



## 520NX PCIe FPGA Board



## Stratix 10 AI-optimized FPGA with HBM2

AI-Optimized for High-Bandwidth, Low-Latency AI Acceleration

Designed to tackle the most demanding artificial intelligence workloads, the 520NX is a PCIe card featuring Intel's Stratix 10 NX2100 FPGA. This revolutionary accelerator delivers a unique combination of capabilities needed to implement low latency and larger AI models:

- High-performance AI Tensor Blocks: 143 INT8 TOPS
- Deep Near-Compute Memory: up to 8GB of HBM2
- High-Bandwidth Networking: up to 600Gbps board-to-board bandwidth

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

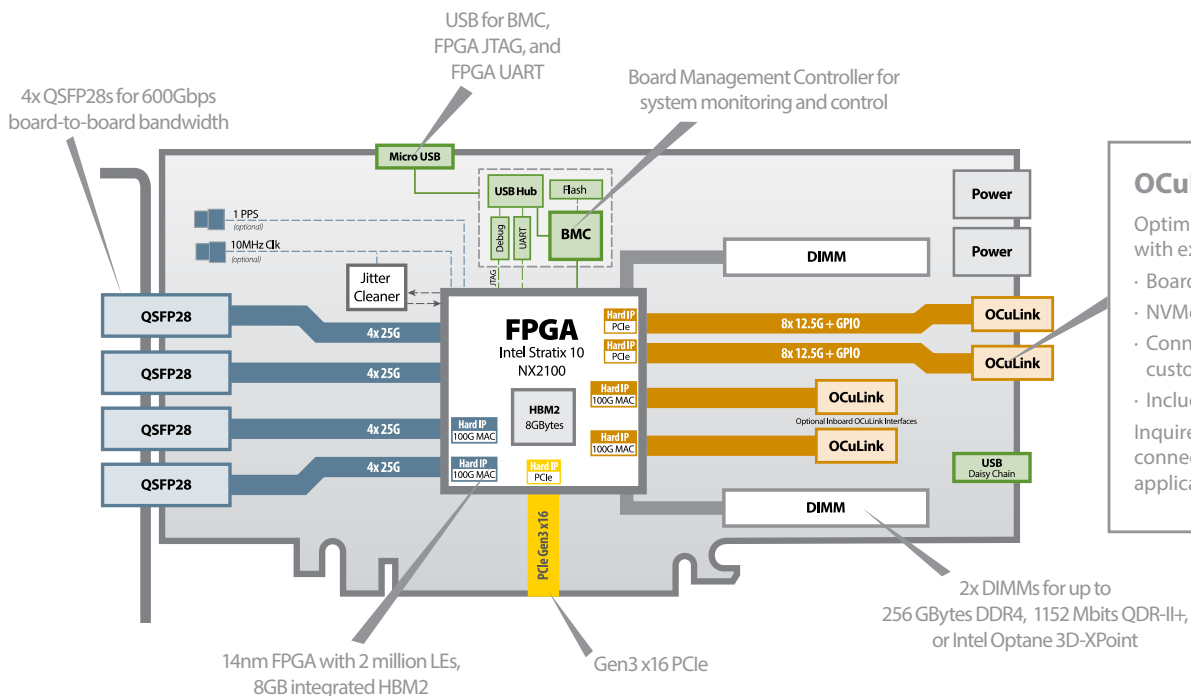


## key features

Intel Stratix 10  
NX2100

8GB of 3D  
stacked HBM2

AI Tensor  
Blocks



### OCuLink Expansion Ports

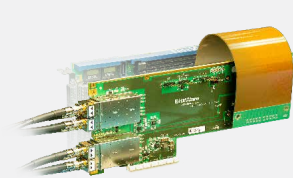
Optimize the 520NX for your application with expansion:

- 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



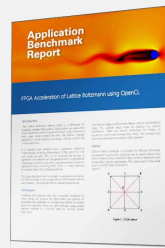
## Customization

[Additional specification options](#) or [accessory boards](#) to meet your exact needs.



