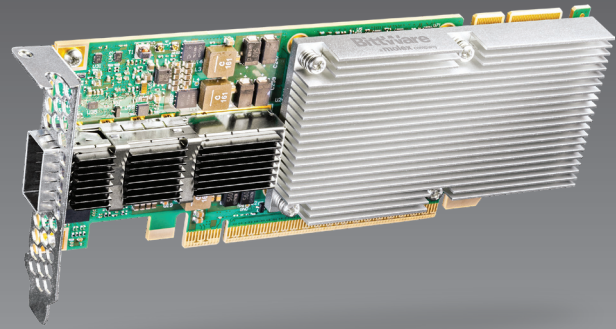**BittWare**
a **molex** company

IA-440i
PCIe FPGA Card

Agilex™ FPGA card with 400GbE and PCIe Gen5 x16
Hard Crypto Blocks and CXL Support

BittWare's IA-440i is an Intel® Agilex™ I-series FPGA card designed to address security challenges for data center, networking and edge compute workloads. The FPGA features optional hardened, high-speed cryptographic engines. The NIC-sized card provides a balance of I/O and memory using the Agilex chip's unique tiling architecture with a QSFP-DD (400GbE), DDR4 SDRAM, and PCIe Gen5 x16 with CXL support for a variety of applications. The IA-440i has support for Intel oneAPI™, which enables an abstracted development flow for dramatically simplified code re-use across multiple architectures.
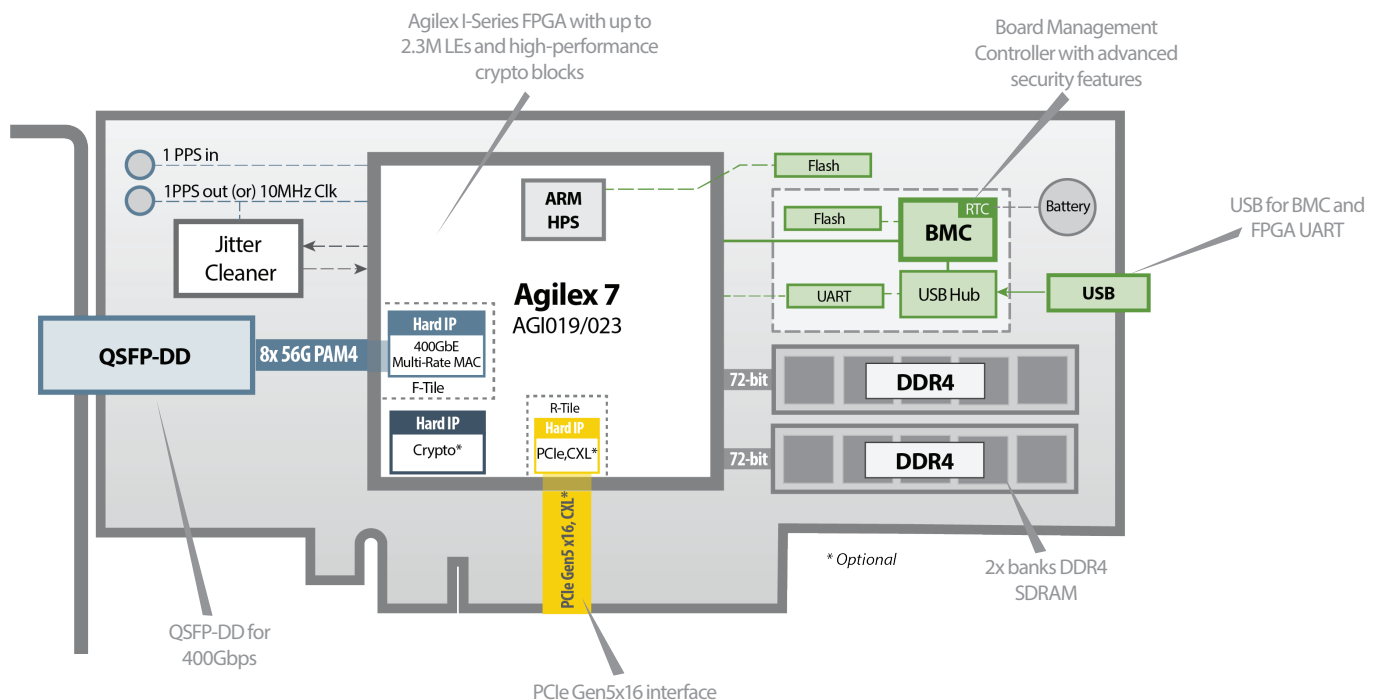
CXL Compute Express Link™

