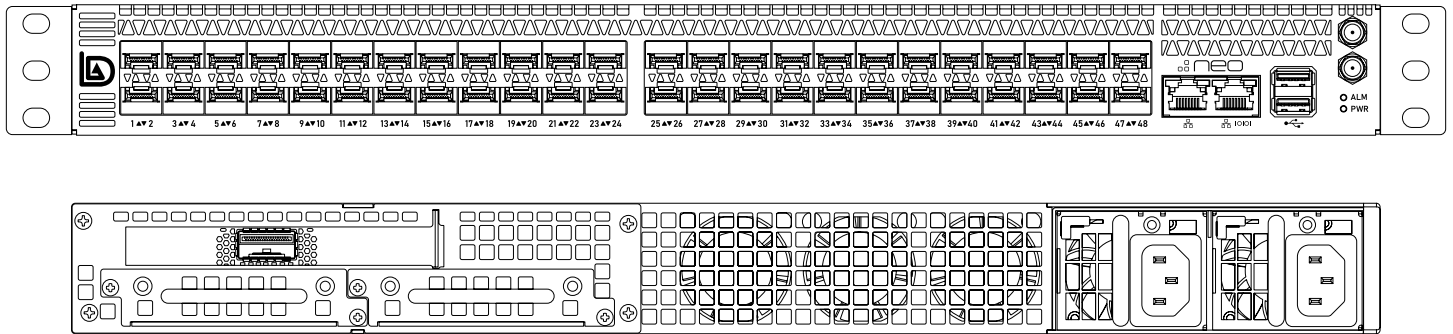# LDA NEO
DATASHEET

LDA NEO
Reconfigurable Networking Platform

Overview

LDA NEO is an FPGA-based network switching development platform. Powered by proprietary Direct SerDes Access (DSDA™) technology, it transforms any FPGA board – no matter what type or vendor – into a high-end reconfigurable networking device.

NEO is an extremely flexible platform that can be adapted to meet any FPGA-based networking needs.

Product Highlights

• 48x front panel ports supporting 10/25/100 Gigabit Ethernet protocols

• Per-port clock and data recovery for error-free communication

• SFP digital diagnostic interface accessible via CLI

• Configuration up to Xeon Gold 2nd Gen CPU, 128 GB DDR4, 4 NVME SSD

• Support for any PCIe form-factor FPGA board, up to full-height/full-length/double-slot

• Extra PCIe x8 slot for an add-on card (e.g., NIC, second FPGA card)

