FantoVision 40 Edge Computer

40 Gb/s image acquisition and processing on FPGA & GPU

Key Features

- 4 x 10GigE-Vision or up to 4 x 12.5 G
- 4 x CoaXPress 2.1
- Computer: Nvidia Jetson Xavier NX
- (Option for Jetson TX2/Orin NX)
- FPGA: Arria 10 – 160/270/660
- Small body: 134 x 90 x 60 mm3 (5.28" x 3.54" x 2.36")
- GPU-FPGA interconnectivity:
  - PCIe Gen 3 x4
- Image processing:
  - On Jetson – supported by Nvidia JetPack SDK
  - On FPGA – supported by Gidel ProcVision suite
- FPGA interfaces: 8 x RS422, 4 x Opto-Isolator, 4 x Output Drivers (30V/0.5A), 6 x GPIO 3.3V bi-dir (5V tolerant), JTAG
- GPIO power out: 2 x 12V (1A)
- Host interfaces: RS232, 1GbE, USB 3.1/2.0, HDMI, UART, Recovery, Restart
- Jetson computer key performance:
  - Up to 100 TOPS AI computation
  - Up to 16 GB LPDDR5 @ 102.4 GB/s
- FPGA resources:
  - 160K/270K/660K LEs
  - 2 GB–10 GB DDR4 @ up to 25.6 GB/s
  - Up to 2,133 M20Ks
  - Up to 3,374 18 x 19 multipliers
  - Up to 16 I/O PLLs
- Max. power consumption : 15-45 W (dependent on system configuration)
- NVMe 100 GB - 2 TB SSD
- Passive or active cooling

Video, Machine Vision and AI Inferences on the Edge

Gidel's Fanto*Vision 40*™ is a pioneering compact computer enabling image acquisition and processing from 4 x 10GigE or 4 x CoaXPress 2.1 cameras. The FantoVision's innovative architecture merges high-end image acquisition with real-time image processing and/or compression using Nvidia Jetson™ embedded computer with optional pre-processing/compression on Intel Arria 10™ FPGA. The Jetson boasts up to 100 TOPS AI compute capability using Nvidia's comprehensive libraries. The GPU and FPGA interconnect via 4-lane PCIe Gen 3. With up to 2 Tera Byte+ SSD, the system can perform demanding real-time processing, compression, and recording. The FPGA is fortified with up to 10 GB DDR4@200 Gb/s.

Open Customizable Image Processing

The FantoVision is also distinct in its open architecture enabling embedded AI/image processing on GPU and FPGA. Software engineers can program their algorithms on GPU using CUDA C/C++ and NVIDIA's AI libraries. In addition, developing and deploying optional pre-processing block on FPGA is simple and fast using Gidel's novel ProcVision™ Suite.

