Personal Automated Design System

Release Highlights

Software Version: PADS VX.2

August 2016

Introduction

This document provides a high-level summary of the PADS VX.2 release. Refer to the Release Notes on SupportNet 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 the release. Refer to the Release Highlights documents on SupportNet for the most up-to-date release information.

New Features Introduced in PADS VX.2

The following new products, features and enhancements are introduced in the PADS VX.2 release.

New Product Options

The PADS Product Creation Platform provides new product options that enhance the core schematic design and layout flow and delivers a full suite of analysis and simulations tools that are available for both PADS Standard and PADS Standard Plus.

- **PADS HyperLynx DC Drop** – Avoid unexpected circuit behavior by identifying power delivery issues early. Validate power supply impedance to optimize power distribution networks. Assess voltage drop by quickly and accurately identifying areas of excessive current density with fast and accurate results.

- **PADS HyperLynx DDR Analysis** – Identify and solve Signal Integrity and timing challenges specific to DDRX designs. Resolve typical SI impairments such as Overshoot/Undershoot and ringing. Identify DDX timing issues such as Setup/Hold, De-rating, Skew and Data bus margins.

- **PADS HyperLynx DRC** – A rules based approach versus traditional simulation to identify non-CAD constraints. Out of the box checks for EMI, Signal Integrity and Power Integrity. Simple to set up and fast time to results. Visual and report form of results for easy identification of violations**.**

- **PADS FloTHERM XT** – 3D computational fluid dynamic (CFD) solution that supports steady state and transient analysis. Allows electrical/hardware engineers to perform thermal analysis much earlier in the design cycle. Easily import mechanical objects such as product enclosures and heat sinks.

- **PADS AMS Design Suite** – Comprehensive circuit design and virtual prototyping environment, including support for analog and mixed signal (AMS) with SPICE based simulation engine and modeling. In addition to standard simulation analysis: DC Bias, time-domain, and frequency-domain simulations, AMS also includes multi-run parametric sweeps, sensitivity, Monte Carlo, and Worst Case analysis.

In addition, there is a new option for PADS Router:

- **PADS Multi-Trace HSD Routing** – Route and tune nets with high speed design constraints automatically without the need for the Batch auto-router.

The PADS 575 bundle has also been upgraded to include newer functionality:

- **PADS 585 bundle replaces the 575 bundle** – Includes PADS 3D + PADS MCAD Collaborator + Design Archive Manager

Improvements to Migration

With each release, improvements and enhancements are continually being delivered for both migration within MGC flows and translations from competitive tools. More than 75 defects have been addressed for VX.2 across the following areas:

- Migration between MGC flows – PCB migration from PADS to PADS Professional and Xpedition Enterprise

- Library Migration – PADS DX Designer and PADS Netlist libraries to Central Library

- Translation from competitive tools – Improved translation, with particular emphasis on Altium, to PADS Layout, PADS Professional and Xpedition Enterprise

PADS Layout

PADS 3D

- Display Control Dialog – Significant improvements have been made with the layout, usability and functionality of the 3D Display Control Dialog.

- Remapping of STEP Models – The process of remapping (changing) a STEP model to a Decal has been improved.

Copper Pour Quality Improvements

A new engine improving the overall quality of flooded/poured copper has been implemented that addresses 60+ customer Service Requests focused on resolving shorting and clearance issues.

Removal of Unused PADS

Improvements to the removal of unconnected pads in embedded planes, anti-pads and thermals that addresses 30+ customer Service Requests.

ODB++ Export improvements

Improvements to all areas of the ODB++ export functionality that addresses 20+ customer Service Requests.

Create PDF improvements

Improvements to all areas of the Create PDF export functionality that addresses 20+ customer Service Requests.

IPC2581 Output

An option to generate IPC2581 has been added to ODB++ export

CAM Output and Pad Stacks Editor

Usability improvements have been made to both the CAM Output and Pad Stacks editor

- Define CAM Documents – Addition of an Auto Define button to define default CAM documents.

- NC Drill Drawing Document – Improvements to:
    - Beginning Header
    - Units used in Drill file
    - Leading/trailing digits
    - Identification of plated tool numbers
    - Identification of unplated tool numbers
- Pad Stacks Properties Dialog – Improve overall layout and support resizing.