• Optional Layer 1 fabric with 2ns replication latency

• Optional equalized latency across all 48 ports: < 250 ps variance

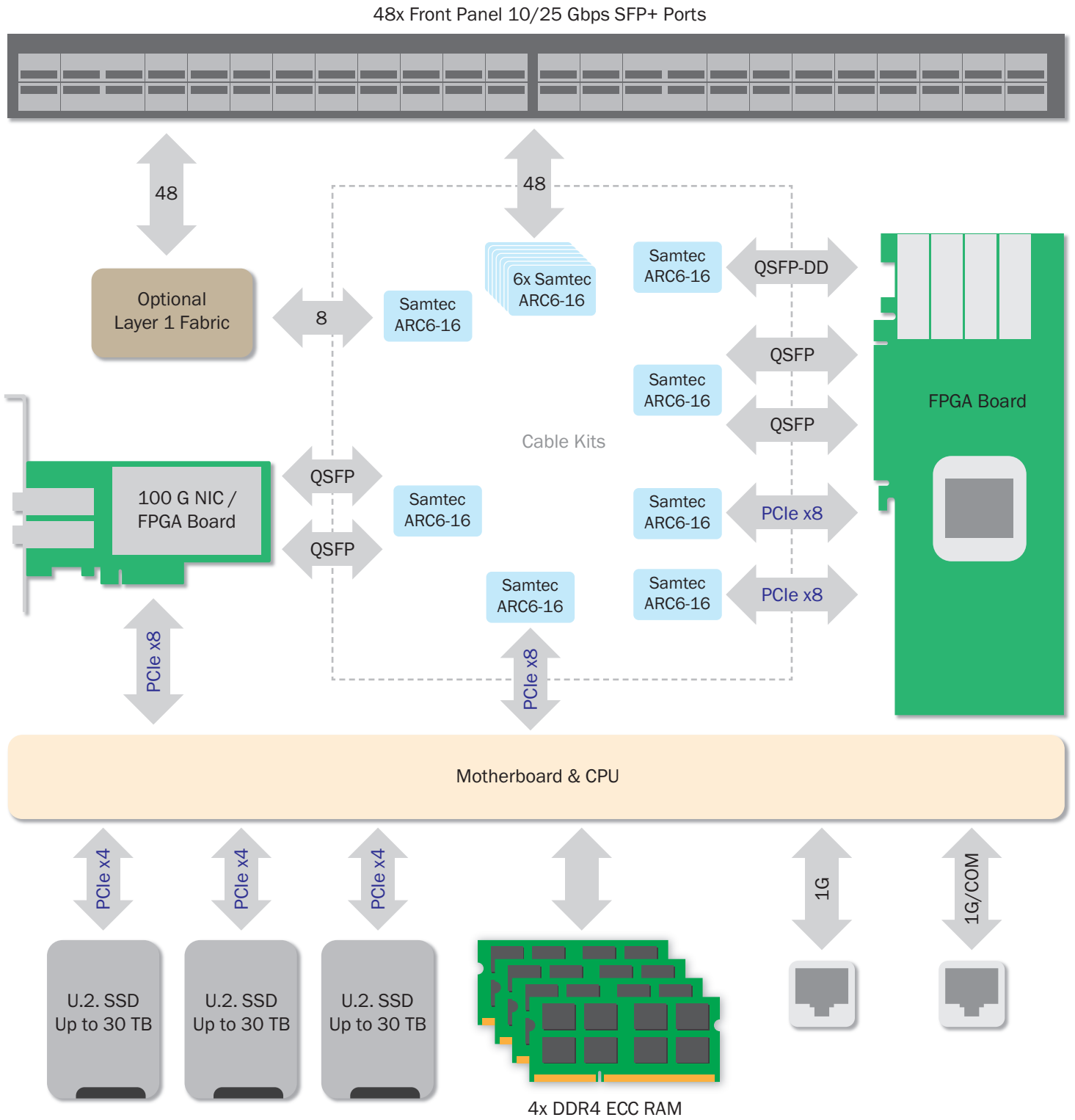• Ultra-low-jitter 5ppb oven controller clock generator

Configurations

The following configuration options are available

Name	Details	Default (Base)	Options
CPU	XEON Scalable 2nd Gen	Xeon Bronze 3204	Upgradable
RAM	Four ECC SO-DIMM DDR4 Slots	8G	Upgradable
NVME SSD	Three U.2 NVME Slots. Four-slot version is available by special order.	1TB	Upgradable
RJ45	One Ethernet port, one either Ethernet or RS232	RS232 / Ethernet	• RS232 / Ethernet; or • Ethernet / Ethernet
Optional Layer 1 Replication	10G	None	Yes / No
Optional NIC	Low-profile	None	Yes (Brand and Model) / No
FPGA Board	See table below for details on Cable Kits	None	Yes (Brand and Model) / No

Platform Design

Diagram 1 outlines the architecture of the NEO device with a maximum three NVME SSDs and one NIC/FPGA board. Option with four NVME SSDs is also supported, but NIC/FPGA PCIe slot will not be available in that case.

48x Front Panel 10/25 Gbps SFP+ Ports

48

48

Optional Layer 1 Fabric

8

Samtec ARC6-16

6x Samtec ARC6-16

Samtec ARC6-16

QSFP-DD

FPGA Board

QSFP

Samtec ARC6-16

QSFP

Cable Kits

100 G NIC / FPGA Board

QSFP

Samtec ARC6-16

Samtec ARC6-16

PCIe x8

QSFP

Samtec ARC6-16

PCIe x8

Samtec ARC6-16

PCIe x8

PCIe x8

Motherboard & CPU

PCIe x4

PCIe x4

PCIe x4

1G

1G/COM

U.2. SSD Up to 30 TB

U.2. SSD Up to 30 TB

U.2. SSD Up to 30 TB

4x DDR4 ECC RAM

NEO is built around LDA's DSDA™ and Samtec's AcceleRate® technologies. Based on DSDA ideology, NEO treats any I/O as an electrical level connectivity channel (or lane) which terminates in a Samtec AcceleRate connector.

