ENVISIONING • EMPOWERING • EXCELLING

PowerArchitect 5
5.2-r3

Release Notes

Revision History

Document No.	Release Date	Change Description
1.0.0	03/11/2012	Initial release of document for 5.01-r0
1.0.1	04/05/2013	Initial release of document for 5.02-r0
1.0.2	04/16/2013	Release of document for 5.02-r1
1.0.3	05/15/2013	Release of document for 5.02-r2
1.1	12/17/2013	Release for 5.1-r1
1.1.1	02/02/2018	Modified the wording in the "Runtime Hex Export" to include programmer flash file generation. Added MaxLinear Information.
200RNR00	4/8/19	Release of documents for 5.2-r3.

Table of Contents

List of Figures

List of Tables

Introduction

PowerArchitect 5 is an intuitive and powerful design tool used to program MaxLinear's Universal PMIC power controller and modules. This release has many usability and feature improvements as well as a number of bug fixes.

PowerArchitect 5.2-r3

Improvements

Increased flash programming pulse width for improved memory retention performance.

Removed obsolete "Modules" option and "XRP7720" Chip selection.

PowerArchitect 5.2-r1

New Features

RAM Imaging

RAM programming requires that there is no valid configuration in the FLASH NVM. A valid configuration is loaded in the chip if in the Dashboard window, the "Reset Chip" (F8) button is clicked and after a short delay, the "Chip Ready" indicates "Yes". When a new configuration is loaded into RAM with a chip that already contains a valid configuration in FLASH NVM, the first step will be to invalidate the FLASH configuration. The device will be reset to clear the prior RAM content and then the new run time configuration gets loaded. PA 5.2 will indicate that it successfully downloaded the configuration to run time registers after which PA 5.2 acting as a host will assert the "Chip Ready" indicator. If the configuration changes I^2C address, the device will respond to the new address at this point.

Bug Fixes

Minor fixes and enhancements.

PowerArchitect 5.2-r0

New Features

Added support for new chips: XR77128, XR77129.

Added support for resistor divider.

Bug Fixes

Minor fixes and enhancements.

PowerArchitect 5.1-r2

New Features

Added support for new development boards.

Bug Fixes

Corrected Reset Out Delay Time, previously calculated incorrectly resulting in longer than expected delay.(1)

Fixed issue where Power Sequencing parameters would not load properly from file.

Fixed Power Sequencing error on PWREN2 if PWREN1 is left empty.

Other minor fixes.

PowerArchitect 5.1-r1

New Features

Added support for new chips: XRP7720, XRP7725, XRP9710, XRP9711.

Expanded wizard directly targeting the module that suggests switching frequencies and components.

Introduced the Arduino as a controller board option.

Changed the Flash programming procedure to improve programming efficiency.

Improved the channel sample positioning algorithm.(1)

Bug Fixes

OTP warning, fault, and restart thresholds adjusted.(1)

Other minor fixes.

1. Changes HEX output

PowerArchitect 5.02-r2

Bug Fixes

Locking Coefficients

Locking coefficient feature was not properly working in previous releases. Files with locked coefficients had problems not converging during loop parameter calculations and when the project file was re-opened displaying the following error:

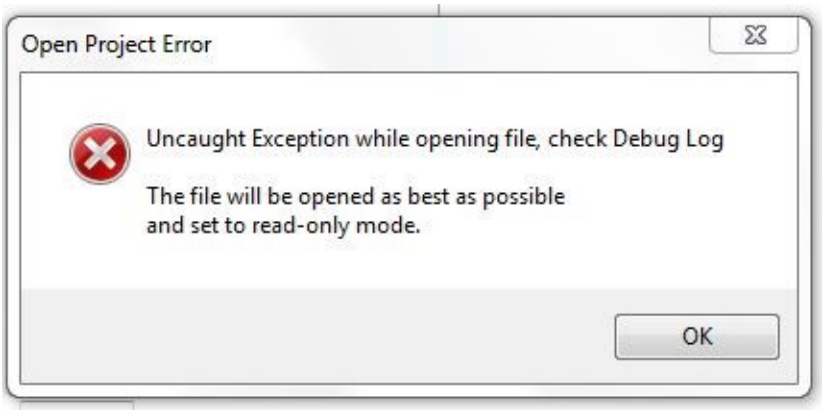

Figure 1: Open Project Error

GPIO / PSIO Functionality

GPIO / PSIOs were not being properly configured to:

- Forward hardware flags to GPIO0
- Accept external clock – Clock in to GPIO0
- Forward Power Good to GPIO1
- Forward clock out – Clock out to GPIO1
- Forward Power OK and Reset Out to any GPIO/PSIO

The issues related to GPIO / PSIO configuration were introduced in 5.02.

