DIAMOND SYSTEMS

June 2022

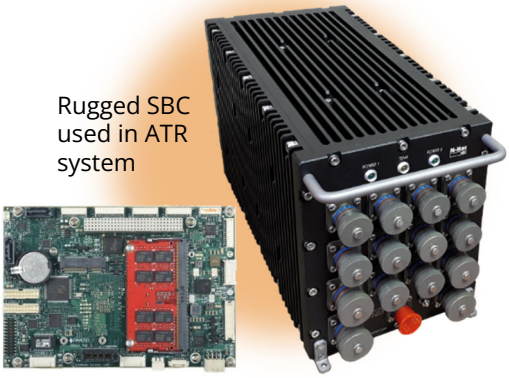
Photo:
Teledyne FLIR Defense

For over 30 years Diamond Systems has been delivering embedded computing boards and systems to customer in a variety of industries around the globe. During this time, our products and services have been utilized in virtually every industry and region around the world. Our specialties are:

- Compact, rugged, and I/O rich designs
- Nvidia Jetson carrier boards and systems
- Managed Ethernet switches with 1G and 10G speeds
- x86 single-board computers and I/O
- Cost-effective rugged systems
- Custom solutions based on our areas of technology expertise

Rugged
Ethernet switch
used in robot

While our standard product offerings fill a wide range of needs effectively, our custom solutions service takes embedded computing to the next level by delivering low minimum quantity, perfect-fit solutions drawing on our experience, expertise, and global supply chain to help our customers achieve better performance and competitiveness.

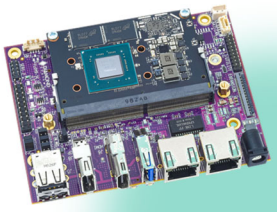


Rugged SBC
used in ATR
system

Global Value Chain

Diamond's extensive global supply base allows us to take advantage of a wider range of design and manufacturing expertise, utilize the latest manufacturing equipment and methods, and gain access to far higher production capacity than companies who try to do it all in house. We are able to meet varying customer needs ranging from small volume or ITAR compliance up to high volume, cost optimized design and manufacturing. Diamond serves as the solution provider, bringing appropriate talent, services, and suppliers together to deliver the best solution for your project, without the limitation of reliance on captive resources.

The products and solutions shown here are a sampling of our overall offering. Please visit our website to learn more or contact us directly: sales@diamondsystems.com

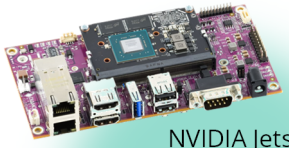


NVIDIA Jetson carrier
used in pharmaceutical
manufacturing

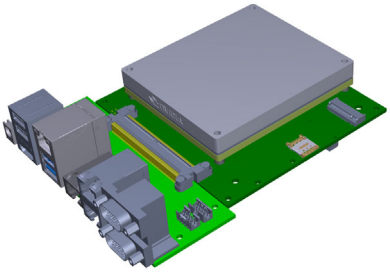
NVIDIA Jetson systems used in
mobile security and
crop harvesting

NVIDIA® JETSON SOLUTIONS

Diamond's NVIDIA Jetson product line features solutions for the complete Jetson product line at every level of integration: Carriers, carriers with Jetson module and thermal solution installed, and full systems. Our extensive carrier board design experience serves as the basis for many custom carrier board projects for customers around the world and helps to reduce design time and risk. Diamond was the first company to combine NVIDIA Jetson high-performance AI-at-the-edge computing with high performance rugged PCIe/104 expansion.



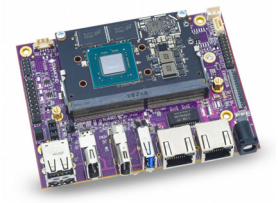
NVIDIA Jetson carriers used in intelligent signage and EV charging stations



COMING SOON!

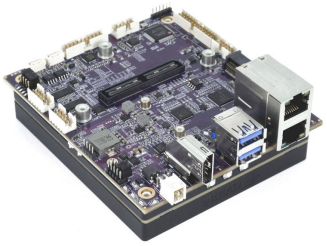
OSBOURNE carrier for Jetson AGX Orin:

- 10Gbps Ethernet
- Multiple M.2 / mPCIe expansion sockets
- Camera adapter with 16 MIPI CSI lanes
- I/O concentrator connector for flexible system integration with standard & custom connector boards



FLOYD-SC

- Carrier for Nano / NX / TX2 NX
- Compact size 4.3x3.3"
- Cost effective
- Expandable with daughterboard



STEVIE

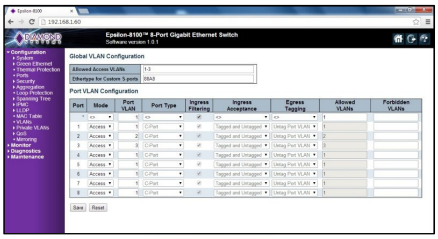
- Carrier for AGX Xavier
- Single/dual Ethernet
- Rich I/O
- Compact size 3.6x4.2"

JETBOX

- Complete systems for Diamond NVIDIA carriers
- Include Jetson module and OS loaded
- Ready to run
- Up to 6 GMSL cameras

ETHERNET SWITCHES

Ethernet switch embedded management software



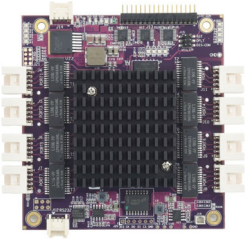
Diamond's **Epsilon** line of Ethernet switches provide compact, convenient, industrial/military grade solutions for managed gigabit Ethernet switching.

