BittWare a molex company

# 520N-MX

PCIe FPGA Board


## Stratix 10 FPGA Board with 16GB HBM2

### Powerful solution for accelerating memory-bound applications

Designed for compute acceleration, the 520N-MX is a PCIe board featuring Intel's Stratix 10 MX2100 FPGA with integrated HBM2 memory. The size and speed of HBM2 (16GB at up to 512GB/s) enables acceleration of memory-bound applications. The board's 100G QSFP28s are ideal for clustering, and OCuLink connectors allow expansion.

Both traditional HDL and higher abstraction C, C++ and OpenCL-based tool flows are supported. Deliverables include an optimized board support package (BSP) for the Intel OpenCL SDK.

The 520N-MX features a Board Management Controller (BMC) for advanced system monitoring and control, which greatly simplifies platform integration and management.

### Tool Flow Flexibility for Software- or Hardware-Based Development

BittWare OpenCL FPGA Tools

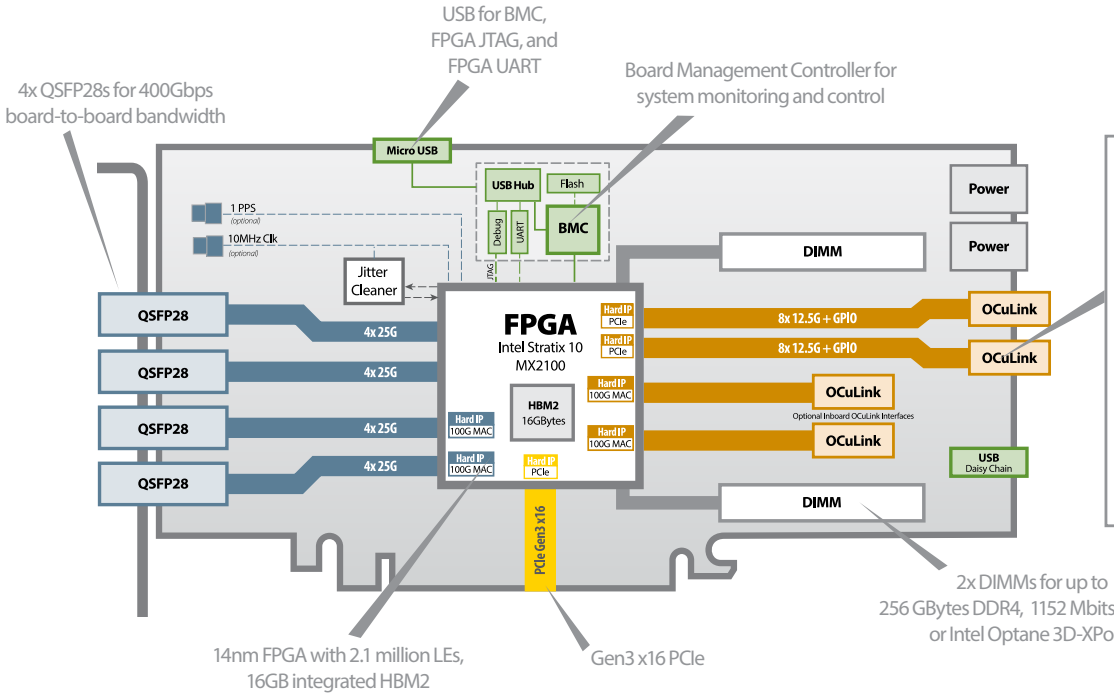
- OpenCL support for software-orientated customers
- Abstration for faster development
- Push-button flow for FPGA executable, driver, and API
- Add optimized HDL IP cores to OpenCL designs as libraries

BittWare HDL FPGA Tools

- Traditional VHDL/Verilog support for hardware-orientated customers
- Hand-code for ultimate performance
- High-Level Synthesis (HLS) available for rapid development
- FPGA card designed to support standard Intel IP cores for Stratix 10

## key features

**Intel Stratix 10 MX2100** | **16GB HBM2 up to 512GB/s** | **OpenCL BSP**




### OCuLink Expansion Ports

Optimize the 520N-MX for your application with expansion:

- Board-to-board interconnect
- NVMe access for storage acceleration
- Connect to accessory boards for customization options
- Includes GPIO

Inquire about customized Molex connectors/cables as required for your application.