Power Good Calculations(2)

Power Good calculations were off by one ADC error bin.

Zero Frequency Selectors

The zero frequency selectors did not work in the frequency mode. They have always worked fine in the multiplier mode. In 5.02-r2, we eliminated the frequency mode selection of the zeros. The zero locations will only be selected by specifying the multipliers; corresponding frequencies will be displayed.

2. This change will cause a change in the HEX image.

Dashboard Issues

Enabling LDO3.3 in dashboard would cause the dashboard to hang.

When GUI handling of interrupts was unchecked, some interrupts were still masked and not able to be forwarded to IOs.

PowerArchitect 5.02-r1

Bug Fixes

Over Voltage Protection (OVP) Setting

If the OVP value was set to <5.0%, it will be read back in as 5.00% when the file is opened. This is a bug only present in 5.02-r0. See the example below. The left hand picture is the value when the project file was saved and the right hand picture is the result when the project file is re-loaded.

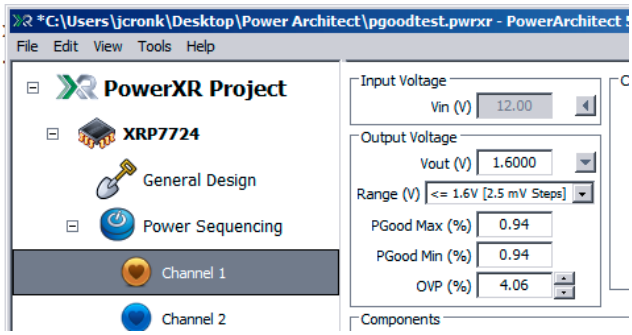

Figure 2: Project File Saved

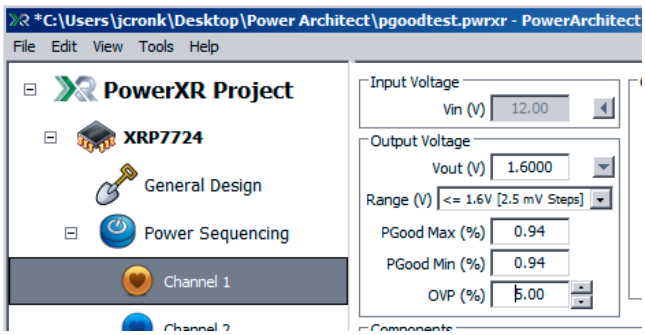

Figure 3: Project File Re-Loaded

PowerArchitect 5.02-r0

General Notice

PowerArchitect 5.02-r0 has restrictions on which previous generation project files may be loaded. The file format has also been changed to add improved forward compatibility, diagnostic capabilities, and prevent loading in previous versions of PowerArchitect 5.xx-rY. This change was necessary to avoid potential programming changes which could result in a physical change in performance of the XRP7724 power system.

The PowerArchitect 5.02-r0 install will direct the files to a new directory so that the user can continue to use the previous version of PowerArchitect until they are ready to fully migrate to the new version.

Table 1: Loading Restriction Details

File Version	Restrictions
File version older than 5.0-r0 or newer than 5.02-r0	Will open the file but will not allow saving of the file or output of any HEX programming files
File version 5.0-r0 or 5.01-r1	Saving the file will upgrade the project file format.
File version 5.0X-betaY (Unreleased Betas)	Will open the file but will not allow saving of the file or output of any HEX programming files. These betas would have been provided to specific customers. MaxLinear will work with those customers to migrate their project files to the main trunk of GUI revisions.

