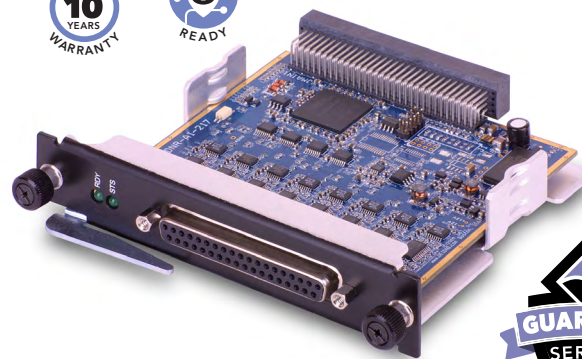# DNA/DNR-AI-217
Guardian™ 16-Channel, 24-bit simultaneously sampling A/D board

- DNA-AI-217 for use in "CUBE" chassis
- DNR/DNF-AI-217 for RACKtangle™/ FLATRACK I/O chassis
- 16 differential analog input channels
- Simultaneous sampling (one A/D converter per channel)
- 120 kHz per channel sample rate (1600 kHz board max)
- 24-bit resolution
- "Open" input wiring detection
- Input over-range detection
- Gains - 1, 2, 4, 8, 16, 32 and 64
- Pin compatible with DNx-AI-207

[DNR-AI-217 Shown]

General Description:

The DNA-AI-217 and DNR-AI-217 are 16-channel simultaneously sampling A/D boards compatible with UEI's popular Cube and RACKtangle chassis respectively. The DNA/DNR versions are electronically identical and feature 24-bit resolution with 7 software selectable input ranges. The DNx-AI-217 is pin compatible with the popular DNx-AI-207 board and offers an easy upgrade path for those looking for more resolution, higher sample rates or simultaneously sampling inputs.

BENEFITS OF UEI'S GUARDIAN SERIES

✓ OPEN INPUT DETECTION
✓ OVERVOLTAGE PROTECTION

UEI's Guardian series boards include a sophisticated, reliable on-board monitoring system, allowing quick and easy system testing, sensor diagnostics monitoring and fault detection for rapid resolution in field or lab.

Learn more about UEI's Guardian series

An A/D per channel configuration allows channels to be sampled simultaneously at rates up to 120 kS/s each (1600 kS/s max aggregate entire board). The A/D per channel configuration virtually eliminates input cross talk and channel settling time issues even when connected to high impedance signal sources.

The DNx-AI-217 is fully isolated from the Cube/RACKtangle and is overvoltage protected up to ±40 V (power on or off). The inputs go into a high impedance mode when power is removed making the AI-217 ideal for use in redundant measurement/control applications.

Connectivity to the DNx-AI-217 is through a 37-pin dSub connector. The DNA-STP-37 used in conjunction with DNA-CBL-37 or 37S series cables provides screw terminal connections for all signals.
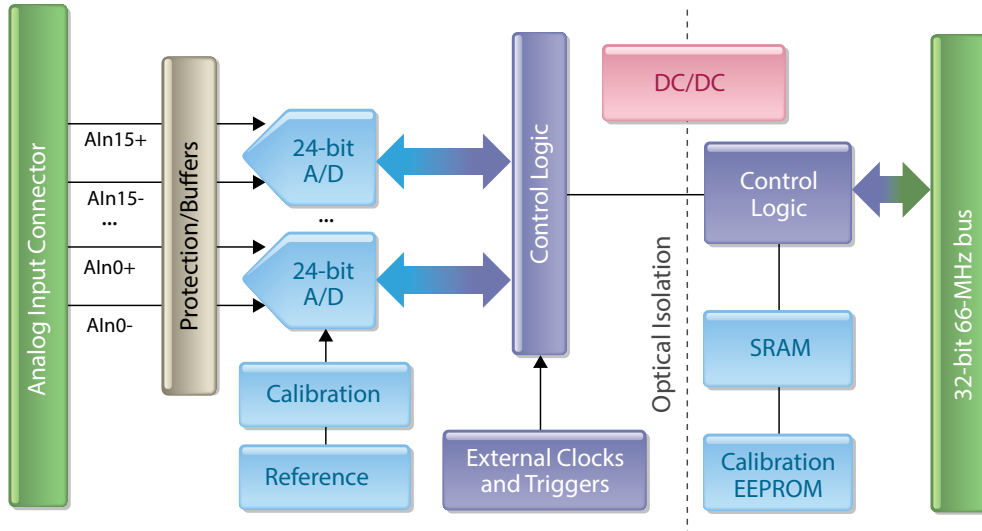
The DNx-AI-217 is a member of UEI's popular Guardian series, which provide high levels of user diagnostics. The AI-217 board provides both open input detection functionality as well as the ability to detect input overvoltage conditions.

