2021

NEW WAVE DV
Design & Verification

Solutions Overview

- High-Performance Interface and FPGA Coprocessor Cards
- High-Speed Serial FPGA IP Cores
- Platforms & Appliances
- Custom Engineering Services

IP Cores

Pre-loaded on New Wave DV Hardware or Available Standalone

Ethernet

ExpressXG™

Complete FPGA design provides Ethernet interface IP, external memory interfaces, DMA controllers, PCIe interface, and software drivers. This IP provides out-of-the-box operation of an FPGA-based Ethernet interface. Easily add custom features for specific applications.

Fibre Channel (FC)

Link Layer

Complete layer 1/layer 2 solution for Fibre Channel. Provides easy-to-integrate frame interface. Supports rates of 1/2/4/8/16Gbs.

Anonymous Subscriber Messaging

Hardware-based full-network stack implementation of FC-ASM. Provides hardware-based label lookup, DMA controllers, and message chain engines. F-35 compatible interface mode available.

Fibre Channel Upper Layer Protocol

Hardware-based full-network stack implementation of the FC-RDMA and FC-AV protocols. Provides hardware-based buffer mapping, DMA controllers, and message chain engines. F-18/F-15 compatible interface mode available.

All New Wave DV IP Cores are available PRE-LOADED OR STANDALONE

Serial Front Panel Data Port (sFPDP)

sFPDP Link Layer

Designed to the ANSI/VITA 17.1-2015 specification supporting rates of 1/2/2.5/4/5Gbs. The sFPDP core provides a complete hardware implementation of the protocol with an easy-to-integrate frame interface.

sFPDP Express

Complete FPGA design provides sFPDP interface IP to ANSI/VITA 17.1-2015 specification supporting rates of 1/2/2.5/4/5Gbs, external memory interfaces, DMA controllers, PCIe interface, and software drivers. This IP provides out-of-the-box operation of an FPGA-based sFPDP interface. Easily add custom features for specific applications.

Mil1394

PHY

1394b (Beta) PHY layer hardware implementation. Includes standard PHY-Link interface.

OHCI Link Layer Controller

1394b (Beta) AS5643-targeted OHCI Link Layer hardware implementation. Includes standard PHY-Link interface and AXI bus for PCIe or embedded processor interface.

GP2Lynx Link Layer Controller

1394 GP2Lynx Link Layer hardware implementation. Includes standard PHY-Link interface.

1394b AS5643 Link Layer Controller

Hardware-based full-network stack implementation of AS5643 (Offload Engine). Provides hardware-based label lookup, DMA controllers, and message chain engines. F-35 compatible interface mode available.

ARINC 818

ARINC 818 DMA

ARINC 818 interface to processor solution. ARINC 818-2 specification compliance, hardware-based container processing, offload of frame handling including: ARINC 818 Container offload, hardware-based Object processing, frame building/checking, CRC generation/checking, DMA controller, and Linux software driver.

ARINC 818 Stream

Built for FPGA-based streaming applications. ARINC 818-2 specification compliance, hardware-based container processing, offload of frame handling including: ARINC 818 Container offload, hardware-based Object processing, frame building/checking, CRC generation/checking, streaming FPGA user interface.

Additional Protocols

HOTLink II

Complete layer 2 hardware implementation for HOTLink II. Provides easy-to-integrate frame interface. Supports full-rate, ½-rate, and ¼-rate operation as specified by the standard. F-18 compatible interface implementation.

High-Speed Data Bus (HSDB)

Complete PHY and Mac layer hardware implementation for HSDB. Provides easy-to-integrate frame interface. F-22 compatible interface implementation.

See our integrated High-Speed Serial Solutions on NI™ 6592 & 7902 PXIe Cards

NI PXIe-6592

NI PXIe-7902

Get these IP Cores pre-loaded on NI™ Hardware.

Contact us for more information.

PMC/XMC Cards

XMC FPGA/Interface Solutions - Pre-loaded or Standalone

V1160 | V1161

NEW FOR 2021

Specifically targeted at high-bandwidth and low-latency Ethernet applications, the V1160/V1161 turns a processor card into a single-slot high-performance sensor interface. Both cards are VITA 42-compliant, meet VITA 20 dimensions for conduction cooling, and meet the VITA 47 ECC4 ruggedization for shock, vibration, and operating temperature range of -40° C to +85° C.

