FEATURES

ARCHITECTURE

- Single Core Intel® Atom® or Dual Core AMD® Fusion® Processor
- 64 GB SSD
- Dimensions (W x H x D): 36 mm X 160 mm X 250 mm
- Weight: < 2.7 lb
- IEEE1588
- Ten 10/100/1000 Ethernet Ports
- Single 10/1000/1000 Gateway/Firewall Ethernet Port
- Dual 1553 Ports
- Dual CAN Bus Ports
- Management Access via Serial or Ethernet Port
- VGA Port
- Two USB 2.0 Ports

ENVIRONMENTAL RESILIENCY

- Operating Temperature: -40° C to +70° C
- Small Lightweight Aluminum Enclosure
- Sealed Mil-Circular Connectors
- Water Resistant IP67 Compliant
- Shock Resilience up to 50G@ 25 msec

POWER INPUT

- 10V to 36V DC

MILITARY SPECIFICATION

- MIL-STD-810G (Vibration)
- MIL-STD-810G (Humidity)
- MIL-STD-810G (Salt Fog)
- MIL-STD-810G (Fungus)
- MIL-STD-461 (EMI)

NanoSWITCH™

Small Form Factor Network Device

OVERVIEW

The Themis NanoSWITCH™ is a Size, Weight, Power, and Cost (SWAP-C) optimized small form factor network device that compliments the NanoPak™ and NanoATR™ small form factor computer systems. Ideal for mission-critical applications, the NanoSWITCH device's robust performance and cost-competitve price make it ideal for ruggedized military, commercial, and industrial use. Typical applications include:

- Intra-vehicle networks
- Vehicle modernization
- VICTORY architecture compliance
- Vehicle management
- Network interconnects and expansion
- Shared processing and peripheral communications

The NanoSWITCH provides ten Gigabit Ethernet ports that can operate at reduced rates of 10 and 100 mbits. The switch supports managed L2 and L3 functions and includes a packet-processing engine along with a TCAM based policy function for secure ingress egress access control. The NanoSWITCH supports sophisticated IPV4 and IPV6 routing and tunneling. The switch supports the latest L2 and L3 VPN services following IETF (VRF, RFC2547), IEEE (802.1ad, 802.1ag) and DSL Forum standards (Q-in-Q), including OAM support for IEEE and RTU extensions.

The NanoSWITCH utilizes sophisticated traffic policies including metering, counting, statistics, scheduling and shaping for optimizing QoS for converged data, voice and video traffic. In addition, the switch supports sFlow, IPFix and remote port analysis for network traffic monitoring and management.

- Themis NanoPAK and NanoATR in distributed systems
  - NanoPAK CPU with user interface and GigE
  - L2/L3 GigE switch with bus gateway
  - NanoATR remote I/O modules
  - System connectivity with GigE
- Themis NanoPAK as robotics controller
- Themis NanoPAK as NAS/application server
  - Removable storage
  - Software RAID
  - Multiple CPUs
  - MIL-STD-1553 or discret I/O

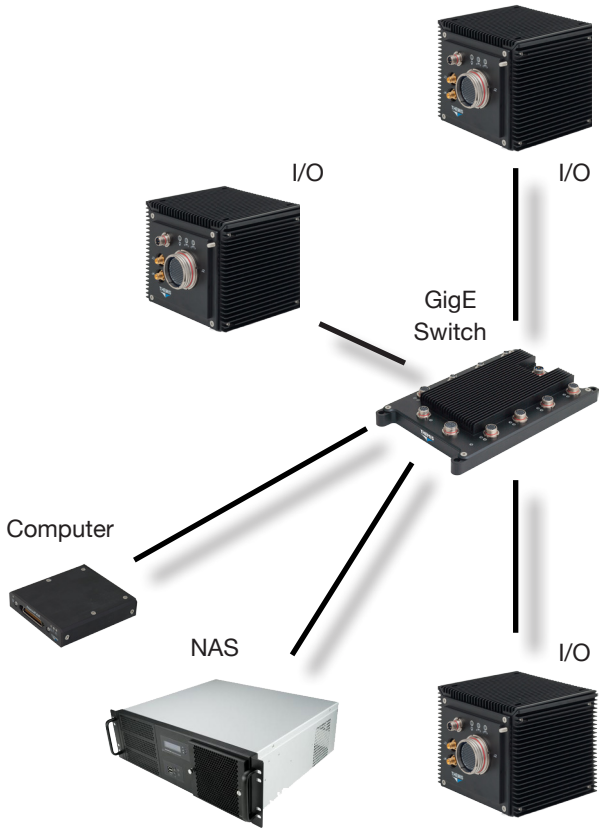

FIGURE 1: Typical Nano Small Form Factor Applications

Management of the switch is accomplished through a serial port or through an Ethernet port. NanoSWITCH can be connected to the Themis Resource Management suite for single point of control operation. In addition to the switch function, the NanoSWITCH includes an optional X86 SBC that can be configured as a gateway to the switch function from either a 1553 bus or a Canbus. The SBC can also function as a system manager for connected devices to the switch. The SBC can be accessed through either a serial port or a monitor/keyboard/ mouse can be attached through the separate USB ports.

