

### OVERVIEW

Today's leading trading firms, market makers, hedge funds, and exchanges demand low latency trade execution and risk management for competitive advantage. For traders seeking a plug-and-play upgrade, quants seeking computational offload to accelerate their algorithms, or partners seeking ultimate flexibility to build their own fintech solutions, the new Alveo X3 series of low latency network adapters and accelerator cards offers both turnkey deployment or custom implementation paths.

Providing a convergence of low latency network technology and adaptive compute, the Alveo X3 series accelerates a range of diverse trading strategies and financial applications.

Available in two variants, the Alveo X3522 low latency network adapter provides a low latency NIC with an optional upgrade for user programmability. The Alveo X3522PV adaptable accelerator card provides a fully programmable option for fintech customers to implement a customized, low latency solution. Collectively, the portfolio reduces overall system latency by bringing compute closer to the wire.

### HIGHLIGHTS

#### Plug-and-Play Low Latency NIC

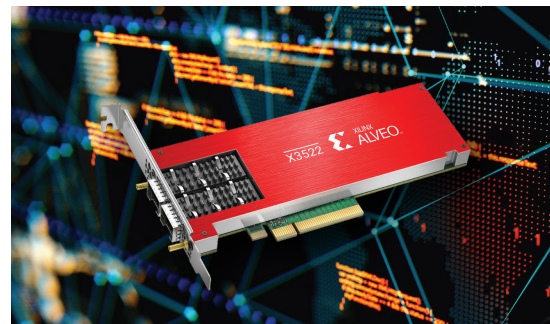
- Low latency networking solution with high port density (up to 4x 10/25GbE\*)
- Optimized architecture for reliable operation and trade execution
- Support for full kernel bypass using field-hardened Onload and TCPDirect
- ef\_vi API for high performance raw Ethernet networking
- Accelerates diverse trading strategies and increases fill rate

#### Programmable Architecture – Bringing Compute Closer to the Wire

- Optimize system latency by offloading functions onto programmable logic
- CPU host processing performed in parallel to low latency functions in FPGA
- Hardware upgradeability for evolving use cases and requirements

#### Custom Design and Implementation for Hardware and Software Developers

- Vitis™ SW environment allows implementation of custom functions in C/C++
- Vivado® Design Suite for RTL design and hardware customization



### TARGET USERS

- Brokers
- Exchanges
- Market Data Vendors
- Sell Side Vendors
- Proprietary Traders

### USE CASES

- Tick-to-Trade
- Algorithmic Trading
- A/B Line Arbitration
- TCP Offload
- Market Data Accelerators
- Market Data Gateways
- Pre-Trade Risk Analysis
- Smart Order Routing
- FIX Gateway

# ALVEO X3522 LOW LATENCY NETWORK ADAPTER

## SPECIFICATIONS

<b>Adapter Hardware</b>	<ul style="list-style-type: none"><li>• 4x10/25GbE* ports</li><li>• PCIe® Gen 4 x8 / Gen 3 x8</li><li>• Half Height Half Length, single PCIe slot, low profile bracket default with spare full height bracket</li><li>• 2x DSFP (SFP28/SFP+ compatible) with support for Direct Attach Copper (DAC) cables or optical transceivers</li><li>• Onboard 8GB DDR4 memory</li><li>• 1PPS In/Out SSMB connectors</li><li>• Tamper resistant adapter – digitally signed firmware and secured private keys</li><li>• Passively cooled</li></ul>
<b>Network Acceleration</b>	<ul style="list-style-type: none"><li>• Onload® - BSD sockets compliant TCP/UDP kernel bypass</li><li>• TCPDirect - TCP/UDP kernel bypass</li><li>• ef_vi low level API for high performance raw Ethernet networking</li></ul>
<b>Adaptable Engine</b>	<ul style="list-style-type: none"><li>• 16nm UltraScale+™ XCUX35 FPGA</li><li>• -3 speed grade optimized for low latency</li><li>• 400K Look-Up Tables (LUTs) for custom workload programmability</li></ul>
<b>OS Support</b>	<ul style="list-style-type: none"><li>• Red Hat RHEL, Ubuntu Server, and SUSE SLES</li></ul>
<b>Software Framework Support</b>	<ul style="list-style-type: none"><li>• Vitis HLS™ software environment to implement custom functions in C/C+</li></ul>
<b>Time Synchronization and Hardware Timestamping</b>	<ul style="list-style-type: none"><li>• On-board Stratum 3 compliant oscillator</li><li>• IEEE 1588-2008 PTPv2</li><li>• Hardware receive and transmit timestamping</li></ul>
<b>Manageability and Remote Boot</b>	<ul style="list-style-type: none"><li>• UEFI • NC-SI over MCTP SMBus • PLDM over MCTP SMBus • MCTP PCIe VDM</li></ul>
<b>Maximum Power</b>	<ul style="list-style-type: none"><li>• X3522 (in 4-port NIC mode): 35W</li><li>• X3522 (upgraded to hybrid mode): Up to 75W (programmable logic dependent)</li></ul>
<b>Physical Dimensions</b>	<ul style="list-style-type: none"><li>• L: 16.75 cm (6.6 in) • W: 6.9 cm (2.7 in)</li><li>• End bracket height: - PCI Express standard: 12.0 cm (4.725 in), 7.92 cm (3.12 in)</li><li>• FCC, UL, CE, UKCA • RoHS - complies with EU directive 2011/65/EU</li></ul>
<b>Temperature and Humidity</b>	<ul style="list-style-type: none"><li>• Operating Temperature: 0°C to 55°C (32°F to 131°F)</li><li>• Storage Temperature: -40°C to 65°C (-40°F to 149°F)</li><li>• Operating Humidity: 10% to 80%</li><li>• Storage Humidity: 5% to 90%</li></ul>

