Connect Tech

Tel: 519.836.1291
Toll Free: 800.426.8979 (North America)

sales@connecttech.com
www.connecttech.com

489 Clair Rd. W., Guelph, ON, Canada, N1L 0H7

2024

PRODUCT GUIDE

Connect Tech

NVIDIA | Elite Partner

QUALITY & STANDARDS

- ▶ **ISO 9001:2015 CERTIFIED**
- ▶ **CANADIAN CONTROLLED GOODS**
- ▶ **ITAR CERTIFIED, US JOINT CERTIFICATION**
- ▶ **MIL-STD-810H, DO-160G FOR SHOCK & VIBRATION**
- ▶ **INGRESS PROTECTION**

ITAR — REGISTERED WITH INTERNATIONAL TRAFFIC IN ARMS REGULATIONS

CGP — REGISTERED WITH CANADA'S CONTROLLED GOODS PROGRAM

MIL-STD 810H Certified

IP67

ISO 9001:2015

Connect Tech

TABLE OF CONTENTS

NVIDIA | Elite Partner

**NVIDIA's Largest Global
Jetson Hardware Partner**

intel partner alliance

MADE IN NORTH AMERICA

NOTE: Specifications found in this guide are subject to change without notice.

Jetson AGX Orin™

EMBEDDED SYSTEMS

AGX Orin™ Inference Server

The AGX Orin™ Inference Server is a high performance AI workstation powered by 12x NVIDIA Jetson AGX Orin Modules. Ready to run NVIDIA's most powerful deep-learning software.

- 12x 275 TOPS, 2048-Core Ampere GPU and 64 Tensor Cores
- 4x 10G SFP+ uplink capability
- Up to 2TB of NVMe Storage per module
- 2U ATX style redundant PSU

UAGX2U

Anvil for AGX Orin™

Ready to withstand the most compute intensive AI applications with its power-efficient and feature rich design. Seamlessly deploy your next generation autonomous vehicle, smart city application, or vision solution.

- 2x 10G Ethernet
- 8x GMSL2, FPD-Link III or HD-SDI camera inputs (optional)
- 2x NVMe M.2 M-Key, 1x B-Key, and 1x E-Key
- USB 3.2, External PCIe
- Wide Input Power Range

ESG620/ESG621

VPX

Graphite VPX/AGX Orin

GraphiteVPX/AGX Orin is a 3U peripheral card that brings the NVIDIA® Jetson AGX Orin™ to the highly rugged embedded VPX marketplace. The GraphiteVPX/GPU Orin features USB 3.2, DisplayPort, and an internal NVMe.

- 3U VPX SOSA Aligned
- NVIDIA® Jetson AGX Orin™ Industrial
- PCIe x8 Gen4 (Endpoint or Host)
- 2x 10GBASE-KR Ethernet
- Complete IMPI Support
- Industrial NVMe 1TB/2TB
- USB 3.2, DisplayPort, 1GBASE-T, GPIO, UART, Debug, OTG Flashing via front panel

VPG004

CARRIER BOARDS
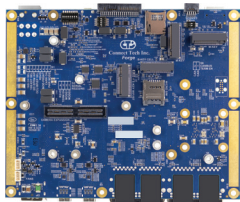
Forge

Full-featured Carrier Board for the NVIDIA® Jetson AGX Orin™. This carrier board is specifically designed for commercially deployable platforms.

- 2x 10G Ethernet
- 2x NVMe M.2 M-Key, 1x M.2 B-Key, and 1x M.2 E-Key
- USB 3.2, PCIe x4 OCuLink connector
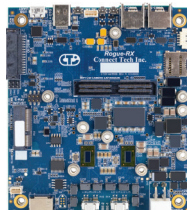- Wide Input Power Range: 10V-36V DC

AGX201

Rogue for AGX Orin™

Small Form Factor Carrier Board for the NVIDIA® Jetson AGX Orin™. Rogue for Orin is specifically designed for commercially deployable platforms, and has an extremely small footprint of 92 x 107mm.

- 2x 10G Ethernet
- Extremely small form-factor (Same size as AGX Orin module)
- 2x NVMe M.2 Key Slots
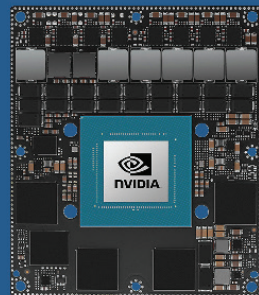- 3x USB 3.2

AGX202

Rogue-RX for AGX Orin™

Rogue-RX is a full featured carrier board specifically designed for rugged and harsh environments. Provides rugged positive locking high-speed connectors.

- Rugged positive locking connectors
- 2x 10G Ethernet
- Extremely small form-factor (Same size as AGX Orin module)
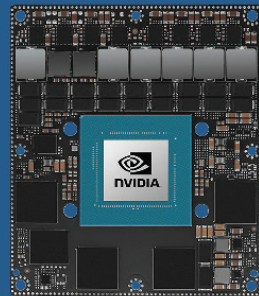- 2x NVMe M.2 Key Slots
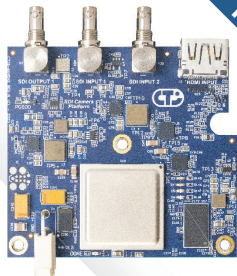- 3x USB 3.2

AGX203

NEW!

Jetson AGX Orin™ 32GB/64GB

Jetson AGX Orin™ Industrial

Learn More on Page 13

CAMERA BOARDS
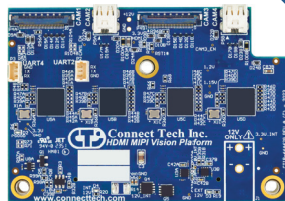
Jetson SDI Vision Platform

The SDI Camera expansion platform allows ultra-low hardware latency, SDI-to-MIPI CSI-2 conversion, providing a direct ISP ingest path to GPU compute on the NVIDIA Jetson platform without the overhead.

• 2x 3G-SDI Inputs, 1x 3G-SDI Outputs (HD-BNC)
• 1x HDMI (Type-A) Input
• 1x High-Density Connector

JCB003

HDMI Vision Platform

The HDMI Camera platform allows for direct HDMI video input, converting to MIPI CSI-2 for input to the NVIDIA Jetson.

• 2x 30pin coax (Sony FCB compliant), Dual Micro HDMI
• HDMI to CSI-2 conversion for vision processing
• Support for up to 4 HDMI Inputs
• Directly powered from Camera Expansion Header

JCB010
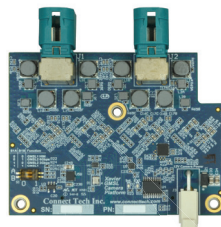
GMSL Camera Board

This expansion board supports up to 8x GMSL1 or GMSL2 cameras to be connected to all AGX Xavier™ and AGX Orin™ Carrier Boards.

