

A177 – Twister

GPGPU Mini Supercomputer



Embedded Computing
without Compromise



The A177 Twister is the smallest and most powerful industrial GPGPU, ideally suited for the next generation of industrial systems in outdoor and indoor environments, with CUDA and deep learning acceleration capabilities for use in Security and Surveillance, Boating and Marine Industries, Smart Cities, Autonomous Robotic Systems, Agricultural Systems, and many other applications.

Its 256 NVIDIA Pascal CUDA cores reach more than 1 TFLOPS at a remarkable level of energy efficiency, providing all the power you need for local processing right where you need it, next to your sensors.

Industrial **GP GPU** is Aitech

- SWaP Optimized Industrial HPEC
- Ultra Small Form Factor – 149 mm [5.9"] square, < 1 kg [2.2 lbs.]
- NVIDIA® Jetson™ TX2 System on Module
 - ▶ Pascal™ Architecture GPU w/256 CUDA® cores
 - ▶ NVIDIA Denver 2 Dual-Core ARM® CPU + Cortex® A57 Quad-Core ARM® CPU
 - ▶ More than 1 TFLOPS
 - ▶ H.264/H.265 HW Encoder
 - ▶ Best Available Performance per Watt – 60 GFLOPS/W
- SATA SSD with Quick Erase & Secure Erase
- Removable MicroSD Card
- 8 GB LPDDR4
- Video Capture
 - ▶ SDI (SD/HD) w/dedicated H.264 encoder
 - ▶ Composite (RS-170A [NTSC]/PAL), 8 channels available simultaneously
- I/O
 - ▶ Gigabit Ethernet
 - ▶ UART Serial
 - ▶ USB 3.0
 - ▶ USB 2.0
 - ▶ Discrettes
 - ▶ HDMI Output
 - ▶ Composite Input
 - ▶ SDI Input
 - ▶ CANbus
 - ▶ Wi-Fi & Bluetooth
- CUDA®, OpenGL, OpenGL ES, EGL
- Deep Learning
- Low Power Consumption
- Environmentally Sealed (IP67)



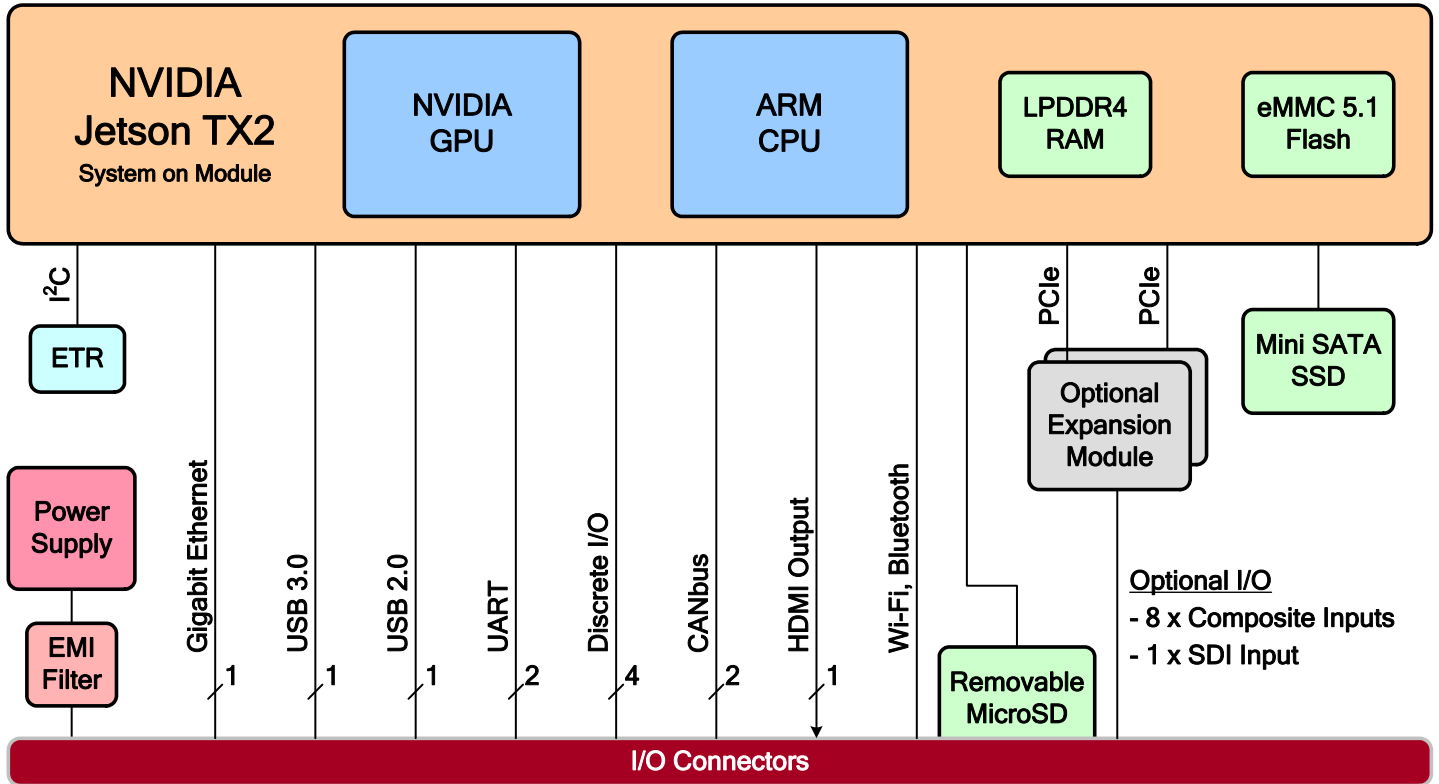
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System Architecture

