



Mellanox SwitchX® Firmware Release Notes

Rev 9.4.2000

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1 Overview

These are the release notes for the SwitchX® and SwitchX-2 firmware, 9.4.2000. This firmware complements the SwitchX silicon architecture with a set of advanced features, allowing easy and remote management of the switch.



Firmware 9.4.2000 is compatible with MFT tools v2.7.1 and above. Using older versions of MFT tools causes failure during image creation.

1.1 Supported Systems in 9.4.2000

This firmware supports the devices and protocols listed in [Table 1](#). For the most updated list of switches supported, visit the firmware download pages via <http://www.mellanox.com>.

Table 1 - Supported PSIDs

| Device Part Number | PSID | Device Description |
|--------------------|---------------|---|
| MSX6015F-xxxS | MT_1260110020 | SwitchX®-2 based FDR InfiniBand Switch, 18 QSFP ports, externally managed |
| MSX6015T-xxxS | MT_1260110029 | SwitchX®-2 based FDR10 InfiniBand Switch, 18 QSFP ports, externally managed |
| MSX6025F-xxxR | MT_1010210021 | SwitchX® based FDR InfiniBand Switch; 36 QSFP; externally managed |
| MSX6025F-xxxS | MT_1010310021 | SwitchX®-2 based FDR InfiniBand Switch; 36 QSFP; externally managed |
| MSX6025T-xxxR | MT_1010210026 | SwitchX® based FDR10 InfiniBand Switch; 36 QSFP; externally managed |
| MSX6025T-xxxS | MT_1010310026 | SwitchX®-2 based FDR10 InfiniBand Switch; 36 QSFP; externally managed |
| MSX6005F-xxxS | MT_1260110021 | SwitchX®-2 based FDR InfiniBand Switch; 12 QSFP ports. |
| MSX6005T-xxxS | MT_1260110026 | SwitchX®-2 based FDR10 InfiniBand Switch; 12 QSFP ports. |

1.2 Supported Cables and Modules

Please refer to the interconnect overview page on the Mellanox website:

http://www.mellanox.com/page/cables?mtag=cable_overview

1.3 Firmware Upgrade

Firmware upgrade may be performed directly from any previous version to this version. To upgrade firmware, please refer to the Mellanox Firmware Tools (MFT) package at:

http://www.mellanox.com/page/management_tools

1.4 PRM Revision Compatibility

Firmware 9.4.2000 complies with the following programmer's reference manual:

- *Switches Programmer's Reference Manual (PRM), Rev 1.40* or later

2 Changes and Major New Features

2.1 Changes in Rev 9.4.2000

- N/A

2.2 Changes in Rev 9.4.1000

- Added system MKey support

2.3 Changes in Rev 9.3.8000

- Support FORE EMAD query operation according to section 2.17.5 of the SwitchX® PRM rev 1.05
- Added support to read UCD sensor and V_{in} sensing according to section 2.8.5 of the SwitchX® PRM rev 1.05
- Added AccessRegisterGMP support for MSPS and fix MSPS firmware configuration

2.4 Changes in Rev 9.3.6000

- Added support for bandwidth monitoring according to Performance histogram in Vendor Specific MAD spec

2.5 Changes in Rev 9.3.4000

- Added support for fan-out-of-range event (FORE) according to PRM section “FORE – Fan Out of Range Event”
- Added LLR max retransmission rate as specified in Vendor Specific MAD V1.1, Table 110 – PortLLRStatistics MAD Description

2.6 Changes in Rev 9.3.2000

- Lowered the externally managed switches default fan speed from 80% to 60%
- Added congestion control attribute “PORT_VL_XMIT_TIME_CONG” according to 3.23 CounterGroupInfo in Vendor Specific MADs version 1.1
- Added support for adaptive routing per L4 transport layer