• GMSL1 or GMSL2 protocols
• Internal or External Camera power
• Allows longer length cabling with a direct path to the Jetson AGX ISPs
• Power over Coax; 4x mini coax connector

**JCB002**
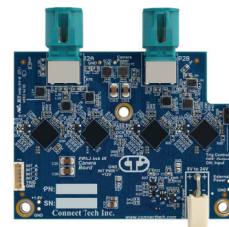
FPD-Link III Camera Board

This expansion board allows for the connection of FPD-Link III Deserializers to be connected to Jetson AGX Xavier and AGX Orin Carrier Boards.

• 8x FPD-Link III camera inputs, 2x per deserializer
• 16-lane MIPI output; single 4-lane MIPI CSI-2 per deserializer
• Power over Coax
• Internal or External Camera power

JCB006

CAMERA BOARD COMPARISON CHART
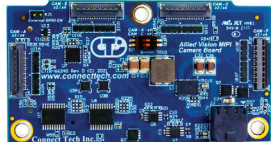
Allied Vision MIPI Camera Board

This Camera Board allows for direct connectivity for up to six MIPI sensors without the need of additional hardware components.

• Simple integration of Allied Vision MIPI CSI-2 sensors to the Jetson AGX Xavier™ and AGX Orin™ platforms.

• Connect up to 6x 2-lane or 4x 4-lane MIPI Cameras

• Seamless integration to Jetson AGX Xavier and AGX Orin Carrier Boards

JCB005

|	HDMI Vision Camera Platform	Allied Vision MIPI Camera Board	GMSL Camera Board	FPD-Link III Camera Board	Jetson SDI Vision Platform
Part Number	JCB010	JCB005	JCB002	JCB006	JCB003
Size	75mm x 52mm (2.95" x 2.05")	75mm x 40.2mm (2.95" x 1.58")	75mm x 57mm (2.95" x 2.24")	75mm x 57mm (2.95" x 2.24")	75mm x 57mm (2.95" x 2.24")
Weight	23g	19g	50g	37g	53g
Connector	1x High Density Connector Camera Board will mate to the Camera Expansion Header on the Rogue, Rogue-X, Forge and Rogue for Orin, and Rogue-RX Carrier Boards				
Camera Inputs	4x HDMI Inputs	Up to 6x MIPI CSI-2 (4x 4-lane or 6x 2-lane)	8x Total (GMSL2/GMSL1)	8x Total	2x 3G-SDI Inputs (HD-BNC)
Deserializer	N/A		Maxim MAX9296A	Texas Instruments DS90UB954	N/A
MIPI Output	A single 4-lane MIPI CSI-2 output from each Bridge (16-lanes total)	4x 4-lane, or 6X 2-lane MIPI CSI-2	A single 4-lane MIPI CSI-2 v1.3 output from each Deserializer (16-lanes total)	A single 4-lane MIPI CSI-2 v1.3 output from each Deserializer (16-lanes total)	4-lane MIPI CSI-2 v1.3 output per SDI Input (8-lanes total)
Camera Input Connectors	2x KEL USL00-30L 2x HDMI Type D (Micro HDMI)	6x MIPI CSI-2 connectors to interface to Allied Vision Alvium cameras	2x MATE-AX Quad Coax Connectors Breakout cables to FAKRA available	2x MATE-AX Quad Coax Connectors Breakout cables to FAKRA available	2x Right Angle HD-BNC Connectors
Power	Directly powered from Camera Expansion Header		All 8 cameras will be sourced Power-Over-COAX from JCB002	All 8 cameras will be sourced Power-Over-COAX from JCB006	+12V is available from Camera Expansion Header as external connector if more power is required
Operating Temperature	-30°C to +70°C (-22°F to +158°F)	-40°C to +85°C (-40°F to +185°F)			

HADRON CARRIER BOARDS
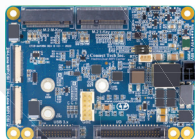
Hadron Dual MIPI

A compact solution for vision applications and unmanned payloads. With rugged latching connectors, it ensures secure connectivity in any environment.

- 2x USB 3.1, 1x GbE, 1x 2242/2230 NVMe, 1x M.2 E-Key (WiFi/BT)
- GPIO, PWM, I2C, RS-232, 3.3V UART, SPI
- Wide Input Range: +9V to +60V

NGX024
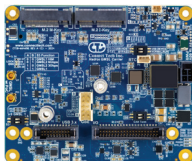
Hadron GMSL

Boasting dual GMSL2 camera inputs. Hadron GMSL ensures high-speed, dependable data communication, crucial for autonomous applications.

- 2x USB3.1, 1x GbE, 2x GMSL Coax Ports
- 1x NVMe M-Key, 1x M.2 E-Key
- 1x 1000BASE-T with Rugged Positive Locking Pin Headers

NGX018

Hadron

The Hadron Carrier Board for Orin™ NX is an ultra small, rugged and feature-rich carrier for AI Computing at the Edge. Just slightly larger than the Jetson™ SODIMM module.

- Tiny footprint: 82.6mm x 58.8mm (3.25" x 2.31")
- 2x USB 3.1, 1x GbE, 1x 4-lane MIPI CSI-2, 1x USB OTG
- Wide power input - +9V to +60V DC

NGX012

	Hadron	Hadron GMSL	Hadron Dual MIPI
Part Number	NGX012	NGX018	NGX024
Size	82.6mm x 58.8mm (3.25" x 2.31")	82.7mm x 68.8mm (3.25" x 2.71")	82.6mm x 58.8 mm (3.25" x 2.22")
Ethernet	1x 1000BASE-T with Rugged Positive Locking Pin Headers		
USB	2 x USB 3.1 (Gen 1) 1x USB 2.0 Programming Port	2x USB 3.2 Gen 1x1 (5 Gbps) with Rugged Positive Locking Pin Header	2x USB 3.1 Gen 1x1
Camera Inputs	1x 4-lane MIPI CSI-2	2x GMSL2 Camera inputs w/ PoC	2x 4-lane MIPI CSI-2 (22-pin connector)
Storage	1x 2242/2230 NVMe (M-Key)	1x 2242 NVMe (M-Key)	1x 2242/2230 NVMe (M-Key)
Misc Interfaces	1x 3.3VTTL UART (CONSOLE) 2x RS-232 Serial Ports 4x PWM capable GPIO 1x 3.3V I2C, 1x 3.3V SPI	1x CAN 2.0b 1x 3.3VTTL UART (CONSOLE) 2x RS-232 Serial Ports 4x PWM capable GPIO 1x 3.3V I2C	1x 3.3VTTL UART (CONSOLE) 2x RS-232 Serial Ports 4x PWM capable GPIO 1x 3.3V I2C, 1x 3.3V SPI
Power	+9V to +60V DC (+12V to +48V DC Nom.)		
Weight	49g	58g	49g
Temperature	-25°C to +85°C (-13°F to 185°F)		

