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The Agilent Medalist X6000 1.13 Software Patch Release Notes

The Agilent x6000 1.13 software patch has been created to correct several issues within the Agilent x6000 1.12 and previous software releases. This patch also provides a large set of enhancements which will change how applications are developed providing both the ability to generate a more reliable application while also improving the overall user experience. It is strongly recommended that users of the previous 1.x software releases install the 1.13 patch.

If you feel we are missing anything or would like to make suggestions on how we can improve the software, we would like to hear from you. Please feel free to contact either your local Agilent Medalist x6000 support representative or send an email to emt-hstd-support_americas@agilent.com

Project Backup Prior to Installation

When loading a previously developed project for the first time with the new 1.13 software, the project will be automatically updated with data that preserves the original project settings. To ensure that users not run into Project compatibility issues, Agilent highly recommends that all users push all current projects to the Project Database with a description of "1.1x project backup." In the event that an application needs to run on a previous software release, such as 1.12, the project can be reloaded from the Project Database.

Note that all projects created with the 1.13 software will not load into a previous release of software. When planning to upgrade to the 1.13 release, all Agilent x6000's and Offline Workstations should be upgraded at the same time to ensure that no project compatibility issues occur.

Enhancements Introduced in the 1.13 Software Release

Agilent Medalist X6000 Help Documentation

Don't miss the new Agilent Medalist X6000 Help document which is available for download on-line. The new help documents further describe each of the new features below with more detail to ensure that you get the most out of 1.13. As in the previous versions of the help documents, you can either navigate your way through the various topics or you can search for specific topics, such as the new features below.

Precision Tuning Image Sets

With 1.13, users will now collect another full set of images called Precision Tuning Image set once they are completed with developing the Project with the Fine Tuning image set. The precision tuning image set employs the full set of surface modeling features which are utilized during ordinary Test Execution. This image set allows the user to further fine tune the Project and ensure that they are correctly using the shading compensation and focusing tools.

To correctly model the surface used by Precision Tuning image sets and Test Execution, the project must accurately test the majority of the panel. The developer **must** initially set up the projects with the Fine Tuning image sets.

Precision Tuning Image sets should be used to refine tuning of joints that are not focused properly in the Fine Turning image sets as well as used to initially learn the Shorts regions. Precision image sets are also the only way to view subtypes which use Predictive Slice Height.

The Precision Tuning Image collection will only image the entire panel so users will be unable to select specific image collections that Fine Tuning allows.

Predictive Slice Height

Predictive slice height is a feature which calculates the z height position to use for focusing a joint by using the z height determined by the PASSING surface mount components around the joint in question. All joint types except for PTH use components which are on the same side of the panel as the joint in question to determine the slice heights. For PTH joints, components on the bottom (or protrusion) side of the panel are used to calculate the slice heights. The calculated position creates the focus plane which is used for the specific joint in question. This feature enables testing of Pressfit parts as well as allows a more repeatable focus for Plated Through-Hole (PTH), Capacitor Networks, Thermal Pads and any type of joint which exhibits a potential focusing issue.

To utilize Predictive Slice Heights on Subtypes, a user can enable or disable the feature through the Slice Setup threshold tab. The Predictive Slice default is enabled for the Pressfit and PTH and disabled for all other algorithms. For applications developed prior to 1.13, Predictive slice is disabled for all algorithms.

Users should note that Predictive Slice Heights will increase the overall test time of an application but is highly recommended for Pressfit parts as well as to ensure an accurate through hole package test.

PressFit Algorithm

The PressFit algorithm allows for the testing of pressfit joints at 2 configurable slice heights to determine whether the joint has an open or a short. The algorithm references the component side as being top and then creates the barrel slice at a default of 75%. The barrel slice, which is user definable in the Slice Setup thresholds tab, uses Maximum Difference of Gray Level from either Nominal or Region Neighbors which determines the presence of the PressFit pin. The component side or top slice uses the Shorts test to determine if the pin is bent on the surface of the board.

