



NIU2A-ES2 – Nano Interface Unit / Ethernet Switch

Multiport Managed Layer 3 Ethernet Switch Interface Unit

The [NIU2A-ES2](#) is a small, rugged, low-power, self-contained Rugged Ethernet Switch system. It is powered by an integrated MIL-STD-704A (designed to meet) power supply. It is a Layer 3, fully managed switch providing sixteen (16) 10/100/1000Base-T (GbE) Ethernet ports and four (4) optional 10 Gb 850 nm fiber-optic ports. Additionally, there is one GbE and one RS-232 port for maintenance / configuration interface. The NIU-ES2 supports Open Systems Interconnection (OSI) model data link (L2) and network (L3) layer, quality of service (QoS) and security features. Ideally suited for rugged Mil-Aero applications, the NIU2A delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems in air, land and sea applications.



(Photo shown with Fiber-Optic (F) connector option)

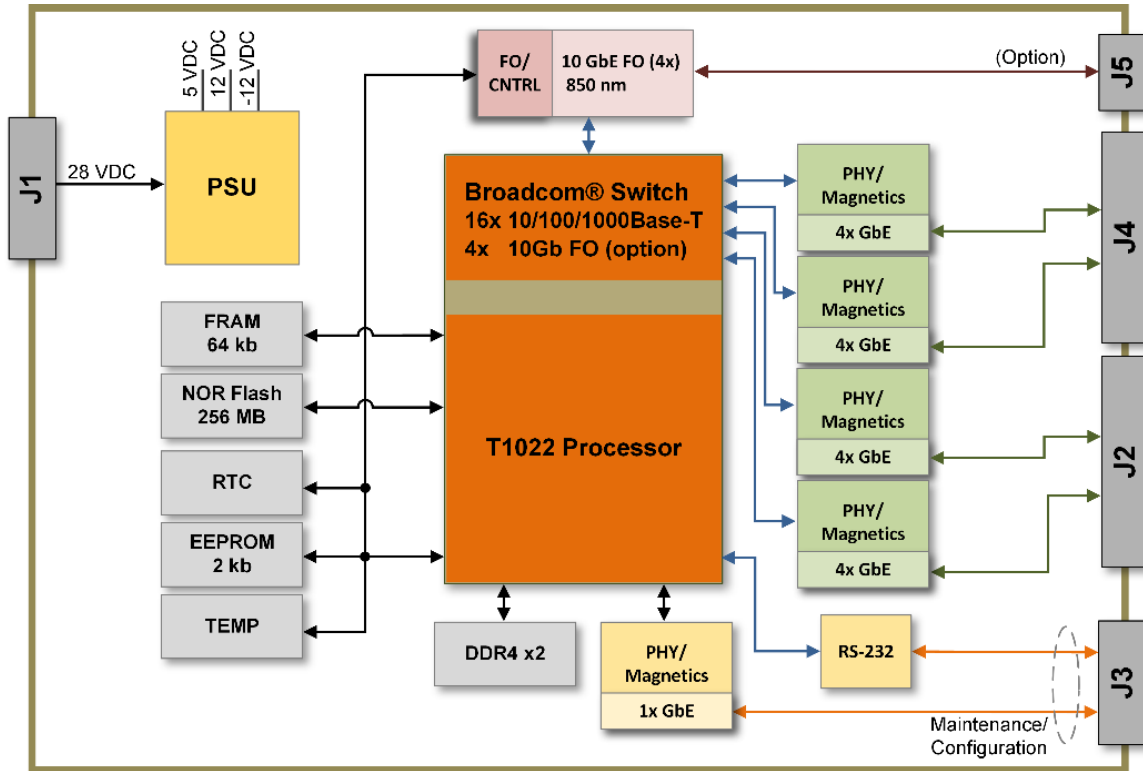
The NIU2A-ES2 rugged switch provides scalable Ethernet links enabling networks including on-board vehicle, marine and aircraft platforms to field and expand digital network architectures for network-centric operations. The NIU2A-ES2 fits seamlessly in NAI's Configurable Open Systems Architecture™ (COSA®) providing the most modular, agile and rugged COTS portfolio of embedded smart modules, I/O boards, Single Board Computers, Power Supplies and Ruggedized Systems.

Features

- **Supports ES2 Managed Switch Module**
 - 16x 10/100/1000Base-T (GbE) ports
 - 4x Multimode Fiber-Optic (10Gb @ 850 nm) option
 - 1x GbE and 1x RS-232 for maintenance
- **Minimized SWaP footprint**
 - ~ 7.0" x 3.0" x 2.5" (incl. connectors)
 - ~ 2.75 lbs. (1.25 kg)
 - 28 VDC input @ ~ 1.0 A Operating
- **Cybersecurity**
 - Internet Protocol Security (IPSec)
 - Internet Key Exchange (IKE (v1, v2))
 - Stateful Firewall
 - Denial-of-Service (DoS) attack defense
- **High-Performance Ethernet Switch**
 - Full auto-negotiation and auto-MDIX
 - IEEE 802.3ab (1000Base-T Gig-E)
 - IEEE 802.3u (100Base-TX Fast Ethernet)
 - IEEE 802.3i (10Base-T Ethernet)
 - IEEE 802.3x (Flow control/full and half-duplex)
- **L2 / L3 Management**
 - Transparent bridging
 - VLAN aware bridging
 - Rapid Spanning Tree Protocol
 - Multiple Spanning Tree Protocol
- **Quality of Service (QoS) and Security Features**
- **Continuous Background BIT** (Pending)
- **VICTORY Interface Services** (Contact Factory)
- **Rugged applications***
 - MIL-STD-810G
 - MIL-STD-461F
 - MIL-STD-704A (Designed to meet)
 - Operating temp: -40° C to +71° C
 - Conduction-cooled and Convection/Air-cooled options (Contact Factory)

*Designed to meet. Characterizations pending. EMI/EMC requires shielded cables and proper grounding practices. Specifications subject to change.