Features

- NVIDIA® Mellanox® ConnectX®-5 network interface device
- Xilinx® UltraScale+™ FPGA (optional)
- Dual 10/25/40/100Gbs Ethernet ports
- Rugged optical ports via MPO (Female) on the front panel or VITA 66 optical backplane.
- Electrical I/O via Pn6 also available
- Supports PCIe Gen4 x16, Gen4 x8, Gen3 x16, Gen3 x8
- On board embedded PCIe Switch device
- Wide range of operating system software support
- Available in air- and conduction-cooled XMC form factors
- Conformal coating and carrier card options available

Capabilities

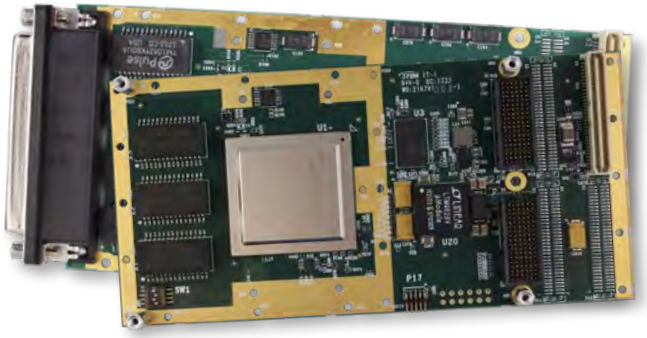
- Dual 10/25/40/100Gbs Ethernet ports with optical or electrical interfaces to both the front panel and backplane
- Performs as a low-latency high-bandwidth Ethernet interface card with an option for FPGA-based application co-processor
- Hardware offloads for UDP, TCP, RoCE v2, DPDK, +more

V1153

- Up to 12 optical ports capable of 10Gbs/port (or 8 ports 10-25Gbs)
- Xilinx® UltraScale™ KU095 or UltraScale+™ VU3P FPGA
- Rugged high-speed interface and coprocessing card
- VITA 42, VITA 20, VITA 47 ECC4-compliant XMC
- Supports: Ethernet, FC, sFPDP, ARINC 818, Aurora, Custom

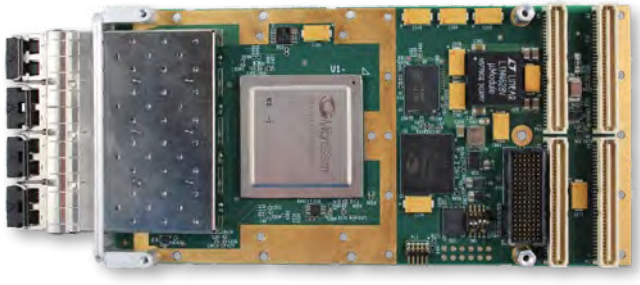
V1151 | V1152

- Up to 12 optical (SFP+/QSFP+) capable of 25Gbs per port
- Xilinx® UltraScale™ KU095 or UltraScale+™ VU3P FPGA
- 8-lane PCI Express Gen 3 host interface
- VITA 42-compliant XMC
- Supports: Ethernet, FC, sFPDP, ARINC-818, Aurora, Custom



V1144 | V1146

- 9 (V1146) or 12 (V1144) transformer-coupled 1394b ports per card
- Microsemi® SmartFusion2® M2S150 FPGA
- Front-panel and backplane IO options available
- VITA 42, VITA 20, VITA 47 ECC4-compliant XMC
- Supports: 1394b PHY, OHCI LLC, 1394b AS5643 LLC



V1141

- Quad SFP+ ports capable of Ethernet or Fibre Channel up to 5Gbs
- Microsemi® SmartFusion2® M2S150 FPGA
- Supports PCI Express, PCI, and XAUI host interfaces
- Streaming front-end FPGA core for quick sensor integration
- Supports: Ethernet, FC, ARINC 818

PCI Express Cards

Powerful PCIe Interface Solutions - Pre-loaded or Standalone

Powerful PCIe Network Solutions

V5051 | V5052

Powered by the Xilinx® Virtex® UltraScale+™ FPGAs, the V5051 & V5052 PCIe cards boast sixteen 25Gbs capable ports on the front panel, and a Gen 3 x 16 PCIe host interface.