# Additional Services

Take advantage of BittWare's range of design, integration, and support options

### Customization

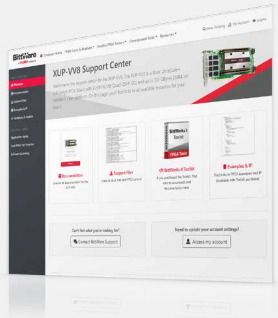
Additional specification options or accessory boards to meet your exact needs.

### Server Integration

Available pre-integrated in our TeraBox servers in a range of configurations.


### Application Optimization

Ask about our services to help you port, optimize, and benchmark your application.




### Service and Support

BittWare Developer Site provides online documentation and issue tracking.

## Board Specifications

| | |
|---|---|
| FPGA | • Intel Stratix 10 MX<br>  • MX2100 in an F2597 package<br>  • 16GBytes on-chip High Bandwidth Memory (HBM2) DRAM, 410 GB/s (speed grade 2)<br>  • Core speed grade -2: I/O speed grade -2<br>• Contact BittWare for other Stratix 10 MX options |
| On-board Flash | • 2Gbit Flash memory for booting FPGA |
| External memory | • 2x 288-pin DIMM slots each fitted with 16GB modules by default, i.e., 32GB total on board (options up to 256GB total)<br>• Contact BittWare for QDR-II+ & Intel Optane (3D-Xpoint) DIMM options |
| Host interface | • x16 Gen3 interface direct to FPGA, connected to PCIe hard IP |
| QSFP cages | • 4 QSFP28 cages on front panel connected directly to FPGA via 16 transceivers<br>• User programmable low jitter clocking supporting 10/25/40/100GbE<br>• Each QSFP28 can be independently clocked<br>• Jitter cleaner for network recovered clocking<br>• 2 QSFP28s have available 100GbE MAC hard IP |
| OCuLink | • 2x edge connectors (A, B) @ 12.5G per lane (default); each supports PCIe Gen 3 x8 hard IP, GPIO, and PCIe master and optional input clocking<br>• 2x inner connectors (C, D) @ 25G per lane (optional); 1x 100GbE MAC hard IP per OCuLink |
| Board Management Controller | • Voltage, current, temperature monitoring<br>• Power sequencing and reset<br>• Field upgrades<br>• FPGA configuration and control<br>• Clock configuration<br>• Low bandwidth BMC-FPGA comms with SPI link<br>• USB 2.0<br>• PLDM support<br>• Voltage overrides |
| Cooling | • Standard: dual-slot active heatsink (with fan)<br>• Optional: dual-slot passive heatsink<br>• Optional: dual-slot liquid cooling |
| Electrical | • On-board power derived from PCIe slot 12V and two AUX connectors (one 8-pin, one 6-pin)<br>• Power dissipation is application dependent<br>• Typical max power consumption 225W |
| Environmental | • Operating temperature: 5°C to 35°C |
| Quality | • Manufactured to IPC-A-610 Class 2<br>• RoHS compliant<br>• CE, FCC & ICES approvals |
| Form factor | • Standard-height PCIe dual-slot board<br>• 4.376 x 10.5 inches (111 x 266.7 mm) |

## Development Tools

| | |
|---|---|
| FPGA development | BIST - Built-In Self-Test for CentOS 7 provided with source code (pinout, gateware, PCIe driver and host test application) |
| Application development | Supported design flows - Intel FPGA OpenCL SDK, Intel High-Level Synthesis (C/C++) and Quartus Prime Pro (HDL, Verilog, VHDL, etc.) |

## Deliverables

- 520N-MX FPGA board
- USB cable (front panel access)
- Built-In Self-Test (BIST)
- OpenCL HPC Board Support Package (BSP)
- 1-year access to online Developer Site
- 1-year hardware warranty

To learn more, visit **www.BittWare.com**

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