

## Product Highlights

### Performance

- 7135LB: 48 x SFP28, 4 x QSFP28
- 5 ns - Layer 1 Latency at 25G<sup>1</sup>
- Non blocking
- Nanosecond level L1 forwarding
- Xilinx Virtex® UltraScale+™ FPGA
- Deterministic forwarding

### Advanced L1 functionality

- Signal regeneration
- Media conversion
- Port mirroring
- Telemetry
- Dynamic patching/link management

### Core Features

- Ports capable of 100M-25Gbps<sup>1</sup>
- Full signal recovery & regeneration
- Bit for bit forwarding for any protocol
- Integrated FPGA for applications

### Ultra Low Latency

- Deterministic ultra low latency
- Less than 100 ps jitter
- Same latency for 1:N port mirroring
- Completely non-blocking

### Redundancy & Data Center Optimized

- Dual redundant, hot swappable PSU
- Dual redundant, hot swappable fans
- AC & DC power options
- Rear to front or front to rear cooling
- Tool-less rails for simple installation

### Monitoring

- Embedded influxdb database
- Eye diagram for monitoring/troubleshooting
- LLDP for discovering network topology
- Full SFP28 interface diagnostics including light levels, temperature & voltage

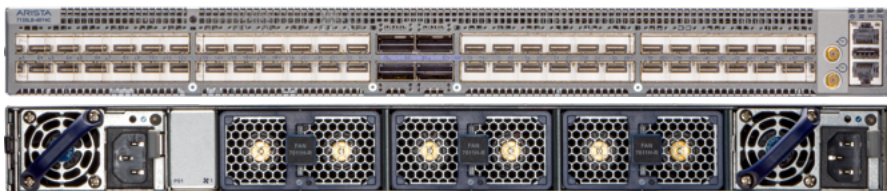
### Management platform

- Linux based
- Industry standard CLI
- JSON RPC API for remote management
- Flexible Time Synchronization with PTP, NTP, PPS

## Overview

Exchanges and traders today tend to do everything possible to shave every nanosecond of latency from the network. FPGA-based applications and Layer 1 X-Point connectivity provide blazing fast data distribution, critical to achieving the lowest possible latency. With increasing volatility and market data volume spiking bursts of traffic, upgrading the speed of the network infrastructure becomes an obvious choice to adapt to rapidly changing market events. The lack of higher speed infrastructure in ultra low latency networks has inhibited HFT venues from performing network upgrades. The Arista 7135LB Series FPGA-enabled devices leverage FPGA technology and a 25G<sup>1</sup> X-Point matrix switch to enable the development and deployment of cutting-edge network applications. With 48 SFP28 ports and 4 QSFP28 ports, the platform supports the next generation of 25G+<sup>1</sup> ultra low latency applications, featuring a Xilinx UltraScale+ FPGA. The 7135LB adds a Layer 1 crosspoint fabric between the FPGA and front-panel, supporting 25G<sup>1</sup> replication at only 5ns.

The Xilinx UltraScale+ FPGA allows customers to run either the applications developed by Arista, or to develop their own custom applications. On top of market-leading FPGA functionality, 7135LB Series combines a range of Layer 1+ network functionality such as signal regeneration, port mirroring, dynamic patching/link management, ad-hoc tapping without rewiring, and media conversion telemetry and more, all in one device.



*Arista 7135LB Series*

Feature	Benefits
Simplified stack	Fan-out with 5 ns of latency, equivalent to a single meter of fiber or copper interconnect and insignificant jitter.
Media conversion	Reduces costs by converting between different media types running at the same rate
Layer 1+ functionality	Save rack space and reduce complexity by leveraging dynamic patching, tapping, one-to-many replication, telemetry and comprehensive port statistics on a single device.
Feature rich	Avoid the need to build features in-house by leveraging Arista's access control, syslog, SNMP, packet stats, tcpdump, JSON RPC API, time series data, streaming telemetry and more - included as standard within the 7135 Series.
Easy app deployment	Streamline operational processes through Arista's built-in application infrastructure which allows developers to wrap applications into simple packages for deployment.
Enterprise ready	Deploy FPGA applications with ease - the FPGA platform integrates with a 64-bit x86 management processor and the MOS and/or EOS Operating systems to provide user extensible solutions.

