Programming and Debug Tools

PolarFire v2.1

Release Notes

![Microsemi logo — Power Matters.]

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About Microsemi
Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions; security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, California, and has approximately 4,800 employees globally. Learn more at **www.microsemi.com**.

Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

Revision 1.1

Added SmartDebug support for the MPF300XT device.

Revision 1.0

Revision 1.0 was the first publication of this document.

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1 PolarFire™ v2.1 Programming and Debug Tools Release Notes

The Libero® system on chip (SoC) PolarFire™ v2.1 release is software for designing with Microsemi PolarFire FPGAs. PolarFire FPGAs are the fifth generation nonvolatile FPGA devices from Microsemi, built on 28-nm flash technology. The PolarFire cost-optimized FPGAs deliver lowest power at mid-range densities.

For more information about PolarFire devices, see the Microsemi website.

The Programming and Debug Tools installer is intended for laboratory and production environments where Libero is not installed or needed. The installer installs the following tools:

- FlashPro (Available on Windows only)
- FlashPro Express
- SmartDebug

1.1 What's New in This Release

This release includes the following new features and enhancements.

1.1.1 Programming

Important note for Block Flow users: In this release, the Block Flow must not be used for designs intended to be programmed onto silicon, for any PolarFire device.

- Programming is supported for the MPF300XT device.
- SmartDebug is supported for the MPF300XT device.
- SPI Flash programming times have been improved in this release, by a factor of approximately 2x. TCK can be configured at up to 15MHz; it was limited to 4MHz in Libero SoC PolarFire v2.0. Increasing TCK will improve programming time for SPI Flash.
- Configuration and programming of Data Storage clients is supported in the SPI Flash.
- BSDL files generated using Libero SoC PolarFire v2.1 are now compliant with IEEE standard 1149.6 as well as 1149.1.

1.2 System Requirements

This release has the following system requirements:

- 64-bit OS
    - Windows 7, Windows 8.1, or Windows 10 OS
    - RHEL 5, RHEL 6, RHEL 7, CentOS 5, CentOS 6, or CentOS 7
        - Programming is not supported on RHEL 5, CentOS 5
- A minimum of 32 GB RAM

Note: Setup instructions for using Libero SoC PolarFire v2.1 on Red Hat Enterprise Linux OS are available on the Libero SoC Documents web page. As noted in that document, installation step 2 now includes running a shell script (bin/check_linux_req.sh) to confirm the presence of all required runtime packages.

Note: Support for the following operating systems will cease after December 2017. Libero SoC PolarFire v2.2 (the next major planned PolarFire release) will not support the below OS versions. For more information, refer to PCN17031.

- RedHat Enterprise Linux 5.x through 6.5
- CentOS 5.x through 6.5

2 Design Migration – Cores

For information about design migration and cores for this release, see the [Libero SoC PolarFire v2.1 Release Notes](#).

3   Resolved Issues

The following table lists the customer-reported SARs resolved in Libero SoC PolarFire v2.1. Resolution of previously reported "Known Issues and Limitations" is also noted in this table.

3.1   List of Resolved Issues

Case Number	Description
493642-2416349115	Eye Monitor takes longer to plot the Eye the first time
493642-2370609002	SmartDebug always shows the Transceiver data width as 40 even though it is configured for a different value
	PF_XCVR: Additional Drive Settings needed to set Lane in EQ-NEAREND mode in SmartDebug
	PF_XCVR: Incorrect Cumulative Error Count Output for internal prbs patterns in SmartBERT tests, SmartDebug

4 Known Issues and Limitations

4.1 SPI Flash Programming

This release includes the following limitations:

- Only the Micron SPI Flash is currently supported with the Evaluation Kit.
- This tool erases the SPI Flash prior to programming. It is recommended to program the SPI Flash with Libero SoC PolarFire v2.1 prior to programming other data on the SPI Flash using non-Libero programming solutions.
- Partial update of the SPI Flash is currently not supported.
- It is not recommended to have huge gaps between clients in the SPI Flash, since gaps are currently programmed with 1's and will increase programming times.

  The following table lists the ERASE, PROGRAM, and VERIFY/READ times for different client sizes. All times are in hh:mm:ss.

  Note: Depending on the SPI-Flash memory silicon version, you may observe a shorter erase time.

SPI Size	ERASE	PROGRAM	VERIFY/READ	TCK	Programmer
1 MB	00:03:55	00:00:45	00:10:46	4MHz	FP5
1 MB	00:03:55	00:00:28	00:10:05	15MHz	FP5
9 MB	00:03:55	00:06:38	01:19:15	4MHz	FP5
9 MB	00:03:55	00:04:26	01:08:49	10MHz	FP5
18 MB	00:03:55	00:09:04	02:32:43	10MHz	FP5
128 MB	00:03:55	00:58:38	22:07:55	15MHz	FP5

4.2 SPI-Slave Programming

Programming Libero SoC PolarFire v2.1 via SPI instead of JTAG is currently not supported. Support for this use model will be added in a future release.

