# 68ARM2 3U OpenVPX Single Board Computers

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

The 68ARM2 is a 3U OpenVPX Zynq® UltraScale+™ 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® and for 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.
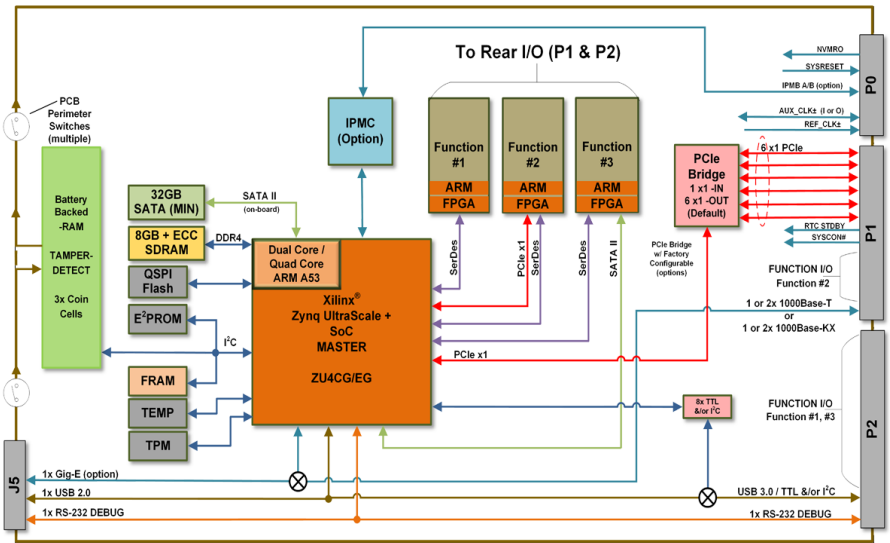
Features

- **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+™ Quad-core ARM® Cortex™-A53 MPCore™ up to 1.3 GHz
  - 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
  - 2x TTL I/O to rear I/O (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
  - PCIe interface to function slot #2 (e.g. for additional Gig-E ports option)
  - 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**
  - Xilinx PetaLinux
  - Wind River® VxWorks®
  - 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)**
  - Air-cooled; 3U, 5HP/1.0" pitch
  - Conduction-cooled; 3U, 1.0" pitch

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Select up to 3 independent functions for your application

I/O Modules					
Function	**Module**	**Description**	**Function**	**Module**	**Description**
Analog-to-Digital	AD1	12 CH. A/D, ±10 V, Dedicated, 256 kHz (max), Sigma-Delta	Digital-to-Analog	DA2	16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control
	AD2	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta		DA3	4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output
	AD3	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta		DA4	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only
	AD4	16 CH. A/D, ± 10 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR	Discrete IO - Multichannel,Programmable	DT1	24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)
	AD5	16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT2	16 CH. Discrete I/O, ±80 V Input/Output, Max Iout 600 mA, Isolated/Ch Switch (out)
	AD6	16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT3	4 CH. Discrete I/O, ±100 V Input/Output, Max Iout 3A, Isolated/Ch Switch/Bridge
	ADE	16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		DT4	24 CH. Enhanced DT1
	ADF	16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		DT5	16 CH. Enhanced DT2
	ADG	16 CH. A/D, ±25 mA, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling	Relay	RY1	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Non Latching
Digital-to-Analog	DA1	12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control		RY2	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching

Measurement & Simulation Modules					
Function	**Module**	**Description**	**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	LVDT RVDT Measurement and Simulation	LD5	4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq
	AC3	2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 – 115 Vrms, 6 VA (Max/Ch) Power	Thermocouple and RTD Measurement	RT1	8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch
LVDT RVDT Measurement and Simulation	LD1	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq		TC1	8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D
	LD2	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq		TR1	8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel
	LD3	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq	Strain Gauge Measurement	SG1	4 CH. Strain Gauge, 4.7 Hz - 4.8 KHz, Measurement, Conventional 4-Arm Bridge
	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq	Variable Reluctance	VR1	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)

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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	FTF	4 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.	MIL-STD-1760	FTJ	1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled
CANBus Communications	CB1	8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate		FTK	2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled
	CB2	8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate	IEEE 1394 (FireWire)	FW1	2 CH. IEEE 1394b (Firewire), tri-port per channel, including TLIM
	CB3	8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel		FW2	2 CH. IEEE 1394b (Firewire), tri-port per channel, direct (no TLIM)
Ethernet NIC Interface	EM1	2 CH. Dual Ethernet I/F, Intel 82850, 10/100/1000	Serial Communications	SC1	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated
MIL-STD-1553B	FTA	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled		SC2	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Isolated Per Channel and From Ground
	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 Comms or GPIO, Programmable, Non-isolated
	FTC	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC7	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non-Isolated w/ (4) SYS-GND pins provided
	FTD	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled	Time-Triggered Ethernet	TE2	3 CH. Single Channel, Tri-Redundant TTE/A664p7/AFDX/Best Effort End System
	FTE	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled			

Combination Modules

Function	Module	Description	Function	Module	Description
Combo	CM5	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	CM8	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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