Features

- Xilinx® UltraScale+™ FPGA (VU9P & KU115)
- One bank of 16GB DDR4 SDRAM
- One bank of 144Mbit QDR-IV SRAM
- 16-lane PCI Express Gen 3 host interface
- Available with a suite of networking IP

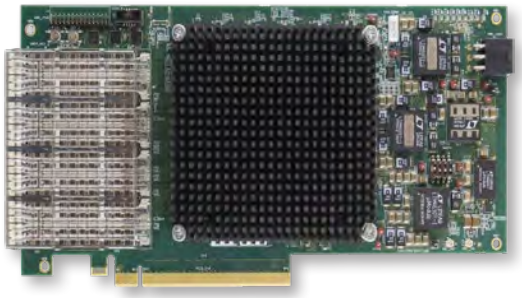
Capabilities

- Up to 16 front panel optical ports that can provide 1 to 25Gbs bandwidth per port
- Perfect for on-card application execution, algorithm-intensive data processing, and traffic filtering/monitoring
- Variety of off-the-shelf IP cores to provide a turnkey solution or a base for your custom interface needs

- 1/10/25Gbs Ethernet
- 40/100Gbs Ethernet
- 1/2/4/8/16Gbs FC
- 1/2/2.5/4.25/5Gbs sFPDP
- ARINC 818
- Aurora (1 to 25Gbs)
- Custom Protocol

V5054

- Up to 30 transformer-coupled front-panel 1394b ports
- Xilinx® UltraScale™ FPGA (KU115)
- Up to 10 independent 1394b nodes
- FPGA-based 1394b PHY, OHCI LLC, or AS5643 Offload Engine
- Rack-based breakout panel available provides standard 1394b connectors and strain relief



CaptureXG™ 1000

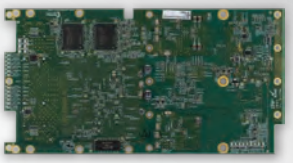
- Sixteen 1/10/25/40/100Gbs Ethernet SFP+ ports
- IRIG-A, B and G time synchronization
- PCAP Next Generation file format
- Programmable 5-tuple filters
- Low-latency, multi-threaded DMA controller
- 16-lane PCI Express Gen 3 host interface

PCIe OHCI Adapter Cards

- Single-Node and Triple-Node configurations available
- Each 1394b node implemented using TI TSB41BA3™/XIO2213B™ chipset
- Single-Node: Three S100/S200/S400 9-pin Beta ports
- Single-Node: x1 PCIe host interface
- Triple-Node: Nine S200/S400 Beta ports via 68-pin D-Sub
- Triple-Node: Transformer-coupled 1394b ports with x4 PCIe

Turnkey Modules

1 Choose your XMC



XMC Card

All New Wave DV XMC cards are available in alternate form factors via New Wave DV-provided carrier cards

2 Select your required form factor carrier

PCIe Carrier

VPX Carrier

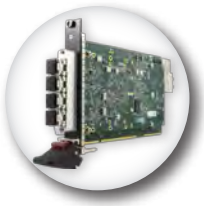
PXIe Carrier

3 Get...

Your Turnkey Module

Air-Cooled PCIe w/ Front Panel IO

Air-Cooled VPX w/ Front Panel IO



Air-Cooled PXIe w/ Front Panel IO

Conduction-Cooled VPX w/ Backplane IO

Conduction-Cooled VPX w/ Front Panel IO

iRepeater Handheld Tester

Easily detect wire harness and module connectivity issues with this compact handheld tester. Designed to provide both node replacement and diagnostic information to help determine wire harness or module connectivity issues. Retrieve general 1394 bus and specific PHY port status information to quickly isolate connectivity issues down to a single port.

- Simple indication of good or bad wire harness / module connectivity
- Monitors Bus Resets and Port Connectivity to determine gross connectivity issues
- Monitors Bit Error Rate to quickly determine more marginal signal quality issues
- Three (3) S200β and S400β transformer-coupled ports
- Over 8 hours of battery life per charge
- IEEE-1394-2008 and SAE AS5643 and AS5643/1 compliant
- Ruggedized for use in harsh ATEX and Military environments

32-Port Programmable Switch

The 32-Port Programmable Switch is ideal for applications that are not covered by a standard Ethernet or Fibre Channel switch. Based on a powerful Xilinx® UltraScale+™ FPGA, this switch is perfect for applications including avionics testing platforms, in-line packet monitoring, on-switch application execution, and security algorithm implementation.

