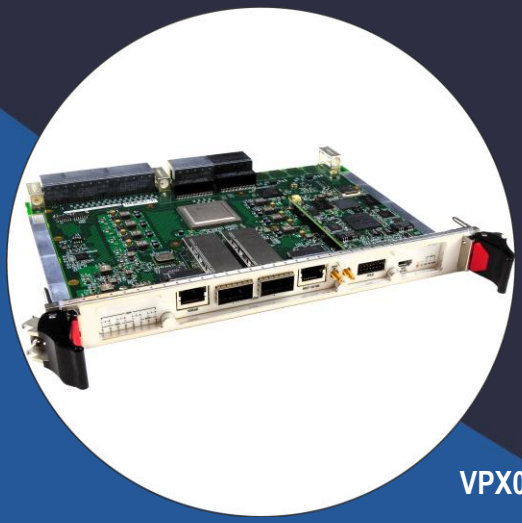
VPX011

6U OpenVPX 40G Switch with Health Management and JSM



VPX011

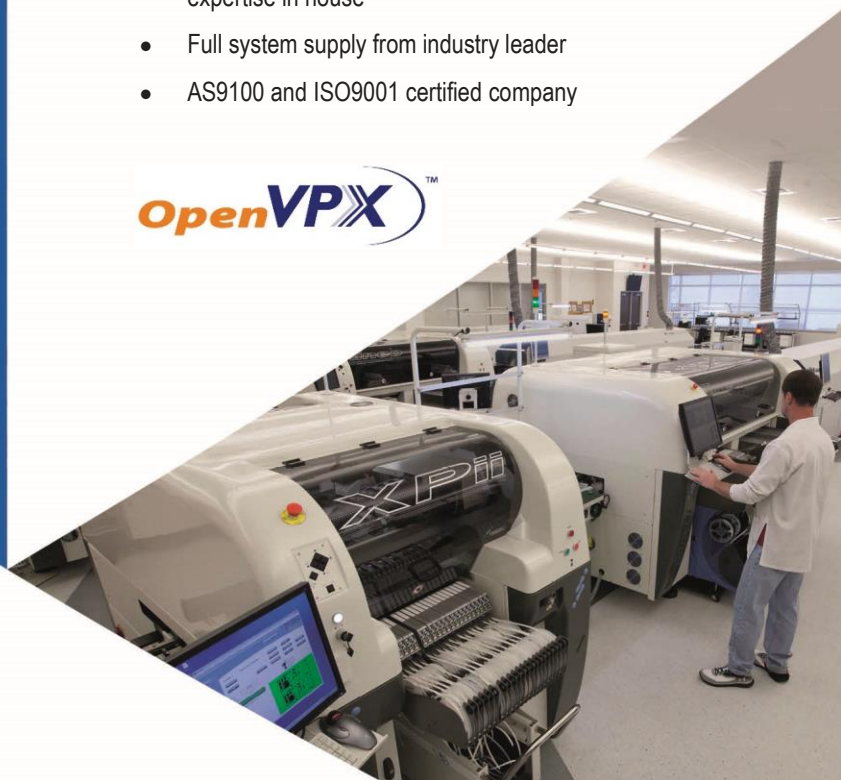
Key Features

- 1.5 GHz quad-core CPU
- 10x 40GbE ports to the backplane (also configuration as 4x 10GbE or 4x 1GbE per 40G port)
- 4x VITA 66.5 Optical to the backplane
- 10GBase-T via RJ-45 to the front
- Dual 40G Egress Ports on the front panel (configurable as 40GbE or quad 10G per QSFP+)
- Each 40G Port could be bifurcated to four 10G/1G Ports
- JSM (JTAG Switch Module)
- Full Layer 3 Managed Ethernet Switch
- PLL synthesizer for generating any clock frequency disciplined to SyncE/IEEE1588/1PPS/10MHz
- Non-blocking 40GbE/10GbE/1GbE
- VITA 46 and VITA 65 compliant

Benefits

- Sophisticated clocking
- Optional virtual JTAG capability for remote programming and debugging eases FPGA code development for other cards in the chassis
- VadaTech's Scorpionware® Shelf Management Software included at no additional cost
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

OpenVPX™



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VPX011

The VPX011 is part of the VadaTech family of 40G switches fully integrated with health management. The health management is the most feature-rich VPX product in the market.