1. 25 Gbps available in an EFT version of EOS

## Arista EOS

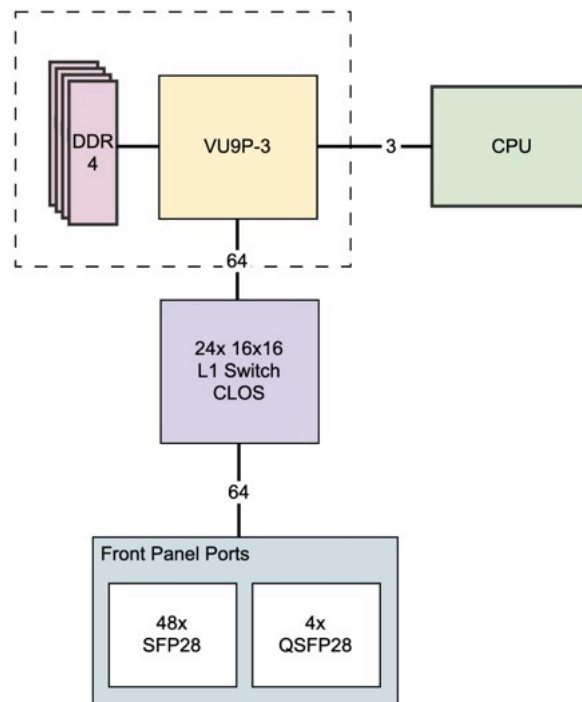
All Arista products including the 7135LB Series run the same Arista EOS software, simplifying network administration with a single standard across all switches. Arista EOS is a modular switch operating system with a unique state sharing architecture that cleanly separates switch state from protocol processing and application logic. Built on top of a standard Linux kernel, all EOS processes run in their own protected memory space and exchange state through an in-memory database. This state sharing architecture provides the foundation for self-healing resiliency and enables straightforward third-party development and application integration.

Arista EOS enables advanced monitoring and automation capabilities such as Zero Touch Provisioning, LANZ, and Linux based tools to be run natively on the switch.

Arista CloudVision provides a network-wide approach for workload orchestration, workflow automation and real-time telemetry enabling companies to manage the network with much fewer human resources. Rapid integration with a wide range of third-party applications for virtualization, management, automation and orchestration services are equally available.

## Platform Architecture

The Xilinx UltraScale+ VU9P-3 FPGA is connected to 48 x SFP28 and 4 x QSFP28 front panel ports through a CLOS network using a 16x16 X-Point, providing much lower latency and port scaling. The platform supports existing Arista applications such as Low Latency Mux or High Precision Timestamping, while allowing the FPGA to be also utilized by the customers for their custom applications. The FPGA also has three direct connections to the CPU card and four direct connections to 8GB DDR4 memory.



### Arista 7135 Applications

Arista offers several powerful network applications to transform network infrastructure. These applications enable a complete lifecycle of networking functions, such as packet replication, multiplexing, filtering, timestamping, Layer 2 switching, aggregation and capture. Arista also provides FPGA development kits as well as IP cores to enable organizations to develop and deploy their own custom applications.

