
- D7256 – Highlight net through whole schematic
- D10985 – Double click to open down on functional blocks in DxD
- D11928 – New way to display 4-way intersection of nets

- D12692 – "Click to Edit" should not reset zoom or remove selection
- D5731 – "Fit All" command all placed symbols should be shown just as "Fit Selected"
- D11260 – Out of grid item move
- 15706 – Verify results must include Ref Des

HyperLynx® DRC

Accuracy Improvements

- Arc trace is natively supported in the database. With this enhancement, geometrical checking can be done more accurately, such as spacing check in an arc area.
- Trapezoidal traces are supported along with surface roughness. Cross sections that have trapezoidal shapes are passed to the field solver to accurate impedance calculation.
- Stackup file (.stk) generated with HyperLynx SI can now be read.

Usability enhancements

- Multiple violations can be selected to view in both embedded viewer and in Xpedition Layout Hazard Explorer. The new feature has been added to allow for easily identifying the areas where the most violations were found.
- A new Object List can be created by selecting objects in Project Explorer. This new feature provides an intuitive way to create an Object List.
- Hierarchical Object List has been supported to manage Object Lists easier. An Object List could contain Object Lists.

New Manual for the Standard Rules

- The VX.2.3 release includes the new *HyperLynx DRC Rules Reference Manual*, which documents all standard rules.

New functions

- IBIS model selector has been supported to allow you to select a model within an IBIS file containing multiple models.
- Creepage measurement engine has been added to run creepage rules faster. Creepage distance can be measured 10 to 100 times faster.

HyperLynx SI/PI/Thermal

SERDES Wizard

One of the biggest features in the HyperLynx VX.2.3 release is the first version of the SERDES Wizard. This new Wizard makes the process of analyzing serial interfaces much more streamlined, allowing for analysis of every signal on a bus all at once. In this first instantiation of the Wizard, it will support S-parameter extraction and analysis, including advanced metrics such as Insertion Loss Deviation and Power Sum Crosstalk. It will also support Channel Operating Margin (COM) as well as some protocol-specific verification modules for busses like USB and PCI Express. Other checks include simulation-based skew and impedance checks, to ensure maximum margins.

The Wizard can be run in a variety of modes. In Compliance-only mode, the Wizard runs only the analysis types required to ensure compliance for a specific protocol. The Wizard will also run on S-parameters taken from measurements, whether they be a single large S-parameter or a group of coupled 4-port S-parameters. The full SERDES Wizard allows you to choose from all available analysis types to cater a solution to their preference.

Automatic 3D Area Creation

Another feature that allows for huge efficiency gains in analyzing multi-Gbps SERDES channels is the automatic 3D area creation. As frequencies increase, certain areas on the board such as vias, DC blocking capacitors, and chip breakouts require a full 3-dimensional electromagnetic solver to be properly characterized. In HyperLynx VX.2.3, all of those areas can be automatically identified, solved, and replaced with solved models for simulation.

In previous releases, the 3D pattern-matching has been available to find areas of the board that match other areas, so that a single solved model can be used for all. This made a drastic improvement in the efficiency of using the 3D solver and made large-scale 3D modeling truly practical. Now, in HyperLynx VX.2.3, you can find all the 3D areas automatically, including all the matching areas, and send off those areas to be solved using the HyperLynx 3D solver. The automatic 3D area creation has been in Beta for a couple years and is now getting officially released in HyperLynx VX.2.3.

General Batch Wizard

In previous HyperLynx versions, you could perform batch simulation of signals using the General Batch Wizard and/or the Advanced Batch Wizard. In VX.2.3, the capabilities of those two Batch Wizards have been combined in the General Batch Wizard, which also features a number of improvements for more efficient Batch simulation. In the General Batch Wizard, you can select from traditional SI analysis types like Signal Quality, Delay, and Crosstalk, as well as Quick Analysis options and EMC analysis. Signals can be grouped into net groups for more efficient application of constraints and analysis. Once the batch analysis completes,

results are generated using the traditional text files and spreadsheets, as well as the more modern, easily-navigable HTML reports.