BOSON CARRIER BOARDS

	Boson for Orin	Boson-22
Part Number	NGX020	NGX021
Display	1x HDMI 2.0	
Storage	1x M.2 M-Key (2280) NVMe PCIe x4 (Gen 3)	
Expansion	1x 2230 E-Key Expansion for WiFi/Bluetooth 1x PCIe x1 + USB 2.0	
Vision	MIPI CSI x4 Connectors	22 Pin MIPI CSI x4 Connectors
USB	1x USB 3.1 Gen 2 w/ OTG capability (Type C) 1x USB 2.0 (Type A)	
Power	+9V to +36V Input Voltage Range	
Misc. Interfaces	3x 3.3V TTL UARTs (1x CONSOLE) 8 GPIOs 3.3V TTL (2x PWM Capable) 2x I2C 3.3V, 1x CAN 2.0b, 2x SPI, 2x 3.3V, 2x 5V, 8x GND	
Operating Temperature	-40°C to +85°C (-40°F to +185°F)	
Weight	80g (2.82oz)	
Dimensions	90mm x 75mm (3.54" x 2.95")	
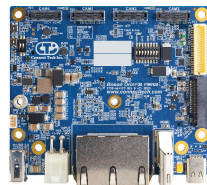
NEW!

Boson For Orin

Boson integrates up to four MIPI cameras within an extremely small footprint. Boson maximizes sensor inputs and storage solutions for high-end vision applications.

• Compatible with the NVIDIA® Jetson Orin™ NX, and Orin™ Nano

• Integrate up to 4x 2-lane or 2x 4-lane MIPI FRAMOS Sensor Modules

• Dual Gigabit Ethernet and Dual USB

• NVMe for additional storage

NGX020

NEW!

Boson-22

A small, but powerful vision-focused board for Jetson Orin NX. Packed with 4x 22-Pin MIPI camera inputs, dual Gigabit Ethernet, USB C, and USB 3.0, all in a rugged and compact package.

• 2x 4-lane MIPI Modules, or 4x 2-lane MIPI Modules, or 2x 4-lane and 2x 2-lane MIPI Modules

• Dual Gigabit Ethernet, USB C, USB3.0

• NVMe for additional storage; WiFi and Bluetooth expansion options

• +9V to +36V wide input voltage range

NGX021

EMBEDDED SYSTEMS

NEW!

Orin™ NX Inference Server

The Jetson Orin™ NX Inference Server is a low wattage, high-performance deep learning inference server powered by the NVIDIA® Jetson Orin™ NX 16GB module.

• 24x 100 TOPS, 1024 GPU CUDA cores with NVIDIA® Ampere™ architecture
• 4x 10G SFP+ uplink capability
• 0°C to +50°C Operating Temperature Range

UNGX2U

BEST IN SHOW
Embedded
COMPUTING DESIGN
embedded world
WINNER

Polaris

Harnessing the Jetson Orin™ NX and built for robotics, smart city and autonomous machines, the rugged Polaris system provides a wide range of I/O in an IP67 rated rugged package.

• IP67 Rated, Actively or Passively Cooled
• Rugged M12: 2x GbE, 2x CAN, GPIO, Wide range isolated power input (+18V to +48V)
• 2x USB3.1, 4x GMSL2 via sealed FAKRA, 4G/5G/LTE, WiFi/BT, GNSS, M.2 2280 NVME M-Key

ESG604/ESG608

Rudi-NX

Rudi-NX is the ultimate Edge AI computing device for state-of-the-art, compute-intensive applications. Rudi-NX is powered by NVIDIA® Jetson Orin™ NX.

• Extremely small footprint: 135mm x 50mm x 109mm
• I/O: 4x GMSL, USB 3.0, USB 2.0, CAN 2.0b, USB OTG, RS-485, I2C, GPIO, SPI, PWM
• 1x NVMe (PCIe x4, 2280)
• -20°C to +80°C Operating Temperature Range

ESG605

Rudi-NX FPD-Link III

Rudi-NX FPD-Link III serves as the ultimate computing solution for cutting-edge, compute-intensive applications at the edge, and features 4x FPD-Link III cameras.

• Extremely small footprint: 135mm x 50mm x 109mm
• I/O: 4x FPD-Link III, USB3.0, USB 2.0, CAN 2.0b, USB OTG, RS-485, I2C, GPIO, SPI, PWM
• 1x NVMe (PCIe x4, 2280)
• -20°C to +80°C Operating Temperature Range

ESG606

NVIDIA® JETSON™ PRODUCT LIFECYCLE
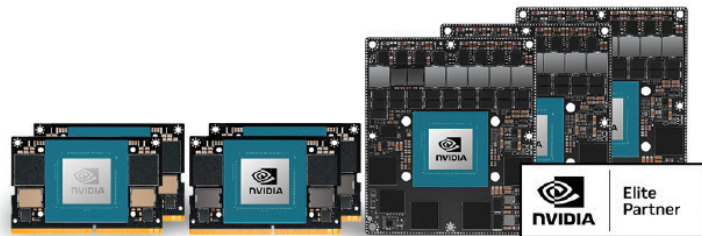
| Jetson Module	Available Through	Jetson Module	Available Through
Jetson AGX Orin 64GB	January 2030	Jetson AGX Xavier (32GB)	January 2028
Jetson AGX Orin 32GB	January 2030	Jetson AGX Xavier Industrial	July 2031
Jetson AGX Orin Industrial	July 2033	Jetson Xavier NX 16GB	January 2026
Jetson Orin NX 16GB	January 2030	Jetson Xavier NX (8GB)	January 2028
Jetson Orin NX 8GB	January 2030	Jetson TX2 NX	February 2028
Jetson Orin Nano 8GB	January 2030	Jetson TX2	January 2025
Jetson Orin Nano 4GB	January 2030	Jetson TX2i	April 2028
Jetson AGX Xavier 64GB	January 2025	Jetson Nano	January 2027

Product Change Notifications

Hardware component changes with possible corresponding software changes may occur during the product lifecycle (e.g. memory component updates). Scan the QR Code below to stay up-to-date with Connect Tech Product Change Notifications.
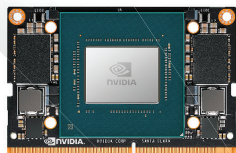
End of Life Notifications

Official End of Life notice will be sent a minimum of 8 months prior to the last shipment. Check EOL Notifications by scanning the QR code below.
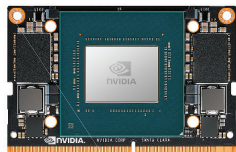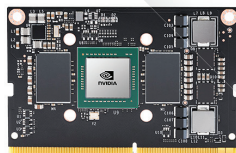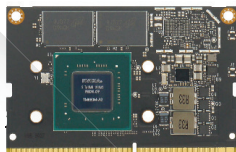
Jetson Xavier™ NX 16GB