System Block Diagram



ES2 Managed Ethernet Switch Specifications

Module ID:	ES2: Multiport Managed Ethernet Switch Module (up to 16 ports)
Number/Type of Channels:	16; 10/100/1000Base-T Additionally: 1x 10/100/1000Base-T maintenance port interface 1x RS-232 maintenance/console port interface Fiber-Optic Channel, 4x 10 Gb
Compatibility Standards	Broadcom® BCM53454x <ul style="list-style-type: none"> IEEE 802.3ab (1000Base-T Gig-E) IEEE 802.3u (100Base-TX Fast Ethernet) IEEE 802.3i (10Base-T Ethernet) IEEE 802.3x (Flow control/full and half duplex)
L2 Features / Standard Management	<ul style="list-style-type: none"> Transparent bridging VLAN aware bridging Rapid Spanning Tree Protocol Multiple Spanning Tree Protocol IGMP snooping – MAC based, filtering, Proxy reporting with snooping MLD snooping (MAC based only supported) Link Aggregation with LACP 802.1x authentication (Port based) Link Layer Discovery Protocol - LLDP (v1, v2), LLDP MED Ethernet OAM – 802.3ah Q-in-Q VLAN tunneling and Provider bridging Non-blocking, Gig-E, fully integrated switch fabric with packet buffer memory Integrated MACs (IEEE 802.x compliant) with support for 9600-byte jumbo frames High-performance, look-up engine with support for unicast MAC address entries Automatic learning and aging tags IPv4 and IPv6 traffic class support (including ARP, ICMP, ND, UDP)

L2 Features / Standard Management (continued)	<ul style="list-style-type: none"> Port segregating/partitioning options available (e.g., separate 8/8 ports for 2x independent networks) management SNMP (v1, v2c, v3) agent and MIB support; configuration save / restore, CLI (Console, Telnet, SSH), pre-defined CLI commands WebUI (HTTP and HTTPS / SSL), pre-defined web pages (As is basis), Clear configuration (As is basis) Syslog – client (with reliable syslog delivery) and relay, email alerts with authentication support TCP/IP stack for IPv4 and IPv6 (including ARP, ICMP, ND, UDP) DHCP (client, server, relay) for IPv4 Stateless DHCP service (Client) for IPv6 for specific options assignment DHCPv6 relay with prefix delegation RADIUS client, DNS client, TACACS+ client, SSH client, Telnet client (all clients with IPv4 and IPv6 support) RMONv1 IP authorized managers Ethernet port control and management Port mirroring
Quality of Service (QOS)	<ul style="list-style-type: none"> ACLs (Access Control Lists) for traffic filtering, Redirect Filter Support in ACL, Out Filter Support in ACL 802.1p, DiffServ, traffic prioritization queuing, policing, shaping Rate limiting and storm control Flow control
L3 Features	<ul style="list-style-type: none"> IPv4 unicast - static routing, RIP v1/v2, OSPFv2 IPv4 multicast – IGMP (v1/v2/v3) router, PIM-SSM IPv4 – NAT (Network Address Translation) – unicast IPv6 unicast - static routing, Neighbor Discovery, RIPv6, OSPFv3IPv6 multicast – MLD (v1/v2), PIM-SSM Route redistribution between IPv4 routing protocols and static routes Route maps for filtering route advertisements and route redistribution – IPv4 and IPv6 Authentication support for OSPFv3 Support for multiple IPv4 addresses per interface - OSPFv2
Security	<ul style="list-style-type: none"> IKE (v1, v2) IPSec Stateful firewall Denial-of-Service (DoS) attack

Part Number Designation

Standard Product = **NIU2A-2-ES2Z0000FH**

	AAA	BBB	P	S	E	H
Module Slot 1 (ES2 pre-configured) ES2 = 16 Port GbE Switch, managed						
Module Slot 2 unavailable w/ ES2 option Z00 = No Module						
Processor/Flash 0 = ES2 version (standard, default)						
Software/OS 0 = No OS (default, standard)						
Fiber Optic Connection Option (4x 10Gb Fiber Optic availability) 0 = No Fiber Optic Connection (Standard, Default) F = Fiber Optic Connection						
Power Supply Hold-up (HU) Option 0 = No power supply HU (Standard, Default) H = Power supply HU installed						

Connectors		
Designator	MIL-DTL (Equivalent)	Shell-Insert / # contacts
J1	D38999/20WA98PA	9-98 / 3
J2	D38999/20WF35SN	19-35 / 66
J3	D38999/20WJ37SN	25-37 / 37
J4	D38999/20WF35SA	19-35 / 66
J5	Amphenol CF-599011-01S	11-01 / Fiber Optic insert



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