Support for Hatched Planes in LineSim

In HyperLynx VX.2.3, the transmission line models in LineSim have been enhanced to support hatched planes. This includes the integration of a new specialized hatched plane solver. Two new transmission line types have been added with hatched plane references: one for microstrip and another for stripline. Additionally, the coupled transmission line capabilities have been enhanced with a new reference conductor type for hatched reference planes. All the new transmission lines allow you to specify the hatching parameters like width and pitch, as well as the orientation of the trace to the hatching.

Improved Loss Modeling in Traces

To allow for greater accuracy at high frequencies, the loss modeling in the transmission line models in HyperLynx has been improved. This includes the addition of supporting new types of surface roughness models, including Modified Hammerstad and Cannonball roughness models.

DC Drop Visualization Improvements

Via currents have been added to the plots generated by DC Drop analysis. You can now view 2D/3D plots of the via currents to more quickly pinpoint areas of excessive via current. Furthermore, the current vector plots have been enhanced to be more intuitive, showing current vectors as arrows of varying color and size to depict the flow of current.

Other DC Drop Analysis Enhancements

Models created for DC Drop analysis can now be saved and re-used for multiple versions of a design, or across multiple designs. The models can be saved as .hlpimodel files, and assigned by .ref or .qpl files. Also, the voltage constraint for DC Drop will now default to being a percentage instead of a fixed voltage. This allows for quicker application of a single percentage for multiple voltage nets for batch analysis, as well as the more intuitive representation of the constraint as a percentage.

Fast-Settling Capacitor Model

A common issue with simulation of multi-Gbps SERDES interfaces is the settling time of capacitor models. There are a number of documented workarounds to this issue on Support Center. In HyperLynx VX.2.3, you no longer need to employ these workarounds, as a built-in fast-settling capacitor model has been added. This models works by the simulator generating two DC operating points prior to simulation, which allows for rapid calculation of the capacitor

bias voltage, and avoidance of the lengthy time for the capacitor to “settle”. This model is disabled by default, but can be toggled under the Advanced Options tab.

Package Wrapping Utility

A new utility has been added to allow for easily adding a package model to an IBIS model. Due to limitations in the built-in IBIS package model, vendors often provide models for their packages in S-parameter and SPICE format. The new wrapping utility provides an intuitive GUI for mapping the package model nodes to pins in the IBIS model, with a choice of formats.

Touchstone Viewer Improvements

In the Touchstone Viewer, you can now save your settings as a project to be re-used later. Also, various viewing improvements were made, including on-the-fly mode conversion for looking at the mixed-mode version of an S-parameter.

Total Net Capacitance

In addition to being available in the General Batch Wizard, the Total Net Capacitance for a net can be quickly seen by right-clicking on the net and viewing the Net Statistics. The capacitance is reported as a total net capacitance, which includes the loading from any attached IC models, and the capacitance of just the trace metal itself.

Automation and Scripting

A scripting infrastructure has been built into HyperLynx for the past several releases, and in this release a scripting debugger has been added to make it much easier to debug scripts. There are also a number of script tutorials available in the HypFiles folder in the install directory.

Licensing

The PADS VX.2.3 release utilizes the Mentor Standard Licensing software version 2016_2. The latest version of licensing software is always available on Account Center:

`https://account.mentor.com/licenses/download`

This version of PADS requires a PCLS FlexNet license server running at version v11.13.1 or higher. If you use floating licenses and your license server is not at least a FlexNet v11.13.1, you will need to update the license server.

Related TechNote: Why upgrade to FlexNet v11.14.1.3? Download the latest licensing software.

Authorization Codes

To use PADS VX.2.3, a minimum license version (Exact Access Date) of 2018.02 (February 2018) is required. The EAD reflects the support contract expiration year and month.