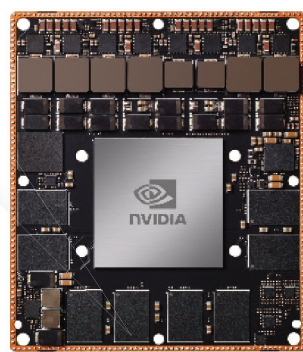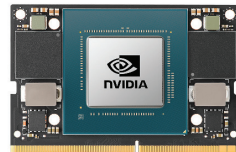**Jetson Xavier™ NX**

Jetson™ TX2 NX

Jetson™ Nano
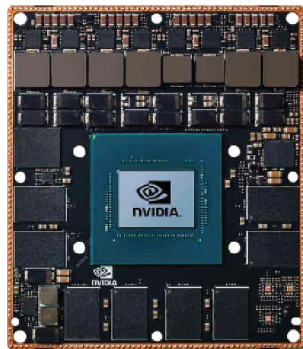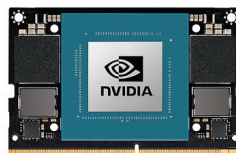

Jetson AGX Xavier™

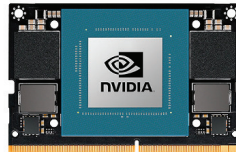

Jetson AGX Xavier™ Industrial

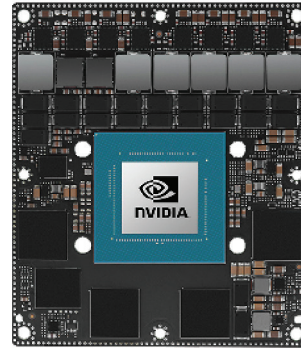**Jetson Orin™ NX 16GB**
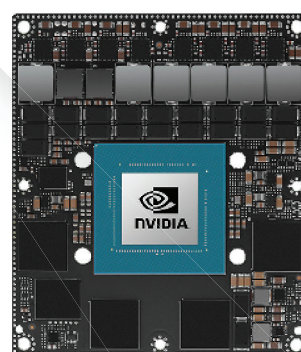

Jetson Orin™ NX 8GB

Jetson Orin™ Nano 4GB

Jetson Orin™ Nano 8GB

Jetson AGX Orin™ 32GB/64GB

Jetson AGX Orin™ Industrial

JETSON ORIN COMPARISON CHART

|	Orin Nano 4GB	Orin Nano 8GB	Orin NX 8GB	Orin NX 16GB	AGX Orin 32GB	AGX Orin 64GB	AGX Orin Industrial
AI Performance	20 TOPS	40 TOPS	70 TOPS	100 TOPS	200 TOPS	275 TOPS	248 TOPS
GPU	512-core NVIDIA Ampere w/ 16 Tensor Cores	1024-core NVIDIA Ampere w/ 32 Tensor Cores			1792-core NVIDIA Ampere w/ 56 Tensor Cores	2048-core NVIDIA Ampere w/ 64 Tensor Cores	
CPU	6-core Arm® Cortex®-A78AE v8.2 64-bit CPU	6-core Arm® Cortex®-A78AE v8.2 64-bit CPU		8-Core Arm® Cortex®-A78AE v8.2 64-Bit CPU	8-core Arm® Cortex®-A78AE v8.2 64-bit CPU	12-core Arm® Cortex® A78AE v8.2 64-bit CPU	
Memory	4GB 64-bit LPDDR5 34 GB/s	8GB 128-bit LPDDR5 68 GB/s	8GB 128-bit LPDDR5 102.4GB/s	16GB 128-bit LPDDR5 102.4GB/s	32GB 256-bit LPDDR5 204.8 GB/s	64GB 256-bit LPDDR5 204.8 GB/s	64GB 256-bit LPDDR5 (+ECC) 204.8 GB/s
Storage	Supports External NVMe				64GB eMMC 5.1		
Power	5W - 10W	7W - 15W	10W / 15W / 20W	10W / 15W / 25W	15W - 40W	15W - 60W	15W - 75W
PCIe	1 x4 + 3 x1 PCIe Gen3		3 x1 + 1 x4 PCIe Gen4		Up to 2 x8, 1 x4, 2 x1 (PCIe Gen4, Root Port & Endpoint)		
CSI Camera	Up to 4 cameras (8 via virtual channels)				Up to 6 cameras (16 via virtual channels)		
DL Accelerator	---		1x NVDLA v2.0		2x NVDLA v2.0		
Vision Accelerator	---		1x PVA v2.0				
Networking	1x GbE	1x GbE	1x GbE		1x GbE | 2x 10GbE		
Mechanical	69.6mm x 45mm 260-pin SO-DIMM connector				100 mm x 87 mm, 699-pin Molex Mirror Mezz Connector		

CARRIER BOARDS

Rogue

Rogue is a full featured Carrier Board for the NVIDIA® Jetson AGX Xavier™ module. Camera Board platforms are available for the Rogue Carrier.

- 6x 2-lane or 4x 4-lane MIPI CSI Camera Inputs
- 2x NVMe M.2 Key M Slots, 3x USB 3.1, 2x GbE
- Wide input power range 9-19V DC
- Dimensions: 92mm x 105mm

AGX101
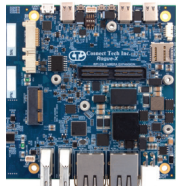
Rogue-X

The Rogue-X allows for the Jetson AGX Xavier™ to interface up to two XIMEA xiX embedded vision cameras, each camera utilizing a PCIe Gen2 x4 connection.

- 6x 2-lane or 4x 4-lane MIPI CSI Camera Inputs
- 1x NVMe M.2 Key M Slot, 3x USB 3.1 2x GbE
- Wide input power range 9-19V DC
- Dimensions: 105mm x 105mm

AGX103

Rogue-X2

The Rogue-X2 is a full featured Carrier Board for the NVIDIA Jetson AGX Xavier™ module, allowing for a PCIe x4 peripheral card to be used for I/O expansion.

- PCIe x4 Card Slot
- 6x 2-lane or 4x 4-lane MIPI CSI-2 Camera Inputs
- 1x NVMe M.2 Key M Slot, 3x USB 3.1, 2x GbE
- Wide input power range 9-19V DC
- Dimensions: 119.5mm x 105mm

AGX108

Rogue-X NVMe Adapter
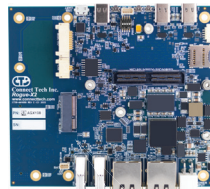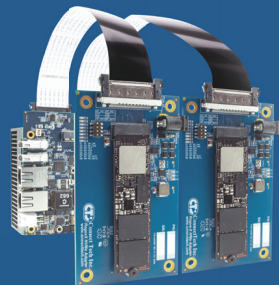### XBG018

Expand your Rogue-X with 2 - 2230, 2242, 2260 or 2280 NVMe PCI x4 modules.

