



Mellanox ConnectX®-3 Firmware (fw-ConnectX3) Release Notes

Rev 2.11.0500

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1 Overview

These are the release notes for the ConnectX®-3 adapters firmware, fw-ConnectX3 Rev 2.11.0500. This firmware supports the following protocols:

- InfiniBand - FDR, QDR, SDR, DDR
- Ethernet - 1GigE, 10GigE and 40GigE
- PCI Express 3.0, supporting backwards compatibility for v2.0 and v1.1



Firmware Rev 2.11.0500 is compatible with MFT tools v2.7.0a and above. Using older versions of MFT tools will cause failure during image creation.

1.1 Supported Cables and Modules

Please refer to the Mellanox Products Approved Cable Lists document (Doc Nr. 3796) for the list of supported cables.

http://www.mellanox.com/related-docs/user_manuals/Mellanox_approved_cables.pdf

1.2 Tested Cables and Modules

Table 1 - Tested Cables and Modules

Speed	OPN #	Description	Vendor
FDR	MC2207130-00A-V	FDR InfiniBand QSFP passive copper cable, 0.5m	Mellanox Technologies
FDR	MC2207130-001-V	FDR InfiniBand QSFP passive copper cable, 1m	Mellanox Technologies
FDR	MC2207130-002-V	FDR InfiniBand QSFP passive copper cable, 2m	Mellanox Technologies
FDR	MC2207128-003-V	FDR InfiniBand QSFP passive copper cable, 3m	Mellanox Technologies
FDR	MC2207126-004-V	FDR InfiniBand QSFP assembled optical cable, 4m	Mellanox Technologies
FDR	MC2207310-010-E	FDR InfiniBand QSFP assembled optical cable, 10m	Mellanox Technologies
FDR	MC2207310-030-E	FDR InfiniBand QSFP assembled optical cable, 30m	Mellanox Technologies
FDR	MC2207310-100-E	FDR InfiniBand QSFP assembled optical cable, 100m	Mellanox Technologies
40GbE	MC2210130-001	40GE QSFP passive copper cable, 1m	Mellanox Technologies
40GbE	MC2210130-002	40GE QSFP passive copper cable, 2m	Mellanox Technologies
40GbE	MC2210128-003	40GE QSFP passive copper cable, 3m	Mellanox Technologies
40GbE	MC2210126-004	40GE QSFP passive copper cable, 4m	Mellanox Technologies
40GbE	MC2210310-020	40GE QSFP assembled optical cable, 20m	Mellanox Technologies
QDR/FDR10	MC2206130-00A	Mellanox copper cable, up to IB QDR/FDR10 (40Gb/s), 4X QSFP, 0.5 meter	Mellanox Technologies
QDR/FDR10	MC2206130-001	Mellanox copper cable, up to IB QDR/FDR10 (40Gb/s), 4X QSFP, 1 meter	Mellanox Technologies
QDR/FDR10	MC2206130-003	Mellanox copper cable, up to IB QDR/FDR10 (40Gb/s), 4X QSFP, 3 meter	Mellanox Technologies
QDR/FDR10	MC2206126-005	Mellanox copper cable, up to IB QDR/FDR10 (40Gb/s), 4X QSFP, 5 meter	Mellanox Technologies
QDR/FDR10	MC2206310-010-E	QDR/FDR10 InfiniBand QSFP assembled optical cable, 10m	Mellanox Technologies
QDR/FDR10	MC2206310-030-E	QDR/FDR10 InfiniBand QSFP assembled optical cable, 30m	Mellanox Technologies
QDR/FDR10	MC2206310-100-E	QDR/FDR10 InfiniBand QSFP assembled optical cable, 100m	Mellanox Technologies
SDR/DDR	MC1204130-001-V	Mellanox QSFP to CX4 (Q2C) Passive copper SDR/DDR cables 1m	Mellanox Technologies