System on Module	NVIDIA Jetson TX2
GPU	<ul style="list-style-type: none">• NVIDIA Pascal GPU Architecture• 256 Shaders/CUDA cores• > 1 TFLOPS (fp16)• CUDA• OpenGL• OpenGL ES
CPU	ARMv8 (64-bit) heterogeneous multi-processing (HMP) architecture with two CPU clusters (6 processor cores) <ul style="list-style-type: none">• NVIDIA Denver 2 Dual-Core @ 2.0GHz, 128 KB L1 instruction cache + 64 KB L1 data cache per core, 2 MB L2 Unified Cache• ARM® Cortex® A57 Quad-Core @ 2.0GHz, 48 KB L1 instruction cache + 32 KB L1 data cache per core, 2 MB L2 Unified Cache
Security	<ul style="list-style-type: none">• HW acceleration for AES 128/192/256 encryption and decryption• HW acceleration for AES CMAC, SHA-1, SHA-256, SHA-384, and SHA-512 algorithms• 2048-bit RSA HW• HW Random Number Generator (RNG) SP800-90
Expansion Options	Main board accommodates up to two optional I/O expansion modules. Available options include: <ul style="list-style-type: none">• Composite Frame Grabber• SDI Frame Grabber Included expansion modules are determined by system I/O Variant, see the I/O section below for details (additional options may be available per customer request, contact an Aitech representative for more info)
System Resources	<ul style="list-style-type: none">• Multi-standard Video/JPEG Decoder/Encoder, HW Encoding for H.264/H.265• Dynamic voltage and frequency scaling• Temperature Sensors• Elapsed Time Recorder• Status Indicator LED

Memory Resources

RAM	8 GB LPDDR4 @ 1866MHz, 128-bit interface
eMMC	32 GB eMMC 5.1 (boot source)
SATA SSD	Optional Mini SATA SSD with Quick Erase and Secure Erase support Standard options are listed in <i>Ordering Information</i> below (additional SLC & MLC options may be available per customer request, contact an Aitech representative for more info)
Removable MicroSD	Optional Removable MicroSD card Standard options are listed in <i>Ordering Information</i> below (additional SLC & MLC options may be available per customer request, contact an Aitech representative for more info)

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I/O	I/O Variant				
	00	01	02	03	
Expansion Card Options	Composite Frame Grabber	–	✓	–	✓
	SDI Frame Grabber	–	–	✓	✓
Composite Input RS-170A (NTSC)/PAL, supports simultaneous capture of all channels at full frame rates	–	8	–	8	
SDI Input 480/60i, 576/50i, 720/60p, 1080/60i, 1080/30p, dedicated H.264 encoder	–	–	1	1	
USB 3.0		1		–	
USB 2.0			1		
Gigabit Ethernet (10/100/1000Base-T)			1		
HDMI Output			1		
Serial Ports (RS-232 UART)		2 (one port is used for debug terminal/console)			
Discrete I/O (Single-Ended)			4		
CANbus			2		
Wi-Fi (IEEE 802.11ac)		Optional (see <i>Ordering Information</i> below)			
Bluetooth 4.1 (3 MB/s)		Optional (see <i>Ordering Information</i> below)			

Software

- Linux OS pre-installed – L4T (Linux for Tegra), a lightly modified Ubuntu-based distribution
- Video capture drivers and sample applications pre-installed, in variants equipped with optional frame grabber(s)

Mechanical

Dimensions	149 x 147 x 63 mm [5.9 x 5.8 x 2.5"]
Weight	< 1 kg [2.2 lbs.]

Power

Input Power	<ul style="list-style-type: none">• Wide input voltage range: 6 – 24 V_{DC} steady state operation• Input reverse polarity protection• EMI/RFI input filter
Power Consumption	<ul style="list-style-type: none">• 8 – 10W under typical CUDA load• 17W when System on Module is fully utilized Total power consumption depends on system configuration and expansion options

Environmental

Operating Temp.	-20 to +65 °C
Ingress Protection	IP67 ⁽¹⁾

Notes: (1) With appropriate connections to system I/O and power connectors

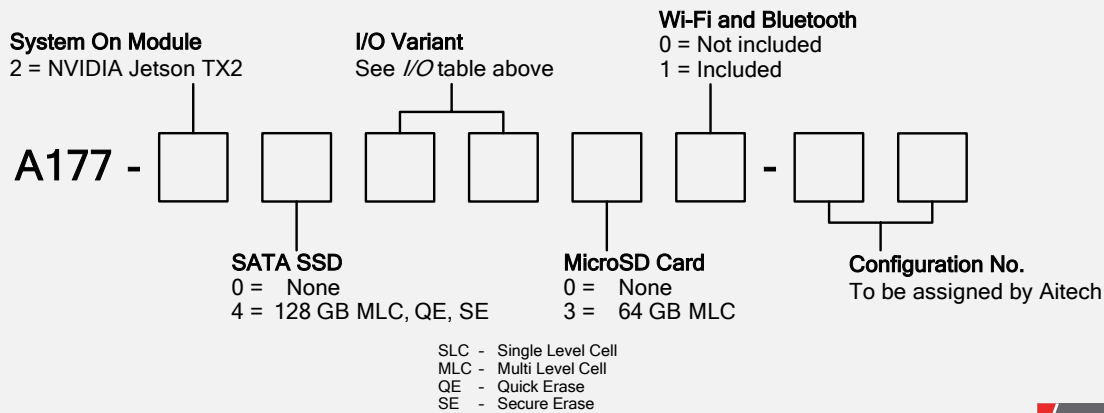
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Ordering Information



Example: A177-240331-00

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Optional Accessories

Contact your Aitech sales representative for information on available accessories, such as I/O cables and external power supplies.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A177 and additional software support.

Aitech Defense Systems, Inc.

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