### Application Comparison for Arista 7135LB Series

Application	Overview	Key Features	Use it for...
<b>MetaWatch</b>	Advanced network monitoring	<ul style="list-style-type: none"> <li>• Regenerative Tapping</li> <li>• Large scale, lossless tap aggregation</li> <li>• Multi-port data capture</li> <li>• Sub-nanosecond precise time stamping</li> <li>• Deep buffering (32 GB)</li> </ul>	<ul style="list-style-type: none"> <li>• In-depth network monitoring and visibility</li> <li>• Improved network reliability &amp; troubleshooting problems</li> <li>• Market data &amp; packet capture</li> <li>• Accurate latency measurement &amp; monitoring</li> <li>• Regulatory compliance (MiFID II/RTS 25)</li> </ul>
<b>MetaMux</b>	Low-latency multiplexing	<ul style="list-style-type: none"> <li>• Data aggregation in 39 nanoseconds</li> <li>• Deterministic jitter</li> <li>• Packet statistics</li> <li>• BGP &amp; PIM support</li> </ul>	<ul style="list-style-type: none"> <li>• Ultra-low latency network connectivity for trading</li> <li>• Market data fan-out and data aggregation for order entry at nanosecond levels</li> </ul>
<b>MultiAccess</b>	Connection sharing with enhanced security	<ul style="list-style-type: none"> <li>• Low-latency multiplexing and security from 55 nanoseconds</li> <li>• ACL-based configurable filtering</li> <li>• Easy to deploy data privacy for connection sharing</li> <li>• Simplified footprint for both mux and filtering applications</li> <li>• 10/1G Speed Conversion</li> </ul>	<ul style="list-style-type: none"> <li>• Secure network connection sharing</li> <li>• Providing sponsored access to multiple clients</li> <li>• Multi tenant exchange access</li> <li>• Low latency interconnect sharing</li> <li>• Supporting Colo deployments with multiple concurrent exchange connections</li> </ul>
<b>SwitchApp</b>	Low latency Layer 2 /Layer 3 switching	<ul style="list-style-type: none"> <li>• 1/10/25/40G Layer 2 switching, implemented in FPGA</li> <li>• Ultra-low latency packet forwarding in 89 -150 ns</li> <li>• Full featured L2/L3 switching pipeline powered by EOS</li> <li>• Non-blocking bandwidth profiles to provide up to 480 Gbps for 10G and 600Gbps for 25G</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange-facing connectivity</li> <li>• L2/L3 Multicast pub/sub</li> <li>• Supporting Colo deployments with multiple concurrent connections</li> <li>• Optimised distribution of traffic</li> <li>• Low latency back-office or message bus infrastructure</li> </ul>

Application	Overview	Key Features	Use it for...
<b>MetaWatch Inline* (formerly ExchangeApp)</b>	In-line packet time-stamping enabling exchange fairness	<ul style="list-style-type: none"> <li>• Timestamp at the edge of trading venue networks</li> <li>• Sub-200ns passthrough latency to apply the timestamp</li> <li>• Reliable accuracy and timestamp precision</li> <li>• Accurately synchronise timestamps between multiple MetaWatch Inline devices</li> </ul>	<ul style="list-style-type: none"> <li>• Increase exchange fairness</li> <li>• Reduce trading venue latency sensitivity</li> <li>• Maintain trade order based on edge timestamps</li> <li>• Reduce complexity and risk of traditional low-latency exchange infrastructures</li> </ul>
<b>MetaProtect* Firewall</b>	Low-latency packet filtering in 135 ns	<ul style="list-style-type: none"> <li>• Architected for ultra-low-latency with forwarding from 135 nanoseconds</li> <li>• Line rate 10GbE packet uni or bidirectional filtering between port-pairs</li> <li>• Stateless security policy with up to 510 rules per ACL</li> <li>• Full packet header logging for noncompliant traffic</li> </ul>	<ul style="list-style-type: none"> <li>• Low-latency firewall</li> <li>• Satisfy InfoSec or regulatory compliance mandates without introducing excessive latency</li> </ul>

## Enabling Custom Applications

While FPGA applications can be challenging to develop, the Arista 7135LB makes them easy to deploy. Arista provides a built-in application framework allowing developers to wrap applications into simple packages for deployment, streamlining operational processes. Arista development toolkits enable complete and unfettered access to the facilities provided by the in-system FPGAs.

These are the same APIs and developer kits used by the Arista engineering team to develop and deploy our applications.

## Specifications

Switch Model	7135LB-48Y4C
Front-Panel Ports	48x SFP28, 4x QSFP28
Layer 1 Throughput	100M-25.8 Gbps per lane <sup>1</sup>
Layer 1 Latency	From 5ns
FPGA	1x Xilinx® UltraScale+™ VU9P-3
FPGA DRAM	4 x 8GB DDR4
FPGA Development Kit (FDK)	Yes
Vitis™ Development Kit (VDK)	Yes <sup>2</sup>
Clock	OCXO
CPU	8-core x86
System DRAM / SSD	32 GB / 120 GB
RS-232 Serial Ports	1 (RJ-45)
USB Ports	1
100/1000 Management Ports	1
PPS Input Ports (5V TTL, 50Ω or Hi-Z)	2
PPS Output Ports (5V TTL)	2
Hot-swap Power Supplies	2 (1+1 redundant)
Hot-swappable Fans	3 (N+1 redundant)
Reversible Airflow Option	Yes
Typical/Max Power Draw	667W/1000W
Rack Units	1 U
Size (WxHxD)	17.3 x 1.7 x 22.4 inches (44.0 x 4.4 x 56.9 cm)
Weight	26.8 lbs (12.2 kg)
Fan Tray	FAN-7011H
Power Supplies	PWR-1511-AC or PWR-1511-DC or PWR-1512-AC
EOS Feature Licenses	Group 3
Minimum EOS	TBD

