



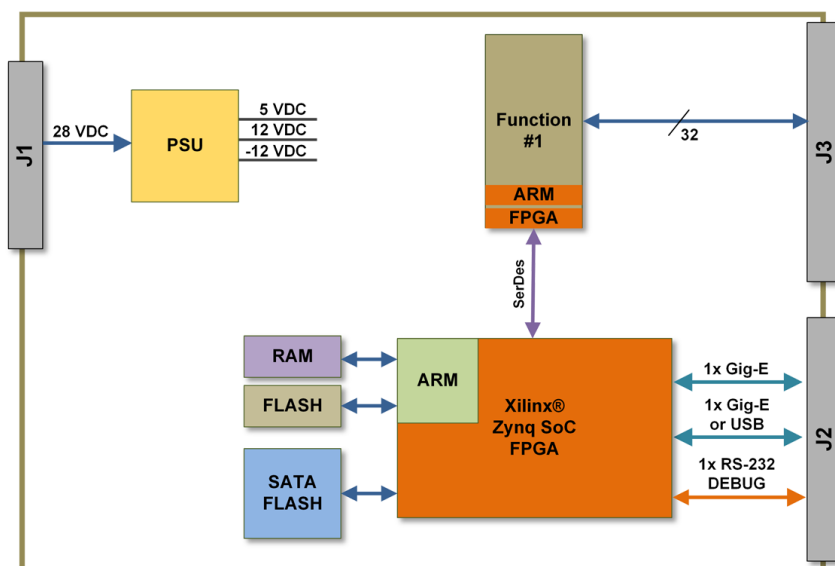
NIU1A Rugged COTS Systems

Nano Interface Unit

**Configure with one I/O or communication function module—
Over 100 different modules to choose from**

NAI's NIU1A contains an integrated power supply, one function module slot, and an optional ARM® Cortex®-A9 processor. This small, low-power unit is ideally suited for rugged military, industrial, and commercial applications. It delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems — *in less time, with NO NRE.*

The NIU1A includes BSP and SSK support for Wind River® Linux and VxWorks®, and for Xilinx® PetaLinux (w/optional ARM Processor). In addition, SSKs are supplied with source code and board-specific library I/O APIs to facilitate system integration.



Features

- **Supports One NAI smart I/O function modules**
 - 100+ modules to choose from
 - Customer-configurable
 - COSA® architecture
- **Minimized SWaP Footprint**
 - 1.5" x 6.8" x 2.5" (incl. connectors)
 - 1.2 lbs. (544 g)
 - 28 VDC Input
 - <15 W MB power dissipation
- **Optional ARM® Cortex® - A9 Dual Core 800MHz Processor**
- **128 MB DDR3 SDRAM**
- **4.784 GB SATA II NAND Flash (up to 32 GB option)**
- **Connectivity**
 - 2x 10/100/1000 Base-T Ethernet or 1x 10/100/1000 Base-T Ethernet and USB
 - 1x RS-232
- **Continuous Background BIT**
- **VICTORY Interface Services (Contact factory)**
- **Operating System Support**
 - Xilinx PetaLinux
 - Wind River® Linux
 - VxWorks®
- **Commercial and Rugged applications***
 - MIL-STD-704A
 - MIL-STD-461
 - Operating temp: -40°C to +71°C