User Defined Initial Thresholds

The new User Defined Initial Thresholds feature helps reduce tuning time by overwriting default thresholds with new user defined ones that are more reflective of the process and joint characteristics. Under the System Configuration – Software Options, users can define the initial thresholds for each algorithm and save them as a specific Initial Thresholds file. The initial threshold file can be used either during the initial import of CAD or during the creation of a new subtype.

Excess testing for discrete Chip Components

Excess is an additional test on the existing Resistor, Cap and PCap algorithms. Excess is the opposite of insufficient test, determining if the joint has an excess of solder. If the measured solder is greater than the maximum thickness percent threshold, default of 150%, the test indicts the joints as excess.

BGA Circularity Test

The BGA algorithm has several new Eccentricity tests which allows for testing of both non-circular joints among normal circular joints and circular joints among normal oval joints. Eccentricity defines how circular an object is. The larger the eccentricity value, the more the non-circular the object is.

To identify non-circular joints among normal circular joints use Open: Maximum Eccentricity for Pad & MidBall. For joints that are less circular, the values will be larger, falling above the maximum allowed eccentricity.

To identify a circular joint among normal oval joints use Minimum Eccentricity for the Pad. Normal joints which should form an oval which don't properly solder will be circular. The eccentricity measurement will be smaller for those joints that are more circular.

Interactive Learning for Exposed Pad

For the Exposed Pad Voiding algorithm, the system can learn what the joint image should be expected to look like. The process in creating this "expected image" is done either through automatically learning all of the images or manually (interactively) reviewing them and determining whether to use each joint to generate the final image. By allowing an interactive learning process, users can easily determine which joint images should be used and which joint images should be ignored to ensure they get the best possible "expected image" for the voiding analysis. This new interactive learning feature is available in the Initial Tuning window and is accessible only when "Exposed Pad Voiding Images" is checked.

For further details on how to properly use Interactive Learning, review the on-line help documentation.

Improvements to Adjust CAD

During the Verification image review, it is now possible to perform the following tasks:

- Adjust Pin Orientation
- Adjust Joint Types
- Toggle status of package between "No Test" and "Set to Test"

All of these tasks are accessible by using the mouse to select pins and Right-clicking on the mouse to bring up the menu to make these modifications.

Improvements in Results tab

When reviewing multiple subtype results in Fine Tuning under the Results tab, users can automatically switch between reviewing just the highlighted subtype or all of the multiple subtype results. This is done by selecting the subtype, Right-clicking on the mouse and highlighting "Select Subtype" or Double-clicking on the subtype. Once the subtype has been selected, the thresholds will be available for editing as well as the subtype being ready to test under the Run Tests tab. To revert back to the original list of defects, right click on a defect and select "See all Results".

Improvements to Measurement tab

When reviewing a subtype under the Measurement tab, a user can easily select which threshold measurement to chart. This is done by selecting the threshold in the threshold list and either Double-clicking the threshold field or Right-clicking and selecting "Chart Measurement." If the threshold is a valid measurement for plotting, the chart will automatically open up.

Decreased test time for Partial Test programs

Projects now run on the 1.13 software will no longer process packages that are set to No Load or No Test during Test Execution. For Fine Tuning image sets, an option is available to capture these components / joints in-case it is determined during development they need to be tested. Precision Tuning Image sets do not capture images for No Load and No Test components / joints. The ability to completely ignore these components / joints allows the system to potentially skip over those areas of the panel, thus decreasing overall test time for these types of applications.

Gullwing Upper Lead Shorts Detection

The Gullwing Shorts algorithm allows users to enable the testing for shorts at a slice higher up the lead. A new threshold was added in the Short Additional list to be able to set this High Short threshold different from the standard short threshold.