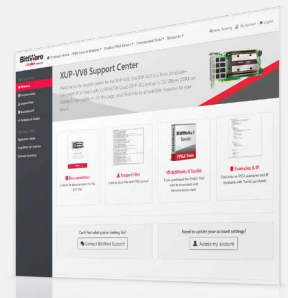
## Server Integration

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	<ul style="list-style-type: none"> <li>Intel Stratix 10 NX <ul style="list-style-type: none"> <li>NX2100 in an F2597 package</li> <li>8GBytes on-chip High Bandwidth Memory (HBM2) DRAM, 410 GB/s (speed grade 2)</li> <li>Core speed grade -2: I/O speed grade -2</li> </ul> </li> <li>Contact BittWare for other Stratix 10 NX options</li> </ul>
On-board Flash	<ul style="list-style-type: none"> <li>2Gbit Flash memory for booting FPGA</li> </ul>
External memory	<ul style="list-style-type: none"> <li>2x 288-pin DIMM slots each fitted with 16GB modules by default, i.e., 32GB total on board (options up to 256GB total)</li> <li>Contact BittWare for QDR-II+ &amp; Intel Optane (3D-Xpoint) DIMM options</li> </ul>
Host interface	<ul style="list-style-type: none"> <li>x16 Gen3 interface direct to FPGA, connected to PCIe hard IP</li> </ul>
QSFP cages	<ul style="list-style-type: none"> <li>4 QSFP28 cages on front panel connected directly to FPGA via 16 transceivers</li> <li>User programmable low jitter clocking supporting 10/25/40/100GbE</li> <li>Each QSFP28 can be independently clocked</li> <li>Jitter cleaner for network recovered clocking</li> <li>2 QSFP28s have available 100GbE MAC hard IP</li> </ul>
OCuLink	<ul style="list-style-type: none"> <li>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</li> <li>2x inner connectors (C, D) @ 25G per lane (optional); 1x 100GbE MAC hard IP per OcuLink</li> </ul>
Board Management Controller	<ul style="list-style-type: none"> <li>Voltage, current, temperature monitoring</li> <li>Power sequencing and reset</li> <li>Field upgrades</li> <li>FPGA configuration and control</li> <li>Clock configuration</li> <li>Low bandwidth BMC-FPGA comms with SPI link</li> <li>USB 2.0</li> <li>PLDM support</li> <li>Voltage overrides</li> </ul>

### Cooling

- Standard: double-width active heatsink (with fan)
- Optional: double-width passive heatsink
- Optional: double-width liquid cooling

### Electrical

- On-board power derived from 12V PCIe slot & two AUX connectors (one 8-pin, one 6-pin)
- Power dissipation is application dependent
- Typical max power consumption 225W

### Environmental

- Operating temperature: 5°C to 35°C

### Quality

- Manufactured to IPC-A-610 Class 2
- RoHS compliant
- CE, FCC & ICES approvals

### Form factor

- Standard-height PCIe dual-slot board
- 4.376 x 10.5 inches (111 x 266.7 mm)

## Development Tools

### FPGA development

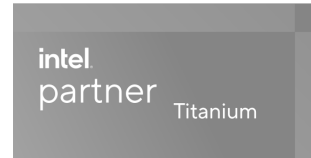
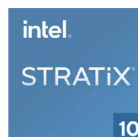
**BIST** - Built-In Self-Test for CentOS 7 provided with source code (pinout, gateware, PCIe driver & host test application)

### Application development

**Supported design flows** - Quartus Prime Pro (HDL, Verilog, VHDL, etc.)

## Deliverables

- 520NX FPGA board
- USB cable (front panel access)
- Built-In Self-Test (BIST)
- 1-year access to online Developer Site
- 1-year hardware warranty



**BittWare**  
a **molex** company

### International Distributors



Sky Blue Microsystems GmbH  
Geisenhausenerstr. 18  
81379 Munich, Germany  
+49 89 780 2970, [info@skyblue.de](mailto:info@skyblue.de)  
[www.skyblue.de](http://www.skyblue.de)



In Great Britain:  
**Zerif Technologies Ltd.**  
Winnington House, 2 Woodberry Grove  
Finchley, London N12 0DR  
+44 115 855 7883, [info@zerif.co.uk](mailto:info@zerif.co.uk)  
[www.zerif.co.uk](http://www.zerif.co.uk)

Rev 2021.11.23 | November 2021

© BittWare 2021

Stratix 10 is a registered trademark of Intel Corp. All other products are the trademarks or registered trademarks of their respective holders.