

Programming and Debug

PolarFire v2.3

Release Notes

9/2018



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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 1.0

Revision 1.0 is the first publication of this document (09/14/2018).

Reference Documents

[PO0137: Product Overview PolarFire FPGA](#)

[DS0141: PolarFire FPGA Datasheet](#)

[UG0743: PolarFire FPGA Debugging User Guide](#)

[UG0714: PolarFire FPGA Programming User Guide](#)

[UG0773: PolarFire FPGA SmartDebug User Guide](#)

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1 Programming and Debug PolarFire™ v2.3 Software Release Notes

The Programming and Debug 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

For more information about PolarFire devices, see the [Microsemi website](#).

2 Device Support

2.1 Pre-production devices

Programming support for the MPF100T/TS and MPF500T/TS pre-production devices has been enabled in the Programming and Debug v2.3 release. Programming support for MPF200T/TS and MPF300T/TS pre-production devices was enabled in the Programming and Debug v2.2 release.

2.2 PolarFire Devices supported in Programming and Debug v2.3

Device	Package	Speed Grade	Core Voltage	Range	License Required
MPF100T	FCSG325	-1, STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
	FCVG484	-1, STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
	FCG484	-1, STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
MPF100TL	FCSG325	STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
	FCVG484	STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
	FCG484	STD	1.0/1.05V	EXT/IND	Eval/Silver/Gold/Platinum
MPF100TLS	FCSG325	STD	1.0/1.05V	IND	Eval/Platinum
	FCVG484	STD	1.0/1.05V	IND	Eval/Platinum
	FCG484	STD	1.0/1.05V	IND	Eval/Platinum
MPF100TS	FCSG325	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCVG484	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCG484	-1, STD	1.0/1.05V	IND	Eval/Platinum
MPF200T	FCSG325	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCSG536	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCVG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCG784	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
MPF200TL	FCSG325	STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCSG536	STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCVG484	STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
	FCG484	STD	1.0 /1.05V	EXT/IND	Eval/vGold/Platinum
	FCG784	STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
MPF200TLS	FCSG325	STD	1.0 /1.05V	IND	Eval/Platinum
	FCSG536	STD	1.0 /1.05V	IND	Eval/Platinum
	FCVG484	STD	1.0 /1.05V	IND	Eval/Platinum
	FCG484	STD	1.0 /1.05V	IND	Eval/Platinum
	FCG784	STD	1.0 /1.05V	IND	Eval/Platinum
MPF200TS	FCSG325	-1, STD	1.0/1.05V	IND	Eval/Platinum

	FCSG536	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCVG484	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCG484	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCG784	-1, STD	1.0/1.05V	IND	Eval/Platinum
MPF300T_ES	FCG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG1152	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCSG536	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCVG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG784	-1, STD	1.0/1.05V	EXT/IND	Eval/Platinum
MPF300TS_ES	FCG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
		STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG1152	-1	1.0 /1.05V	EXT/IND	Eval/Gold/Platinum
		-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCVG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG784	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
MPF300XT	FCG1152	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG784	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
MPF300T	FCG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG1152	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCSG536	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCVG484	-1, STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG784	-1, STD	1.0/1.05V	EXT/IND	Eval/Platinum
MPF300TL	FCG484	STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG1152	STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCSG536	STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCVG484	STD	1.0 /1.05V	EXT/IND	Eval/Platinum
	FCG784	STD	1.0/1.05V	EXT/IND	Eval/Platinum
MPF300TLS	FCG484	STD	1.0 /1.05V	IND	Eval/Platinum
	FCG1152	STD	1.0 /1.05V	IND	Eval/Platinum
	FCSG536	STD	1.0 /1.05V	IND	Eval/Platinum
	FCVG484	STD	1.0 /1.05V	IND	Eval/Platinum
	FCG784	STD	1.0/1.05V	IND	Eval/Platinum
MPF300TS	FCG484	-1, STD	1.0/1.05V	IND	Eval/Gold/Platinum
		STD	1.0 /1.05V	IND	Eval/Platinum
	FCG1152	-1	1.0 /1.05V	IND	Eval/Gold/Platinum
		-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCVG484	-1, STD	1.0/1.05V	IND	Eval/Platinum
	FCG784	-1, STD	1.0/1.05V	IND	Eval/Platinum
MPF500T	FCG784	-1, STD	1.0/1.05V	EXT/IND	Eval/Platinum
	FCG1152	-1, STD	1.0/1.05V	EXT/IND	Eval/Platinum
MPF500TL	FCG784	STD	1.0/1.05V	EXT/IND	Eval/Platinum

	FCG1152	STD	1.0/1.05V	EXT/IND	Eval/Platinum
MPF500TLS	FCG784	STD	1.0/1.05V	IND	Eval/Platinum
	FCG1152	STD	1.0/1.05V	IND	Eval/Platinum
MPF500TS	FCG784	-1, STD	1.0 /1.05V	IND	Eval/Platinum
	FCG1152	-1, STD	1.0 /1.05V	IND	Eval/Platinum

See the [Licensing](#) web page for licensing details.

Note: There are no license restrictions for FlashPro Express programming.

3 Known Issues and Limitations

3.1 SPI-Slave Programming

Programming via SPI-Slave instead of JTAG is currently not supported. Support for this use model will be added in a future release.