Features:
- PCIe Gen3 x4 interface
- 1x NVMe M.2 Key M Slot
- Direct 12V power from an AGX103 or 2.1 external positive barrel jack
- 107.95 x 63.5 mm

CARRIER BOARD COMPARISON CHART

	Rogue Carrier	Rogue-X Carrier	Rogue-X2 Carrier
Part Number	AGX101	AGX103	AGX108
Dimensions	92mm x 105mm (3.62" x 4.13")	105mm x 105mm (4.13" x 4.13")	119.5mm x 105mm (4.70" x 4.13")
Weight	103g (3.63oz)		
Camera Inputs	6 x2 Lane MIPI CSI-2 OR 4 x4 Lane MIPI CSI-2	2x PCIe Gen2 x4 Connections (for ximea xiX cameras) 6x 2 Lane MIPI CSI-2 or 4x 4 Lane MIPI CSI-2	6x 2 lane MIPI CSI-2 OR 4x 4 lane MIPI CSI-2
User Expansion	1x M.2 Key-E Slot with PCIe & USB (WiFi + BT modules)	2x PCIe Gen2 x4 1x M.2 Key-E Slot with PCIe & USB (WiFi + BT modules)	1x M.2 Key-E expansion slot (WiFi + BT modules) 1x PCIe x8 Edge Card Connector
USB	3x USB 3.1, 1x USB OTG		
Networking	2x Gigabit Ethernet		
Display Output	2x HDMI 2.0		
Storage	1x Micro SD/UFS Card Slot	2x NVMe M.2 Key M Slots	1x Micro SD/UFS Card Slot	1x NVMe M.2 Key M Slots	
UART	2x @ 3.3V levels UART0 and UART1		2x 3.3V Logic Level UARTs	1x USB based Debug UART3
I2C/SPI	1x I2C Channel @ 3.3V IO	1x SPI Channel @ 3.3V IO		
CAN	2x CAN 2.0b Port		
GPIO	4 bits of 3.3V (level shifted GPIO)		
Input Power	9-19V DC Wide Input Power (4 pin Mini-fit Jr Connector) 14-19V required for full camera support with GPU under load		
Operating Temperature	-40°C to +85°C (-40°F to +185°F)		

EMBEDDED SYSTEMS

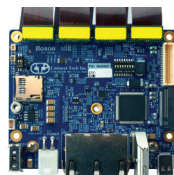## CARRIER BOARDS

Rudi-NX

Rudi-NX is the ultimate Edge AI computing device for state-of-the-art, compute-intensive applications. Rudi-NX is powered by NVIDIA® Jetson Xavier™ NX.

• Extremely small footprint: 135mm x 50mm x 109mm
• I/O: 4x GMSL, USB 3.0, USB 2.0, CAN 2.0b, USB OTG, RS-485, I2C, GPIO, SPI, PWM
• 1x NVMe (PCIe x4, 2280), 1x SD Card
• -20°C to +80°C Operating Temperature Range

ESG602

Boson for FRAMOS

Boson for FRAMOS is an AI vision powerhouse, integrating up to four MIPI cameras within an extremely small footprint.

• Compatible with Xavier NX, TX2 NX & Nano
• Integrate up to 4x 2-lane or 3x 4-lane MIPI FRAMOS Sensor Modules
• Dual GbE and Dual USB
• NVMe and microSD card for additional storage
• WiFi and Bluetooth expansion options
• +9V to +36V wide input voltage range

NGX007

Photon AI Camera Platform

The Photon carrier board is a Jetson AI Camera Platform specifically designed to support smart camera applications.

• Compatible with Orin NX, Orin Nano, Xavier NX/TX2 NX & Nano
• PoE PD (NGX002) capable, power via separate input or over Ethernet
• 1 x GbE, 1x NVMe (M.2 M-Key), 1 microSD, 4x GPIO, I2C, USB Console UART, USB OTG for programming
• DC barrel power input also available
• Internal or External Camera power

NGX002/NGX003
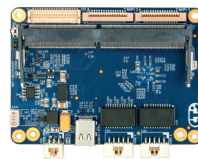
Quark

Quark Carrier is an affordable, ultra small feature rich carrier. Just slightly larger than the Jetson™ module, it's ideal for vision applications, inference, and unmanned payloads.

• Tiny footprint: 82.6mm x 58.8mm (3.25" x 2.31")
• 1x USB 3.1, 2x GbE, 2x 2-lane MIPI CSI-2, 1x USB OTG
• 1x SD card slot, 3x 3.3V UART, 2 x I2C, 1x CAN 2.0b, and 1x SPI
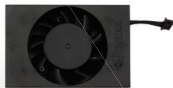• For Jetson Xavier NX, TX2 NX & Nano only

NGX004

Name	Hadron Carrier	Quark Carrier	Photon Carrier	Boson Carrier for FRAMOS
Part Number	NGX012	NGX004	NGX002/NGX003	NGX007
Dimensions	82.6mm x 58.8mm (3.25" x 2.31")	82.6mm x 58.8mm (3.25" x 2.31")	145mm x 64.5mm (5.7" x 2.53")	90mm x 75mm (3.54" x 2.95")
Ethernet	1x 1000BASE-T Ports • 1x GBE from Jetson GBE Port	2x 1000BASE-T Ports • 1x GBE from Jetson GBE Port • 1x GBE from PCIe x1 i210 PHY	1x 1000BASE-T Uplink • PoE IEEE 802.3af-2003 (15.4W) PD • PoE+ IEEE 802.3at-2009 (25.5W) PD	2x 1000BASE-T Ethernet Ports • 1 Port sourced directly from NX • 1 Port sourced from i210
USB + OTG	2x USB 3.1 1x USB 2.0 (OTG)	1x USB 3.1	1x USB 3.1, 1x USB 2.0 OTG 1x USB FTDI UART	1x USB 3.0 Gen 2 w/ OTG capability (Type C) 1x USB 2.0 (Type A)
MIPI Cameras	1x 4-lane MIPI CSI-2 22-pin FPC Connector	2x 2-lane MIPI CSI-2	2x 2-lane MIPI CSI-2	Up to: • 4x 2-lane MIPI FRAMOS Sensor Modules, or • 3x 4-lane FRAMOS Sensor Modules
Misc Interfaces	1x 3.3VTTL UART, 2x RS-232 Serial Ports, 4x PWM capable GPIO 1x 3.3V I2C, 1x 3.3V SPI	3x UARTs, 8x GPIO, 2x I2C 3.3V, 1x CAN 2.0b, 1x SPI	1x I2C, 4x GPIO, 1x Power Output	3x 3.3V TTL UARTs (1x CONSOLE), 8 GPIOs 3.3V TTL (2x PWM Capable), 2x I2C 3.3V, 1x CAN 2.0b, 2x SPI, 2x 3.3V, 2x 5V, 8x GND
Storage	1x 2242/2230 NVMe (M-Key)	1x Micro SD Card Slot	1x SD Card Slot 1x NVMe 2280 (M.2 M-KEY)	1x M.2 M-Key (2280) NVMe PCIe x4 1x Micro SD Card
Display Output	None (Headless Operation only)	None (Headless Operation only)	1x HDMI 2.0	
Wireless Expansion	1x 2230 E-Key Expansion for WiFi/Bluetooth	N/A	1x 2230 E-Key Expansion for WiFi/Bluetooth 1x 2230 B-Key Expansion for LTE/GNSS	1x 2230 E-Key Expansion for WiFi/Bluetooth 1x PCIe x1 + USB 2.0
Power Input	+9V to +60V DC	+5V DC Input (Positive Locking MiniTek Connector)	1x 2mm DC Barrel Jack +12V DC +/- 5%	+9V to +36V Input Voltage Range Auto-ON operation by default
Operating Temperature	-25°C to +85°C (-13°F to +185°F)	-25°C to +85°C (-13°F to +185°F)	-25°C to +85°C (-13°F to +185°F)	-40°C to +85°C (-40°F to +185°F)
Weight	33g (1.16oz)	33g (1.16oz)	76g (2.68oz)	80g (2.82oz)

