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IA-860m
PCIe FPGA Card

Agilex™ FPGA card featuring 400G and Gen5 PCIe
M-series FPGA with HBM2e supporting 1TBps total memory bandwidth

BittWare's IA-860m is an Altera Agilex™ M-series FPGA card optimized for throughput- and memory-intensive applications. The M-series FPGA features an extensive memory hierarchy including integrated high-bandwidth memory (HBM2e) and a hard memory Network-on-Chip (NoC) to maximize memory bandwidth. The IA-860m card provides a balance of I/O and memory leveraging the Agilex chip's unique tiling architecture with QSFP-DDs, PCIe Gen5 x16 with CXL support, and MCIO expansion port for a variety of applications.

The IA-860m has support for Intel oneAPI™, which enables an abstracted development flow for dramatically simplified code re-use across multiple architectures.

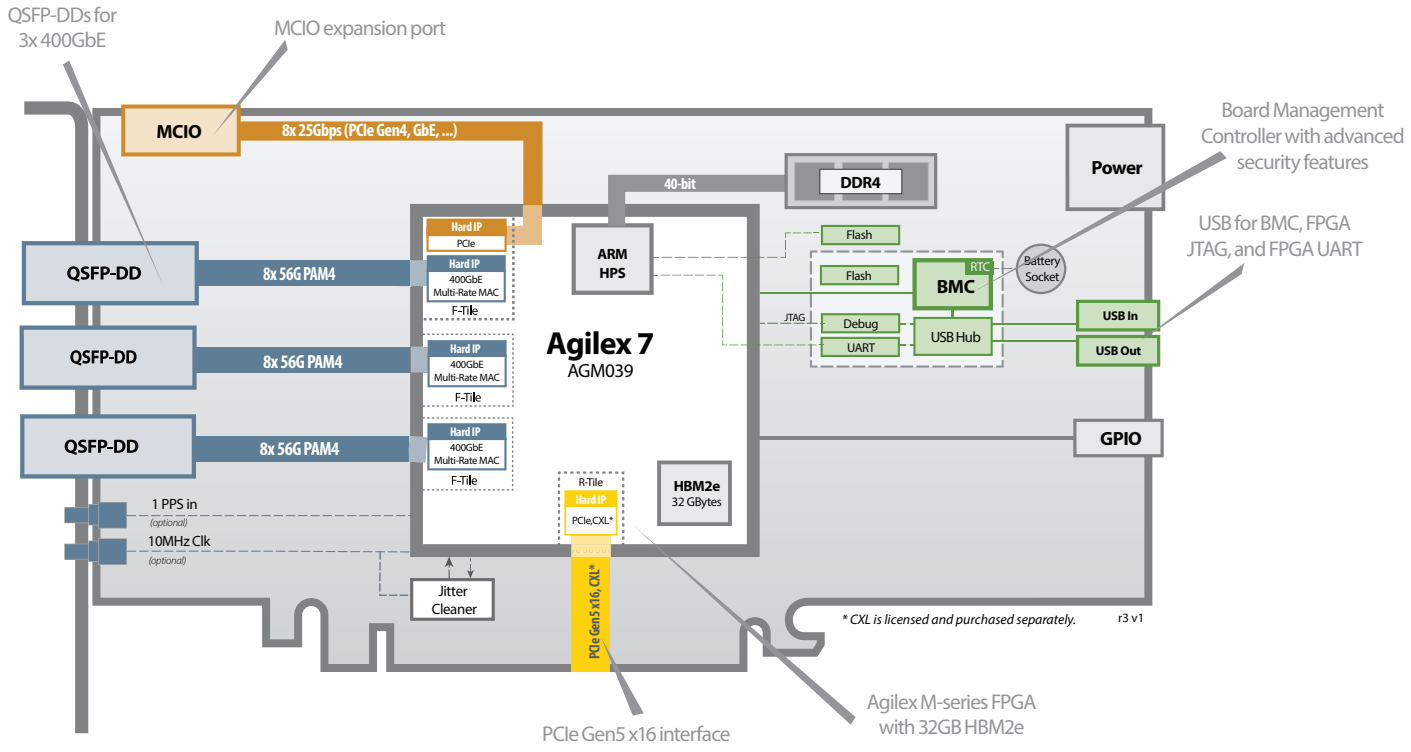
CXL Compute Express Link™

oneAPI

Agilex™ 7

key features

- **3x 400G,** 12x 100G, or 24x 10/25/50G
- **PCIe Gen5** with support for **CXL**
- **32 GB HBM2e** Memory



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Board Specifications

FPGA	• Altera Agilex 7 M-Series: AGM039 (default)
	  • Package: R47A
	  • 32GB HBM2e
	  • Core speed grade -2; XCVR speed grade -1
	  • CXL with XCVR speed grade -1 (CXL IP is licensed and purchased separately)
	  • FPGA includes ARM HPS

ARM HPS	• Dedicated 40-bit DDR4 • Dedicated Flash memory for booting ARM
On-board Flash	• 2Gbit Flash memory for booting FPGA
Host interface	• x16 PCIe Gen5 interface direct to FPGA • CXL support (CXL IP is licensed and purchased separately)
QSFP-DD cages	• 3x QSFP-DD cages on front panel connected directly to FPGA via 24 transceivers • User programmable low jitter clocking supporting 10/25/40/100/200/400GbE • Each QSFP-DD can be independently clocked • Jitter cleaner for network recovered clocking • Multi-rate hard MAC+FEC • Fully backward compatible with QSFP28s
MCIO	• x8 connector supporting 2x Gen4 x4 root complexes
GPIO	• 4x GPIO
External clocking	• 1 PPS and 10MHz ref clk front panel inputs (optional)
USB	• USB access to BMC, USB-JTAG, 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: dual-width passive heatsink • Optional: dual-width liquid cooling
Electrical	• On-board power derived from PCIe slot 12V and 12-pin AUX power connector • Power dissipation is application dependent • Typical max power consumption TBD
Environmental	• Operating temperature: 5°C to 35°C (passive heatsink)
Quality	• Manufactured to IPC-A-610 Class 2 • RoHS compliant • CE, FCC, UKCA & ICES approvals
Form factor	• Standard-height, full-length, dual-slot PCIe card • 111.15mm x 312.00mm (4.376in x 12.283in)

Accessory Cables

Access to USB andJTAG requires accessory cables. **Cables are sold separately.**

USB In cable	Pico-lock to USB A cable BittWare part number: RS-PL05-UAP-83 Designed for deployment in servers
USB Out cable	Pico-lock to Pico-lock BittWare part number: RS-PL05-PL05-24
JTAG-only cable	Pico-lock to JTAG cable BittWare part number: RS-PL06-JTB-13 Recommended for development

Development Tools

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

Safety & Compliance

- FCC (USA) 47CFR15.107 / 47CFR15.109
- CE (Europe) EN55032:2015 / EN55035:2017 / EN61000-3-2:2019 + A1:2021 / EN610003-3:2013
- UKCA (United Kingdom) BS EN55032:2015 / BS EN55035:2017 / BS EN61000-3-2:2019 +
- ICES (Canada) ICES-003 Issue

To learn more, visit **www.BittWare.com**

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