1. 25 Gbps available in an EFT version of EOS

2. Not currently supported in EOS

### Standards Compliance

EMC	FCC Class A, ICES-003, EN 55032, EN IEC 61000-3-2:2019, EN 61000-3-3
Immunity	EN 55035 EN 300 386
Safety	EN 62368-1:2014 + A11:2017 IEC-62368-1:2014
Certifications	BSMI (Taiwan) CE (European Union) KCC (South Korea) NRTL (North America) RCM (Australia/New Zealand) UKCA (United Kingdom) VCCI (Japan)
European Union Directives	2014/53/EU Radio Equipment Directive 2014/35/EU Low Voltage Directive 2014/30/EU EMC Directive 2012/19/EU WEEE Directive 2011/65/EU RoHS Directive 2015/863/EU Commission Delegated Directive
Further Information	<a href="#">Product Certification Portal</a>

### Environmental Characteristics

Operating Temperature <sup>1</sup>	0 to 40°C (32 to 104°F)
Relative Humidity	10% to 85% non-condensing
Maximum Altitude	2,000m (6,500ft)

### Power Supply Specifications

Power Supply	PWR-1511-AC	PWR-1511-DC	PWR-1512-AC
Input Voltage	200-240V AC	-48 to -60V DC	200-240V AC
Typical Input Current	9.6A	35.2A Max (-48V)	9.6A
Input Frequency	50/60Hz	DC	50/60Hz
Output Power	1500W	1500W	1500W
Input Connector	IEC 320-C13	AWG #6 Max	IEC 320-C13
Efficiency (Typical)	93% Platinum	92%	93% Platinum

1. Certain airflow configurations or the use of higher power or reduced temperature range optics may reduce maximum operating temperature.

### Arista Optics and Cables

The 7135LB Series accepts a wide range of QSFP and SFP optics and cables. The QSFP ports of the 7135LB Series accept QSFP optics and cables configured at 100GE, 4x 25GE, 40GE and 4x 10GE speeds, while the SFP28 ports accept SFP optics and cables configured at 25GE and 10GE speeds.

Arista's Enhanced Performance (E-Series) QSFP and SFP optical transceivers, such as the QSFP-100G-SR4-E, SFP-25G-SR-E and SFP-25G-LR-E enable 100G and 25GE operation without requiring FEC, eliminating the FEC delay usually present in 100GE and 25GE optical links. Apart from Arista's E-Series optical transceivers, 100GBASE-LR4 and certain copper cables, all 100GE and 25GE links require FEC, while all 10GE and lower data rates do not use FEC.

The table below summarizes the most commonly used optics and cables in the 7135LB platforms. For more details about Arista's pluggable optics and cables, refer to the Optics Modules and Cables Data sheet, the Arista Transceiver and Cable Guide, and Arista's Enhanced Performance Series Optics Q&A.