The Ethernet Switch is managed with an enterprise grade Layer-3 switching/routing stack that supports IEEE1588 and Synchronous Ethernet. Each 40GbE port is also configurable to run as four 10GbE or four 1GbE. The switch has a throughput of 730Gb which allows each port to run at full 40G speed without any blocking.

The VPX011 runs Linux on its centralized quad-core CPU.

The module has clock inputs for 1PPS LVCMOS and/or 10MHz sine wave (up to 300MHz) with an on-board PLL that can lock to generate the necessary clocks for SyncE as well IEEE1588v2. The module can act as a PTP-to-NTP bridge and PTP Boundary Clock.

The module has a JTAG Switch Module (JSM) which provides JTAG to each slot. The Virtual Probe allows the JTAG to be managed by the on-board CPU thru an Ethernet port. This can replace having a JTAG dongle to the FPGA modules in the system.

The VPX011 has advanced clocking features including high-quality clock distribution/synthesis to the two VPX P0 clocks across the backplane.

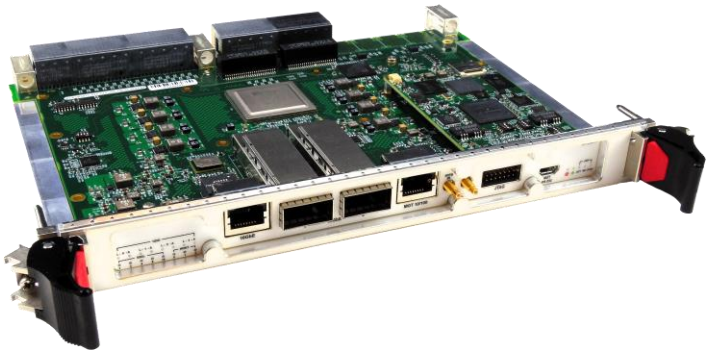

Figure 1: VPX011

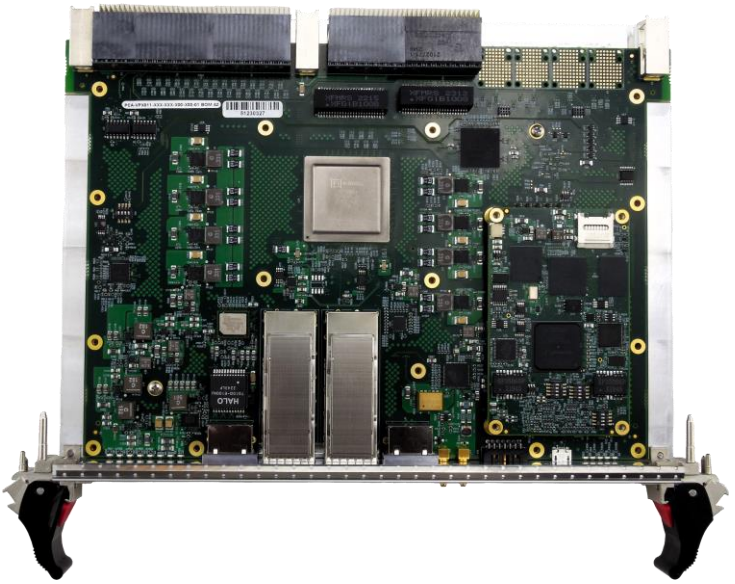

Figure 2: VPX011 Top View

Figure 3: VPX011 Front Panel View

Block Diagram

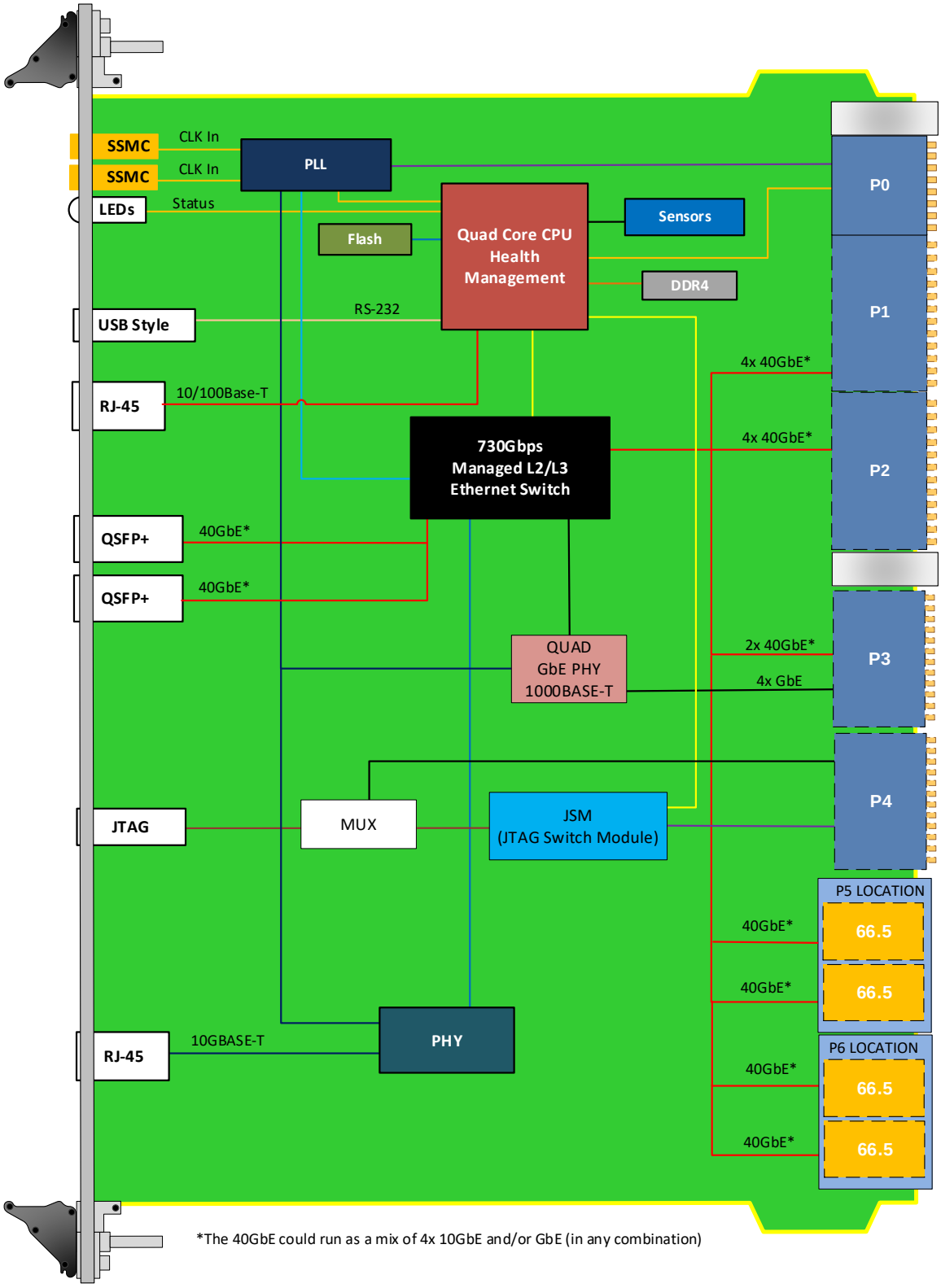

Figure 4: VPX011 Functional Block Diagram

Architecture

Fat Pipe Fabric

The VPX011 40GbE Switch provides:

- Layer 3 management protocols and functions
- SyncE and IEEE1588v2
- 730 Gbps aggregate bandwidth

General-Purpose Clocks