Hadron, Photon and Boson are compatible with Jetson Orin™ NX, Xavier™ NX, TX2™ NX, Orin™ Nano and Nano™. While Quark is only compatible with Jetson Nano™, TX2™ NX, and Xavier™ NX SoMs, some I/O availability will change across modules.

THERMAL SOLUTIONS

ACTIVE HEAT SINKS

Jetson Orin NX/Nano
XHG325

Jetson Xavier NX & Nano
XHG312, XHG314, XHG309

Jetson TX2-NX
XHG318

PASSIVE HEAT SINKS

Jetson Orin NX/Nano
XHG324

Jetson Xavier NX & Nano
XHG311, XHG308

Jetson TX2 NX - XHG317

THERMAL PLATES

Jetson Orin NX/Nano
XHG323

Jetson Xavier NX & Nano
XHG313, XHG310

Jetson TX2 NX - XHG316

Jetson Accessories:

Connect Tech carrier boards and system level solutions offer a wide variety of expansion options and accessories.

Accessories include:

Cables, antennas, power supplies, camera adapters, camera expansions, enclosures, thermals, WiFi modules, 5G & LTE Modules, frame grabbers, storage, bluetooth modules, and more.

ACCESSORIES

Active Heat Sink

This active heat sink features a built-in fan for enhanced cooling, ensuring optimal performance and longevity of your NVIDIA® Jetson™ AGX module.

• Specifically designed to fit the NVIDIA® AGX Orin™. Also compatible with Jetson AGX Xavier™ modules
• Dissipates the heat produced by the module through a fan
• Dimensions: 100mm x 87mm x 54.5mm

XHG319

Passive Heat Sink

Efficiently dissipates heat from your NVIDIA® Jetson AGX Orin™ and AGX Xavier™ modules, ensuring optimal performance and longevity.

• Specifically designed to fit the NVIDIA® AGX Orin. Also compatible with Jetson AGX Xavier™ modules
• Dissipates the heat produced by the module through convection
• Dimensions: 100mm x 87mm x 33.5mm

XHG320

Liquid Cooling Block

Superior thermal management, keeping your NVIDIA® Jetson™ AGX module cool under heavy loads for maximum performance.

• Industrial grade Liquid Cooling solution
• Ideal for space constrained or limited airflow applications
• 8 customizable side ports where inlet/outlet flow can be directed
• Incredibly quiet, high-performance heat dissipation solution

XHG307
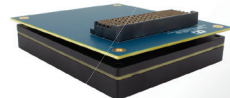
Connector Saver

The NVIDIA® Jetson AGX Xavier™ and AGX Orin™ Connector Saver attaches directly to the AGX production module to save your connector from wear.

• Minimizes contact damage
• Protects connectors from mating and unmating wear
• Dimensions: 92mm x 105mm (3.62" x 4.13")
• Compatibility: NVIDIA Jetson AGX Xavier™, Jetson AGX Orin™, Connect Tech Forge, and Rogue Carriers

ADG110
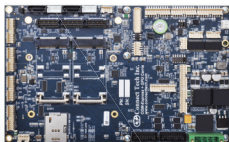
COM Express Type 6 + GPU Embedded System

The COM Express® Type 6 + GPU Embedded System combines High-End NVIDIA GPUs with latest generation x86 processors into a ruggedized small form factor embedded system.

- GPUs can be targeted for independent display outputs OR for a headless GPU processing system utilizing CUDA® cores
- CPU: Intel Raptor Lake (13th Gen), Alder Lake (12th Gen) and Tiger Lake (11th Gen) options available
- GPU: NVIDIA RTX A4500. A2000, A1000 & A500 (Ampere) & RTX 5000, RTX 3000 and T1000 (Turing) Options Available

VXG SERIES

COM Express Type 7 + GPU Embedded System

The COM Express Type 7 + GPU Embedded System combines 2x 10 GbE with Intel Xeon® D (Server Class) processors with high-end NVIDIA GPUs all into a small form factor embedded system.

- GPUs can be targeted for independent display outputs OR for a headless GPGPU processing system using CUDA® cores
- CPU: Intel Ice Lake D, Broadwell D and Denverton Server Class Options Available
- GPU: NVIDIA RTX A4500. A2000, A1000 & A500 (Ampere) & RTX 5000, RTX 3000 and T1000 (Turing) Options Available

V7G SERIES

V7G GPU System

The V7G GPU System combines Intel Xeon D (Server Class) and Intel Atom C3000 x86 processors with high-end NVIDIA Quadro GPUs in a black aluminum enclosure. Half-rack rail mount or Standalone mounting brackets available.

- Ideal for highend encode/decode video applications or GPGPU CUDA processing, Deep Learning and AI applications.
- CPU: Intel Ice Lake D, Broadwell D and Denverton Server Class Options Available
- GPU: NVIDIA RTX A4500. A2000, A1000 & A500 (Ampere) & RTX 5000, RTX 3000 and T1000 (Turing) Options Available

ESG7 SERIES

NVIDIA | Elite Partner

Connect Tech is a leader in high-end compute platforms for the embedded market. Choose from the latest NVIDIA GPUs paired with Xeon D (Server Class) and Intel Atom C3000 x86 processors in a compact system designed to be highly portable. Available in a fully enclosed system as well as a non-enclosed version for customer designed thermal solutions.

ESG701-01 - 2U Half-rack enclosure system

Product Features	NVIDIA RTX A2000	NVIDIA RTX A1000
GPU Architecture	NVIDIA Ampere	
Peak FP32	9.3 TFLOPS	7.4 TFLOPS
CUDA Cores	2560	2048
RT Cores	20	16
Tensor Cores	80	64
GPU Memory	8GB | 4GB	4GB
Memory Type	GDDR6	
Memory Interface	128-Bit	
Memory Bandwidth	192-Bit	
Maximum Power	60W / 35W	

AGX Orin

NEW!

Graphite VPX/AGX ORIN

GraphiteVPX/AGX Orin is a 3U peripheral card that brings the NVIDIA® Jetson AGX Orin™ to the highly rugged embedded VPX marketplace. The GraphiteVPX/GPU Orin features USB 3.2, DisplayPort, and an internal NVMe.