- FPGA-based 32-port network switch
- Implicit Fibre Channel mode available for avionics networks
- Ethernet and Fibre Channel capable, up to 25Gbs per port
- Embedded x86 processor available for control plane operations
- Customized functionality available

Mil1394 Dual Quad-Port Repeater Hub

Two quad-port Mil1394 transformer-coupled S200β and S400β capable repeaters/hubs conveniently enclosed in a 1U 19inch rack mount enclosure. Provides a cost- and space-efficient solution to extend cable distances, isolate 1394 test equipment from modules during testing, and better manage up to four directly connected devices through a single hub.

- Integration of two 4-port hubs using the Texas Instruments TSB41BA3F™ PHY into a single 1U 19" rack mount chassis
- Mil1394 active transformer-coupled ports allow for longer cable length
- Standard 9-Pin bilingual connectors support connection of beta-only and bilingual cables
- Direct connection of four devices without additional daisy-chaining

IEEE-1394b SFP Tranceiver

Copper & Fiber Optic

The New Wave DV small form-factor pluggable (SFP) IEEE-1394b transceivers work at the physical network layer using bit-for-bit operations. The SFPs are logically transparent (they don't appear as nodes on the 1394 bus) to other network devices. When coupled with a Media Cross Connect™ system the SFP-1394 support up to 2x range extension, topology changes, fiber-to-copper media conversion, and a full range of data rates.

- Copper Data Rates: S100β, S200β, S400β, and S800β
- Fiber Data Rates: S100β, S200β, S400β, S800β, and S1600β
- Full transparency to other network nodes
- Two media connection models:
  - 9-pin (FW-SFP-1394B)
  - LC optical (FW-SFP-FO-1394B)
- IEEE-1394b (Beta) standard compliant

Design & Verification Services

New Wave DV provides custom engineering services and welcomes the opportunity to create a solution unique to your specific requirements.

New Wave DV has a dynamic team that excels at hardware, FPGA/ASIC, software, and systems design and development. Our team is made up of domain experts in high-speed interfaces, FPGA processing, network offload, and systems operations with a long history of successful programs in the Mil/Aero/Defense market.

Solutions can be based on existing New Wave DV products or all-new. We will analyze your requirements, leverage existing hardware and IP cores where possible, create new where required, and ultimately deliver your solution.

Reach out today via phone or email for a discussion on your requirements!

Services Summary

- FPGA/ASIC Design
- FPGA/ASIC Verification
- Printed Circuit Board Design
- Software Driver Development
- LabVIEW Development
- High-Speed Interface Development
- Systems Architecture
- Ultra-Low Latency Network Design

Partner Endorsement

"New Wave DV enables our customers to simulate and validate their high-speed avionics interfaces in a true reconfigurable COTS environment, minimizing the amount of NRE and cost of ownership associated with building and designing test systems. Their proven track record of delivering solutions specific to customers' applications, demonstrate their insight and understanding of serving both business and technical needs of this market."

Christer Ljungdahl, NI Aerospace and Defense Avionics Business Strategy Manager

Industry Associations

SOSA™ Sensor Open Systems Architecture

VITA Open Standards, Open Markets

SAE INTERNATIONAL™

AFCEA

Enabling Our Partners to Change the World

New Wave Design and Verification (New Wave DV) is driven to help our partners change the world. Our products and services can be found in critical programs and platforms across the US and allied countries military, aerospace, medical, and energy industries. We are proud of who we work for and the impact we make with our partners.

New Wave DV products and services are focused on high-bandwidth, ultra-low latency, and specialized networking and interface solutions designed and built for rugged and harsh environments.

Our team is made up of passionate engineers with extensive experience designing, building, testing, and delivering electronic systems. By providing off-the-shelf solutions and custom engineering resources, New Wave DV confidently serves you to meet your cost, schedule, and technical requirements.

CONTACT

Minneapolis Headquarters:
New Wave Design and Verification
4950 W 78th Street
Minneapolis, MN 55435
USA

Colorado Office:
New Wave Design and Verification
1920 Vindicator Drive Suite 112
Colorado Springs, CO 80919
USA

www.newwavedv.com
info@newwavedv.com
+1 952-224-9201

NEW WAVE DV
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