The VadaTech VPX011 has the most sophisticated clocking distribution in the market to meet the most stringent requirements such as wireless infrastructure, high speed A/D, etc. The VPX011 supports the general-purpose clocking features:

- Low-jitter/low-skew backplane routing
- Clock disciplining with arbitrary clock frequency output and holdover (Stratum-3) including 1PPS regeneration and holdover
- Flexible integration and synchronization between SyncE, PTP, and NTP clocking
- 'Any Frequency' high-quality clock generation/jitter cleaning for up to two backplane clocks
- Supports hitless automatic clock failover for improved reliability

Specifications

Architecture		
Physical	**Dimensions**	6U, 1” pitch
Type	**Controller**	OpenVPX Switch
Standards		
VPX	**Type**	VITA 46.x
VPX	**Type**	VITA 65 OpenVPX
VPX	**Type**	VITA 66.5 Optical to the back plane (location P5 and P6)
Configuration		
Power	**VPX011**	~70W (traffic dependent)
		Main power from +12V input
Front Panel	**Interface Connectors**	Dual 40G over QSFP+ (40G/4x10G/4x1G per port configuration)
		CPU 10/100BASE-T (RJ-45)
		CPU RS-232 via MicroUSB style connector
		10GBase-T via RJ-45
		LEDs Status per port
		CLK Inputs via SSMC (PPS/Sinewave)
VPX Interfaces	**Slot Profiles**	See Ordering Options
	Rear IO	JTAG
		VPX Clocks
		40GbE on P1/P2/P3 and 4x VITA 66.5 in location of P5/P6
Software Support	**Operating System**	Linux
Other		
MTBF	MIL Hand book 217-F@ TBD hrs	
Certifications	Designed to meet FCC, CE and UL certifications, where applicable	
Standards	VadaTech is certified to both the ISO9001:2015 and AS9100D standards	
Warranty	Two (2) years, see VadaTech Terms and Conditions	