### Supported 100G QSFP Optics and Cables

Application / Interface Type	Supported Optics and Cables	Description and Reach
100GBASE-CR4	CAB-Q-Q-100G-xM	QSFP to QSFP Copper Cables: 1m to 5m
4x 25GBASE-CR	CAB-Q-4S-100G-xM	QSFP to 4x SFP Breakout Copper Cables: 1m to 5m QSFP port configured for 4x 25GE, SFP breakout ports configured for 25GE
	CAB-Q-Q-100G-xM	QSFP to QSFP Copper Cables: 1m to 5m QSFP ports configured for 4x 25GE
100GBASE-AOC	AOC-Q-Q-100G-xM	100G QSFP to QSFP Active Optical Cables: 1m to 30m
100GBASE-SR4-E	QSFP-100G-SR4-E (E-Series Transceiver for low latency)	30m OM3 / 50m OM4 Parallel MMF without FEC (for low latency), or 70m OM3 / 100m OM4 Parallel MMF with FEC
4x 25GBASE-SR-E	QSFP-100G-SR4-E (E-Series Transceiver for low latency)	QSFP-100G-SR4-E Transceiver configured as 4x 25GE 30m OM3 / 50m OM4 Parallel MMF without FEC (for low latency), or 70m OM3 / 100m OM4 Parallel MMF with FEC
100GBASE-SR4	QSFP-100G-SR4	70m OM3 / 100m OM4 Parallel MMF
4x 25GBASE-SR	QSFP-100G-SR4	QSFP-100G-SR4 Transceiver configured as 4x 25GE 70m OM3 / 100m OM4 Parallel MMF
100GBASE-SRBD / SWDM4	QSFP-100G-SRBD / SWDM4	70m OM3 / 100m OM4 duplexMMF
100GBASE-PSM4 / PLRL4	QSFP-100G-PSM4 / PLRL4	500m / 2km over Parallel MMF
4x 25GBASE-LR	QSFP-100G-PSM4 / PLRL4	QSFP-100G-PSM4 / PLRL4 Transceiver configured as 4x 25GE 500m / 2km over Parallel MMF
100GBASE-LR4	QSFP-100G-LR4	10km over duplex SMF without FEC
100GBASE-LRL4	QSFP-100G-LRL4	2km over duplex SMF
100GBASE-CWDM4 / XCWDM4	QSFP-100G-CWDM4 / XCWDM4	2km / 10km over duplex SMF
100GBASE-DR / FR / LR	QSFP-100G-DR / FR / LR	500m / 2km / 10km over duplex SMF

### Supported 40G QSFP Optics and Cables

Application / Interface Type	Supported Optics and Cables	Description and Reach
40GBASE-CR4	CAB-Q-Q-xM	QSFP to QSFP Copper Cables: 0.5m to 5m
4x 10GBASE-CR	CAB-Q-S-xM	QSFP to 4x SFP Breakout Copper Cables: 0.5m to 5m QSFP port configured for 4x 10GE SFP breakout ports configured for 10GE
	CAB-Q-Q-xM	QSFP to QSFP Copper Cables: 1m to 5m QSFP ports configured for 4x 10GE
40GBASE-AOC	AOC-Q-Q-40G-xM	100G QSFP to QSFP Active Optical Cables: 3m to 100m
40GBASE-SR4	QSFP-40G-SR4	100m OM3 / 150m OM4 Parallel MMF
4x 10GBASE-SR	QSFP-40G-SR4	QSFP-40G-SR4 Transceiver configured as 4x 105GE 100m OM3 / 150m OM4 Parallel MMF
40GBASE-SRBD	QSFP-40G-SRBD	100m OM3 / 150m OM4 duplex MMF
40GBASE-UNIV	QSFP-40G-UNIV	100m OM3 / 150m OM4 duplex MMF or 500m duplex SMF
40GBASE-PLR4 / PLRL4	QSFP-40G-PLR4 / PLRL4	10km / 1km over Parallel MMF
4x 10GBASE-LR	QSFP-40G-PLR4 / PLRL4	QSFP-40-PLR4 / PLRL4 Transceiver configured as 4x 10GE 10km / 1km over Parallel MMF
40GBASE-LR4 / LRL4	QSFP-40G-LR4 / LRL4	10km / 1km over duplex SMF