New Features

Runtime Hex Export

As well as being able to generate an Intel Hex binary file for use with third party programmers, it is possible to have a host device load the operating configuration into the runtime RAM memory rather than rely on the on board FLASH memory. There is now an option to export the runtime HEX image. The process to load this image is documented in ANP-39 *"Loading XRP7724 RAM with Runtime Intel HEX File".* To create a flash hex file, select "Export IntelHEX" in the "Tools" menu. Select "Flash" to create a programmer binary file. Select "Runtime" to generate a runtime file.

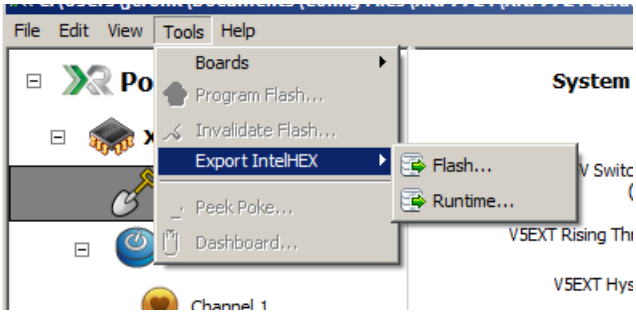

Figure 4: Create Flash Hex File

GUI Revision History

In the "PowerXR Project" tab, there is a new field called "Saved GUI Versions". The screen capture below shows an example of a project file saved in revision 5.0-r0 and then saved in the current version 5.02-r0.

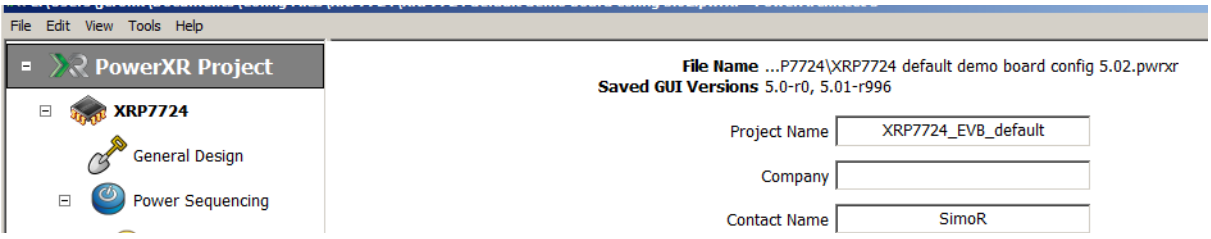

Figure 5: Saved GUI Versions

Another screen shot shows what happens when an old beta version of the GUI is loaded. Note that the save options are no longer available and export HEX files is also disabled.

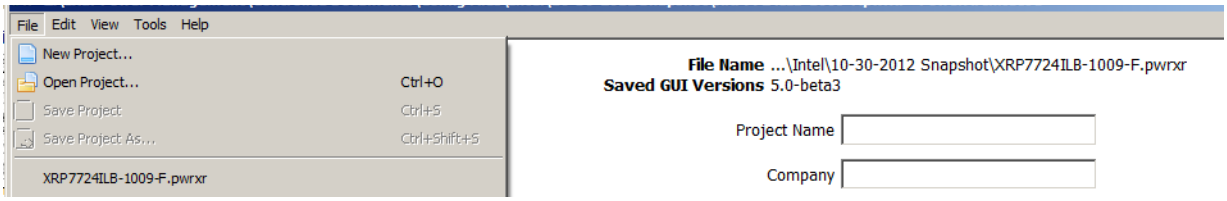

Figure 6: Old Beta Version of GUI

Bug Fixes

SET_CURRENT Commands Non-Functional(3)

Certain default register values set by the GUI effectively disabled the following commands:

0x24 PWR_SET_CURRENT_CH1

0x25 PWR_SET_CURRENT_CH2

0x26 PWR_SET_CURRENT_CH3

0x27 PWR_SET_CURRENT_CH4

This has been corrected and the commands should function as described in ANP-38 *XRP7724 I2C Command Set and Programming Guide.*

3. This fix will result in a change to the HEX file. However, it will not result in any change in physical performance.

LDO33 ResetOut Non-Functional

When the LDO33 box was checked, the function was not activated and the selection was not saved in the project file. This has been corrected.

