# 67G6 6U OpenVPX Multifunction I/O Boards
6U OpenVPX Multifunction I/O Board

The 67G6 is NAI's latest rugged 6U OpenVPX multifunction I/O and communications board. It provides high-performance I/O capabilities specifically designed for demanding aerospace, defense, and industrial applications. The board can accommodate up to six NAI Configurable Open Systems Architecture™ (COSA®) smart function modules and includes an optional on-board 24-channel Discrete I/O hardware option. By configuring the 67G6 with NAI smart modules, engineers and systems architects can customize the board's functional capabilities to suit their specific application requirements and accelerate the deployment of SWaP-optimized systems.
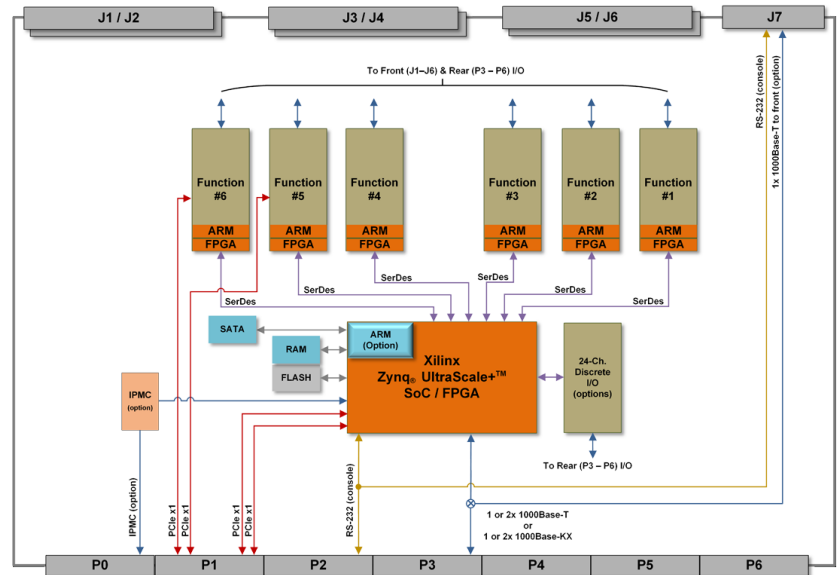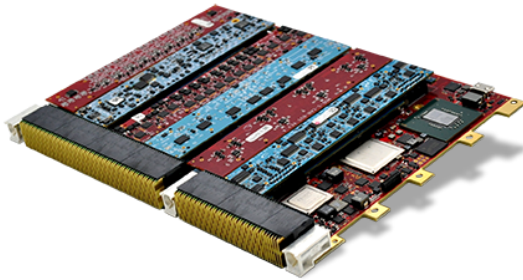
Features

- **OpenVPX Profile:**
  - Slot profile: SLT6-PER-4U-10.3.3
  - Module profile: MOD6-PER-4U-12.3.3-2
- **Data plane:**
  - 2 x1 PCIe (end point only)
  - 2 x1 PCIe direct to module
- **Control plane:**
  - 2x 10/100/1000Base-T or 2X 1000Base-KX
- **IPMC Support (configured option)**
  - VITA 46.11 Tier-2 compatible

- **Supports six NAI smart I/O function modules**
  - COSA® architecture
  - 100+ modules to choose from
  - Independent x1 SerDes interface to each function module slot
- **24 Channels programmable Discrete I/O (option)**
  - 0 to 60 VDC; Sink, source or push/pull
  - Standard (SF) or Enhanced (EF) Function
- **RS-232 console/maintenance port**
- **Continuous Background BIT**

- **ARM® Cortex®-A53 Processor (option)**
  - Provides access for local I/O processing
  - 2 GB DDR4 + ECC / 32 GB SATA (std.)
  - PetaLinux, Deos™, VxWorks® 7
- **Intelligent I/O library support included**
- **VICTORY Interface Services (Contact factory)**
- **Commercial or rugged applications operating temperature**
  - Commercial: 0°C to 70°C
  - Rugged: -40°C to 85°C

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Select up to 6 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	DA5	4 CH. D/A, High-Voltage/High-Current Half-Bridge (2 Channels Full-Bridge) External VCC Sourced Outputs	
	AD2	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta		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	
	AD3	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta			DF2	16 CH. 16 Channel Enhanced Differential I/O	
	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. DT Switch Output @ 65V/2A (max), Isolated/Ch, External VCC/VSS (paired)	
	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	
	DA2	16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control		Digital IO - TTL,CMOS	TL1	24 CH. TTL I/O, Standard Functionality, Programmable	
	DA3	4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output			TL2	24 CH. TTL I/O, Enhanced Functionality, Programmable	
	DA4	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only		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**		**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	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq	
	AC3	2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 – 115 Vrms, 6 VA (Max/Ch) Power			LD5	4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq	
Synchro Resolver Measurement and Simulation	DSK	3 CH. Digital to Synchro, 2-28 VLL, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq, .5 VA/Ch (Max)		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	

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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)
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)
	FTE	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)	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	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)

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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