The NanoSWITCH is packaged in a compact, 7 inch x 10 inch x 1.5 inch, water resistant aluminum enclosure. The connectors for each port function are sealed miniature mil-circular types. The switch operates off of a wide DC input voltage range of 10V to 36V.

VEHICULAR INTEGRATION FOR C4ISR/EW INTEROPERABILITY (VICTORY)

A member of all three Vehicular Integration for C4ISR/EW Interoperability (VICTORY) working groups, Themis builds tactical systems for Army combat vehicles to take advantage of the VICTORY architecture and to be VICTORY-compliant. Applying non-propriety commercial standards, Themis builds embedded computing systems for demanding environments, enabling the Army increase the use of low-cost open standards-based COTS electronics in military ground vehicles.

Themis applications for the VICTORY architecture include Rugged Displays, Display and Video Processors, Mission Computers, Server Farms, Network Attached Storage (NAS) devices, Data Recorders, Inertial Measurement Units, Sensor Processors, and Ethernet Switches.

The Themis NanoSWITCH is also VICTORY compliant as an Infrastructure Switch and Network Time Source via PTP (IEEE-1588).

GPS AND INERTIAL NAVIGATION SERVICES

The NanoSWITCH device supports direct connection to an external GPS receiver to provide real-time GPS data. An internal Inertial Measurement Unit (IMU) is included as standard, along with support for an external IMU. These devices provide centralized time, position, speed, heading and orientation data that can be distributed to network devices, eliminating equipment duplication and lowering overall platform costs and complexity.

Physical Specifications

PARAMETER	DESCRIPTION
Power Input	10V to 36V DC
Size (W x H x D)	36 mm x 160 mm x 250 mm
Weight	< 2.7 lb
Environmental/Thermal	Operating Temperature: -40° C to +70° C
Humidity	0 to 100% condensing per MIL-STD 810 method 507.4
Shock	50G@ 25 msec
Vibration	3.0 Grms, 10 Hz to 2000 Hz
Altitude	Operating: -500 to +12,000 feet Non-operating per MIL-STD-810F method 500.4: -500 to +50,000 feet
Military Specifications	MIL-STD-810G (Vibration) MIL-STD-810G (Humidity) MIL-STD-810G (Salt Fog) MIL-STD-810G (Fungus) MIL-STD-461 (EMI)

Hardware Specifications

PARAMETER	DESCRIPTION
Ethernet Switching Fabric	Carrier Grade L2 Gigabit Ethernet Switch - Fully non-blocking wire-speed performance with all ports and all frame sizes - 4Mb integrated shared packet memory
External Ethernet Ports	10 ports tri-speed 1000Base-T supporting 10Base-T, 100Base-TX, and 1000Base-T copper interfaces
Ethernet Port Specifications	- 10Base-T interfaces per IEEE 802.3 - 100Base-TX interfaces per IEEE 802.3u - 1000Base-T interfaces per IEEE 802.3ab - Auto-MDI/MDIX crossover - Max 100m segment length
Ethernet Maintenance Port	RS-232 Serial Port
System Processor	Single Core Intel® Atom® or Dual Core AMD® Fusion®
Vetronics Interfaces	- 2x CANbus interfaces, per ISO-11898 - Up to 1Mbps interface speeds - 1x RS-232 Auxiliary Interface
Internal Sensors	Internal 3-axis Inertial Measurement Unit (IMU)
LED Indicators	- Switch status - Processor status - Ethernet port link status
Management Access	Serial or Ethernet Port
VGA Port	One
Protocols	Dual 1553 Ports, Dual CAN Bus Ports

Ethernet Software Specifications

PARAMETER	DESCRIPTION
Layer-2 and Layer-3 Switch	- Packet-processing engine with a TCAM based policy function for secure ingress egress access control - Sophisticated IPV4 and IPV6 routing and tunneling - Current L2 and L3 VPN services following IETF (VRF, RFC2547), IEEE (802.1ad, 802.1ag) and DSL Forum standards (Q-in-Q), including OAM support for IEEE and RTU extensions

THEMIS SMALL FORM FACTOR SOLUTIONS

Themis designs small form factor systems for various rugged environments including unmanned vehicles, ground vehicles, man-wearable, shipboard and other environments, where space, weight, power and cost are critical.

THEMIS VALUE

Themis provides systems manufacturers and end-users with the most modern, best-of-breed computing resources available. Package and performance scale from small form factor embedded servers to bladed servers. Themis listens, understands, and works closely with our customers to optimize computing solutions that are easy to integrate, yet inexpensive to own and operate. Themis solutions achieve the right balance between standard commercial technology and requirements for rugged environments. For more information on Themis products, visit www.themis.com.

ABOUT THIS DATA SHEET

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THEMIS

Corporate Headquarters
47200 Bayside Parkway
Fremont, CA 94538
Tel: 510-252-0870
Fax: 510-490-5529
www.themis.com

European Sales Office
5 rue Irène Joliot-Curie
38320 Eybens, France
Tel: +33.476.14.77.86
Fax: +33.476.14.77.89

For More Information
Please visit www.themis.com or contact Themis sales at 510-252-0870.