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

Ordering Options

VPX011 – ABC-DEF-GHJ-K00

A = Fabric routing (rear only)	D = Optical cable interface*	G = Applicable Slot Profile	K = VPX Connector Type
0 = P1/P2/P3 loaded 1 = P1/P2/P3 not loaded 2 = P1/P2 loaded 3 = P1 loaded 4 = Reserved 5 = Reserved 6 = Reserved	0 = None (for option C = 0) 1 = LC style 2 = MTP/MPO	0 = 5 HP, VITA 46 1 = 5 HP, VITA 48.1	0 = Standard 50u Gold Rugged 1 = KVPX Connectors
B = Health Management	**E = JSM and Virtual Probe**	**H = Environmental**	
0 = No Health Management 1 = Health Management	0 = No JSM 1 = JSM 2 = JSM with Virtual Probe	See Environmental Specification	
C = QSFP28 TXCVRs (two total)	**F = VITA 66.5 Optical**	**J = Conformal Coating**	
0 = No TXCVRs 1 = 40GBASE-SR 2 = 40GBASE-LR (1 KM) 3 = 40GBASE-LR (10 KM) 4 = Reserved 5 = Reserved 6 = Reserved 7 = Reserved	0 = None 1 = 4x Loaded (P5/P6 location) 2 = 2x Loaded (P5 location) 3 = 2x Loaded (P6 location) 4 = 1x Loaded (P5 location) 5 = 1x Loaded (P6 location) 6 = Reserved	0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic	

Notes: *The optical cable determines the 40G WDM

Environmental Specification

	Air Cooled		Conduction Cooled		
Option H	**H = 0**	**H = 1**	**H = 2**	**H = 3**	**H = 4**
Operating Temperature	AC1* (0°C to +55°C)	AC3* (-40°C to +70°C)	CC1* (0°C to +55°C)	CC3* (-40°C to +70°C)	CC4* (-40°C to +85°C)
Storage Temperature	C1* (-40°C to +85°C)	C3* (-50°C to +100°C)	C1* (-40°C to +85°C)	C3* (-50°C to +100°C)	C3* (-50°C to +100°C)
Operating Vibration	V2* (0.04 g2/Hz max)	V2* (0.04 g2/Hz max)	V3* (0.1 g2/Hz max)	V3* (0.1 g2/Hz max)	V3 (0.1 g2/Hz max)
Storage Vibration	OS1* (20g)	OS1* (20g)	OS2* (40g)	OS2* (40g)	OS2* (40g)
Humidity	95% non-condensing	95% non-condensing	95% non-condensing	95% non-condensing	95% non-condensing

Notes: *Nomenclature per ANSI/VITA 47. Contact local sales office for conduction cooled (H = 2, 3, 4).

Related Products

VPX550

- Xilinx Kintex UltraScale™ XCKU115 FPGA
- COM Express Module Type-6
- 8 GB of DDR4 Memory to FPGA

VPX551

- Dual Kintex UltraScale™ XCKU115
- 16 GB of 64-bit wide DDR4 Memory to each FPGA
- Rear fibre I/O via VITA 66.5

VPX580

- Xilinx UltraScale+ XCZU19EG FPGA
- 8 GB of 64-bit wide DDR4 Memory (single bank) with ECC
- Dual FMC+ sites (16 SERDES to each) on a 6U VPX

Contact

VadaTech Corporate Office

198 N. Gibson Road, Henderson, NV 89014
Phone: +1 702 896-3337 | Fax: +1 702 896-0332

Asia Pacific Sales Office

7 Floor, No. 2, Wenhu Street, Neihu District, Taipei 114, Taiwan
Phone: +886-2-2627-7655 | Fax: +886-2-2627-7792

VadaTech European Sales Office

VadaTech House, Bulls Copse Road, Southampton, SO40 9LR
Phone: +44 2380 016403

info@vadatech.com | www.vadatech.com

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