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Issues addressed by the 1.13 Software Release

Software revision 1.13 addresses the following issues:

Problem Description	Resolution
Programs with mixed pin level subtyping throws an assert during program generation	Program generation allows for mixed pin level subtyping
Grayscale adjustment would attempt to run before Test Execution with a panel loaded, forcing the panel to be unloaded prior to running the adjustment.	New timing and logic has been added to ensure that grayscale adjustment will only run when a panel is unloaded during Test Execution.
Alignment would throw an error if a panel contained a matching component on the top and bottom side.	Alignment now ignores the matching components and only uses the component on the appropriate side identified during alignment setup.
An assert would be thrown if a user tried deleting all of the Short Background Region learned data.	The software handles deleting the Short Background Regions by ensuring the file is not being accessed by the current panel.
QFN needs a Heel/Toe Signal Measurement	New QFN Opens threshold added: Enable Toe Test if Center to Heel Thickness Test Fails – default is 130%
An Assert is thrown if you change an algorithm family subtype test to an all test after reviewing measurements.	The set of steps are correctly handled by fine turning.
The system slows down while collecting an image set on a panel which is testing 0201 packages.	The memory allocations of the controller have been setup to handle the smaller images which are generated by small package types like 0201 packages.
Focus confirmation does not retest passing joints at the correct Z height.	Focus confirmation now begin Z height testing based off of the correct focus rather than the incorrect starting Z height.
IRP_RECONSTRUCTION_NOT_IMAGED_KEY error which do not allow some projects to be imaged.	The alignment issues with IRP's have been addressed allowing for projects that saw this error to be tested by the x6000.
Large joint count projects (< 75,000 joints) can cause a Java heap error during inspection.	The Java memory allocation has been arranged to handle larger sets of images to accommodate projects with 100,000 joints or more.
Assert during learning non-collapsible bad BGA images (Inner region has to be smaller than outer region)	Bad BGA images are now handled by allowing them to be learned.
Selecting multiple results in Review Results can cause a java heap error.	Review Results will load as many results as possible. The system will stop prior to generating a java heap error.
The new Short Region Exclusion zones are not displayed on X-ray image	The Short Region Exclusion zones are displayed on both the X-ray image and on the diagnostics graphics.
When loading a project that contains small letters as part of the project naming via a serial number in Test Execution, the project name is switched to capital letters. This results in the Repair Tool seeing to Project names.	The letters are left with the previous sizes when the application is saved to ensure project name consistency.
If a pad used for alignment has its algorithm type changed, an Assert will be thrown next time alignment runs.	The pad's algorithm type change now propagates through the system alerting the user that a change has occurred and alignment should be performed again to ensure the setup is still correct.

Capacitor subtypes will record a different set of learned fillet thickness when using automatic learning in Initial Tuning vs. Update Nominal's in Fine Tuning.	Update Nominal's in Fine Tuning has been corrected to update the correct nominal Fillet Thickness values.
Exposed Pad does not learn multiple panel image sets correctly for the voiding analysis.	Exposed Pad correctly generates the expected image based off of multiple panel runs. Users also have the ability to run Interactive Learning to create the expected image.
Inspection regions exclude fiducials, exempting them as alignment points.	The system will now reconstruct regions with fiducials, allowing a developer to set them up as alignment points.
Assert – InspectionRegion for component doesn't fit on either sub-panel of long panel	This was an issue with a component being located near the divide line on a long panel. The software now correctly places the component in the correct location.
The entire long panel will be tested when trying to collect just a single subtype image set.	The system will now correctly stop testing the entire long panel and will only test enough of the panel to collect the single subtype image set.
Cap and Res algorithms incorrectly learn the background measurement.	The background measurement will be left at its default setting which is working better then the learned value.
Collapsible BGA needs the ability to determine if a ball diameter is smaller than its neighbors at the package slice.	A minimum region outlier test has been added to collapsible BGA Opens at the package slice.
Panel NDF defined as being greater than 18 inches long or wide would generate an assert when initially loaded into the x6000 software.	NDF's may be loaded into the user interface, but the developer will be required to correct the panel dimensions before loading the panel into the x6000 for alignment.
The image reconstruction processor would hang when the 2nd half of a long panel components are set to no test.	The system will no longer generate image sets for components set to either no load or no test.
The update nominals feature was not working for clear caps and resistors.	The feature has been fixed and now properly updates nominals for clear caps and resistors.