

FantoVision 20 Edge Computer

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



Preliminary Data Sheet
July 2021

Key Features

- 2 x 10GigE-Vision or up to 2 x 12.5 G
- Camera Link (up to 80-bit/Dual-Base)
- Computer: Nvidia Jetson Xavier NX (Option for Jetson Nano/TX2 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 @ up to 20 Gb/s
- Image processing:
 - On Jetson – supported by Nvidia JetPack SDK
 - On FPGA – supported by Gidel ProcVision suite
- FPGA interfaces: 2 x SFP+, PoCL, 8 x RS422 (IN), 4 x Opto-Isolators (IN), 2 x High-Voltage Drivers (OUT), JTAG
- Host interfaces: 1GbE, USB 3.1/2.0, HDMI, UART, Recovery, Restart
- Jetson computer resources:
 - Up to 6-core Nvidia ARM CPU
 - GPU: up to 384 cores + 48 Tensor Cores (Nvidia Volta)
 - Up to 21 TOPS AI computation
 - Up to 8 GB LPDDR4 @ 51.2 GB/s
 - H.264/5, VP9 encoding/decoding
- FPGA resources:
 - 160K/270K/660K LEs
 - 2GB – 10GB 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 : 15-40 W (dependent on system configuration)
- NVMe (optional) high-capacity SSD
- uSD (optional for Jetson Nano)
- Passive or active cooling



Video, Machine Vision and AI Inferences on the Edge

Gidel's Fanto *Vision 20*[™] is a pioneering compact computer enabling image acquisition and processing from 2 x 10GigE Vision and from 80-bit or Dual-Base Camera Link 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 21 TOPS AI compute capability using Nvidia's comprehensive libraries. The GPU and FPGA interconnect via 4-lane PCIe capable of up to 20 Gb/s. With up to 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 Fanto *Vision* 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 Fanto *Vision* opens the way for new compact, cost-effective, scalable vision and imaging solutions for high-bandwidth, low-latency applications. Multi-Fanto *Vision* 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.



North America:

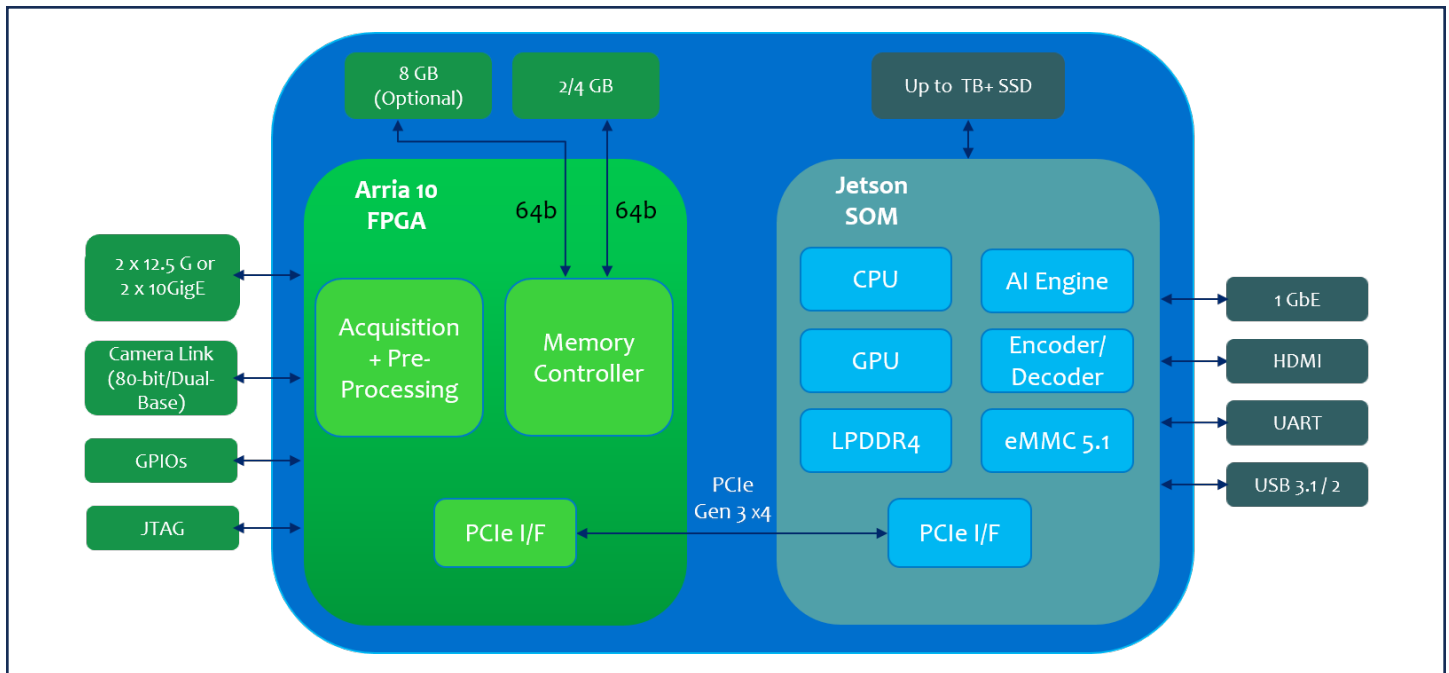
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FantoVision 20 System Block Diagram

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 Bandwidth/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 Nano	Jetson TX2 NX	Jetson Xavier NX
AI Performance	472 GFLOPS	1.33 TFLOPS	21 TOPS
NVIDIA GPU	128-core Maxwell™ GPU	256-core Pascal™ GPU	384-core Volta™ GPU with 48 Tensor Cores
CPU	Quad-core ARM® Cortex®-A57 MPCore processor	Dual-core Denver 2 64-bit CPU and quad-core ARM® Cortex®-A57 MPCore processor	6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6MB L2 + 4MB L3
Memory	4 GB @ 25.6 GB/s	4 GB @ 51.2 GB/s	8 GB @ 51.2 GB/s
Storage	16 GB eMMC 5.1	16 GB eMMC 5.1	16 GB eMMC 5.1
Video Encode	1x 4Kp30 2x1080p60 4x1080p30 4x720p60 9x720p30 (H.265 & H.264)	1x 4Kp60 3x 4Kp30 4x 1080p60 8x 1080p30 (H.265 & H.264)	2x 464 MP/s 2x 4Kp30 6x 1080p60 14x 1080p30 (H.265 & H.264)
Video Decode	1x 4K60 2x 4K30 4x 1080p60 8x 1080p30 (H.265 & H.264)	2x 4Kp60 4x 4Kp30 7x 1080p60 14x 1080p30 (H.265 & H.264)	2x 690 MP/s 2x 4Kp60 4x 4Kp30 12x 1080p60 32x 1080p30 (H.265)
Jetson to FPGA	PCIe x4 Gen. 2	PCIe x2 Gen. 2	PCIe x4 Gen. 3



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