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

Select up to 1 independent functions for your application

| I/O Modules | | | | | |
|--------------------------------------|--|--|--|---|--|
| Function | Module | Description | Function | Module | Description |
| Analog-to-Digital | <u>AD1</u> | 12 CH. A/D, ±10 V, Dedicated, 256 kHz (max), Sigma-Delta | Digital-to-Analog | <u>DA3</u> | 4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output |
| | <u>AD2</u> | 12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta | Digital IO - Differential Transceiver | <u>DF1</u> | 16 CH. Differential I/O, Input: -10 V to +10 V (422), -7 V to +12 V (485) Output: -.25 V to +5 V |
| | <u>AD3</u> | 12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta | | <u>DF2</u> | 16 CH. 16 Channel Enhanced Differential I/O |
| | <u>AD4</u> | 16 CH. A/D, ± 10 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR | Discrete IO - Multichannel,Programmable | <u>DT1</u> | 24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out) |
| | <u>AD5</u> | 16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR | | <u>DT2</u> | 16 CH. Discrete I/O, ±80 V Input/Output, Max Iout 600 mA, Isolated/Ch Switch (out) |
| | <u>AD6</u> | 16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR | | <u>DT4</u> | 24 CH. Enhanced DT1 |
| | <u>ADE</u> | 16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling | | <u>DT5</u> | 16 CH. Enhanced DT2 |
| | <u>ADF</u> | 16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling | Relay | <u>RY1</u> | 4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Non Latching |
| <u>ADG</u> | 16 CH. A/D, ±25 mA, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling | <u>RY2</u> | | 4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching | |
| Digital-to-Analog | <u>DA1</u> | 12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control | Digital IO - TTL,CMOS | <u>TL1</u> | 24 CH. TTL I/O, Standard Functionality, Programmable |
| | <u>DA2</u> | 16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control | | <u>TL2</u> | 24 CH. TTL I/O, Enhanced Functionality, Programmable |
| Measurement & Simulation Modules | | | | | |
| Function | Module | Description | Function | Module | Description |
| AC Reference | <u>AC2</u> | 2 CH. AC Reference Source, 47 Hz - 20 KHz, ± 3% Acc, 2 – 28 Vrms, 6 VA (Max/Ch) Power | LVDT RVDT Measurement and Simulation | <u>LD4</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq |
| | <u>AC3</u> | 2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 – 115 Vrms, 6 VA (Max/Ch) Power | | <u>LD5</u> | 4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq |
| LVDT RVDT Measurement and Simulation | <u>LD1</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq | Thermocouple and RTD Measurement | <u>RT1</u> | 8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch |
| | <u>LD2</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq | | <u>TC1</u> | 8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D |
| | | <u>LD3</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq | Variable Reluctance | <u>VR1</u> |

| Communication Modules | | | | | |
|-----------------------|------------|--|-----------------------|------------|--|
| Function | Module | Description | Function | Module | Description |
| ARINC Communications | <u>AR1</u> | 12 CH. ARINC 429, 100 KHz or 12.5 KHz, RX/TX, 256 Word Tx/Rx Buffer | MIL-STD-1553B | <u>FTE</u> | 2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled |
| | <u>AR2</u> | 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. | | <u>FTF</u> | 4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled |
| CANBus Communications | <u>CB1</u> | 8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate | MIL-STD-1760 | <u>FTJ</u> | 1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled |
| | <u>CB2</u> | 8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate | | <u>FTK</u> | 2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled |
| | <u>CB3</u> | 8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel | Serial Communications | <u>SC1</u> | 4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated |
| MIL-STD-1553B | <u>FTA</u> | 1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled | | <u>SC2</u> | 4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Isolated Per Channel and From Ground |
| | <u>FTB</u> | 2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled | | <u>SC3</u> | 8 CH. (max) RS-232/422/485 Serial Comms or GPIO, Programmable, Non-isolated |
| | <u>FTC</u> | 4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled | | <u>SC7</u> | 4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non-Isolated w/ (4) SYS-GND pins provided |
| | <u>FTD</u> | 1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled | | | |
| Combination Modules | | | | | |
| Function | Module | Description | Function | Module | Description |
| Combo | <u>CM5</u> | 1 CH. Combination, MIL-STD-1553 (2-Ch, redundant) & ARINC 429/575 (8-Ch), 100 KHz or 12.5 KHz, RX or TX, 256 Word Tx/Rx Buffer | Combo | <u>CM8</u> | 1 CH. Combination, MIL-STD-1553 (AMC), 2-Ch. Dual-redundant & 12-Ch. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out) |

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.

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