Integrated Projects

In a continued effort to reduce the differences between the Netlist and Integrated projects, the following functionality was added for Integrated projects:

- Associated/Electrical Nets
- Virtual Pins
- Board Edge Clearance to Via, Pad, Trace and Copper
- Copper Clearance to Via, Pad, SMD, Trace and Copper

PADS DX Designer

There are several ease of use improvements and new functionality for the VX.2 release.

Windows Layout

There are three layout options delivered that provide increased visibility for Toolbars, Icons, data panes and window layouts as your expertise level increases:

- **Default** – Provides simplified toolbars and windows for basic use.

- **Classic** – Provides even more tool access and additional window navigation controls.

- **Symbol Edit** – Provides access to those most commonly used commands while in the embedded symbol editor.

Part Search/Replace

- Smart, Google like search across design, libraries and Databook.

- Replace utilizes the Part Search function, wizard to step through the process.

In Line block Editing

Simplified block creation process. Place block by name immediately. Add, delete move, rename pins and rename nets (keep pin names), change pin type.

Cross Referencing

Replacement for SCOUT. Supports hierarchy and Xref annotations, uses border zone information and no need to close schematic to run.

Color by Net

Capability to color nets and apply across the design with switchable visibility.

Embedded Symbol Editor

- Developed using PADS DX Designer. Identical look and feel, same settings, Fonts, Grids, Layered Graphics and Color Schemes etc.

- Same editor engine, all PADS DX Designer functionality inherited: grab handles, Group/Ungroup, Smart shapes etc.

- Full support for OLE objects.

- Shared PADS DX Designer automation layer: VB Script and Java.

- Support for Compound Symbols: replace multiple symbol definitions (.1, .2 files etc.) with single definition for all rotational views. Removes the need to reposition properties after placement/rotation.

Selection Filter

Support for Schemes, by user or site wide via WDIR.

Exclude from Layout

Capability to set "Forward to PCB=False" directly in the schematic, with options to exclude from Part list at the same time.

Object Rotation

Enhanced to support symbols and connectivity, modify the center of rotation, rotate clockwise and anti-clockwise.

Object Manipulation

- Grab Handles have been added to Arc, Box, Circle and Line. Removes the need for the "Stretch" command.

- Symbol Scale added to Properties dialog, editable directly. Removes the need for the "Scale" command.

Net Merge

Support for multi-net merge, removal of pop up messages with simple selection mechanism.

IDEAS

40+ IDEAS implemented for VX.2.

PADS Logic

Some of the top IDEAS submitted by users have been addressed.

- IDEA D248 – Snap to grid when pasting circuits in Logic

- IDEA D5697 – Retain designator and other attribute locations after part update

- IDEA D11988 – BOM Make 'Fields - Design' dialog resizable

Power, Ground, and Off-Page Symbol Mapping

Improved overall capabilities for mapping and updates of multiple Power, Ground, and Off-Page symbols between libraries and where used on schematics.

Import from OrCAD

Updated support of OrCAD version 16.6 import into PADS Logic.

HyperLynx SI/PI/Thermal 9.4

Overview

HyperLynx v9.4 is a major release that adds many new features to HyperLynx's signal integrity, SERDES (including 3D electromagnetic), power-integrity, and mixed SI/PI simulation capabilities. The release also offers compatibility with Mentor's latest PCB-design tools. Finally, HyperLynx v9.4 includes a large number of defect fixes and improvements.

New Signal Integrity Features

Component Model Symbol

The new Component model symbol in LineSim allows for much neater schematics when dealing with schematics with a lot of drivers and receivers. Drivers and receivers on the same component can be grouped together in the Component model symbol.

IPC-2581 File Import

Another PCB output file format, IPC-2581, can now be imported into BoardSim.

New Reports for Generic Batch

In HyperLynx v9.4, Generic Batch simulation adds new HTML-formatted reports, similar to those that were introduced in v9.3 in the DDRx Wizard. The new batch-analysis reports have multiple pages - a Summary page and subsequent pages with details on the individual analyses in the simulations.

ODT Sweeps in DDRx Wizard in LineSim

The ability to sweep on-die termination (ODT) settings in the DDRx Wizard has been added to LineSim in HyperLynx v9.4. Users can set up a series of different ODT settings for the Wizard to sweep through when running the analysis. The settings will include the device, signal group, and ODT status.

New Power Integrity Features

New Reports for DC Drop

In HyperLynx v9.4, DC Drop simulation adds new HTML-formatted reports, similar to those that were introduced in v9.3 in the DDRx Wizard. The new batch-analysis reports have multiple pages - a Summary page and subsequent pages with details on the individual nets analyzed. The reports will have the same data as the old text reports, organized into tables for easier viewing.