4.3 PolarFire and FlashPro Express - MPF300T_ES or MPF300TS_ES programming file will fail to program a MPF300XT device

In Libero SoC PolarFire v2.1 and FlashPro Express, the MPF300T_ES or MPF300TS_ES programming file cannot program a MPF300XT device, and vice versa.

Workarounds:

1. Change the device in Libero to match the target device.
2. Export DAT file format to use for DirectC.
3. Export a STAPL file from Libero and use standalone FlashPro on Windows in single mode to program.

4.4 SmartDebug

This release includes the following limitations:

- General Limitations
  - Standalone SmartDebug: Non Microsemi Devices in chain: Microsemi devices present in chain along with non-Microsemi devices cannot be debugged using standalone SmartDebug. **Workaround**: Users should use SmartDebug through the Libero flow to debug Microsemi Devices.

  - Standalone SmartDebug: ID Code of Microsemi device cannot be read when non-Microsemi device is connected in chain when using standalone SmartDebug.
    Workaround: Users should use SmartDebug through the Libero flow to perform this operation.
  - Logical View: The logical view cannot be reconstructed for:

    - LSRAM/uSRAM for port widths of x1 inferred through RTL.

    - LSRAM/uSRAM configurations when a single net of output bus is used i.e. A_DOUT[0]/B_DOUT[0] for DPSRAM/uSRAM and RD[0] for TPSRAM and others are unused. The memories can be read/write using physical view.

    - LSRAM/uSRAM configurations inferred using IP Cores CoreAHBLtoAXI (Verilog flow), CoreFIFO (Verilog and VHDL flow).

    - HDL modules inferring RAM blocks are instantiated in SmartDesign.

- Transceiver Limitations
  - CDR-Far End loopback mode does not successfully loopback the data from Rx to Tx. This will be fixed in an upcoming Libero SoC PolarFire release.

  - Plot eye introduces a burst of errors in data traffic on XCVR lanes when started. This will be fixed in an upcoming Libero SoC PolarFire release.

  - The Custom DFE solution (using the Optimize DFE option in the Eye Monitor tab) does not work when the transceiver is configured in 8B10B PCS-PMA mode and the receiver is DFE.
    Workaround: Perform the following steps to obtain the expected eye output with PLOT_EYE.

    1. Assert PCS RX RESET
    2. Optimize DFE
    3. Plot Eye
    4. De-Assert PCS RX RESET

  - SmartBERT IP does not work when lanes are configured at 250Mbps data rate.

- Linux Limitations
  - Demo Mode does not work on Linux platforms. SmartDebug crashes when Debug XCVR is invoked in demo mode without connecting a programmer to the machine.

  - Optimize DFE does not work on Linux platforms. This will be fixed in the next Libero SoC PolarFire release.
  - Signal Integrity parameters modification through SmartDebug does not work on Linux platforms. This will be fixed in the next Libero SoC PolarFire release.

4.5   Installation on Local Drive Only

This release is intended for installation only on a local drive. The Installer might report permission rights problems if the release is installed across a networked drive.

4.6   Installation

C++ installation error can be ignored. Required files will install successfully.

On some machines, the InstallShield Wizard displays a message stating:

The installation of Microsoft Visual C++ Redistributable Package (x86) appears to have failed. Do you want to continue the installation?

Click Yes and the software is installed successfully.

4.7   Installation on Windows 7

During Libero SoC PolarFire v2.1 installation on Windows 7 machines, you may see pop-up warning messages about shortcuts toward the end of installation process.

These messages can be safely ignored. Click OK to close the pop-up windows and the installation will proceed and complete as expected. All Windows shortcuts will appear correctly.

4.8   Antivirus Software Interaction

Many antivirus and HIPS (Host-based Intrusion Prevention System) tools will flag executables and prevent them from running. To eliminate this problem, users must modify their security setting by adding exceptions for specific executables. This is configured in the antivirus tool. Contact the tool provider for assistance.

Many users are running Libero SoC PolarFire successfully with no modification to their antivirus software. Microsemi is aware of issues for some antivirus tool settings that occur when using Symantec, McAfee, Avira, Sophos, and Avast tools. The combination of operating system, antivirus tool version, and security settings all contribute to the end result. Depending on the environment, the operation of Libero SoC PolarFire v2.1, ModelSim ME and/or Synplify Pro ME may or may not be affected.

All public releases of Libero software are tested with several antivirus tools before they are released to ensure that they are not infected. In addition, Microsemi's software development and testing environment is also protected by antivirus tools and other security measures.

5   Download Programming and Debug Tools PolarFire v2.1 Software

The following are available for download:

[Programming and Debug Tools PolarFire v2.1 for Linux](#)

[Programming and Debug Tools PolarFire v2.1 for Windows](#)

Note: Installation requires administrative privileges.