# 68G5 3U OpenVPX Multifunction I/O Boards

3U OpenVPX Multifunction I/O Board

The 68G5 is NAI's latest rugged 3U 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 three NAI Configurable Open Systems Architecture™ (COSA®) smart function modules. By configuring the 68G5 with these modules, engineers and systems architects can customize the board's functional capabilities to suit their specific application requirements and accelerate the deployment of SWaP-C optimized systems.
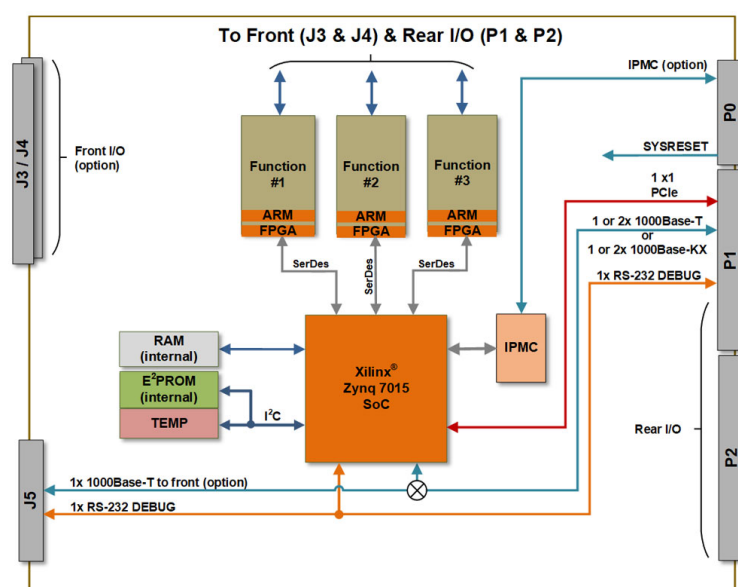
Features

- **3U OpenVPX**
- **Profiles Supported:**
  - Module profile: MOD3-PER-1U-16.3.3-2
  - Slot profile: SLT3-PER-1U-14.3.3
- **Front and/or rear I/O**
- **PCIe (x1)**

- **Supports Three NAI smart I/O function modules**
  - COSA® architecture
  - 100+ modules to choose from
  - Independent x1 SerDes interface to each function module slot
- **2x 10/100/1000 Base-T or 1000Base-KX Ethernet; 2 to rear or 1 to rear and 1 to front I/O**

- **Intelligent I/O library support included**
- **Background Built-in-Test Continuous (BIT)**
- **VICTORY Interface Services (Contact factory)**
- **Operating Temperature**
  - Commercial: 0°C to 70°C
  - Rugged: -40°C to 85°C

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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	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
Chip Detector and Fuzz Burn	CD1	6 CH. Chip Detector (CD) and Fuzz Burn (FB)		RY2	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching
Digital-to-Analog	DA1	12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control	Digital IO - TTL,CMOS	TL1	24 CH. TTL I/O, Standard Functionality, Programmable
	DA2	16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control		TL2	24 CH. TTL I/O, Enhanced Functionality, Programmable
	DA3	4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output	Variable Reluctance	VR1	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)
	DA4	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only			

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	IRIG Timecode Receiver and Generator	RG1	1 CH. IRIG Timing Function Interface
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
	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq			

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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	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	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		SC3	8 CH. (max) RS-232/422/485 Serial Communications or GPIO, Programmable, Non-isolated
	FTB	2 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
	FTC	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC6	4 CH. RS-232/422/485 communications, individual SYS GND provided per channel (non-isolated)
	FTD	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	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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