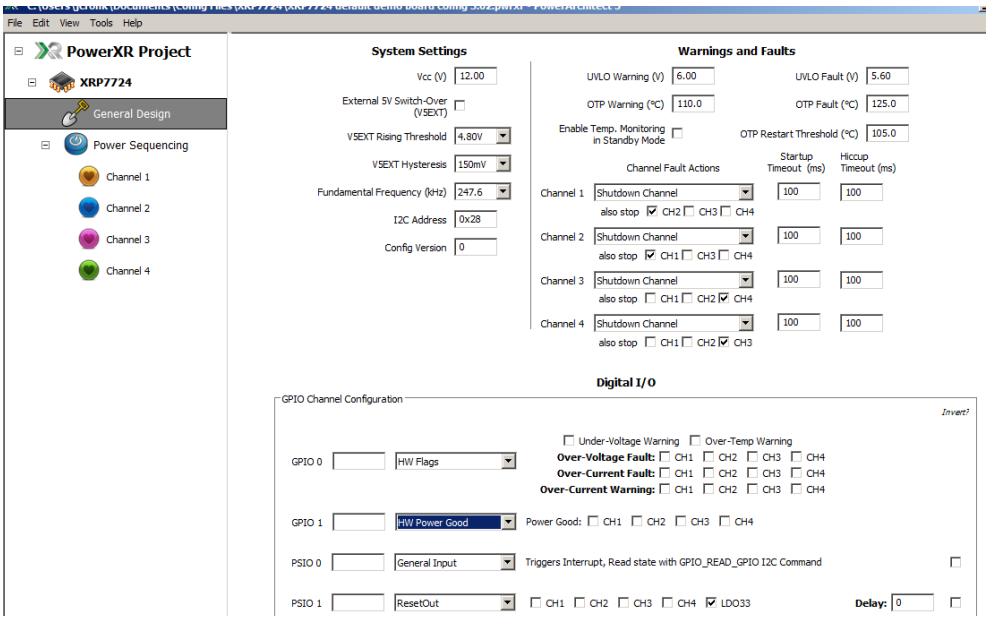

Figure 7: LDO33

Power Architect 5.01-r0

General Notice

Before the release of PowerArchitect 5.0-r0, some customers were offered the use of beta releases of PowerArchitect 5. PowerArchitect project files (*.pwrxr) are NOT forward compatible with release versions. Please contact your MaxLinear sales representative if you require support in moving from early beta versions to the release versions of PowerArchitect 5.

PowerArchitect 5.01-r0 was provided as a soft release to certain customers.

New Features

Follow On Fault Functionality

Instead of follow on fault being restricted to channels in the same group, this functionality has been moved and expanded. When selecting the fault behavior of a given channel, one can now select the channels which should follow (see right side of figure below). This also allows channels to be in the same enable and sequencing group but avoid follow on fault behavior if it is not desired.

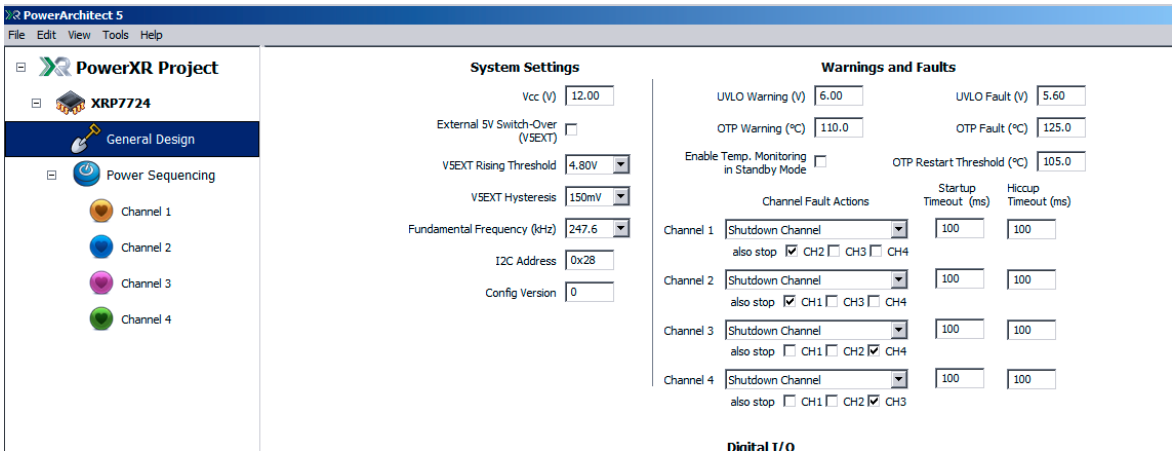

Figure 8: Follow On Fault

Configuration Version(4)