3.2 FlashPro Express

- Error message is displayed when an sNVM client is not selected for programming
The following error message is displayed when an sNVM client is not selected for programming:
“Exit -22 Bitstream or data is corrupted or noisy”

Workaround: Enable all sNVM clients for programming.

- Updating the security or sNVM with a security-only bitstream or sNVM-only bitstream on a device that has the Fabric programmed will disable the Fabric.

If the Fabric has been disabled, then you must reprogram the Fabric to enable it.

Workaround:

1. sNVM only bitstreams: Field update bitstream files should always program the Fabric with sNVM.
 2. Security only bitstreams: Security only bitstream should be used on a blank device only.
- When a device is programmed with a blank Silicon Signature field, it will not get erased.

Workaround:

1. Specify a Silicon Signature that is not blank and program the device to change value.
2. Perform Erase program action to erase it.

3.3 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 that are instantiated in SmartDesign.
Workaround: There are no workarounds for the issues above at this time.
- Physical View: RAM content read using the Physical View of SmartDebug for LSRAM 1Kx18 configuration (which are inferred through RTL) is incorrect. This is due to improper pin assignments on A_DIN and A_DOUT ports. This will be fixed in upcoming Libero SoC PolarFire releases.
- The runtime to Generate SmartDebug FPGA Array Data for designs with 500T device is very large. This runtime issue will be addressed in the upcoming Libero SoC v12.0 release.
- Running Probe insertion from SmartDebug on a large MPF500T device results in SmartDebug tool crash. This issue will be fixed in the upcoming Libero SoC v12.0 release.
- Transceiver Limitations
 - 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.
Workaround: Enable Eye Monitor using the PowerOn Eye Monitor option before starting the traffic. This will power on the DFE and EM receivers in CDR mode and no errors will be seen during eye plot.
 - 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.
 - SmartBERT IP PRBS tests take more time to start/stop/inject error on RHEL 7.x and Cent OS 7.x platforms as compared to RHEL 6.x and Windows OS. This issue is seen only with PRBS patterns from SmartBERT IP, and will be fixed in upcoming Libero SoC PolarFire releases.
 - The Power ON eye monitor TCL command (eye_monitor_power) does not work correctly in Libero SoC PolarFire v2.3. RX PLL does not lock to the incoming data after this TCL command is run. This will be fixed in upcoming Libero SoC PolarFire releases.
Workaround: There are no workarounds for the issues above at this time.
- Signal Integrity Limitations
 - The RX Polarity Signal Integrity parameter (Polarity P/N reversal) has no effect when a PDC file is imported using the Import option in SmartDebug. This flow works fine in GUI mode. This will be fixed in upcoming Libero SoC PolarFire releases.
 - For specific settings of Signal Integrity in SmartDebug (in CDR or DFE mode), there is no matching RX_CTLE Libero name after Optimize Receiver.
Workaround: Currently, there is no workaround for this issue. The Optimize Receiver step runs successfully. However, the RX_CTLE value in the Signal Integrity pane of the SmartDebug GUI is not updated.

3.4 sNVM write fails due to ROM client created by previous design

In the scenario where a PolarFire device is first programmed with a design with an sNVM client, and then reprogrammed with a (different) design without an sNVM client, upon completion of programming with the second design, the sNVM client will not be erased. In such a case, if there are sNVM pages that are locked, writes to those pages will fail.

There is no programming action to erase SNVM completely.

Workaround: In Libero SoC PolarFire v2.3, create a dummy sNVM client (filled with 0's) in the second design.

3.5 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.

3.6 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.

3.7 64-bit Linux package containing libpng12.so 64-bit library may be missing

In addition to the steps outlined in the [Libero SoC Linux Environment Setup User Guide](#), Libero SoC Linux users must check to see if the 64-bit package containing the libpng12.so 64-bit library is installed. Follow the steps below to check/install the package on RHEL/CentOS 6 and RHEL/CentOS 7 systems.

RHEL/CentOS 6

1. Run the following command:

```
yum provides libpng
```

2. Check the output and verify that libpng.*.el6*.x86_64 is shown as installed.
3. If not installed, run the following command under root/sudo:

```
yum install libpng.x86_64
```

RHEL/CentOS 7

1. Run the following command:

```
yum list installed | grep png12
```

2. Check the output and verify that libpng12.x86_64 is shown as installed.
3. If not installed, run the following command under rtoot/sudo:

```
yum install libpng12.x86_64
```

3.8 Installation on Windows 7

During Libero SoC PolarFire v2.3 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.

3.9 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 v2.3, 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.

4 System Requirements

The Programming and Debug v2.3 release has the following system requirements:

- 64-bit OS
 - Windows 7, Windows 8.1, or Windows 10 OS
 - RHEL 6.6 or later, RHEL 7, CentOS 6.6 or later, or CentOS 7
- A minimum of 32 GB RAM

Note: Setup instructions for using Libero SoC PolarFire v2.3 on Red Hat Enterprise Linux OS or CentOS are available [here](#). 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.

5 Download Programming and Debug PolarFire v2.3 Software

The following are available for download:

- [Programming and Debug PolarFire v2.3 for Linux](#)
- [Programming and Debug PolarFire v2.3 for Windows](#)

Note: Installation requires administrative privileges.