1 oneAPI

intel. Agilex™ 7

key features

1x 400G, 4x 100G, or 8x 10/25/50G	PCIe Gen5 with support for CXL	Intel Agilex™ I-Series FPGA with Hard Crypto Blocks

Agilex I-Series FPGA with up to 2.3M LEs and high-performance crypto blocks

Board Management Controller with advanced security features

1 PPS in
1PPS out (or) 10MHz Clk

Jitter Cleaner

QSFP-DD — 8x 56G PAM4

ARM HPS

Flash
Flash
UART

Agilex 7 AGI019/023

Hard IP
400GbE Multi-Rate MAC
F-Tile

Hard IP
Crypto*

R-Tile
Hard IP
PCIe,CXL*

RTC
BMC
USB Hub

Battery

USB

72-bit — **DDR4**
72-bit — **DDR4**

PCIe Gen5 x16, CXL *

USB for BMC and FPGA UART

* Optional

2x banks DDR4 SDRAM

QSFP-DD for 400Gbps

PCIe Gen5x16 interface

Additional Services

Take advantage of BittWare's range of design, integration, and support options

Customization
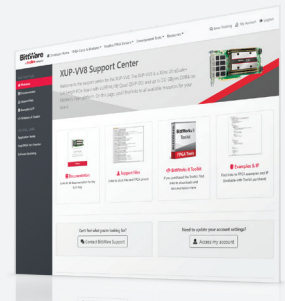[Additional specification options or accessory boards](#) to meet your exact needs.

Server Integration
Available pre-integrated in our [TeraBox servers](#) in a range of configurations.

IP and Solutions
Our portfolio of IP and solutions reduce risk for development and deployment.

Service and Support
BittWare Developer Site provides online documentation and issue tracking.

Board Specifications

FPGA	• Intel Agilex 7 I-Series AGI019 or AGI023
	    • AGI019: Core speed grade -2: XCVR speed grade -1
	    • AGI023: Core speed grade -1: XCVR speed grade -1
	    • XCVR speed grade -1 supports CXL (CXL IP is licensed and purchased separately)
	    • FPGA includes ARM HPS
	 • Other Agilex FPGA options are available, including
	    • Hard crypto blocks

On-board Flash	• 2Gbit Flash memory for booting FPGA
External memory	• 2x banks on-board DDR4, up to 16GB each (32GB total)
Host interface	• x16 Gen5 interface direct to FPGA, connected to PCIe hard IP • CXL v1.1 (CXL IP is licensed and purchased separately)
QSFP-DD cage	• 400 Gbps (8x 50Gbps PAM4) • PAM4: 1x 400GbE, 2x 200GbE, 4x 100GbE, 8x 50GbE • NRZ: 1x 200GbE, 2x 100GbE, 4x 50GbE, 8x 10/25 GbE • Multi-rate hard MAC supports all combinations • Jitter cleaner for network recovered clocking
External clocking	• 1 PPS and 10MHz ref clk inputs (in-board)
USB	• USB access to BMC, USB-UART

|	

Board Management Controller	• Power sequencing and reset
	 • Voltage, current, temperature monitoring
	    • Protection shut-down
	 • Clock configuration
	 • Low bandwidth BMC-FPGA comms with SPI link
	 • USB 2.0
	 • PLDM support
	 • Card-level security
	    • BMC Root of Trust
	    • BMC and FPGA secure boot
	    • BMC and FPGA secure upgrade
	    • Key management
	 • RTC with battery backup

Cooling	• Standard: single-width passive heatsink
Electrical	• On-board power derived from PCIe slot • Power dissipation is application dependent • Max power consumption 75W
Environmental	• Operating temperature: 5°C to 35°C
Quality	• Manufactured to IPC-A-610 Class 2 • RoHS compliant • CE, FCC and ICES approvals
Form factor	• Low profile (half-height, half-length) PCIe slot card • Size: 68.90mm x 167.65mm (2.713in x 6.600in)

Development Tools

System development	BittWare SDK including PCIe driver, libraries, and board monitoring utilities
Application development	Supported design flows - Intel FPGA oneAPI Base Toolkit, Intel High-Level Synthesis (C/C++) and Quartus Prime Pro (HDL, Verilog, VHDL, etc.)

To learn more, visit **www.BittWare.com**
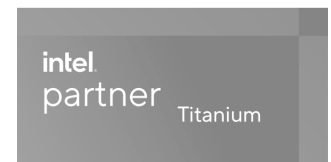
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Largest Supplier of Electrical and Electronic Components

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