### Supported 25G SFP Optics and Cables

Application / Interface Type	Supported Optics and Cables	Description and Reach
25GBASE-CR	CAB-S-S-25G-xM	SFP to SFP Copper Cables: 1m to 5m
25GBASE-AOC	AOC-S-S-25G-xM	25G SFP to SFP Active Optical Cables: 3m to 30m
25GBASE-SR-E	SFP-25G-SR-E (E-Series Transceiver for low latency)	30m OM3 / 50m OM4 duplex MMF without FEC (for low latency), or 70m OM3 / 100m OM4 duplex MMF with FEC
25GBASE-SR	SFP-25G-SR / SFP-25G-MR-SR	70m OM3 / 100m OM4 duplex MMF
25GBASE-XSR	SFP-25G-MR-XSR	200m OM3 / 300 OM4 duplex MMF
25GBASE-LR-E	SFP-25G-LR-E (E-Series Transceiver for low latency)	2km duplex SMF without FEC (for low latency), or 10km duplex SMF with FEC
25GBASE-LR	SFP-25G-LR / SFP-25G-MR-LR	10km duplex SMF with FEC

### Supported 10G Optics and Cables

Application / Interface Type	Supported Optics and Cables	Description and Reach
10GBASE-CR	CAB-SFP-SFP-xM	SFP to SFP Copper Cables: 0.5m to 5m
10GBASE-AOC	AOC-S-S-10G-xM	10 SFP to SFP Active Optical Cables: 3m to 30m
10GBASE-SR	SFP-10G-SR	300m OM3 / 400m OM4 duplex MMF
10GBASE-SRL	SFP-10G-SRL	100m OM3 / 150m OM4 duplex MMF
10GBASE-LR / LRL	SFP-10G-LR / LRL	10km / 1km duplex SMF
10GBASE-T	SFP-10G-T	30m Cat6a copper cable



Product Number	Product Description
DCS-7135LB-48Y4C#	Arista 7135 Series with 48 SFP28, 4 QSFP28, Layer 1 X-point, VU9P-3 FPGA, configurable fans & psu
DCS-7135LB-48Y4C-F	Arista 7135 Series with 48 SFP28, 4 QSFP28, Layer 1 X-point, VU9P-3 FPGA, front-to-rear air, 2xAC
DCS-7135LB-48Y4C-R	Arista 7135 Series with 48 SFP28, 4 QSFP28, Layer 1 X-point, VU9P-3 FPGA, rear-to-front air, 2xAC
FAN-7011H-F	Spare fan module for Arista 7000 Series 1RU High Speed Fan (front-to-rear airflow)
FAN-7011H-F#	Configurable fan module for Arista 7000 Series 1RU High Speed Fan (front-to-rear airflow)
FAN-7011H-R	Spare fan module for Arista 7000 Series 1RU High Speed Fan (rear-to-front airflow)
FAN-7011H-R#	Configurable fan module for Arista 7000 Series 1RU High Speed Fan (rear-to-front airflow)
PWR-1511-AC-RED	Arista PSU, 1RU, AC, 1500W, FORWARD, 73.5MM
PWR-1511-AC-RED#	Configurable PSU, 1RU, AC, 1500W, FORWARD, 73.5MM
PWR-1511-AC-BLUE	Arista PSU, 1RU, AC, 1500W, REVERSE, 73.5MM
PWR-1511-AC-BLUE#	Configurable PSU, 1RU, AC, 1500W, REVERSE, 73.5MM
PWR-1512-AC-RED	Arista PSU, 1RU, AC, 1500W, FORWARD, 73.5MM
PWR-1512-AC-RED#	Configurable PSU, 1RU, AC, 1500W, FORWARD, 73.5MM
PWR-1512-AC-BLUE	Arista PSU, 1RU, AC, 1500W, REVERSE, 73.5MM
PWR-1512-AC-BLUE#	Configurable PSU, 1RU, AC, 1500W, REVERSE, 73.5MM
PWR-1511-DC-RED	Arista PSU, 1RU, DC, 1500W, FORWARD, 73.5MM
PWR-1511-DC-RED#	Configurable PSU, 1RU, DC, 1500W, FORWARD, 73.5MM
PWR-1511-DC-BLUE	Arista PSU, 1RU, DC, 1500W, REVERSE, 73.5MM
PWR-1511-DC-BLUE#	Configurable PSU, 1RU, DC, 1500W, REVERSE, 73.5MM

## Warranty

The Arista 7135LB series switches come with a one-year limited hardware warranty, which covers parts, repair, or replacement with a 10 business day turn-around after the unit is received.

## Service and Support

Support services including next business day and 4-hour advance hardware replacement are available. For service depot locations, please see: <http://www.arista.com/en/service>

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