

6U, VME, D/S and MULTI-FUNCTION I/O CARD

Features

- Multiple I/O and serial communication functions on a single slot 6U VME card.
- Up to ten separate D/S Channels.
- User can specify five different function modules.
- Automatic background BIT testing continually checks and reports health of each channel.
- Control via VME or Ethernet.
- FIFO Buffering/Trigger (select modules).
- Optional onboard 5 VA programmable reference supply.
- Connections via front panel, rear connector, or both.
- Designed for both Commercial and MIL applications.
- Convection and Conduction cooled versions.
- Software Support Kit and Drivers available.





Conduction-Cooled

Simulation

Connectors)

Description

following page.)

The 64CS4 is a single slot Multi-function 6U VME card for applications requiring higher power Digital-to-Synchro/Resolver or L(R)VDT (D/S, D/L(R)VDT) stimulus output, as well as I/O and Communication functions. The 64CS4 provides up to ten separate D/S channels with multiple programmable features. The "mother board" contains 5 independent module slots, each of which can be populated with a function specific module. This unique design eliminates the need for multiple, specialized, singlefunction cards by providing a single-board solution for a broad assortment of programmable, multi-channel signal interface I/O modules such as: Digital (TTL/CMOS, Differential, Discrete, Relay); Analog (A/D, D/A, RTD, Strain Gage, Isolated Power Supply); Positional/Motion Control (Synchro/Resolver/ LVDT/RVDT Measurement/ Simulation, AC Reference, Encoder/Counter).

In addition, the 64CS4 incorporates communication

User I/O Analog & Digital Signals User Synchro/LVDT Or User Synchro/LVDT Simulation (Via Front Panel or Backplane (Via Front Panel or Backplane Connectors)

Proudly made in the USA



modules such as RS-232/422/423(188C)/485, MIL-STD-1553, CANBus and ARINC 429/575. This approach increases packaging density, saves enclosure slots and reduces power consumption. Additional enhancements include FIFO data buffering for A/D, D/A, S/D and LVDT functions. (Please see all available functions on the

NAI's flexible, leading-edge, fully programmable and continuous background built-in-test (BIT) feature is always enabled and continually checks the health of each channel. If a fault is detected, it is immediately reported and the specific channel is identified with no downtime for troubleshooting. Testing is totally transparent to the user, requires no external programming, and has no effect on the standard operation of the card.



General Board Specification

• Power - +5VDC, (±12VDC for select modules)

•Operating Temp – 0° C to 70° C or -40° C to 85° C •Size – 2

•Size - 233mm x 20mm x 160mm (6U)

