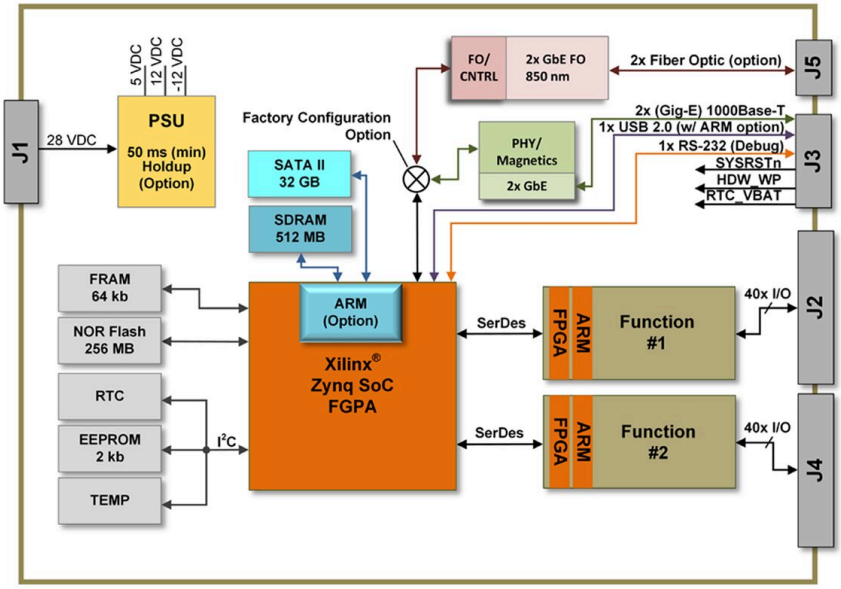
NIU2A Rugged COTS Systems

Multifunction Nano Interface Unit with optional ARM Processor

The NIU2A is a small, rugged, low-power, self-contained, multifunction I/O system. It is powered by an integrated MIL-STD-704F (designed to meet) power supply. The NIU2A can be fitted with up to two smart NAI Configurable Open Systems Architecture™ (COSA®) function modules. The NIU2A is configured to operate as a standalone Ethernet connected Remote Interface Unit (RIU) or optionally configured with access to the ARM Cortex-A9 processors operating as an integrated SBC, fully managing the I/O and a user software application. The NIU2A is configured with standard 10/100/1000Base-T (GbE) Ethernet ports or two optional 1 Gb 850 nm fiber-optic ports. Additionally, there is an RS-232 port for maintenance / diagnostic or configuration interface. 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.

The NIU2A rugged multifunction I/O platform provides scalable Ethernet or other communications interface linked I/O enabling networks including on-board vehicle, marine and aircraft platforms to field and expand digital network architectures for network-centric operations. With dual function module capability, the NIU2A has the capability of being programmed as an I/O and communications protocol converter. The NIU2A integrates seamlessly within NAI's COSA® family 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 two NAI smart I/O function modules**
  - 100+ modules to choose from
  - Customer-configurable
  - COSA® architecture
- **Minimized SWaP Footprint**
  - 7.2" x 2.7" x 3.0" (incl. connectors)
  - ~2.7 lbs. (1.22 kg)
  - 28 VDC @ ~0.18 A (est.) / 5-25 W typical operating (depending on module configuration & application)
- **Optional ARM processing**
  - ARM® Cortex®-A9 Dual Core Processor @ 800MHz
  - 512 MB DDR3L SDRAM
  - 32 GB SATA II NAND Flash
- **Ethernet Connectivity**
  - 2x 10/100/1000Base-T (GbE)
  - 2x 1 Gb Fiber Optic 850 nm (Option)
- **Operating System Support***
  - Xilinx® PetaLinux OS
  - Wind River VxWorks (Option)
- **Continuous Background BIT (module dependent)**
- **VICTORY Interface Services (Contact Factory)**
- **Rugged applications***
  - MIL-STD-810G
  - MIL-STD-461F
  - MIL-STD-704F
  - 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. Please contact factory for other OS support.

Select up to 2 independent functions for your application

I/O Modules

Function	Module	Description
Analog-to-Digital	AD1	12 CH. A/D, ±10 V, Dedicated, 256 kHz (max), Sigma-Delta
	AD2	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta
	AD3	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta
	AD4	16 CH. A/D, ± 10 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR
	AD5	16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR
	AD6	16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR
	ADE	16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling
	ADF	16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling
Chip Detector and Fuzz Burn	CD1	6 CH. Chip Detector (CD) and Fuzz Burn (FB)
Digital-to-Analog	DA1	12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control
	DA2	16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control
	DA3	4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output
	DA5	4 CH. D/A, High-Voltage/High-Current Half-Bridge (2 Channels Full-Bridge) External VCC Sourced Outputs

