



# Mellanox BF1600 BlueField™ Dual Port 100Gb/s Controller Card

Bringing advanced application offload capabilities to high-performance storage and cloud platforms

The Mellanox BF1600 BlueField Dual Port 100Gb/s Controller Card is the perfect solution for managing NVMe storage drives in storage and hyperconverged systems. BlueField Dual Port 100Gb/s Controller Card delivers the highest NVMe-oF target performance, reducing TCO and increasing ROI.

## BOOSTING STORAGE PERFORMANCE

Three main trends are driving today's storage OEM market. OEMs seek innovative, scalable and cost-effective storage solution designs. In addition storage companies strive to extend product lifetimes and reduce TCO by reusing existing designs. Finally, storage vendors turn to NVMe-oF based solutions as these provide storage scalability and easy migration to the cloud.

Mellanox is a leading provider of NVMe-oF network adapters. Mellanox was first to market with 25, 40, 50, and 100GbE adapters, and is leading the fifth generation Remote Direct Memory Access (RDMA) products, which are at the base of NVMe-oF technology. By deploying Mellanox BF1600 Controller Cards, customers are taking advantage of Mellanox's vast and proven success in RoCE and NVMe-oF deployments.

## BLUEFIELD MULTICORE SYSTEM-ON-CHIP (SoC)

Mellanox BlueField SoC is a highly integrated and efficient controller, optimized for NVMe storage systems, Network Functions Virtualization (NFV), Cloud and AI workloads.

### Ideal solution for JBOF and JBOD systems

BlueField SoC integrates all the discrete components of a storage system appliance into a single chip (CPU, PCIe switch, and Network controller), making it the premier SoC solution for building Just-a-Bunch-Of-Flash (JBOF) systems, All-Flash-Array and storage appliances for NVMe over- Fabrics.

With an integrated NVMe-oF offload accelerator, the BlueField SoC gives the BF1600 Controller Card a superior performance advantage over existing JBOF systems, significantly reducing storage transaction latency, while increasing IOPs (I/O operations per second).

## KEY BENEFITS

The BF1600 Controller Card is a standard PCIe card, which can transform existing JBOF systems into NVMe-oF compliant solutions, simply by plugging the card into the PCIe slot. It supports up to 32 PCIe Gen3.0/4.0 lanes, enabling connectivity for up to 16 SSD drives without the need for an external PCIe switch. The card's small form factor allows customers to install multiple BlueField controller cards in a single system to support a larger number of SSDs as well as high-availability storage architecture.

## HIGHLIGHTS

### BENEFITS

- Increases ROI by leveraging the NVMe-oF accelerator to maximize performance
- Enables a shorter time to market
- Reduces TCO by replacing both CPU and adapter with a single BlueField Dual Port 100Gb/s Controller Card
- Supports up to 16 NVMe SSDs without requiring an external PCIe switch
- Can be used as a GPU controller card for Machine Learning systems

### FEATURES

- Two QSFP ports supporting:
  - 10/25/40/50/100 GbE
  - EDR/FDR InfiniBand speeds
- Integrated BlueField SoC
- 2 x 16GB DDR4 SODIMM
- SPI flash for NIC firmware
- 16GB eMMC flash memory for software
- FH3/4L standard PCIe Gen4.0 x16
- Expandable to PCIe Gen3.0 x32

Mellanox BF1600 Controller Card offers a wide range of dedicated offloads to maximize virtualization scalability and efficiency, via a powerful blend of hardware accelerators, embedded software and fully integrated advanced network capabilities.

The integration of Crypto engines within the BlueField BF1600 Controller Card simplify the implementation of security applications. These enhanced security capabilities reduce the threat of exposure and minimize risk, while enabling real-time prevention, detection and responses to potential threats.

BlueField SoC also offers cost-effective and integrative solutions for Machine Learning appliances, enabling efficient data delivery for real-time analytics and data insights based on superior RDMA and GPUDirect® RDMA technologies. Support for PCIe Gen4.0 helps future-proof the next generation of high performance GPU cards.