In the figure above, there is a new input at the bottom of “System Settings” called “Config Version”. This is a register intended to allow one to easily identify which version of a configuration file was used to program the chip. The user can manually set the value from 0 to 255. The value programmed into the XRP7724 is displayed on the dashboard.

4. Adding a value in this box will make a change in the HEX output written to the XRP7724. It is a change that will have no impact on operation of the part.

Invalidate Flash Tool

If one sets the fault action for any given channel as “Restart Chip” and if none of the I/Os are configured to act as the enable for this channel, any failure of this channel will continuously restart the part. This makes communication impossible and thus eliminates the monitoring provided for debugging. In general, we recommend that during development the options of “Shutdown Channel” or “Shutdown and Auto-restart Channel” be used.

If one finds themselves in a continuous restart loop, the new “Invalidate Flash Tool” is a way to gain communications with the chip. It does this by continuously writing to the chip in an effort to write a single Flash page CRC. This results in an invalid CRC and the chip will not load the contents of the Flash. The user can now write in a new configuration.

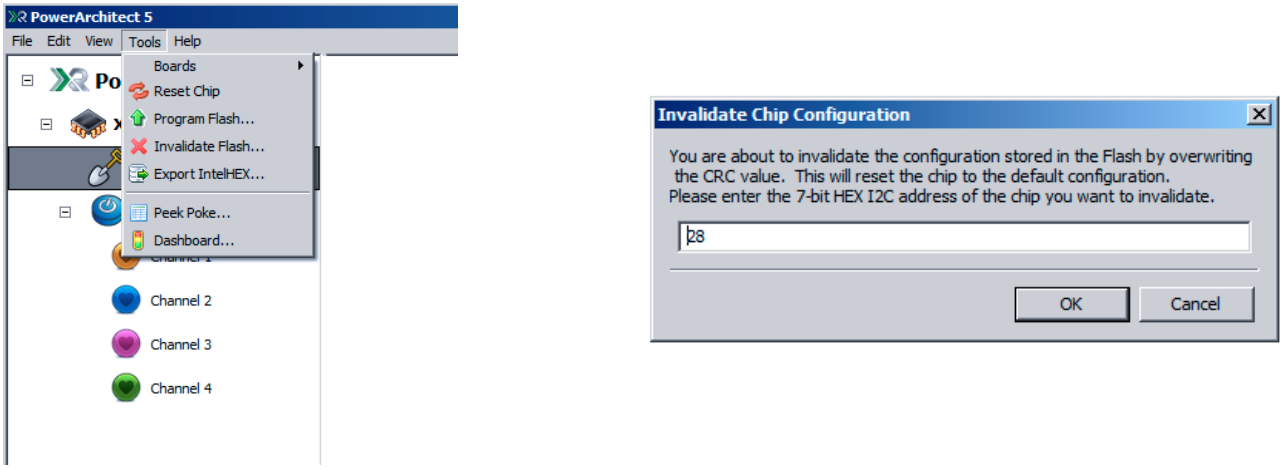

Figure 9: Invalidate Flash Tool

Note that the I^2C address of the chip to be invalidated must be entered into the dialog window. Once the CRC has been invalidated, the chips I^2C address will become the original default, 7-bit HEX 0x28.

Program from Dashboard

Rather than requiring the user to go to the main menu, the chip may be re-programmed from the dashboard.