Available Function Modules

(GEN2 Platforms)				Note 1 – Indicates wide selection (See part number in Operations Ma Note 2 – Contact factory for availability Note 3 – Additional channels available from front panel on certain plat			
	Module	Channels	Input Scaling	Resolution	Accuracy (±)	Sampling (programmable)	
A/D Converter	C1	10	±1.25.2.5.5 or 10 VDC	16 bit	0.05% FS	200 KHz max	
	C2	10	±5,10,20 or 40 VDC	16 bit	0.1% FS	200 KHz max	
	C3	10	0-25 mA	16 bit	0.1% FS	200 KHz max	
	C3 C4	10	±6.25.12.5.25 or 50 VDC	16 bit	0.1% FS 0.1% FS	200 KHz max	
						200 KHZ Max	
	CA Module	10 Channels	(Channels 1-6 are C2 type and			O-Million Marca	
D/A Converter			Output Range	Resolution	Accuracy (±)	Settling time	
DIA COnventer	F1	10	±10 or 0-10 VDC	16 bit	0.05% FS	15μs max	
	F3	10	±5 or 0-5 VDC	16 bit	0.05% FS	10μs max	
	F5	4	±25 or 0-25 VDC	16 bit	0.05% FS	10μs max	
	J3	10	±1.25 or 0-1.25 VDC	16 bit	0.05% FS	10μs max	
	J5	10	±2.5 or 0-2.5 VDC	16 bit	0.05% FS	10µs max	
	J8	4	±20 to ±100 VDC	16 bit	0.15% FS	350μs max	
	Module	Channels	Update rate	Resolution	Accuracy	Interface	
RTD	G4	6	16.7 Hz/channel	16 bit	(±) 0.05% FS	2, 3 or 4 wire	
	Module	Channels	Update rate	Resolution	Accuracy	Interface	
Strain Gage	G5 ²	4	4.7 Hz – 4.8 KHz	16 bit	(±) 0.1% FS	Conventional 4-Arm Bridge	
	Module	Channels	Signal Voltage	Resolution	Modes	Conventional 47 am Bhage	
Encoder/Counter	E7	4	RS422 / 24 VDC	32 bit	Encoder (SSI, A-Quad-B	Counter (un/down)	
	Module	Channels		Resolution		Interface	
L(R)VDT/D			Frequency	16 bit			
	-	4	360 Hz to 20 KHz		(±) 0.025% FS	2 or 3/4 wire	
	Module	Channels	Frequency	Resolution	Accuracy	Tracking Rate	
SYN(RSL)/D	S ¹	4	50 Hz to 20 KHz	16 bit	(±)1 arc-min	190 RPS	
DIOV(MICON)	Module	Channels	Frequency	Resolution	Accuracy	Power (max)	
D/SYN(RSL)	3*, 4*1	1	47 Hz – 10 KHz	16 bit	(±) 0.067°	3.0 VA / channel	
	1*, 2* ¹	2	47 Hz – 10 KHz	16 bit	(±) 0.017°	1.5 or 2.2 VA / channel	
	6* ¹	3	47 Hz – 10 KHz	16 bit	(±) 0.1°	0.25 VA / channel	
	Module	Channels	Frequency	Resolution	Accuracy	Power (max)	
D/L(R)VDT	5* ¹	2/4	47 Hz – 10 KHz	16 bit	(±) 0.1% FS	1.5 VA / channel	
	5* ¹	3	47 Hz – 10 KHz	16 bit	(±) 0.2% FS	0.1 VA / channel	
	Module	Channels	Input Range	Output level	Programmable		
I/O, TTL/CMOS	D7	16	0-5.5 V	TTL/CMOS	Input or Output		
	Module	Channels	Input Range (422)	Input Range (485)	Output Range (422/485)		
	D8	11 (16) ³	-10V to +10V	-7V to +12V	-0.25V to +5V		
	Module	Channels	Input Range	Output Range	Programmable	Notes	
I/O, Discrete	K6 (v4)	16	0 - 60 VDC	0 – 60 VDC	Input or Output	(500 mA – 2 A) (source/sink)	
	K7 ²	12 (16) ³	±80V	±80V	Input or Output	Isolated switch (600mA)	
	Module	Channels	Type	SW Volt/Current	SW Power (max)	Notes	
Relay Serial Communications CANBus	KN ² , KL ²	4	DPDT (1 CH Form C)	220V / 2A (max)	60W / 62.5 VA	KN=non-latch, KL=latching	
	Module	Channels	HW Interface levels support		Bit rate (Async/Sync)	Tx/Rx Buffer Notes	
	P8	4	RS-232/422/423(MIL-STD-188		1 / 4 Mbit/s per Ch.	32KB Partial modem	
	Module	Channels	CAN protocol	Message Buffer	Data rate (Prog)	Notes	
	P6. PA	4	P6= 2.0A/B / PA=J1939	16K RX/TX	1 Mb/s max.	Bosch® IP Core	
	Module	Channels	Operational Modes	Onboard RAM	Bus Coupling Configur		
MIL-STD-1553							
WIIL-01D-1000	N7, N8	2	BC,RT, BM, BM/RT	128Kbyte per ch	N7 = Transformer / N8 =	Direct	
ARINC 429/575	Module	Channels	Frequency	Input/output	Message Buffer		
	A4	6	100 KHz or 12.5 KHz	RX/TX	256 word Tx/Rx		
DC Power Supply	Module	Channels	Voltage Output	VOut Regulation	Current Output		
	V1, V2 ²	1, 2	+/- 15V	+/- 1%	+/- 450 mA(max)		
	Module	Channels	Frequency	Accuracy	Voltage	Power	
AC Reference	W ¹	1	47 Hz – 20KHz	+/- 3%	2 – 115 VRMS	6 VA	