Advanced Decoupling Analysis Down to 10 KHz

The simulation engine used by Advanced Decoupling Analysis has been enhanced in HyperLynx v9.4 to support accurate AC analysis down to 10 KHz.

Loop Inductance Report from Advanced Decoupling Wizard

The Advanced Decoupling Wizard now has the option to output a loop inductance report which details the quality of the connection of the IC pins to the PDN. This report is generated in HTML format.

New Decoupling Capacitor Model Libraries

The HyperLynx v9.4 installation now features a library of models for common capacitor types. These are available in the LIBS directory in the install.

DC Drop Simulator Performance Improvement

The DC Drop simulator has been enhanced to simulate faster. Noticeably faster simulation times; up to 2x for very large boards.

GUI Improvements

Improved Panning Capability

In HyperLynx v9.4, users can now pan in BoardSim and LineSim by holding down the middle mouse button and moving the mouse in the desired direction of panning. The same panning and zooming scheme is used in the board viewer, schematic editor, PDN editor, and DC Drop board viewer.

New Measure Feature in BoardSim

A new feature has been added to the board viewer to allow users to measure between two objects. A crosshair is snapped to a specific location and the cursor moved to measure distances to other objects. This feature works in conjunction with the new panning capability to facilitate measuring large distances on a board.

HyperLynx DRC 6.3

Summary

The HyperLynx DRC v6.3 release offers new features and includes a number of defect fixes and improvements.

HyperLynx DRC is a powerful and fast design rule checking tool that can run complex design rules that are not easily simulated, such as rules for EMI/EMC. HyperLynx DRC ships with 23 standard design rule checks (DRCs) (such as traces crossing reference plane splits, reference plane changes, and signal via quantities). This capability enables you to quickly identify locations on your board that may cause EMI/EMC, signal integrity, and power integrity issues.

HyperLynx DRC accesses database objects through the automation object model (AOM), and enables advanced geometrical operations on them. This provides detailed access to the design database and allows you to develop many types of DRCs. With support for VBScript and JavaScript, as well as thorough documentation of the AOM and DRC coding standards, and a built-in script debugging environment, you can quickly start writing your own DRCs.

The sections below describe the new features in this release.

Usability Improvements

- New Welcome screen – Quick access to the user manuals, tutorials, reference guides, recent projects and more

- Better organized object lists branch – Separate "classifying" object lists from others

- Layout data grouping for easy and quick access

- Quick finding in Project Explorer (Windows Explorer style) – Quickly type a sequence of letters to find and select an object

- Glob (wildcard) filtering condition in addition to regular expression

Broader Data Type Support

- New support for IPC2581 design format

- Improved ODB++

- New Constraint Classes branch – Full hierarchy is available via GUI and AOM

Enhanced Rules

- All rule documents now list both English and Metric default values

- Impedance and Differential Impedance – Eliminate false violation around anti-pad areas if "IgnoreViaConnections" is set to yes

- Long Stub – Eliminate false violation in area fill areas in certain specific cases

- Net Crossing Gap – Now support constant traces in addition to planes and area fills

- Metal Island – More accurate to detect violation areas requiring additional vias

- Edge Shield –Now a through hole pin is considered as a stitching component

- Termination Check – Now support differential pairs

- Vertical Reference Plane Changes:

    o Better stripline and dual-stripline supports

    o Improved anti-pad recognition

    o Covering reference plane change related to serial discrete components that use via-in-pad

    o Split out Signal Supply check

    o Various bug fixes

Better Integration and Platform Support

- Windows console mode

HyperLynx DRC Debugger Usability Enhancements

- Object Browser

    - Easy access to HLDRC AOM objects, their properties and methods

    - Add references to external type libraries for developing rules driving external applications (Xpedition, SI/PI, MS Excel, etc.)

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- Prefix Manager and intelliSense

    - Easy coding and AOM insertion

AOM Enhancements

- New graph engine (apply powerful methods of graph theory on PCB designs and easy write powerful rules as length matching, connectivity walking, maze algorithm, path finding etc.)

