

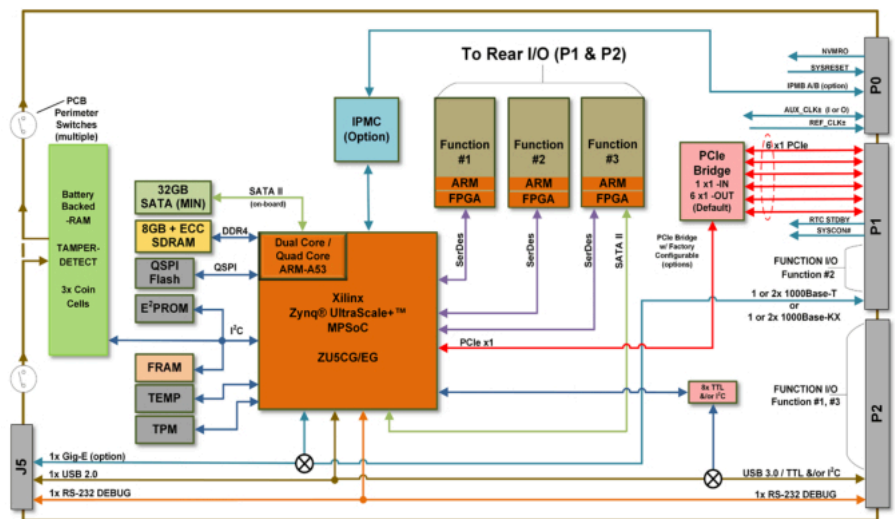


68ARM2 3U OpenVPX Single Board Computers

3U OpenVPX™ Rugged, Cybersecure & Anti-Tamper Single Board Computer

The 68ARM2 is a 3U OpenVPX Zynq® UltraScale+™ dual- or quad-core ARM® Cortex™-A53 MPCore™ based Single Board Computer that can be configured with up to three NAI Smart I/O and communications function modules. Ideally suited for rugged Mil-Aero applications, the 68ARM2 delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems in air, land and sea applications.

The 68ARM2 includes BSP and SSK support for Wind River®/VxWorks® 7.x and HVP, Xilinx® PetaLinux and DDC-I Deos™. In addition, SSKs are supplied with source code and board-specific library I/O APIs to facilitate system integration.



Features

- **3U OpenVPX (ANSI/VITA 65)**
- **Profiles Supported:**
 - MOD3-PAY-1F2U-16.2.11-2
 - Data plane: 6 x1 PCIe (default)(other factory configurations avail.)
 - Control plane: 2x 10/100/1000Base-T or 2x 1000Base-KX*
 - SLT3-PAY-1F2U-14.2.12
- **Processor/Memory**
 - Xilinx Zynq® UltraScale+™ dual- or quad-core ARM® Cortex™-A53 MPCore™ up to 1.2 GHz (max)
 - 8 GB DDR4 SDRAM w/ ECC
 - 32 GB SATA II NAND Flash
- **Motherboard Peripheral I/O:**
 - USB 2.0 to front maintenance J5 (option)
 - USB 3.0 to rear I/O (option)
 - I2C Bus to rear I/O (option)
 - 1x RS232 console port to front maintenance J5 & rear I/O
 - 4x TTL I/O to rear I/O (up to 8x TTL option)
- **Supports three NAI smart I/O function modules**
 - COSA® architecture
 - 100+ modules to choose from
 - Independent x1 SerDes interface to each function module slot
 - SATA II interface to function slot #3 (e.g. for 256 GB expansion function option)
- **Security / Cybersecurity (Option)**
 - FIPS 140-3 Level 3 Design Support
 - Crypto-key storage
 - Battery-backed RAM
 - Secure Boot
 - Anti-tamper / Tamper Detect & Sanitize
- **IPMC Support (configured option)**
 - VITA 46.11 Tier-2 compatible
- **Power**
 - < 15 W power dissipation (est./typ.)(not including module power)
- **Operating Systems**
 - Wind River® Helix™ Virtualization Platform, Wind River® Linux, VxWorks®, VxWorks® Cert Edition, Xilinx® PetaLinux, DDC-I Deos™
- **Intelligent I/O library support included**
- **Background Built-in-Test Continuous BIT (as applicable)**
- **VICTORY Interface Services (Contact factory)**
- **Commercial or Rugged Applications**
- **Operating Temperature**
 - Commercial: 0°C to 70°C
 - Rugged: -40°C to 85°C
- **Mechanical Options (ANSI/VITA 48)**
 - Conduction-cooled; 3U, 1.0" pitch

*The product Ethernet PHY supports 1000Base-X. Product interoperability with 10/100/1000BASE-KX systems is supported with 1000BASE-X (provided that auto-negotiation is disabled).