<u>XX</u>

Part Number Designation

Enter either D/S, DLV, S/D, LVD, Multifunction or Ref Module W1 as defined below. See Note SLOT 4 & 5 DEFINITION Enter D/S or DLV Module only or Z0 if no module is used in this slot DN-BOARD REFERENCE SUPPLY (M7) D = No On-Board Reference Module 1 = 2-28Vrms, 360-10kHz Programmable On-Board Ref Module 2 = Reserved for future use 3 = 115Vrms Fixed, 360-10kHz Programmable On-Board Ref Module MECHANICAL F = Front Panel J1-J5 and P2 & P0 I/O; S = Front Panel J1-J5 and P2 I/O (No P0); P = P2 & P0 I/O only; G = P2 I/O only (No P0); W = P With Wedge locks; A = VME64 Blank Front Panel and P2 & P0 I/O only; R = VME64 Blank Front Panel and P2 only (No P0); B = VME64 Front Panel J1-J5, P2 & P0 I/O; T = VME64 Front Panel J1-J5, P2 I/O (No P0); D = VME64 Blank Front Panel, ow profile extractors and P2 & P0 I/O only ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating K = C with Removable Conformal Coating	art Rumber Designation						
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P = P2 & P0 I/O only; G = P2 I/O only (No P0); W = P With Wedge locks; A = VME64 Blank Front Panel and P2 & P0 I/O only; R = VME64 Blank Front Panel and P2 only (No P0); B = VME64 Front Panel J1-J5, P2 & P0 I/O; T = VME64 Front Panel J1-J5, P2 I/O (No P0); D = VME64 Blank Front Panel, Low profile extractors and P2 & P0 I/O only ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating K = C with Removable Conformal Coating ENVIRONETTIME D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	MECHANICAL						
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and P2 only (No P0); B = VME64 Front Panel J1-J5, P2 & P0 I/O; T = VME64 Front Panel J1-J5, P2 I/O (No P0); D = VME64 Blank Front Panel, Low profile extractors and P2 & P0 I/O only ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating ETHERNET D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	P = P2 & P0 I/O only; G = P2 I/O only (No P0);	W = P With W	edge lock	is;			
T = VME64 Front Panel J1-J5, P2 I/O (No P0); D = VME64 Blank Front Panel, ow profile extractors and P2 & P0 I/O only ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating K = C with Removable Conformal Coating ETHERNET D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	A = VME64 Blank Front Panel and P2 & P0 I/C	only; R = VME	E64 Blank	Front P	anel		
Low profile extractors and P2 & P0 I/O only ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating (C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating ETHERNET D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	and P2 only (No P0); B = VME64 Front Panel .	J1-J5, P2 & P0	I/O;				
ENVIRONMENTAL C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating ETHERNET D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	T = VME64 Front Panel J1-J5, P2 I/O (No P0);	D = VME64 BI	lank Front	Panel,			
C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating C = 0°C to +70°C; H = -40°C to +85°C with Removable Conformal Coating ETHERNET D = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	Low profile extractors and P2 & P0 I/O only						
K = C with Removable Conformal Coating ETHERNET 0 = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) 0 = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION 0 = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	ENVIRONMENTAL]	
ETHERNET 0 = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) 0 = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module et12V DC POWER OPTION 0 = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	C = 0°C to +70°C; H = -40°C to +85°C with Re	movable Confo	ormal Coa	ting			
) = No Ethernet; 1 = Front Panel Ethernet Connection; 2 = P0 Ethernet Connection ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) 0 = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION 0 = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	K = C with Removable Conformal Coating						
ENCODERS (used only with S/D or LVDT Module (in slots 1 and/or 2) D = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module E12V DC POWER OPTION D = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	ETHERNET						
0 = No Encoder outputs; 1 = Encoders included for each specified Synchro/LVDT module <u>12V DC POWER OPTION</u> 0 = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	0 = No Ethernet; 1 = Front Panel Ethernet Con	nection; 2 = P0) Ethernet	Connec	ction		
• EXAMPLE POWER OPTION • VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.	ENCODERS (used only with S/D or LVDT Me	odule (in slots	1 and/or	2)			
) = VME Power is used; 1 = VME ±12VDC Power is isolated from PCB power planes.		d for each spec	cified Synd	chro/LVI	DT mo	dule	
							_
SPECIAL OPTION CODE (Leave blank for standard)			from PCB	power p	planes	; .	
	SPECIAL OPTION CODE (Leave blank for st	andard)					

Note: Enter 'Z0' if slot is not populated and no On-board Reference Supply is chosen. If slot is unpopulated and an On-board Reference Supply is selected, enter either 'W6' if low voltage supply is selected (1), or 'W7' if high voltage supply (3) is selected

For detailed specifications & complete part number designation, visit www.naii.com to download Operations Manual.

For Ordering Information:

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