- Layer 2 / Layer 3 switching / routing capability with feature-rich embedded software
- Up to 24 1G ports + 4 10G ports on a single rugged board
- In-band web GUI and out-of-band serial port interfaces
- IEEE 1588 / PTP capability available on most products
- Embedded software can be customized with your own branding
- Latching connectors, thicker PCBs, and industrial -40/+85C operating temperature
- Qualified to MIL standards for shock and vibration

Switch module used in IEC 61850-qualified switch for electrical substation

EPS-8130

- 8 Gbe ports
- Latching connectors
- Layer 2+ management
- Heat sink / heat spreader options

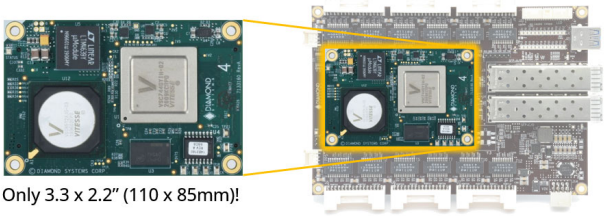


EPS-24G4X

- 24 1Gbps ports
- 4 10Gbps SFP+
- Conduction cooling
- Layer 3 routing
- IEEE-1588 PTP

Ethernet Switch Modules

Our EPSM Ethernet switch modules provide compact off-the-shelf solutions that eliminate 95% of the design effort and risk for a custom managed Ethernet switch. Customers have the flexibility to define their own form factor and connectors while enjoying vastly reduced development time and cost.



Only 3.3 x 2.2" (110 x 85mm)!

Speed up design of custom Ethernet switches

DIAMOND SYSTEMS

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SINGLE-BOARD COMPUTERS

Diamond has a diverse line of small form factor SBCs targeting rugged and I/O-rich applications. Product highlights demonstrate our commitment to ruggedness and I/O:

- Integrated conduction cooling mounting plates for efficient thermal dissipation
- Latching connectors and thicker PCBs
- Integrated data acquisition
- Wide temperature -40 to +85C operation

Compact SBCs offer rugged performance with rich I/O and flexible expansion in a small size.

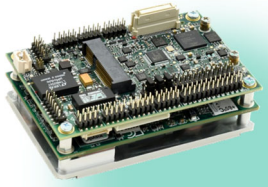
VENUS
- 7th gen Core i7
- Up to 20GB RAM with RSODIMM
- PCIe/104 expansion
- 3.5 inch form factor
- Rugged design
- -40 to +80C

VENUS SBC used in rock formation analysis instrumentation

2-in-1 SBCs with integrated professional quality analog and digital I/O circuits save space for applications requiring real-world I/O.

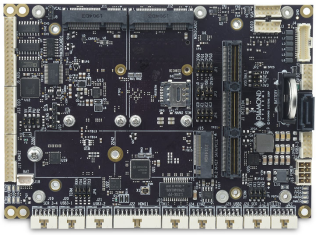
SATURN
- E3940 Apollo Lake
- 4-8GB RAM
- PCIe/104 expansion
- Compact size 4.5x4.0"
- Rugged design
- -40 to +85C

ZETA ultra-compact 110x85mm SBC used in unmanned underwater vehicle



COM Express SBCs consist of a carrier board in an industry-standard form factor with a COM Express module installed to provide the CPU function. This integrated design provides scalable performance and extended lifetime through the use of interchangeable COMs, while the expansion sockets support easy I/O customization to fit each application.

NEW!
JASPER carrier for COM Express type 6
- Rich expandability with mPCIe, M.2, and PCIe/104
- Rugged design
- 3.5 inch form factor
- -40 to +85C



I/O EXPANSION

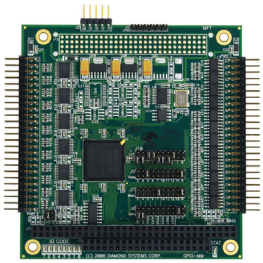
Rugged PC/104 I/O Modules provide easy off-the-shelf I/O expansion for embedded systems requiring ruggedness and a high level of I/O.