    - Available through HLDRC AOM

        - GraphEngine, Graph, GraphEdge, GraphNode, GraphShortestPath

    - Allow to use various graph theory methods on layout designs

        - Shortest path, depth first search, breadth first search, …

    - Some predefined graphs are available

        - Connectivity graph built-in for connectivity building

        - Topology graph for electrical and physical nets

    - Other types of graphs can be created as needed

- Electrical Net: NamedByUser, Clock, LowPower, NetClass, RadiationClass, SusceptibilityClass, Analog, Noisy, Sensitive, SetName, SetVoltage, SetFrequency, SetSwitchFrequency, SetKneeFrequency, GetPinsByType, GetCouplingNetCapacitance, GetCouplingNetInductance

- Component: SetType;\, AssignModelBy, ModelByType, ModelBy

- Cross Section: FieldSolverIgnore, IsFieldSolverIgnored

- Geometry Engine: DistanceEx

- Pin: PackageDelay, PackageLength

- TransLine: RefUpperObjects, RefLowerObjects, RefLeftObjects, RefRigthObjects

- ObjectList: ContentType, Filter, Description

- Pad: ConnectedObjects

More Controls from External Automation

New Settings object

- Access via Application.Settings property

- Control most of settings available in Options dialog

  - Exclusion: Default Values -> Physical Net; Differential Pairs -> Custom Differential Pairs Builder

Licensing

The PADS VX.2 release utilizes the Mentor Standard Licensing Server MGLS v2015_1. The latest version of MGLS is always available from SupportNet by searching for the product "System Administration" under the Product Finder. This version of PADS requires a FlexNet license server running at version v11.13.1.2 or higher. If you use floating licenses and your license server is not at least a FlexNet v11.13.1.2, you will need to update the license server.

Note: Customers desiring to run their Licensing Server on Windows 10 operating systems, should install Mentor Graphics Standard Licensing v2015_1 with FLEXnet v11.13.1.2 (or newer) currently only available from SupportNet.

Related TechNote:

Why upgrade to FlexNet v11.13.1.2/v11.13.1.4? Download the latest licensing software.

Authorization Codes

To use PADS VX.2, you must be on support contracts for these products as of May 2016. For more information about "Exact Access" authorization code formats, see the explanation on SupportNet at:

http://supportnet.mentor.com/about/other-info/exact_access.cfm

You may download your site's existing authorization codes from SupportNet at:

http://supportnet.mentor.com/myaccount/index.cfm?fa=user.licenses

For additional information on licensing, refer to the *Licensing Mentor Graphics Software* manual.

Ordering Licenses

PADS users must order new software licenses prior to installing PADS VX.2. To order licenses, contact your local Mentor Graphics sales office. They can provide you with information on the number of node-locked and floating licenses your company purchased and any current license sever configurations you may have. You must provide them with:

- Any new license server configuration

- The host ID numbers of client and license server workstations for node-locked licenses

- The host ID number of the license server workstation for all floating licenses

Existing Mentor customers are reminded that your licensing report is available at the SupportNet web site (*http://supportnet.mentor.com/myaccount*), and then choose the My **Licenses** tab.

Note: The Customer Support web site requires a login and password. To register and obtain a password, go to *http://supportnet.mentor.com/user/register.cfm*. If you have difficulties, email *csd_registration@mentor.com*.

If you are registered, but have forgotten your password, go to

http://supportnet.mentor.com/user/forgot_password.cfm

Installation Information

This release uses the Mentor Graphics Standard Installation program. For additional information on installation, refer to *Managing Mentor Graphics PCB Systems Software* manual and the help system within the installation software. You can view this manual at the top level of the CD and on SupportNet.

Platform Support Changes

The following Windows platforms are no longer supported with the release of PADS VX.2:

- Windows Vista

- Windows Server 2008

Support Information

If you have questions about this software release, please log in to SupportNet. You may search the KnowledgeBase with thousands of technical solutions or open a Service Request online at:

    http://www.mentor.com/supportnet

If you do not have a SupportNet login, you may easily request one by filling out a short form:

    http://www.mentor.com/supportnet/quickaccess/SelfReg.do

For phone support in the United States or Canada, please call 1-800-547-4303. For phone support in other locations, please contact your local sales office or distributor. All Customer Support contacts can be found on our web site at:

    http://www.mentor.com/supportnet/support_offices.html

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 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 <u>Processor Note for Intel/AMD Processors</u> 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 <u>Processor Note for Intel/AMD Processors</u> above.

Memory: 8GB recommended

Swap Space: 2x the amount of RAM

Windows Server 2012 & 2012 R2

The following configurations are only supported for the sharing of libraries. All other PADS VX.2 products are not supported on any Windows Server platforms:

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

Warning: The new Microsoft Edge Browser delivered with Windows 10 is not supported with PADS VX.2.

