Dolphin MXH94x Transparent Adapter Firmware Release Note

February 15th, 2024

Version 2.10

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1   Introduction

This release note covers the MXH94x PCIe Gen4 x16 Transparent Adapter card firmware. The firmware consists of Microchip PFX runtime executables and configuration data and Board Management Controller firmware (BMC config). This release note contains a summary of the changes made. Please contact Dolphin for details.

1.1   Supported topologies

The latest released firmware supports the following transparent configurations. The actual maximum link width and number of links are limited by the type of card / number and type of FireFly modules mounted. More information can be found in the MXH94x Transparent Adapter Users Guide.

- Single Transparent x16 Host
- Dual Transparent x8 Host
- Quad Transparent x4 Host
- Transparent Target single upstream link x4-x16 – single x16 downstream Edge
- Transparent Target single upstream link x4-x16 – dual x8 downstream Edge
- Transparent Target single upstream link 4x-x16 – quad x4 downstream Edge

1.2   BMC Firmware versions

The Firmware version covers the MXH94x BMC firmware changelog.

Firmware version	Release date	Note
1.0	September 24th 2020	Initial firmware release. Support for single x16 link.
1.1	November 12th, 2020	• Added reset LED, 500ms pulse triggered by EDGE_PERST falling edge. • Create 5ms reset pulse on all cable ports in a logical port.
1.2	December 3rd, 2020	• Adds Board Firmware Recovery support. • Adds support for transparent dual x8 and quad x4 configurations.
1.4	February 25th 2021	• Adds firmware version reporting. • FireFly temperature and voltage readouts.
1.5	March 12th, 2021	• Fixed issue with reset on dual x8 configurations Current shipping version. Bundled with eXpressWare 5.18
2.0	June 24th 2021	• Added longer delay before releasing PFX from reset after power on in order to allow clocks to stabilize. • Fixed link status issues with MR2 PFX firmware.
2.1	October 29th 2021	• Added support for MXH94x C revision cards. • Added support for overtemperature shutdown and DIP-switch to disable. • Bundled with eXpressWare 5.19.2
2.5	February 3rd 2022	• Companion releases PFX FLASH version 4 - MR4 checksum.
2.6	February 24th 2022	• No changes for MXH94x Transparent cards
2.7	April 24th 2022	• Adds support for 3 and 5 slot backplanes (only 3 slot available for test). • Added support for extended serial number format
2.8	May 16th 2022	• Improved cable present detect for reduced systems (where some cables are missing / malfunctioning vs the configured width) Bundled with eXpressWare 5.20.0
2.9	October 7th 2022	• Added support for MXH94x/95x Rev CD with PM40052 chip • Bundled with eXpressWare 5.20.2 and newer
2.10	February 5th, 2024	• Changed FireFly reset voltage to follow high level given by external pull-up. The previous value was too low but had no impact on functionality.

		• Improved the algorithm recording the overall FireFly maximum temperature stored in non-volatile memory. Prior to this fix, maximum temperature detected may erroneously be stored as value 0xFF. • Improved MCU Config upgrade process for older versions of firmware tool.

1.3 PFX FLASH Versions

The PFX FLASH version changelog. Please note that the Dolphin software tools report the PFX FLASH version as the EEPROM version.