2.7 Changes in Rev 9.3.1200

- Added GA support for MFA1A00-Exxx EDR 100Gb/s AOCs over SwitchX® based systems

2.8 Changes in Rev 9.3.0000

- Added support for SX6710 and SX1710 switch systems
- Added support for timestamp in mirrored packages
- Added support for MCP1600-E001/MCP1600-E002 EDR cables
- Added support for FDR 2.5m (MC2207128-0A2)

2.9 Changes in Rev 9.2.8000

- Added power optimizations when ports are disabled
- Added TuneX support
- Bug fixes

2.10 Changes in Rev 9.2.6100

- Added LLR capability indication as part of extended port info MAD according to Vendor Specific MADs document version 1.1
- 3rd party FDR cables are allowed to raise link at FDR (56Gb/s)
- Added support for fan and power supply monitor MAD according to section 2.12 in Vendor Specific MADs document version 1.1 and section 2.17 in Mellanox PRM version 1.0
- Improved FDR systems link-up time after reboot

2.11 Changes in Rev 9.2.4002

- Added support for 12-port SX6005 switch system
- Added ability to Set Node Description according to errata proposal #9109
- Updated SMP and GMP CapabilityMask as appear in VS Mad Specification document version 0.56
- Added support for temperature sensor MAD according to section 2.12 in Vendor Specific MADs document version 1.1 and section 2.17 in Mellanox PRM version 1.0
- Added support for voltage sensor MAD
- Added a port disable power-saving feature
- Added support for reading VPD from flash (supported with systems coming out of factory with FW 9.2.4002 or higher only)
- Added support for alternate source of the following fiber cable P/Ns: MC2207310-XXX-F-A2, MC2210310-XXX-F-A2, MC2206310-XXX-F-A2 (See PCN MLNX-15-838)
- Added support for the MC2207312-XXX 56Gb/s active fiber cables.
- Added support for MC2207310-XXX-F-A2, MC2207310-XXX-F-A2, MC2206310-XXX-F-A2 active fiber cables
- Added support for MC2207411-SR4 56Gb/s active optical module

2.12 Changes in Rev 9.2.3000

- Improved FDR and FDR10 link stability
- Port mirroring bug fixes
- Added best-effort mirroring capability
- Fixing FDR10 switch link issue discovered in 9.2.0000

2.13 Changes in Rev 9.2.0000

- Added support for SwitchX®-2 SX6015
- Added support for Congestion Control Class
- Added support for InfiniBand multi-swid
- Enabled MultiCastFDBTop=0xBFFF to discard MC traffic
- Added a new INI field for the NodeInfo and DeviceID parameters

2.14 Changes in Rev 9.1.7000

- Enabled LLR by default
- Added Mellanox Proprietary Link negotiation (MLPN) support
- Added support for MC2207312-XXX FDR optical cables up to 300m
- Added support for SwitchX®-2 based FDR and FDR10 edge switch systems
- Improved Eye Opener Machine

2.15 Changes in Rev 9.1.5000

- Added InfiniBand Port Mirroring support
- Reduced port PLLs jitter
- Enabled Gradient Decent (GDS) in MSX6025T and MSX6025F systems
- Added optimize SL2VL support
- Improved link negotiation process

2.16 Changes in Rev 9.1.3000

- Link negotiation protocols improvements

2.17 Changes in Rev 9.1.2000

- Added PKEY enforcement on external ports

2.18 New Features and Changes in Rev 9.1.0000

- InfiniBand switch supported speed:
 - FDR v1.3
 - FDR10 - Mellanox Technologies propriety
 - QDR/DDR/SDR v1.2.1
- 36 FDR (56Gb/s) ports in a 1U switch
- FDR10 supports 20% more bandwidth over QDR using the same cables/connectors

3 Known Issues

Table 2 describes known issues in this firmware release and possible workarounds.