There are no other changes to authorization codes for this release. You may download your existing authorization codes from Account Center:

`https://account.mentor.com/licenses`

For additional information on licensing, refer to the *Licensing Mentor Graphics Software* manual, or *Getting Started with Licensing* on Account Center:

`https://account.mentor.com/licenses/guide`

Support Information

If you have questions about this software release, please log in to Support Center. You may search thousands of technical solutions, view documentation, or open a Service Request online at:

`https://support.mentor.com/`

If your site is under current support and you do not have a Support Center login, you may easily register for Support Center by filling out the short form at:

`https://support.mentor.com/en/register`

Platform Support Changes

No platforms changes for PADS VX.2.3.

Supported Platforms

Overall Notes

- Specified patches below are minimum levels. Later versions of the patches are valid, supported configurations.
- Except as noted, all products are supported on all platforms.
- Processor and Memory requirements vary based on the mix of applications being used, the design complexity, and infrastructure requirements. Individual needs may vary from those published below.

Processor Note for Intel/AMD Processors

All Windows OS variants run on Intel or AMD x86 or x64 processors. In the past, the processor GHz speed determined the performance, but recent changes in the internal architecture of both Intel and AMD processors have made these comparisons difficult. Therefore, the following recommendations are being made for **all** Windows systems:

- Supported processors and systems are those manufactured since 2008 which conform to the subsequent requirements.
- Intel Celeron processors are not recommended.
- Minimum requirement is a dual-core (or dual processor) system. A quad core is recommended for improved overall system performance. A hyper-threaded processor should be considered a single processor, not a dual processor.
- For best results, maximize processor speed and L1/L2/L3 processor cache memory.
- Typically, cost is the best indicator of performance, and extra investment in processor capability returns better system performance.

Microsoft Windows 7

Microsoft Windows 7 (32 and 64 bit versions), Professional Edition, Ultimate Edition, and Enterprise Edition are supported. While there is no known issue with running Microsoft Windows 7 Starter Edition and Microsoft Windows 7 Home Premium Edition, the product has not been tested with these editions, and therefore is not supported.

Kernel Configuration: N/A

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8GB recommended

Swap Space: 2x the amount of RAM

Windows Server 2008 R2

The following configurations are only supported for the sharing of libraries. All other PADS VX.2.3 products are not supported on any Windows Server platforms.

Microsoft Windows Server 2008 R2, Standard Edition with all current updates via Windows Update, both 32-bit and 64-bit versions.

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8GB recommended (per simultaneously logged in user)

Swap Space: 2X the amount of RAM

Microsoft Windows 8.1

Microsoft Windows 8.1 (32 and 64 bit versions), Enterprise Edition and Pro Edition are supported. While there is no known issue with running Microsoft Windows 8.1 Basic Edition, the product has not been tested with this edition, and therefore is not supported.

Kernel Configuration: N/A

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8GB recommended

Swap Space: 2x the amount of RAM

Windows Server 2012 R2

The following configurations are only supported for the sharing of libraries. All other PADS VX.2.3 products are not supported on any Windows Server platforms:

Microsoft Windows Server 2012 R2 with all current updates via Windows Update.

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8 GB recommended (per simultaneously logged in user)

Swap Space: 2X the amount of RAM

Microsoft Windows 10

Microsoft Windows 10 (32 and 64 bit versions), Enterprise Edition and Pro Edition are supported.

While there is no known issue with running Microsoft Windows 10.0 Home Edition or Educational Edition, the product has not been tested with these editions, and therefore is not supported.

Kernel Configuration: N/A

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8GB recommended

Swap Space: 2x the amount of RAM

Windows Server 2016

The following configurations are only supported for the sharing of libraries. All other PADS VX.2.3 products are not supported on any Windows Server platforms:

Microsoft Windows Server 2016 with all current updates via Windows Update.

Processor: Dual-core Intel or AMD processor minimum. See Processor Note for Intel/AMD Processors above.

Memory: 8 GB recommended (per simultaneously logged in user)

Swap Space: 2X the amount of RAM