Scalable Solution

The FantoVision opens the way for new compact, cost-effective, scalable vision and imaging solutions for high-bandwidth, low-latency applications. Multi-FantoVision units can be interconnected to provide unique and scalable topologies. Using Gidel's InfiniVision™ open frame grabber flow, 100+ sensors can be synchronized and processed simultaneously.
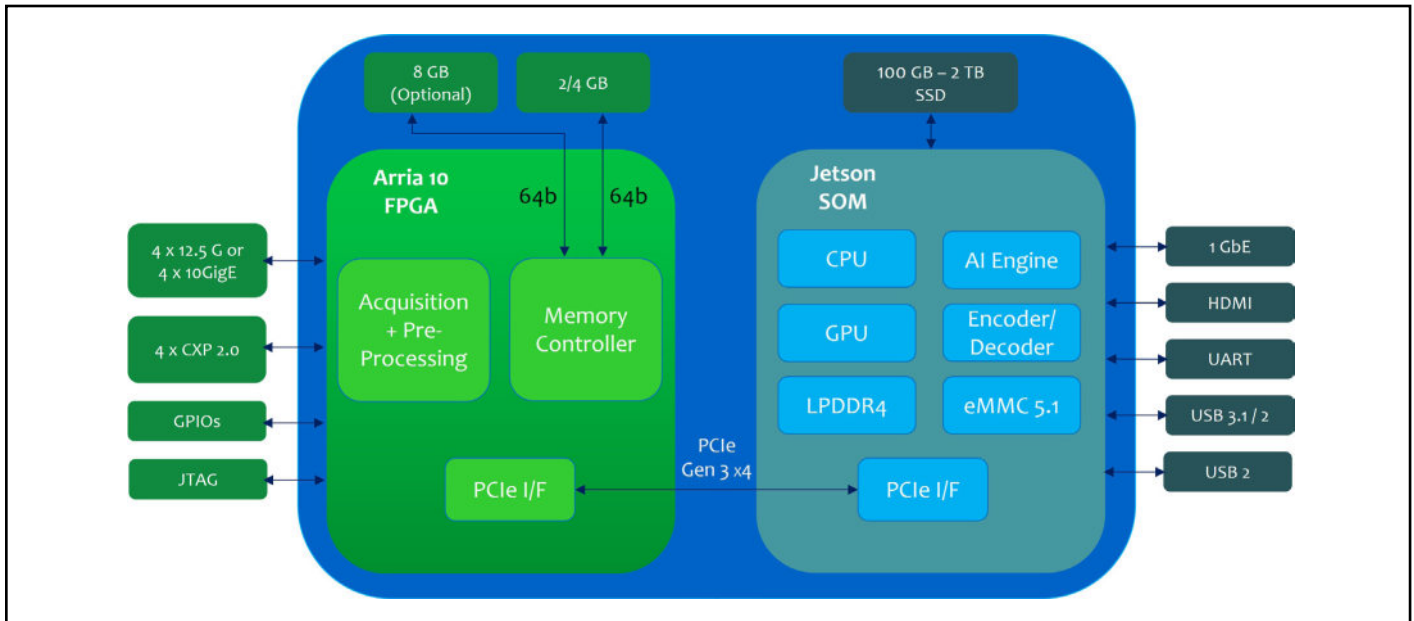
Fanto *Vision 40* System Block Diagram

FPGA Options

FPGA	Arria 10 160 GX	Arria 10 270 GX	Arria 10 660 GX
DRAM Throughput	12.8 GB/s	25.6 GB/s	19 GB/s
On-board DDR4	2 or 4 GB	10 GB	9 GB
Max Band-width/SFP+	Up to 12.5 Gb/s	Up to 12.5 Gb/s	Up to 12.5 Gb/s

FPGA Resources:

Logic Elements	160K	270K	660K
M20K	440	750	2,133
18x19 MAC	312	1,660	3,374
I/O PLL	6	8	16

Embedded Computer Options

Model	Jetson Orin NX*	Jetson Xavier NX	Jetson TX2 NX
AI Performance	Up to 100 TOPS	21 TOPS	1.33 TFLOPS
NVIDIA GPU	1024 Core Ampere, with 32 Tensor Cores	384-core Volta™ GPU with 48 Tensor Cores	256-core Pascal™ GPU
CPU	Up to 8-core Arm Cortex-A78AE 2MB L2 + 4MB L3	6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6MB L2 + 4MB L3	Dual-core Denver 2 64-bit CPU and quad-core ARM® Cortex®-A57 MPCore processor
Memory	Up to 16GB @ 102.4 GB/s	Up to 16 GB @ 59.7 GB/s	4 GB @ 51.2 GB/s
Storage	Supports external NVMe	16 GB eMMC 5.1	16 GB eMMC 5.1
Video Encode	1x 4K60 3x 4K30 6x 1080p60 12x 1080p30 (H.265), H.264, H.265, AV1	2x 464 MP/s 2x 4Kp30 6x 1080p60 14x 1080p30 (H.265 & H. 264)	1x 4Kp60 3x 4Kp30 4x 1080p60 8x 1080p30 (H.265 & H.264)
Video Decode	1x 8K30 2x 4K60 4x 4K30 9x 1080p60 18x 1080p30 (H.265) H.264, H.265, VP9, AV1	2x 690 MP/s 2x 4Kp60 4x 4Kp30 12x 1080p60 32x 1080p30 (H.265)	2x 4Kp60 4x 4Kp30 7x 1080p60 14x 1080p30 (H.265 & H.264)
Jetson to FPGA	PCIe x4 Gen. 3	PCIe x4 Gen. 3	PCIe x2 Gen. 2

*For availability, contact Sky Blue.

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