Table 1 - Tested Cables and Modules

Speed	OPN #	Description	Vendor
SDR/DDR	MC1204130-002-V	Mellanox QSFP to CX4 (Q2C) Passive copper SDR/DDR cables 2m	Mellanox Technologies
SDR/DDR	MC1204130-003-V	Mellanox QSFP to CX4 (Q2C) Passive copper SDR/DDR cables 3m	Mellanox Technologies
SDR/DDR	MC1204128-005-V	Mellanox QSFP to CX4 (Q2C) Passive copper SDR/DDR cables 5m	Mellanox Technologies
10GbE	SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter, passive	Cisco
10GbE	SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter, passive	Cisco
10GbE	SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter, passive	Cisco
10GbE	487649-B21	HP 10GbE Copper 487651-001 HP BLc SFP+ 5m	HP
10GbE	487652-B21	HP 10GbE Copper 487654-001 HP BLc SFP+ 1m	HP
10GbE	487655-B21	HP 10GbE Copper 487657-001 HP BLc SFP+ 3m	HP
10GbE	487658-B21	HP 10GbE Copper 487660-001 HP BLc SFP+ 7m	HP
1GbE	453151-B21	SFP+ Opt Kit HP BLc VC 1Gb SX	HP
10GbE	455885-B21	SR SFP+ Opt HP BLc 10Gb SR	HP
10GbE	455886-B21	SFP+ LR SFP+ Opt HP BLc 10Gb	HP
10GbE	J9150A	SFP+ LC SR Transceiver HP X132 10G	HP
10GbE	J9151A	SFP+ LC LR Transceiver HP X132 10G	HP
10GbE	J9283B	SFP+ 3m DAC Cable HP X242 10G	HP
10GbE	J9285B	SFP+ 7m DAC Cable HP X242 10G	HP

1.3 Tested Switches

Table 2 - Switches Tested in Rev 2.11.0500

Speed	OPN # /Name	Description
10/40Gb/s	Dell Force10 S4810P-AC	1RU 48-port 10Gb/40Gb Managed Switch
10Gb/s	Juniper EX2500	24-port 10GbE Ethernet SFP+ Switch
10Gb/s	Arista DCS7148S	48-port 10Gb Ethernet SFP+ Switch
10Gb/s	Fujitsu XG2000	10Gb 20-Port (20 XFP Ports) Ethernet Switch

Table 2 - Switches Tested in Rev 2.11.0500

Speed	OPN # /Name	Description
10Gb/s	HP 6600-24XG	24 port SFP+ 10-GbE Switch
10Gb/s	Brocade BR-8000-0008	8 x 8Gb Fibre Channel, 24 x SFP+ Ethernet Switch
10Gb/s	Blade BAF-00027-00	24-port 10GbE Ethernet Switch
10Gb/s	Cisco Nexus 5020	56 port 2RU, 10 Gb SFP + Ethernet/FCoE Switch
10Gb/s	Cisco Nexus 5010	20 port 1RU, 10 Gb Ethernet and FCoE SFP+ Switch.
10Gb/s	Cisco Nexus 3064	48 port 1RU 10 Gb SFP+ and 4 QSFP+ port Switch
10/40Gb/s	MSX1036B-1BFR	SwitchX™ based 36-port QSFP 40GigE 1U Ethernet
10/40Gb/s	BNT 7309-HC4	48 10Gb SFP+ ports and four 40Gb QSFP+ ports Switch
10Gb/s	Extreme Summit X650-24x	24 10GBASE-X SFP+, VIM slot populated with 1 VIM1-SummitStack (2 SummitStack stacking ports and 4 100/1000BASE-X SFP ports), ExtremeXOS Advanced Edge License, unpopulated dual PSU power slot
IB DDR	F-X430044	24-port 4X DDR InfiniBand Switch with Media Adapter Support, single power supply, 1U chassis
IB SDR	F-X430060	24-port 4X SDR InfiniBand Switch with Media Adapter Support, single power supply, 1U chassis
IB DDR	VSR9024	Infiniband 1U 24 Port DDR Network Switch
IB QDR	QLogic 12300	36-Port 40Gb QDR Infiniband Switch, Management Module, Dual Power
IB QDR	MIS5030Q	InfiniScale® IV QDR IS5030/IS5035 36-port 40Gb/s InfiniBand Switch Systems
IB FDR	MSX6036F-1BFR	SwitchX™ based FDR InfiniBand Switch, 36 QSFP ports, 1 Power Supply, Short depth, Managed, PSU side to Connector side airflow, Rail Kit and RoHS6
IB FDR10	MSX6025T-1SFR	SwitchX™ based FDR10 Infiniband Switch, 36 QSFP ports, 1 Power Supply, Standard depth, Unmanaged, PSU side to Connector side airflow, Rail Kit and RoHS6

1.4 Tools, Switch Firmware and Driver Software

Firmware Rev 2.11.0500 is tested with the following tools, SwitchX® firmware, and driver software:

- Driver versions:
 - MLNX-OFED 1.5.3-3.0.0 and above
 - WinOF 3.0.0 and above
 - VMware ESXi 5.0 Ethernet
- MFT for Linux version: 2.7.0a and higher
- MFT for Windows version: 2.7.1 and higher
- FlexBoot version 3.4.000 for Ethernet adapter cards
- SwitchX® software: MLNX-OS managed version 3.2.0500. A required version for ConnectX® to SwitchX 40GbE link

1.5 Supported Devices

This firmware supports the devices and protocols listed in Table 3. For the most updated list of adapter cards supported, visit the firmware download pages via <http://www.mellanox.com>.



Please contact your Mellanox local FAE for firmware updates to pre-production cards not on this list.

Table 3 - Supported PSIDs (Sheet 1 of 2)

Device Part Number	PSID	Device Name	Supported Protocols
MCX353A-FCA	MT_1060110019	ConnectX-3 VPI adapter card; single-port QSFP; FDR IB (56Gb/s) and 40GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1060120019		
MCX353A-FCB	MT_1100110019	ConnectX-3 VPI adapter card; single-port QSFP; FDR IB (56Gb/s) and 40GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1100120019		
MCX353A-QCA	MT_1120110018	ConnectX-3 VPI adapter card; single-port QSFP; QDR IB (40Gb/s) and 10GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1120120018		
MCX353A-QCB	MT_1060110018	ConnectX-3 VPI adapter card; single-port QSFP; QDR IB (40Gb/s) and 10GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
MCX353A-TCA	MT_1060110028	ConnectX-3 VPI adapter card; single-port QSFP; FDR10 IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s;RoHS R6	InfiniBand/ Ethernet VPI
	MT_1060120028		

Table 3 - Supported PSIDs (Sheet 2 of 2)

Device Part Number	PSID	Device Name	Supported Protocols
MCX353A-TCB	MT_1100110028	ConnectX-3 VPI adapter card; single-port QSFP; FDR10 IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
MCX354A-FCA	MT_1020110019	ConnectX-3 VPI adapter card; dual-port QSFP; FDR IB (56Gb/s) and 40GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1020120019		
MCX354A-FCB	MT_1090110019	ConnectX-3 VPI adapter card; dual-port QSFP; FDR IB (56Gb/s) and 40GigE; PCIe3.0 x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1090120019		
MCX354A-QCA	MT_1020110018	ConnectX-3 VPI adapter card; dual-port QSFP; QDR IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1020120018		
MCX354A-QCB	MT_1090110018	ConnectX-3 VPI adapter card; dual-port QSFP; QDR IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
MCX354A-TCA	MT_1020110028	ConnectX-3 VPI adapter card; dual-port QSFP; FDR10 IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
	MT_1020120028		
MCX354A-TCB	MT_1090110028	ConnectX-3 VPI adapter card; dual-port QSFP; FDR10 IB (40Gb/s) and 10GigE; PCIe3.0x8 8GT/s; RoHS R6	InfiniBand/ Ethernet VPI
MCX311A-XCA	MT_1170110023	ConnectX®-3 EN network interface card, 10GbE, single-port SFP+, PCIe3.0 x4 8GT/s, RoHS R6	Ethernet
MCX312A-XCA	MT_1050110023	ConnectX-3 EN network interface card; 10GigE; dual-port SFP+; PCIe3.0 x8 8GT/s; RoHS R6	Ethernet
	MT_1050120023		
MCX312A-XCB	MT_1080110023	ConnectX-3 EN network interface card; 10GigE; dual-port SFP+; PCIe3.0 x8 8GT/s; RoHS R6	Ethernet
	MT_1080120023		
MCX313A-BCA	MT_1110110023	ConnectX-3 EN network interface card; 40GigE; single-port QSFP; PCIe3.0 x8 8GT/s; RoHS R6	Ethernet
	MT_1110120023		
MCX313A-BCB	MT_1060110023	ConnectX-3 EN network interface card; 40GigE; single-port QSFP; PCIe3.0 x8 8GT/s; RoHS R6	Ethernet
MCX314A-BCB	MT_1090110023	ConnectX-3 EN network interface card; 40GigE; dual-port QSFP; PCIe3.0 x8 8GT/s; RoHS R6	Ethernet

1.6 Revision Compatibility

Firmware fw-ConnectX3 Rev 2.11.0500 complies with the following programmer's reference manual:

- *ConnectX Programmer's Reference Manual (PRM), Rev 0.90 or later*, which has Command Interface Revision 0x3. The command interface revision can be retrieved by means of the `QUERY_FW` command and is indicated by the field `cmd_interface_rev`.