The platform comprises multiple AcceleRate sockets with eight lanes. Each socket has identical pinouts that enable "any-to-any" internal I/O connections using various Cable Kits.

The platform I/O lanes include:

- 48 from front panel SFP+ ports
- 8 from motherboard
- 16 from FPGA PCIe socket

Depending on the installed FPGA board and required platform functionality, various interconnect patterns can be used.

An optional Layer 1 board can be installed to support ultra-low latency port replication (data incoming from a port is replicated to one or more front panel ports). Port-to-FPGA and back replication can be achieved if FPGA is connected to an AcceleRate socket on the Layer 1 board, but the number of lanes will be limited to eight.

Software

NEO has two independent subsystems: platform management system controlled by embedded software and an operating system running on the motherboard. The management subsystem handles low-level hardware and is fully independent of the motherboard. It is managed via CLI or API. For details, refer to the NEO CLI guide.
The user controls the OS as with any standard server.

IP Cores

For select FPGA boards, the following LDA IP Cores are available. Contact the LDA Sales team for licensing information.

- MAC/PCS: 10G 644Mhz
- MAC/PCS: 10G 322MHz
- MAC/PCS: 25G (no FEC)
- Timestamping / Latency Measurement
- Mux
- L3 Switch
- Multicast Router
- FPGA Networking Framework
- 10G-to-100G Tap Aggregation

FPGA Board Connectivity

Based on the selected FPGA board, different Cable Kits will be needed to expose the maximum number of available interfaces. Check the table below to identify the connectivity provided by the FPGA of interest

Connector*	Number of Lanes	Main Routing Option**
QSFP	4	ports on the front panel
QSFPDD	8	ports on the front panel
PCIe x16	16	• PCIe x16 to MB – no front panel ports; or • PCIe x8 to MB – 8 ports on front panel; or • PCIe x4 to MB – 12 ports on front panel; or • No PCIe to MB – 16 ports on front panel
Serial Expansion Port	Depends on the board	Depends on the board
SlimSAS	8	• PCIe x8; or • 8 ports on front panel
Oculink	4 or 8 (depending on the board)	• PCIe x4 (or x8); or • 4 (or 8) ports on front panel

Product Comparison

A comparison of NEO vs. the most powerful configuration of C5 platform is given below.

Description	c5 PRO Configuration	NEO Base Configuration
CPU	Core i7-7600U	Intel Xeon Bronze 3204 (upgradable)
Core Number	2	6 (upgradable)
Thread Number	4	6 (upgradable)
TDP	15 W	85 W (upgradable)
RAM	8G DDR4 SODIMM (upgradable)	8G ECC SO-DIMM DDR4 (upgradable)
SSD	2 × 480 G (upgradable)	1 × 1TB NVME (upgradable)
PCIe	1 lane to FPGA	8 lanes to FPGA 12 lanes to NVME drives 8 lanes to dedicated NIC
Out-of-band management	Lantronix Networking Module	IPMI KVM over IP Serial console redirection
Ports	48x 10 G	48x up to 25 G
Support for 100G on front panel	No	Yes (up to 12 100 G connections)
Extra PCIe slot for a NIC or similar	No	Yes
Layer 1 replication latency	3 ns	1.8 ns

Specifications

Description	Specification
Dimensions (W x H x D)	17.375" x 1.75" x 24.25"
Weight	21 lbs
Supported Connectors	SFP/ SFP+ (single-mode /multi-mode/ direct-attached copper) RJ45 100M/1G Ethernet RJ45 Serial Console SMA PPS (5V)
Power Supply	100-240V 800W Dual Redundant
Temperature (Centigrade)	Operating: +5 to +35 Storage: -20 to +45
Humidity	5% to 80% noncondensing
LED Indicators	Power, Alarm, SFP Link

Warranty

The product comes with one-year Standard Warranty and Support (upgradable upon user's request) and is subject to LDA support schedule.

For details and available options see http://www.ldatech.com/support-schedule/.

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