## SOFTWARE SUPPORT

The BF1600 Controller Card is shipped with Mellanox BlueOS™ and a UEFI-based bootloader pre-installed. BlueOS is a Linux reference distribution targeted at BlueField-based embedded systems; Mellanox OFED and NVMe-oF support are installed by default.

BlueOS itself is based on the Yocto Project Poky distribution. Through the use of the OpenEmbedded Build System and provided metadata, BlueOS can be easily modified by customers to meet their specific Linux distribution requirements.

BlueOS is Linux-based and run all customer Linux applications seamlessly. Storage customers may also choose to run the Linux distribution of their choice instead of BlueOS.

## FEATURES

### BF1600 Controller Card

- FH¼L form factor
- BlueField SoC with 16 ARMv8 A72 cores (64 bit)
- PCIe Gen4.0 x16 golden finger connector (root complex)
- Two on-card x8 PCIe Gen3.0 I-PEX connectors

- Dual-port BlueField Virtual Protocol Interconnect (VPI) interface
  - Ethernet: 10/25/40/50/100GbE QSFP ports
  - InfiniBand: FDR/EDR QSFP ports
- Single-slot/dual-slot width heatsink - passive cooling
- NCSI-connector on card
- External PCIe power connector
- CPLD for SSD control signals expansion
- 16GB eMMC memory for SoC BIOS and OS
- SPI flash for NIC firmware

### DRAM DIMM Support

- 2 sockets for DRAM DIMMS
- 2x16GB DDR4 SODIMM

Table 1 - Part Numbers and Descriptions

OPN	Description
MBF1M616A-CSNAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto disabled, 2x 16GB Memory DIMM, FH¼L, Single Slot, ROHS R6, Tall Bracket
MBF1M606A-CSNAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto disabled, No Memory DIMM, FH¼L, Single Slot, ROHS R6, Tall Bracket
MBF1M616A-CSCAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto enabled, 2x 16GB Memory DIMM, FH¼L, Single Slot, ROHS R6, Tall Bracket
MBF1M626A-CSNAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, BlueField™ E-Series 16 cores, PCIe Gen3.0 x16, Auxiliary Card PCIe Gen3.0 x16, 2 x CABLINE-CA II PLUS 350mm Cable, Crypto disabled, No Memory DIMM, FH¼L, Single Slot width, ROHS R6, Tall Bracket
MBF1M636A-CSNAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, BlueField™ E-Series 16 cores, PCIe Gen3.0 x16, Auxiliary Card PCIe Gen3.0 x16, 2 x CABLINE-CA II PLUS 350mm Cable, Crypto disabled, 2x 16GB Memory DIMM, FH¼L, Single Slot width, ROHS R6, Tall Bracket
Contact Mellanox	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto disabled, 2x 16GB Memory DIMM, FH¼L, Dual Slot, ROHS R6, Tall Bracket
Contact Mellanox	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto disabled, No Memory DIMM, FH¼L, Dual Slot, ROHS R6, Tall Bracket
Contact Mellanox	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, PCIe Gen4.0 x16, BlueField™ E-Series 16 cores, Crypto enabled, 2x 16GB Memory DIMM, FH¼L, Dual Slot, ROHS R6, Tall Bracket
MBF1M6C6A-CSNAT	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, BlueField™ E-Series 16 cores, PCIe Gen3.0 x16, Auxiliary Card PCIe Gen3.0 x16, 2 x CABLINE-CA II PLUS 350mm Cable, Crypto disabled, No Memory DIMM, FH¼L, Dual Slot width, ROHS R6, Tall Bracket
Contact Mellanox	BlueField™ Controller card, Dual Port 100Gb/s QSFP28, BlueField™ E-Series 16 cores, PCIe Gen3.0 x16, Auxiliary Card PCIe Gen3.0 x16, 2 x CABLINE-CA II PLUS 350mm Cable, Crypto disabled, 2x 16GB Memory DIMM, FH¼L, Dual Slot width, ROHS R6, Tall Bracket

## Support

For information about Mellanox support packages, please contact your Mellanox Technologies sales representative or visit our [Support page](#).



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