2 Supported Features

2.1 Changes and Major New Features in Rev 2.11.0500

- Added SRI-OV support
- Added VPI auto-sensing support
- Mellanox Link Property Negotiation (MLPN)
Enables ports to negotiate link properties between Mellanox devices.
The MLPN is activated by INI.
- CR4 + KR4
Auto-negotiation 40GBASE CR4 and KR4 as described in IEEE 802.3.
CR4 + KR4 is enabled by the INI.
- 1GbE Clause37
Auto-negotiation 1000BASE-X as described in IEEE 802.3 clause 37.
1GbE Clause37 is enabled by default.
- cable_info MAD extension for more I2C addressed
Enables different address for cable access through I2C.
cable_info MAD extension is enabled by the INI.
- secure_host
smp firewall described in the PRM.
Activated by the INI (active by default).
- cq_2_eq mapping command
Modifies EQ by MODIFY_CQ command, described in the PRM
- multi-function reserved lkey
Described in the PRM.
- increase CQE timestamp to 48bit
Described in the PRM.
- 56Gb Ethernet (proprietary) - Beta level
Activated by the INI (disabled by default).
- mlxconfig - Beta level (requires MFT 3.0.0-3 or above)
Modifies the device cfg.
- FMR for SRIOV - Beta level
Described in the PRM.
- Power reduction in PCI Gen3
- Fixed general_info MAD
- “Bug Fixes History” on page 16.

2.2 Changes and Major New Features in Rev 2.10.0800

- No new features
- “Bug Fixes History” on page 16.

2.3 Changes and Major New Features in Rev 2.10.0700

- No new features
- “Bug Fixes History” on page 16.

2.4 Changes and Major New Features in Rev 2.10.0000

- InfiniBand:
 - FDR
 - FDR10
 - QDR
 - SDR
 - DDR
- Ethernet:
 - 1GigE
 - 10GigE XAUI
 - 10GigE XFI/SFI
 - 40GigE
- PCI Express 3.0, with backwards compatibility with v2.0 and v1.1
- Huge pages



ConnectX®-3 cards with firmware 2.10.0000 will include all ConnectX®-2 cards supported features.

3 Known Issues

The following table describes known issues in this firmware release and possible workarounds.

Table 4 - Known Issues

Index	Issue	Description	Current Implemented Workaround in FW	Scheduled Release (fix)
1.	sense_port failure	Ethernet cards fail to work with mlnx_ofed unless the do_sense is disabled in the INI	Add 'do_sense = false' in the INI under the [IB] section	Future Release
2.	SBR assertion	SBR should be asserted for a minimum of 50 milliseconds for the ConnectX®-3 adapters	N/A	N/A
3.	NC-SI support	NC-SI is not supported in the current release	N/A	Future Release
4.	40GbE is not supported in Auto-Sensing	Auto-Sensing is not supported with 40GbE connections in VPI cards	N/A	Future Release
5.	Wrong hardware revision ID	Wrong hardware revision ID reported in NodeInfo MAD	N/A	Future Release
6.	PCIe Gen2 link	PCIe Gen2 link unstable at temperature sweep of 10C/min for MT27518A1-FDIR-BV	N/A	Future Release
7.	Changing from an LLR to non-LLR requires driver restart	Driver restart required when switching from InfiniBand FRDR link with LLR enabled to InfiniBand link w/o LLR (for example: between SwitchX® and GD4036).	N/A	Future Release
8.	VLAN filter	VLAN filter is currently not supported.	N/A	Future Release
9.	Bloom filter	Bloom filter is currently not supported.	N/A	Future Release
10.	PXE	PXE is currently not supported in 40GbE in VPI cards	N/A	Future Release
11.		PXE is currently not supported in QSFP to SFP+ hybrid cable	N/A	Future Release

Table 4 - Known Issues

Index	Issue	Description	Current Implemented Workaround in FW	Scheduled Release (fix)
12.	Firmware down-grade	<p>When downgrading from firmware v2.11.0000 and using MFT 3.0.0-3, the following message is displayed due to the mlxconfig tool:</p> <pre>You are trying to override configurable FW by non-configurable FW. If you continue, old FW configurations will be cleared, do you want to continue ? (y/n) [n] : y You are trying to restore default configuration, do you want to continue ? (y/n) [n] : Y</pre>	N/A	Future Release

4 Bug Fixes History

Table 5 lists the bugs fixed in this release.