Function	Module	Description
Digital IO - Differential Transceiver	DF1	16 CH. Differential I/O, Input: -10 V to +10 V (422), -7 V to +12 V (485) Output: -.25 V to +5 V
	DF2	16 CH. 16 Channel Enhanced Differential I/O
Discrete IO - Multichannel, Programmable	DT1	24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)
	DT2	16 CH. Discrete I/O, ±80 V Input/Output, Max Iout 600 mA, Isolated/Ch Switch (out)
	DT3	4 CH. Discrete Hi & Lo Side Switch Output @ 65V/2A (max), external individual supplied VCC & VSS per channel pair
	DT4	24 CH. Enhanced DT1
	DT5	16 CH. Enhanced DT2
Relay	RY1	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Non Latching
	RY2	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching
Digital IO - TTL/CMOS	TL1	24 CH. TTL I/O, Standard Functionality, Programmable
	TL2	24 CH. TTL I/O, Enhanced Functionality, Programmable
Variable Reluctance	VR1	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)

Measurement & Simulation Modules

Function	Module	Description
AC Reference	AC2	2 CH. AC Reference Source, 47 Hz - 20 KHz, ± 3% Acc, 2 – 28 Vrms, 6 VA (Max/Ch) Power
	AC3	2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 – 115 Vrms, 6 VA (Max/Ch) Power
LVDT RVDT Measurement and Simulation	DLx	1 - 3 CH. Digital to LVDT/RVDT, 2 - 90 Vrms Full Scale, 2 - 115 Vrms Exc, 47 Hz - 20 kHz Freq
	LD1	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq
	LD2	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq
	LD3	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq
	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq
	LD5	4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq

Function	Module	Description
Synchro Resolver Measurement and Simulation	DSx (DRx)	1 - 3 CH. Digital to Synchro/Resolver, 2 - 90 VLL, 2 - 115 Vrms Exc, 47 Hz - 20 kHz Freq
	SDx	4 CH. Synchro/Resolver to Digital, 2 - 90 Vrms Input, 2 - 115 Vrms Exc, 47 Hz to 20 kHz Freq
IRIG Timecode Receiver and Generator	RG1	1 CH. IRIG Timing Function Interface
Thermocouple and RTD Measurement	RT1	8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch
	TC1	8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D
	TR1	8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel
Strain Gauge Measurement	SG1	4 CH. Strain Gauge, 4.7 Hz - 4.8 KHz, Measurement, Conventional 4-Arm Bridge

Communication Modules					
Function	Module	Description	Function	Module	Description
ARINC Communications	AR1	12 CH. ARINC 429, 100 KHz or 12.5 KHz, RX/TX, 256 Word Tx/Rx Buffer	MIL-STD-1553B	FTE	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled
	AR2	1 CH. ARINC 568 (CH-1, RX & TX) & 1 Channel ARINC 579 (CH-2, Programmable RX or TX), 1024-Word TX & RX Buffers per Ch.		FTF	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled
CANBus Communications	CB1	8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate	MIL-STD-1760	FTJ	1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled
	CB2	8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate		FTK	2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled
	CB3	8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel	IEEE 1394 (FireWire)	FW1	2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, including TLIM
Ethernet Switch	ES2	16 CH. (Ports) (max.) Ethernet Switch, 10/100/1000Base-T (GbE), 4 x Fiber Optic Ports (opt.), Layer 2+/3 Managed		FW2	2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, direct (no TLIM)
MIL-STD-1553B	FTA	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled	Serial Communications	SC1	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated
	FTB	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC3	8 CH. (max) RS-232/422/485 Serial Communications or GPIO, Programmable, Non-isolated
	FTC	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC5	4 CH. RS-232/422/485 communications, isolated per channel and from SYS GND
	FTD	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled		SC6	4 CH. RS-232/422/485 communications, individual SYS GND provided per channel (non-isolated)

Storage					
Function	Module	Description	Function	Module	Description
SATA Solid State Drive (SSD)	FM2	1 CH. 480 GB MLC SATA Flash, extended temp -40°C to 85°C operation			

Combination Modules					
Function	Module	Description	Function	Module	Description
Combo	CM5	2 CH. Dual-redundant MIL-STD-1553 & 8 Channel ARINC 429/575, 100 KHz or 12.5 KHz, RX or TX, 256 Word Tx/Rx Buffer	Combo	CME	8 CH. ±10V A/D (ADE-type) & 8 Channels ±10V D/A (DA2-type), Combination
	CM8	2 CH. Dual-redundant MIL-STD-1553 & 12 Channel Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)		CMF	8 CH. ±100V A/D (ADF-type) & 8 Channels ±10V D/A (DA2-type), Combination

Architected for Versatility

NAI's Configurable Open Systems Architecture™ (COSA®) offers a choice of over 100 smart I/O, communications, or Ethernet switch functions, providing the highest packaging density and greatest flexibility of ruggedized embedded product solutions in the industry. Preexisting, fully-tested functions can be combined in an unlimited number of ways quickly and easily.

One-Source Efficiencies

Eliminate man-months of integration with a configured, field-proven system from NAI. Specification to deployment is a seamless experience as all design, state-of-the-art manufacturing, assembly and test are performed - by one trusted source. All facilities are located within the U.S. and optimized for high-mix/low volume production runs and extended lifecycle support.

Product Lifecycle Management

From design to production and beyond, NAI's product lifecycle management strategy ensures the long-term availability of COTS products through configuration management, technology refresh and obsolescence component purchase and storage.

Made in the USA
Certified Small Business