Select up to 3 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>DA5</u> | 4 CH. D/A, High-Voltage/High-Current Half-Bridge (2 Channels Full-Bridge) External VCC Sourced Outputs |
| | <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>DT3</u> | 4 CH. Discrete Hi & Lo Side Switch Output @ 65V/2A (max), external individual supplied VCC & VSS per channel pair |
| | <u>ADE</u> | 16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling | | <u>DT4</u> | 24 CH. Enhanced DT1 |
| <u>ADF</u> | 16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling | <u>DT5</u> | | 16 CH. Enhanced DT2 | |
| Chip Detector and Fuzz Burn | <u>CD1</u> | 6 CH. Chip Detector (CD) and Fuzz Burn (FB) | Relay | <u>RY1</u> | 4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Non Latching |
| Digital-to-Analog | <u>DA1</u> | 12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control | | <u>RY2</u> | 4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching |
| | <u>DA2</u> | 16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control | Digital IO - TTL/CMOS | <u>TL1</u> | 24 CH. TTL I/O, Standard Functionality, Programmable |
| | <u>DA3</u> | 4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output | | <u>TL2</u> | 24 CH. TTL I/O, Enhanced Functionality, Programmable |
| | <u>DA4</u> | 4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only | Variable Reluctance | <u>VR1</u> | 8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max) |
| 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 | Synchro Resolver Measurement and Simulation | <u>DSx (DRx)</u> | 1 - 3 CH. Digital to Synchro/Resolver, 2 - 90 VLL, 2 - 115 Vrms Exc, 47 Hz - 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>SDx</u> | 4 CH. Synchro/Resolver to Digital, 2 - 90 Vrms Input, 2 - 115 Vrms Exc, 47 Hz to 20 kHz Freq |
| LVDT RVDT Measurement and Simulation | <u>DLx</u> | 1 - 3 CH. Digital to LVDT/RVDT, 2 - 90 Vrms Full Scale, 2 - 115 Vrms Exc, 47 Hz - 20 kHz Freq | Pulse Timer Receiver and Generator | <u>PT1</u> | 2 CH. Pulse Timer 1-PPS &/or 10 MHz Input with Multiple Outputs and 2 Channels Isolated RS-422/485 Serial Communications |
| | <u>LD1</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq | IRIG Timecode Receiver and Generator | <u>RG1</u> | 1 CH. IRIG Timing Function Interface |
| | <u>LD2</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq | | <u>RT1</u> | 8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch |
| | <u>LD3</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq | Thermocouple and RTD Measurement | <u>TC1</u> | 8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D |
| | <u>LD4</u> | 4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq | | <u>TR1</u> | 8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel |
| | <u>LD5</u> | 4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq | Strain Gauge Measurement | <u>SG1</u> | 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 | <u>AR1</u> | 12 CH. ARINC 429, 100 KHz or 12.5 KHz, RX/TX, 256 Word Tx/Rx Buffer | MIL-STD-1553B | <u>FTF</u> | 4 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. | MIL-STD-1760 | <u>FTJ</u> | 1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer 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 | | <u>FTK</u> | 2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled | |
| | <u>CB2</u> | 8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate | IEEE 1394 (FireWire) | <u>FW1</u> | 2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, including TLIM | |
| | <u>CB3</u> | 8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel | | <u>FW2</u> | 2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, direct (no TLIM) | |
| Ethernet NIC Interface | <u>EM1</u> | 2 CH. Dual Ethernet I/F, Intel 82850, 10/100/1000 | 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>SC3</u> | 8 CH. (max) RS-232/422/485 Serial Communications or GPIO, Programmable, Non-isolated | |
| | <u>FTB</u> | 2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled | | <u>SC5</u> | 4 CH. RS-232/422/485 communications, isolated per channel and from SYS GND | |
| | <u>FTC</u> | 4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled | | <u>SC6</u> | 4 CH. RS-232/422/485 communications, individual SYS GND provided per channel (non-isolated) | |
| | <u>FTD</u> | 1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled | | Time-Triggered Ethernet | <u>TE2</u> | 1 CH. Tri-Redundant TTE/A664p7/AFDX/Best Effort End System |
| | <u>FTE</u> | 2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled | | | | |
| Storage | | | | | | |
| Function | Module | Description | Function | Module | Description | |
| SATA Solid State Drive (SSD) | <u>FM2</u> | 1 CH. 480 GB MLC SATA Flash, extended temp -40°C to 85°C operation | SATA Solid State Drive (SSD) | <u>FM9</u> | 1 CH. 1.92 TB SATA TLC NAND Flash, Extended Temperature Operation | |
| | <u>FM8</u> | 1 CH. 1 TB SATA TLC NAND Flash, Extended Temperature Operation | | | | |
| Combination Modules | | | | | | |
| Function | Module | Description | Function | Module | Description | |
| Combo | <u>CM4</u> | 2 CH. 4 Ch. RS-422/485 ASYNC (TX±/RX±) & 12 Channel Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out) | Combo | <u>CM8</u> | 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) | |
| | <u>CM5</u> | 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 | | | | |

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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