Software is included, providing a comprehensive, yet easy-to-use API that supports all popular operating systems, including Windows, Linux, and most real-time operating systems—such as QNX, Intime, VXworks, and more. Additionally, the UEIDAQ Framework—an even higher level Windows driver—supplies complete support for those creating applications in many popular Windows programming languages, as well as data acquisition software packages such as LabVIEW and MATLAB/Simulink.

Technical Specifications:

Number of channels:	16 fully differential
ADC resolution / type	24 bits / SAR. (AD7766)
Sampling rate	120 kS/s per channel (max); 1600 kS/s max aggregate for entire board
FIFO depth	2048 samples
Input bias current	< 2 nA typical
Input offset	<4 µV; G=1, <2µV; G=2, <1 µV; G>2 (@ 25°C) (-40°C to +85°C spec is 2.5 times 25°C offset)
Gain and INL error	< 0.004 % (40 ppm) max
Input impedance	100 MΩ (min)
Input range	±10 Volt (gain = 1)
Input resolution	1.19 µV (gain = 1), 18.6 nV (gain = 64)
Gains	1, 2, 4, 8, 16, 32, 64
Common mode rejection	110 dB typical
Chan to Chan crosstalk	< 1 µVrms
Open input detection current	100 µA
Isolation	350 Vrms
Overvoltage protection	-40V to +40V (power on or off)
Power off leakage current	< 10 µA (-40V to + 40V)
Power consumption	2.2W max
Operating temp. (tested)	-40°C to +85°C
Operating humidity	95%, non-condensing
Vibration IEC 60068-2-6 IEC 60068-2-64	5 g, 10-500 Hz, sinusoidal 5 g (rms), 10-500Hz, broadband random
Shock IEC 60068-2-27	100 g, 3 ms half sine, 18 shocks @ 6 orientations 30 g, 11 ms half sine, 18 shocks @ 6 orientations
Altitude	120,000 ft
MTBF	275,000 hours

Block Diagram:

Pinout Diagram:

DB-37 (female)
37-pin connector:

Pin	Signal		Pin	Signal
1	Ext_Trig		20	AIn 15-
2	AIn 15+		21	AIn 14-
3	AIn 14+		22	+13V, 50 mA
4	AIn 13-		23	AIn 13+
5	AIn 12-		24	AIn 12+
6	AIn 11-		25	AIn 11+
7	AIn 10-		26	AIn 10+
8	Gnd		27	AIn 9-
9	AIn 9+		28	AIn 8-
10	AIn 8+		29	AIn 7-
11	AIn 7+		30	AIn 6-
12	AIn 6+		31	rsvd
13	AIn 5-		32	AIn 5+
14	AIn 4-		33	AIn 4+
15	AIn 3-		34	AIn 3+
16	AIn 2-		35	AIn 2+
17	Gnd		36	AIn 1-
18	AIn 1+		37	AIn 0-
19	AIn 0+			

Connection Options:

Part #	Description
DNA-CBL-37S	Shielded 37 conductor cable
DNA-CBL-37	Unshielded ribbon 37 conductor cable
DNA-STP-37	37-pin screw terminal panel
DNA-STP-3762	Universal 37/62-pin screw terminal panel (includes DIN rail mount)
Extended Warranty	Option to purchase UEI's extended 5 year warranty is available