BittWare’s XUP-P3R is a 3/4-length PCIe x16 card based on the Xilinx Virtex UltraScale+ FPGA. The UltraScale+ devices deliver high-performance, high-bandwidth, and reduced latency for systems demanding massive data flow and packet processing. The board offers extensive memory configurations supporting up to 512 GBytes of memory, sophisticated clocking and timing options, and four front panel QSFP cages, each supporting up to 100 Gbps (4x25) - including 100GbE.

The XUP-P3R also incorporates a Board Management Controller (BMC) for advanced system monitoring, which greatly simplifies platform integration and management. All of these features combine to make the XUP-P3R ideal for a wide range of data center applications, including network processing and security, acceleration, storage, broadcast, and SigInt.

Serial Expansion Interface
Optimize the XUP-P3R for your application with expansion:
- Board-to-board interconnect
- Connect to accessory boards for customization options such as x16 PCIe or 4x 100G
- 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.

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**Board Specifications**

<table>
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<tr>
<th>Category</th>
<th>Details</th>
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</table>
| FPGA                   | • Virtex UltraScale+  
                        |   • VU9P  
                        |   • Core speed grade - 2  
                        |   • Contact BittWare for additional FPGA options                                                                                   |
| External memory        | • 4 DIMM sites, each supporting*:  
                        |   • Up to 128 GBytes DDR4 x72 with ECC  
                        |   • Up to 576 Mbits dual QDR-II+ x18 (2 independent 288 Mbit banks)                                                                |
| Host interface         | • x16 Gen3 interface direct to FPGA                                                                                                                                                                    |
| USB header             | • Micro USB: (USB 2.0) for debug and programming FPGA and Flash                                                                              |
| Serial expansion port  | • Expansion interface to FPGA via 20x GTY transceivers (optional; requires second slot)  
                        |   • 14x GPIO signals to the FPGA                                                                                                            |
| QSFP cages             | • 4 QSFP28 (2QSFP) cages on front panel connected directly to FPGA via 16 transceivers  
                        |   • Each supports 100GbE, 40GbE, 4x 25GbE, or 4x 10GbE and can be combined for 400GbE                                                    |
| On-board Flash         | • Flash memory for booting FPGA                                                                                                                                                                         |

* DIMM sites 1/2 and sites 3/4 must have the same memory type, or be empty.

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**Development Tools**

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<tr>
<td>System development</td>
<td>• BittWorks II Toolkit - host, command, and debug tools for BittWare hardware</td>
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</tbody>
</table>
| FPGA development        | • FPGA Examples - example Vivado projects  
                        |   • Xilinx Tools - Vivado® Design Suite                                                                                                        |