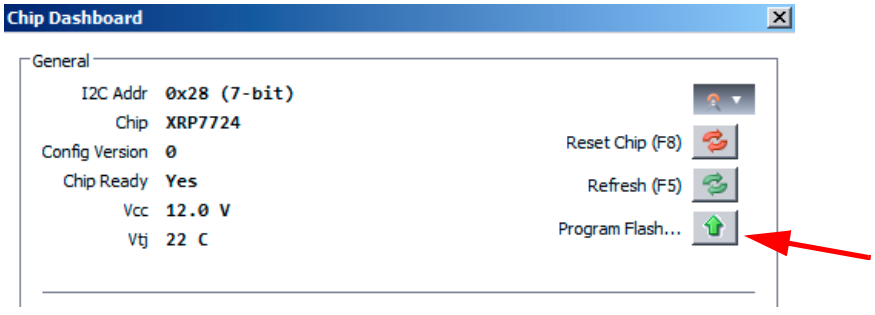

Figure 10: Program from Dashboard

Report an Issue

A new menu item under “Help”, “Report an issue…” allows you to save diagnostic information about your design. This information can then be forwarded to your MaxLinear sales representative or Field Application engineer.

Please provide a short explanation of what you were trying to do as compared to the result. Place your email address in the window provided and click “Save As…”. The resulting file is encrypted to ensure integrity of the data.

A common problem that designers run into are those around selecting “Restart Chip” as described in the previous topic.

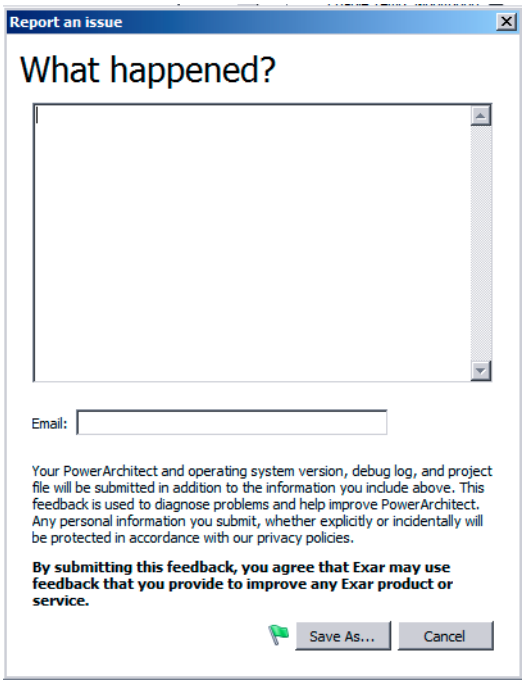

Figure 11: Reporting an Issue

Bug Fixes

OTP Restart Threshold Set Above OTP Fault(5)

The GUI allowed OTP Restart Threshold to be set above OTP fault resulting in oscillating power up and shutdown sequencing. OTP Restart Threshold can no longer be set above OTP Fault.

Dashboard Channel Control After Fault

Depending on conditional fault settings, the dashboard would not properly handle re-enabling of channels after fault. Status indicators would not clear upon re-enabling. This has been fixed.

5. If your configuration violated this new restriction, then the HEX output to the XRP7724 will be changed. Functionality of the part will be changed to avoid the condition noted above.

Improved Dashboard Functionality when Chip Unresponsive

Dashboard no longer displays “InReg” when I^2C communication is disrupted. The default assumption is that the I^2C communication has failed due to a “Reset Chip” fault response.

Also improved is the ability to properly communicate through the XCM (XRP77XXEVB-XCM) and find XRP7724 ICs connected to the I^2C bus. In some cases customers had to restart PowerArchitect and / or unplug and reconnect the XCM to make the system responsive.

Power Good Thresholds(6)

Allowed settings beyond chip limits corrected.

Power Good signal is gated by completion of soft-start. Sequencing graphic on Power Sequencing tab has been updated.

Current Limit

Current limit no longer displays 3 decimal places. Two decimal places seemed quite sufficient.

Other

Dashboard “Under Temp” Flag indicator has been eliminated.

Minimum Requirements

Windows XP

1GB RAM

100MB Hard Disk Space

USB Port

6. Values in the HEX output to the part may have been changed. Revalidating PGOOD, PowerOK, and RSTB functions advised.

MaxLinear, Inc.
5966 La Place Court, Suite 100
Carlsbad, CA 92008
760.692.0711 p.
760.444.8598 f.

www.maxlinear.com