## ORDERING INFORMATION

<b>A-X3522-P08G-PQ-G</b>	<ul style="list-style-type: none"><li>• 4-port, 10/25GbE PCIe low latency network adapter</li></ul>
<b>SW-X3522-001</b>	<ul style="list-style-type: none"><li>• X3522 configuration file to enable programmability</li><li>• SKU provides a license to use the config file to upgrade a single X3522 adapter to enable programmability</li></ul>

# ALVEO X3522PV ACCELERATOR CARD

## SPECIFICATIONS

<b>Adapter Hardware</b>	<ul style="list-style-type: none"><li>• 4x10/25GbE* ports</li><li>• PCIe® Gen 4 x8 / Gen 3 x8</li><li>• Half Height Half Length, single PCIe slot, low profile bracket default with spare full height bracket</li><li>• 2x DSFP (SFP28/SFP+ compatible) with support for Direct Attach Copper (DAC) cables or optical transceivers</li><li>• Onboard 8GB DDR4 memory</li><li>• 2 Gb QSPI flash</li><li>• 1PPS In/Out SSMB connectors</li><li>• Passively cooled</li></ul>
<b>Adaptable Engine</b>	<ul style="list-style-type: none"><li>• 16nm UltraScale+™ XCUX35 FPGA</li><li>• -3 speed grade optimized for low latency</li><li>• 1030K Look-Up Tables (LUTs) for custom workloads programmability</li></ul>
<b>Software Framework Support</b>	<ul style="list-style-type: none"><li>• Vivado® Design Suite for RTL design and hardware customization</li></ul>
<b>Time Synchronization and Hardware Timestamping</b>	<ul style="list-style-type: none"><li>• On-board Stratum 3 compliant oscillator</li><li>• IEEE 1588-2008 PTPv2</li></ul>
<b>Maximum Power</b>	<ul style="list-style-type: none"><li>• 75W</li></ul>
<b>Physical Dimensions</b>	<ul style="list-style-type: none"><li>• L: 16.75 cm (6.6 in) • W: 6.9 cm (2.7 in)</li><li>• End bracket height: - PCI Express standard: 12.0 cm (4.725 in), 7.92 cm (3.12 in)</li><li>• FCC, UL, CE, UKCA • RoHS - complies with EU directive 2011/65/EU</li></ul>
<b>Temperature and Humidity</b>	<ul style="list-style-type: none"><li>• Operating Temperature: 0°C to 55°C (32°F to 131°F)</li><li>• Storage Temperature: -40°C to 65°C (-40°F to 149°F)</li><li>• Operating Humidity: 10% to 80%</li><li>• Storage Humidity: 5% to 90%</li></ul>

## ORDERING INFORMATION

<b>A-X3522-P08G-PQ-G</b>	<ul style="list-style-type: none"><li>• 4-port,10/25GbE adaptable accelerator card</li></ul>
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\*Note: Feature availability is dependent on software release support. 25GbE support in 2023. Please contact support-nic@amd.com for details.

## TAKE THE NEXT STEP

- Learn more at [www.xilinx.com/x3](http://www.xilinx.com/x3)
- Contact your local sales representative or complete the Product Inquiry form at [www.xilinx.com/x3](http://www.xilinx.com/x3)

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