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 10 VMWare Based Virtual Machine Installation

PADS VX.2 installation may not complete on VMWare based Virtual Machines running Windows 10 without the System Variable _JAVA_OPTIONS=-Dsun.java2d.d3d=false.

1. Go to System Properties -> Environment Variables -> New and add the following system variable. **Please pay attention to the following details**. Variable name has an underscore in the beginning and the variable value begins with a dash with an all lower case "false" at the end.

   Variable name: _JAVA_OPTIONS
   Variable value: **-**Dsun.java2d.d3d=**false**
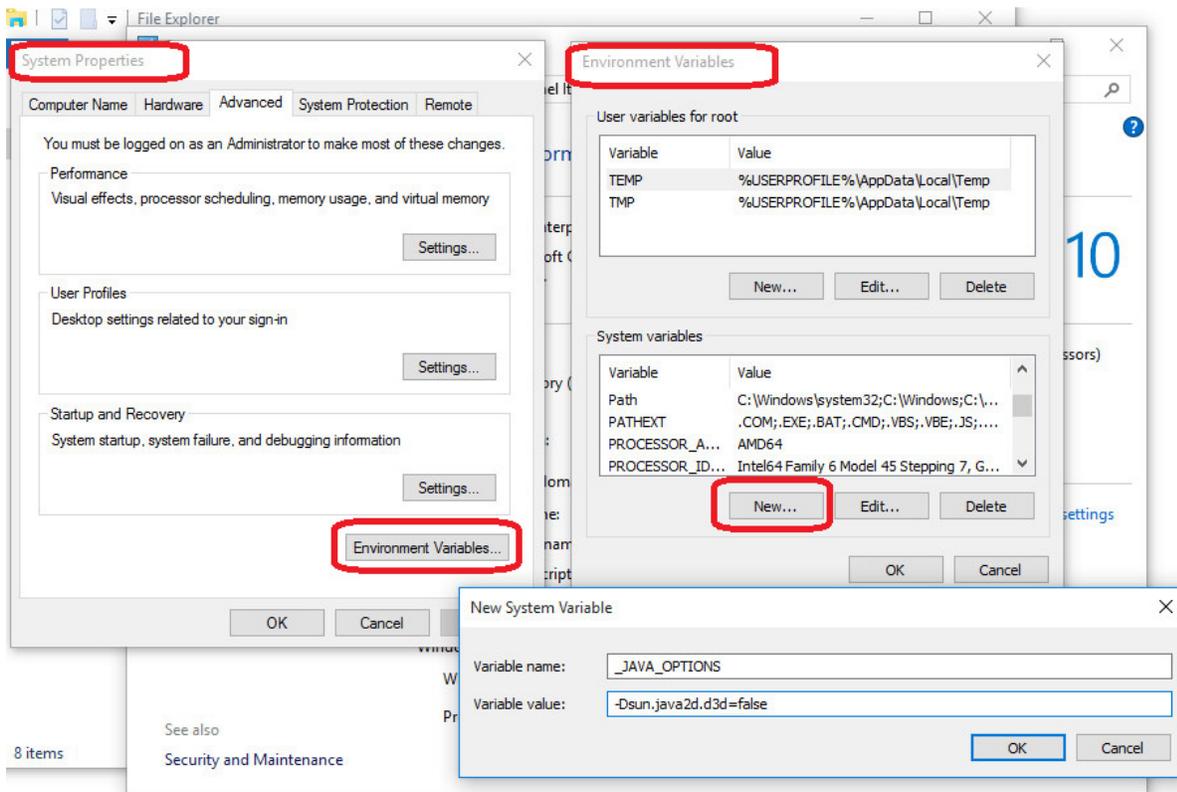
2. After you save it make sure to double check that this System variable set as documented.

3. Invoke PADSVX.2_mib.exe to start the PADSVX.2 Installer.

Warning: While performing the steps to set up the environment variable, ensure you do not copy and paste the variable text into the New System Variable dialog box; Microsoft Windows inadvertently converts the en dash into an em dash, thereby making the variable incorrect.

For more info about "en dash" vs "em dash" https://support.office.com/en-us/article/Automatically-format-hyphens-as-en-dashes-and-em-dashes-8742dd30-af01-464f-a8c8-ec6fdee23197