Table 2 - Known Issues

| Index | Category | Description | Workaround |
|-------|---------------------|---|------------|
| 1. | Counters | The SampleCounter mechanism is not supported. | N/A |
| 2. | Counters | Resetting the counters of port receive packets and port receive unicast packets using “Performance class MAD” or the VL15 received packets and data counters using Mellanox Vendor Specific MAD resets all of the above counters. | N/A |
| 3. | Network Interfaces | FDR link may raise as FDR10 when plugged in near an FDR10 cable. | N/A |
| 4. | Network Interfaces | Link width negotiation is not supported. | N/A |
| 5. | Network Interfaces | Link up negotiation may take up to 70 seconds. | N/A |
| 6. | Network Interfaces | DDR link may rise with errors or at SDR speed when connecting to ConnectX®-3 version 2.30.3000 or earlier, Connect-IB™ version 10.10.1000 or earlier, or previous releases of SwitchX®. | N/A |
| 7. | Switch Capabilities | QDR capabilities at the INI must be enabled when working in FDR mode. | N/A |
| 8. | General | Downgrading to firmware version 9.2.0000 requires power cycling the switch for the firmware to load. | N/A |
| 9. | Cables | Loopback modules are not supported and do not link up. | N/A |
| 10. | Link | 56GbE ports may take up to 60 seconds to link up. | N/A |

4 Bug Fixes History

Table 3 lists the bugs fixed in this release.

Table 3 - Bug Fixes History

| Index | Category | Description | Discovered in Release | Fixed in Release |
|-------|--------------------|--|-----------------------|------------------|
| 1. | LEDs | UID LED MAD is not responsive. | N/A | 9.4.1000 |
| 2. | Chassis Management | PSU fans set to work with 60% max speed by default | 9.3.8000 | 9.4.1000 |
| 3. | Chassis Management | The command “show interfaces ib * transceiver” shows no cable is connected while link is up. | 9.3.8000 | 9.4.1000 |
| 4. | Power | AC/DC status info not available when reading address 0x900D (MSPS via in-band MAD). | 9.3.6000 | 9.3.8000 |
| 5. | Network Interfaces | Cannot enable 40GbE on backplane ports | 9.3.4000 | 9.3.6000 |
| 6. | System Management | Reset cannot be performed during I ² C operation | 9.3.4000 | 9.3.6000 |
| 7. | Adaptive routing | Fixed case of traffic loss between node pairs | 9.3.2000 | 9.3.4000 |
| 8. | pLFT | When activating private linear forwarding table (pLFT), last port was not mapped to 0 by default | 9.3.2000 | 9.3.4000 |
| 9. | IB spec | MLID limit at 0xFDE8 instead of 0xFE00 | 9.3.2000 | 9.3.4000 |
| 10. | Latency | Reduced forwarding latency when Skip symbols were lost | 9.3.2000 | 9.3.4000 |
| 11. | Links | Fixed fast FDR mechanism issue | 9.3.2000 | 9.3.4000 |
| 12. | Latency | Fixed latency issues in SX65xx switch systems | 9.3.2000 | 9.3.4000 |
| 13. | LEDs | Unexpected LED behavior once a LED Vendor Specific MAD configures any port LED to a blinking mode. | 9.3.0000 | 9.3.2000 |
| 14. | Links | Fix for parts going down randomly. | 9.3.0000 | 9.3.2000 |
| 15. | Chassis Management | Fix fan error indication when changing AC modules. | 9.3.0000 | 9.3.2000 |
| 16. | Cables | Fix for supporting SFP+ cables in force FDR10 mode. | 9.2.8000 | 9.3.0000 |
| 17. | VS MADs | Fix MSGI register to return data with little Endian instead of big Endian. | 9.2.8000 | 9.3.0000 |
| 18. | Counters | Congestion control supported counters in the Sample counters option mask is missing. | 9.2.8000 | 9.3.0000 |
| 19. | Counters | PortRevPkts counter is miscalculated when LLR is enabled. | 9.2.8000 | 9.3.0000 |