• 3U VPX SOSA Aligned
• NVIDIA® Jetson AGX Orin™ Industrial
• PCIe x8 Gen4 (Endpoint or Host)
• 2x 10GBASE-KR Ethernet
• Complete IMPI Support
• Industrial NVMe 1TB/2TB
• USB 3.2, DisplayPort, 1GBASE-T, GPIO, UART, Debug, OTG Flashing via front panel

VPG004

GPU

NEW!

Graphite VPX/GPU

GraphiteVPX/GPU is a VITA 65 compliant 3U peripheral card that brings the NVIDIA® RTX A2000 and RTX A1000 GPUs to the highly rugged embedded VPX marketplace. The GraphiteVPX/GPU provides up to four DisplayPort outputs or 2 DVI outputs.

• GPU Options:
  • NVIDIA RTX A2000
  • NVIDIA RTX A1000
• 3U VPX SOSA Aligned
• VITA 46, 48, and 65 compliant
• PCIe 3.0 (x8 or two x4) Data plane only

10GbE

NEW!

Graphite VPX/10GBE

Excellent for demanding applications with rugged environments and extreme temperatures, the GraphiteVPX/10GbE Managed Ethernet Switch is also a highly reliable way to communicate with 10GbE in an embedded system.

• 3U VPX SOSA Aligned 10G/2.5G/1G Ethernet Switch
• 12x 10G SERDES Ports
• 10GBASE-KR/5GBASE KR/2.5GBASE-KX/1000BASE-KX
• 24x 2.5G/1G Copper Ports 2.5GBASE-T/1000BASE-T
• Fully-managed L2 and L3 multi-layer switching services
• -40°C to +85°C (-40°F to +185°F)
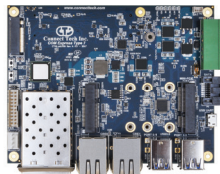
COM-HPC
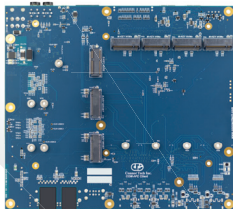
COM-HPC® Carrier Board

Our first Carrier Board for the new COM-HPC® platform. This carrier board features high-speed PC style connectors and locking pin header connectors.

• 2 x 2.5-Gigabit Ethernet
• 3 x USB4 via USB type C
• 1 x 3042 M.2 B-Key, 1 x 2230 M.2 E-Key, 1 x 16-Lane PCIe Expansion
• Dimensions: 160mm x 120mm
• Extended Temperature Range -40°C to +85°C

HPC001

TYPE 7

Type 7 Carrier Board

This Type 7 Carrier Board is ideal for high-compute, enterprise level applications needing access to high-end Intel® Xeon® D class and Intel® Atom® C3000 processors.

• Dual 10-Gigabit Ethernet
• Ultra High Speed Storage with M.2 NVMe SSD support
• Extremely Small Form Factor: 125mm x 95mm
• Extended Temperature Range -40°C to +85°C

CCG070

TYPE 10
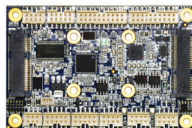
Type 10 Mini Carrier Board

The Type 10 Mini Carrier Board is an extremely small carrier board featuring rugged, locking connectors and offers the ultimate in durability.

• Extremely small size: 84mm x 55mm
• CCG010 supports USB2.0, CCG020 supports USB3.0
• 2 x mini PCIe, mSATA, SATA, 2 x GBE, 6 x USB, LVDS, DisplayPort HDMI/DVI/VGA, HD Audio, 2x RS 232/422/485
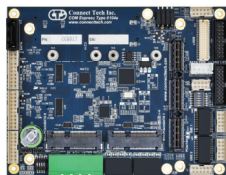
CCG010/CCG020

COMING SOON:

COM-HPC® mini

• High-end PICMG standard for credit card-sized COMs
• Up to 76 Watts of headroom for performance CPUs
• Soldered memory provides high resistance against shock and vibrations

CONNECT TECH INC.

TYPE 6

Type 6 104e

This is a compact carrier board which matches the dimensions of a COM Express® Basic module and offers the ultimate durability with rugged, locking pin header connectors.

• 4x USB 3.0, 2x GbE, 2x RS-232/485, LVDS (2×24), VGA
• PCIe/104 Type 1 (CCG018) or PCIe/104 Type 2 (CCG017)
• On-Board DisplayPort/HDMI/DVI display switching
• Extended temperature range -40°C to +85°C

CCG017/CCG018
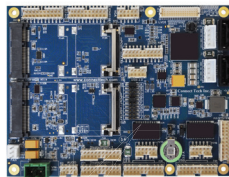
Type 6 Rugged Ultra Lite Carrier Board

The Type 6 Rugged Ultra Lite Carrier Board is compact. It offers the ultimate durability with locking, rugged pin headers. CCG011 supports only USB 2.0 and CCG012 supports USB 3.0.

• Mini-PCIe Expansion, USB 2.0, DisplayPort++
• Small size, 95mm x 125mm
• Supports latest Intel® processor sets
• Extended temperature range -40°C to +85°C

CCG011/CCG012
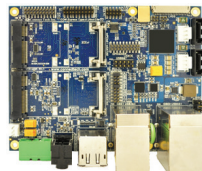
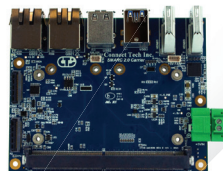### Type 6 Ultra Lite Carrier Board

The Type 6 Ultra Lite Carrier Board is a compact carrier board with standard PC connectors and is ideal for space constrained applications.

• COM Express® Type 6 Compatibility
• Mini-PCIe Expansion
• Supports latest Intel® processor sets
• Extended temperature range -40°C to +85°C

CCG008

SMARC

SMARC 2.0 Carrier

Connect Tech's SMARC 2.0 carrier is an extremely small SMARC carrier board ideal for low power IoT applications. Users can take advantage of the integrated on-board wireless capabilities.

• Feature Packed (HDMI, SATA, 2x MIPI CSI-2 Camera Interfaces)
• 2x USB 3.0, 2x USB 2.0, 2x USB 2.0 to miniPCIe
• Input Voltage +5V DC only
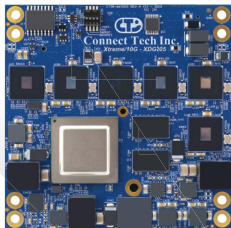• Extended temperature range -40°C to +85°C

SRG004

10GbE

Xtreme/10G Managed Ethernet Switch /Router

Xtreme/10G Managed Ethernet Switch/ Router provides high density, high port count Layer 2 switching and Layer 3 routing with 10G uplinks. A total of 36 switchable ports, with 12x 10G/5G/2.5G and 24x 2.5G/1GbE copper ports in an extremely small form factor 85mm x 85mm (3.35" x 3.35").

XDG205 features 1588 PTP support!