PFX Multiconfig version	Release date	Note
3	July 1st, 2020	• Initial internal firmware release, BB Boards. • Support for single link configurations.
4	August 4th, 2020	• Unified DIP switch setting.
5	October 2nd, 2020	• Applied Microchip firmware pm74605_pfx_03600049.
6	December 10th, 2020	• Fixed PFX firmware upgrade problem.
7	February 25th 2021	• Applied Microchip firmware MR2, 3.70.0.4f. Bundled with eXpressWare 5.18
8	July 6th 2021	• ChipLink version 1.62.00 • Fixed PCI-SIG compliance test issues. STATUS PASS • Enabled CTS on UPS • Enabled AER reporting on CTS • Set Link Capability (LnkCap) 0x70 for USP (vEP) • Enabled Reset Partition on USP link down • Increased TLP throttling from 50.000 to 70.000 (Microchip recommendation) • Added support for MXH94x C revision cards. Bundled with eXpressWare 5.19.2
9	February 24th 2022	Applied Microchip MR4 3.90.0.5b • File format 3.90.0.5b • ChipLink version 1.68.00 • Fixes MR2 related problem with Optical support that could cause link to train to lower speed or narrower links.
10	16th May 2022	• Added GPIO control for improved cable present detect. Bundled with eXpressWare 5.20.0 and newer
11	February 15th, 2024	Applied Microchip MR5 Patch 3 • File format 3.90.0.6c • ChipLink version 1.80.05 • Enabled GAS access for all partitions. Improves diagnostic capabilities. • Changed default serial number from 00 00 00 00 to 00 00 00 01 – will be overwritten by actual serial number during initial manufacturing. • Enabled: "No link down for EP speed change" to avoid link down events by PCIe speed changes. • Improved Throttling Window from 120 us to 80 us to reduce number of throttling events during diagnostic testing. • Set "Port Down Hold-Off Time" to 20.000 us for the DSP – to have a slightly longer cable link down after link failures. • NXP v2.10: emmentaler-main-nxp-v2.10.bin • NXP BL v5.0: emmentaler-bootloader-nxp-v5.bin Bundled with eXpressWare 5.22.0 and newer

2 Appendix

2.1 How to check Firmware and EEPROM version

The version of the firmware components can be retrieved using the **dis_diag** tool. Please see options using –h option. This tool is available by installing eXpressWare Board Management Software 5.18 or newer. The software is available for both Windows and Linux and can be downloaded from www.dolphinics.com/mx

2.1.1 Linux platforms

```
# cd /opt/DIS/sbin
# ./dis_diag
```

2.1.2 Windows platforms

```
> cd %ProgramFiles%\Dolphin Express MX\Util
> .\dis_diag
```

2.1.3 Example output:

```
# dis_diag
================================================================================
  Dolphin diagnostic tool --  dis_diag version 5.18.0 (Mon Oct 12 16:44:17 CET 2020)
================================================================================

dis_diag compiled in 64 bit mode
Driver : Dolphin IRM (GX) 5.18.0 Oct 24th 2020 (rev 33fff3a)
Date   : Mon Oct 12 12:59:28 CET 2021
System : Linux somenode 3.10.0-514.21.1.el7.x86_64 #1 SMP Thu Oct 12 17:04:51 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux


Number of configured local adapters found: 1


Adapter 0 > Type                  : MXH942
            Mode                  : TRANSPARENT
            NodeId                : 4
            Serial number         : MXH942-CC-000015
            MXH chip family       : MICROSEMI - PFX GEN4
            MXH chip vendorId     : 0x11f8
            MXH chip device       : 0x4036
            MXH chip revision     : 0x0 (ZB)
            EEPROM version        : 11
            EEPROM vendor info    : 0x0000
            Firmware version      : 2.10
            Card revision         : CC
```

2.2 How to upgrade the firmware

The firmware can be upgraded using the upgrade_eeprom utility bundled with eXpressWare 5.18 or newer.

2.2.1 Linux platforms

```
# cd /opt/DIS/sbin
# ./upgrade_eeprom.sh --upgrade
```

2.2.2 Windows platforms

Start PowerShell with administrative capabilities (Press Windows+X, select Windows PowerShell (Admin))

```
PS > cd "${env:ProgramFiles}\Dolphin Express MX\Util"
PS > Set-ExecutionPolicy AllSigned -Scope Process
PS > .\upgrade_eeprom.ps1 --upgrade
```

Please carefully review the output from the upgrade utility.

A complete power cycle of the system (including removal of AuxPower) is required after the firmware upgrade.

Please verify the firmware upgrade was successful after system is powered on again following the steps found in section 2.1 How to check Firmware and EEPROM version above.

2.3   How to contact Dolphin Support

For general support questions, please contact Dolphin via the Jira Service Management portal: https://www.dolphinics.com/csp.