Table 3 - Bug Fixes History

| Index | Category | Description | Discovered in Release | Fixed in Release |
|-------|---------------------|---|-----------------------|------------------|
| 20. | Counters | Port receive packets and port receive unicast packets counters may show incorrect values when port is down. | 9.2.4002 | 9.2.8000 |
| 21. | Health | Fixed temperature sensing MAD. | 9.2.6000 | 9.2.8000 |
| 22. | Network Interfaces | Ports may stay at INIT state after power-cycle. | 9.2.6000 | 9.2.6100 |
| 23. | IB Spec | Fixed Neighbor MTU default size to be 256, as defined in IB SPEC. | 9.2.4002 | 9.2.6000 |
| 24. | IB Spec | Set operation in MADs PortXmitWaitVL and PortXmitWaitVLExtended does not function properly when setting VL15. | 9.2.4002 | 9.2.6000 |
| 25. | IB Spec | Wrong behavior of trap 128 when physical link is moving to “down”. | 9.2.3000 | 9.2.4002 |
| 26. | Links | Link may have stability issues after closing a port. | 9.2.3000 | 9.2.4002 |
| 27. | Links | Cables limited only to QDR may not rise links at all. | 9.2.3000 | 9.2.4002 |
| 28. | LLR | Rate counters are not reset upon request. | 9.2.3000 | 9.2.4002 |
| 29. | Cables | Cable insertion internal interrupts may be lost in rare cases resulting in the link not rising. | 9.2.3000 | 9.2.4002 |
| 30. | Remote IB Mirroring | Packet always sent with vl=0. | 9.2.0000 | 9.2.3000 |
| 31. | Remote IB Mirroring | Mirrored packets sent from the switch are corrupted if their size is bigger than 64 bytes. | 9.2.0000 | 9.2.3000 |
| 32. | Port Mirroring | Truncation does not properly crop the packet. | 9.2.0000 | 9.2.3000 |
| 33. | Cables | Link issues when working with Finisar (non-Mellanox) non-FDR AOC cables. | 9.2.0000 | 9.2.3000 |
| 34. | Links | FDR10 switch fails to raise links when several links are disconnected at the remote side. | 9.2.0000 | 9.2.3000 |
| 35. | Traps | SwitchX® does not send Congestion Control traps. | 9.2.0000 | 9.2.3000 |
| 36. | Routing | SL2VL mapping issue which may render the SwitchX® unresponsive. | 9.1.7000 | 9.2.0000 |
| 37. | Traps | Trap257 and Trap258 are not supported. | 9.1.7000 | 9.2.0000 |
| 38. | Counters | Performance counters option mask corrupted. | 9.1.7000 | 9.2.0000 |
| 39. | Counters | Wrong behavior of PortRcvDataSL & PortXmit-DataSL counters. | 9.1.7000 | 9.2.0000 |

Table 3 - Bug Fixes History

| Index | Category | Description | Discovered in Release | Fixed in Release |
|-------|--------------------|---|-----------------------|------------------|
| 40. | LLR | Wrong behavior of PortUnicastRcvPkts counter when LLR is active. | 9.1.7000 | 9.2.0000 |
| 41. | Network Interfaces | The link up is raised as SDR or is not raised when connected to the Qlogic switch. | 9.1.7000 | 9.2.0000 |
| 42. | FRU LEDs | On all externally managed 1U switches, FRU LEDs remain OFF after boot. | 9.1.5000 | 9.1.7000 |
| 43. | Cables | Fixed support for MFS4R12CB-XXX FDR10 optical cables up to 100m. | 9.1.5000 | 9.1.7000 |
| 44. | Cables | When repeatedly plugging out and plugging in cables, the cable might not be recognized, causing the links to remain down. | 9.1.2000 | 9.1.3000 |
| 45. | Cables | FDR10 cable P/N MFS4R12CB-XX is supported in ports 9-36 only. | 9.1.0000 | 9.1.2000 |
| 46. | Network Interfaces | The link is raised as SDR. | 9.1.0000 | 9.1.2000 |
| 47. | Network Interfaces | InfiniBand link vs FDR device rises as DDR. | 9.1.0000 | 9.1.2000 |
| 48. | Network Interfaces | When sending PortInfo MAD to an Active port using the POLLING command, the link might rise as SDR. | 9.1.0000 | 9.1.2000 |

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