XDG205

- Drop-in replacement to previous generation module (XDG201/XDG202)
- 36 switchable ports (12x10G/5G/2.5G; 24x 2.5G/1GbE)
- High-density board-to-board connector
- +4V to 14V input range
- Measurements: 85mm x 85mm (3.35" x 3.35")
- Extended Temperature Range -40°C to +85°C (-40°F to +185°F)

**Software Packages for Managed Ethernet Switches**

Connect Tech's software design team builds support for our line of managed ethernet switches using industry-leading firmware.

IStaX

Breakout Board
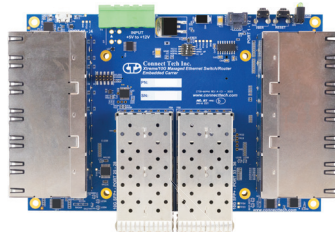
### Xtreme/10G Managed Ethernet Switch /Router Embedded Carrier

- PPS_IN and PPS_OUT IO support.
- Improved RJ-45 magnetics: supporting 24x 2.5G/1G Copper Ports
- 8x 10G SFP+ ports (compared to 4x 10G and 4x 1G on XBG301)
- Legacy support for XDG201
- Improved USB and Serial Connectors
- Improved 3.3V Power Supply to support higher power demand

XBG305
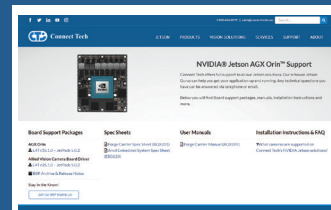
CONNECTTECH.COM/SUPPORT

We're proud to offer a convenient way for our customers to stay up-to-date with the latest BSP software updates. Our web page allows users to subscribe to updates for their purchased hardware, ensuring that they have access to the latest features and improvements. We've made it easy for our customers to receive them directly through their inbox.

Connect Tech

1GbE
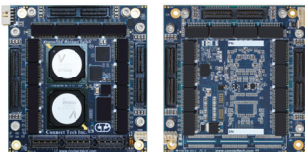
Xtreme/GbE 24-Port Managed Carrier Ethernet Switch

Xtreme/GbE 24-Port Managed Carrier Ethernet Switch provides high density, high port count, Carrier Grade Ethernet switching capabilities in an extremely small embedded form factor. Excellent for any space constrained, mission-critical application needing an embedded high-density/high-port count managed Ethernet Switch.

The XDG025 is designed for standalone applications, with all thermal extraction on one layer and connector/cabling on the opposite layer. Where as the XDG024 is intended to stack directly into a PCIe/104 stack.

- 24 Port Gigabit Ethernet (10/100/1000 Mbps) Switch
- All 24 Port Magnetics Integrated on-board
- High-Density Ruggedized Board-to-Board/Board-to-Cable Port Breakout
- Extremely Small Footprint 90 × 96 mm (3.550 × 3.775 inches)
- Conduction cooled Heatplate or Air cooled Heatsink Options
- Extended Temperature Range -40°C to +85°C

XDG024/XDG025

LINQ/GbE

LINQ/GbE is a Rugged Managed Ethernet Switch Box. LINQ/GbE series of products offers 12 or 24 Ethernet ports of 10/100/1000 Mbps.

- 12 and 24 Port 10/100/1000 Mbps Managed Switch Box
- Ruggedized Sealed RJ-45 Acclimate Connector Series
- IP68 Dust and Waterproof Solid Aluminum Enclosure
- Layer 2+ Carrier Ethernet Management
- Low Power Passively Cooled Construction

ESG301/ESG302
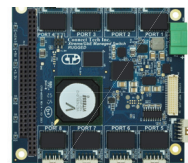
Xtreme/GbE Managed Carrier Ethernet Switchs

This 8 or 12 port Ethernet Switch is available with either standard RJ45 or rugged latching connectors, conduction cooled heatplates, and PC/104, PCIe/104 or standalone options.
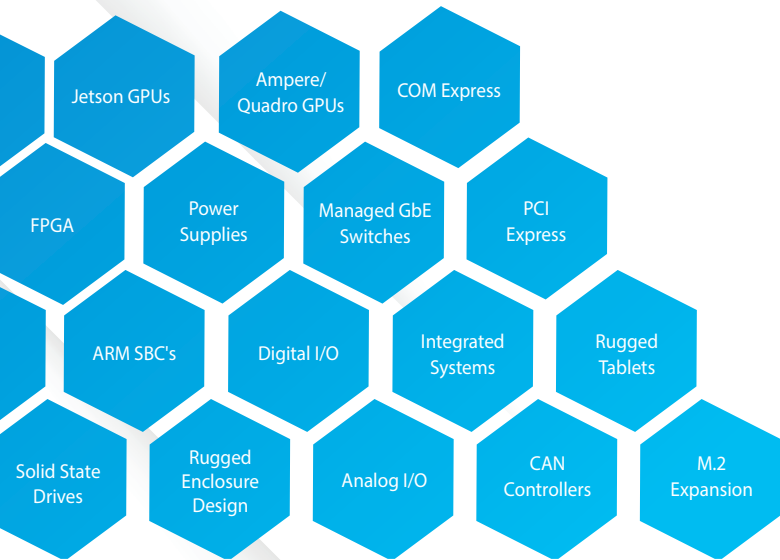
- Conduction cooled Heatplate or Air cooled
- 8 or 12 Port 10/100/1000 Mbps Switch
- Carrier Grade Ethernet Switching
- Available with RJ-45 or Rugged Locking connectors
- PC/104 Compliant: 4.550" x 4.393" (115.57mm x 111.58mm)
- Extended Temperature Range -40°C to +85°C (-40°F to +185°F)

ENGINEERING SERVICES
Custom Product Development

IP Pool for Custom Design

Jetson GPUs

Ampere/ Quadro GPUs

COM Express

FPGA

Power Supplies

Managed GbE Switches

PCI Express

ARM SBC's

Digital I/O

Integrated Systems

Rugged Tablets

Solid State Drives

Rugged Enclosure Design

Analog I/O

CAN Controllers

M.2 Expansion

MODIFIED OFF-THE-SHELF

CUSTOM DESIGN

Why choose CTI's engineering services?

- 50% of CTI's business is customized designs
- Well defined and polished custom design process
- Over 36 years of IP developing a breadth of hardware solutions
- Unprecedented Revision-A success rate
- Guaranteed functional prototypes in as little as 10-12 weeks

Connect Tech

Connect Tech Inc. is NVIDIA's largest global embedded hardware partner offering a wide array of NVIDIA® Jetson™ solutions, as well as embedded products for a variety of industry standards including COM Express, SMARC, and more. With in-house design and manufacturing services, Connect Tech can provide fast turn-around of custom design services, taking you from development to deployment in record time.

NVIDIA Elite Partner

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Tel: 519.836.1291
Toll Free: 800.426.8979 (North America)

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489 Clair Road West, Guelph, ON, Canada, N1L 0H7