Table 5 - Fixed Bugs List

Issue	Description	Discovered in Release	Fixed in Release
40GbE switches link down upon repeated insertion and removing of cables	When repeatedly plugging out and plugging in cables to/from a 40GbE switch, the link remains down.	2.10.0800	2.11.0500
FDR/QDR vs DDR switch	The link is raised as SDR rather than DDR	2.10.0800	2.11.0500
0.5M, 1M Copper FDR cable support	0.5M, 1M Copper FDR cables (Paralink11, Paralink14) are not supported in back to back connection.	2.10.0800	2.11.0500
Changing FDR cables from Fiber to Copper	Changing FDR cables from Fiber to Copper and vice versa might cause link speed degradation from FDR to FDR10 or FDR10 to QDR.	2.10.0800	2.11.0500
Changing 40GbE connection	Changing 40GbE connection from back to back to a switch port and vice versa might cause the link to stay down in the ConnectX®-3 side.	2.10.0800	2.11.0500
SDR vs QDR switch	InfiniBand link vs QDR switch rises as DDR or SDR	2.10.0800	2.11.0500
QDR link up time	On rare occasions, the QDR link up time between an FDR card and a QDR device was up to 4 minutes	2.10.0800	2.11.0500
QDR Link stability	QDR Link stability between ConnectX®-3 and InfiniScale® IV	2.10.0800	2.11.0500
Signal integrity issues	Signal integrity issues in all speeds	2.10.0800	2.11.0500
PCI correctable error	Fixed bad PCI reporting	2.10.0800	2.11.0500
RoCE re-transmission	Not re-transmitting from the beginning of the message but from PSN NAK.	2.10.0800	2.11.0500
RoCE	R-RoCE ignored SMAC check	2.10.0800	2.11.0500
Function Level Reset (FLR)	FLR to PPF in SRIOV	2.10.0800	2.11.0500
	FLR in no-driver mode	2.10.0800	2.11.0500
SR-IOV	Comchannel bug fix	2.10.0800	2.11.0500

Table 5 - Fixed Bugs List

Issue	Description	Discovered in Release	Fixed in Release
40GbE performance	40GbE full wire speed was not reached with former cards configuration for MCX314 and MCX313 40GbE cards. Fix: Increased core frequency to support 40GbE full wire speed. This change requires 1V input. Affected cards: MCX313A-BCB, MCX314A-BCB	2.10.0700	2.10.0800
	The ConnectX® card was not receiving frames with minimum IPG when configured to 40GbE. Fix: Updated firmware configuration. Affected cards: All cards capable of 40GbE speed	2.10.0700	2.10.0800
GUIDs for RoCE	Ethernet only cards did not have GUIDs flashed on the device. This caused RoCE to fail once two or more cards were active on the same machine. Fix: The firmware generates the GUIDs from the flashed MACs for ETH only cards. Affected cards: All ETH only cards.	2.10.0700	2.10.0800
40GbE signal integrity	Signal integrity improved in 40GbE speed.	2.10.0000	2.10.0700
PCIe Gen3 receiver sensitivity due to BIOS changes	Due to BIOS changes required by latest Intel guidelines for PCIe Gen3, a sensitivity in PCIe eye_centering algorithm caused link degradation on some platforms.	2.10.0600	2.10.0620
FDR, FDR10, 10GbE XFI/SFI signal integrity	Signal integrity improved for the following speeds: FDR, FDR10, 10GbE XFI/SFI.	2.10.0000	2.10.0600
VDD_MODE GPIO changed after reset	In boards with VDD_MODE GPIO, the GPIO was dropped after reset hence, causing voltage to be reduced to 0.9v. Fix: The GPIO in boards with VDD_MODE GPIO is no longer dropped across resets.	2.10.0000	2.10.0600
PCIe configuration type1 requests were dropped after a PCIe hot reset	After a PCIe hot reset, PCIe configuration type1 requests were dropped instead of being replied as unsupported. Fix: A proper notification is sent every time PCIe configuration type1 requests are dropped.	2.10.0000	2.10.0600