- Analog I/O with autocalibration and programming library
- Digital I/O with counter/timers and PWM
- Serial ports with RS-232/422/485 capability
- Relay and opto-isolated I/O
- CAN ports
- Custom designs

Analog I/O PC/104

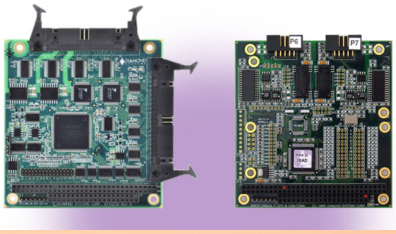
PC104

PCIe104 OneBank



Digital I/O PC/104

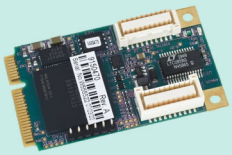
Serial Ports PCIe/104



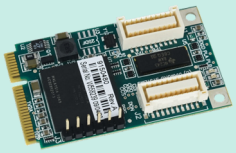
PC/104 I/O used in locomotive

PCIe Minicards

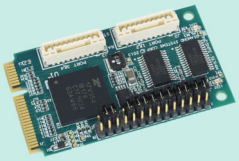
These cost-effective modules offer economical I/O expansion in a popular ultra-compact form factor.



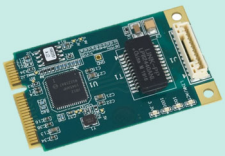
Analog I/O



Digital I/O



RS-232/422/485



Ethernet

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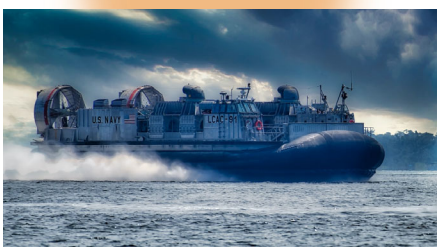
RUGGED SYSTEMS

Rugged Ethernet switch for US Navy hovercraft

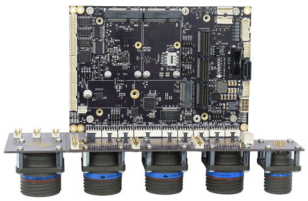


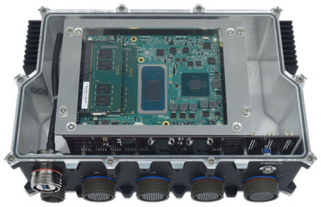
SABRE systems provide economical rugged solutions for Diamond's embedded SBCs (SabreCom) and Ethernet switches (SabreNet). These systems can be easily customized with rugged power supplies and additional I/O to meet application requirements. These systems feature IP67 environmental protection and MIL-STD-202G shock/vibration ratings. MIL-STD-461 / 1275 / 704 power supply compatibility is available on all products. SabreNet switches feature 1G and 10G data rates with both copper and fiber capability.

GEODE is Diamond's newest rugged system family offering quicker time to market and easier I/O expansion. Geode features a cable-free design for increased ruggedness and expansion-ready I/O connectors to simplify I/O customization. The COM Express-based architecture supports multiple processor options for scalable performance and increased product lifetime.

Rugged Core-i7 computer used on military vehicle

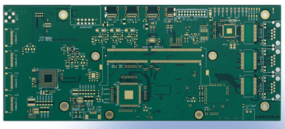
GEODE rugged computer system



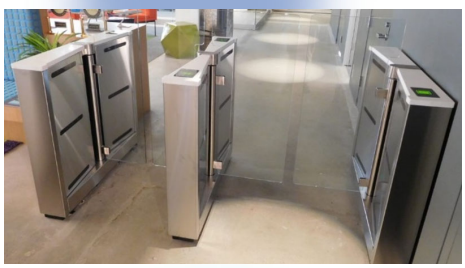


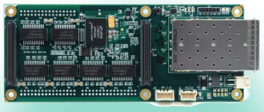
Internal construction features cable-eliminating I/O board (left) and conduction cooled COM-based CPU (right)

CUSTOM SOLUTIONS



Custom NVIDIA Jetson carrier used in entrance control system



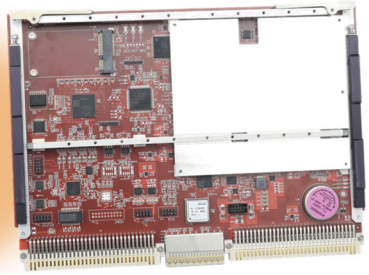


Custom Ethernet switch module carrier for rugged system

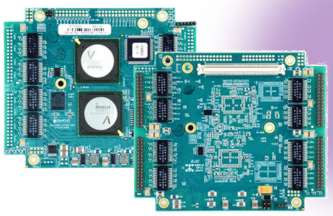
Diamond's custom solutions program offers perfect-fit board, subassembly, and system solutions based on x86, Nvidia Jetson, and Ethernet switch technologies.

- Our extensive design experience in all three domains enables us to define an optimal architecture, choose the best components, and implement the ideal physical form factor based on customer priorities and current industry conditions.
- We utilize industry-standard technologies and form factors wherever possible to enable quicker time to market, greater flexibility, and longer lifetime.
- In today's difficult supply chain conditions, a custom solution also provides improved cost and manufacturability by designing out older components and technologies and selecting newer ones with better performance, availability, and lifetime.
- Program includes modifications to standard products to optimize them for customer applications

Rugged custom VME64x SBC used on US Army M1 tank



Rugged custom Ethernet switch used on Predator drone



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