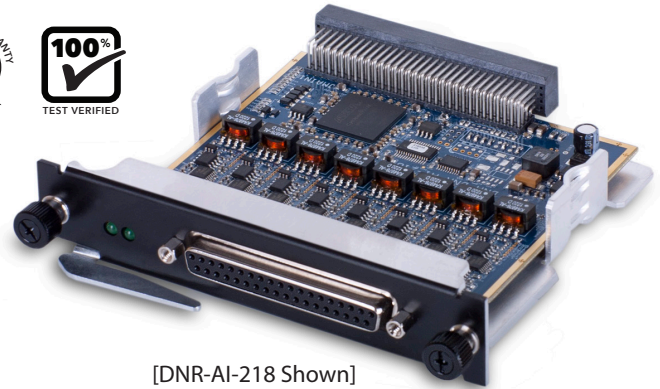


DNA/DNR-AI-218

8-Channel, 24-bit, fully isolated A/D board



- DNA-AI-218 for use in "CUBE" chassis
- DNR-AI-218 for RACKtangle™ I/O chassis
- 8 differential analog input channels
- 350 Vrms isolation (channel to channel and channel to chassis)
- Simultaneous sampling (one A/D converter per channel)
- Built-in anti-aliasing filters (@ 48% of sample rate)
- 120 kHz per channel sample rate (480 kHz board max)
- 24-bit resolution
- Gains - 1, 2, 4, 8, 16, 32 and 64
- Extensive Built-in / Self test functionality



[DNR-AI-218 Shown]

General Description:

The DNA-AI-218 and DNR-AI-218 are 8-channel fully isolated, simultaneously sampling A/D boards compatible with UEI's popular Cube and RACKtangle chassis respectively. The DNA/DNR versions are electronically identical. The DNx-AI-218 features 24-bit resolution, and 7 software selectable input ranges. Each channel also includes and isolated logic-level DIO bit.

An A/D per channel configuration allows channels to be sampled simultaneously at rates up to 120 kS/s each (480 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.

Each channel is electrically isolated from all other channels as well as from the Cube or RACKtangle chassis. In addition to the isolation, each input is overvoltage protected up to ±40V (power on or off). The inputs go into a high impedance mode when power is removed making the AI-218 ideal for use in redundant measurement/control applications.

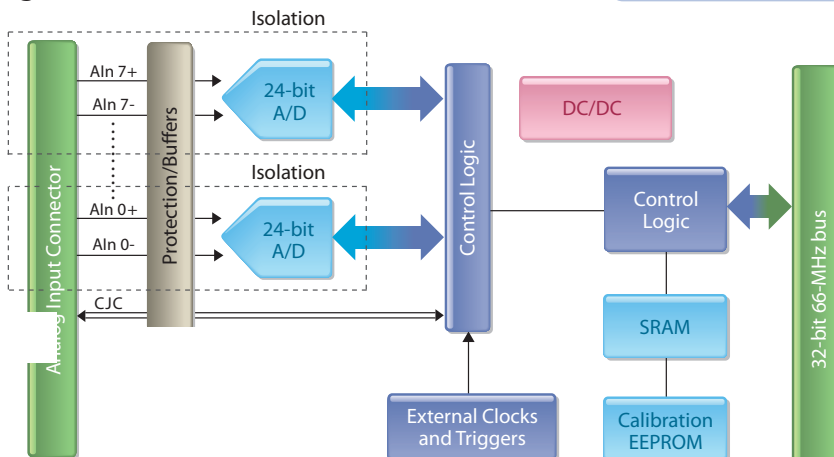
All connections to the DNx-AI-218 are through a female DB37 connector. OEMs will find it easy to find mating connectors for custom cables, while end-users may take advantage of UEI's popular DNA-STP-37 screw terminal panel via the DNA-CBL-37 or DNA-CBL-37S series cables.

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.

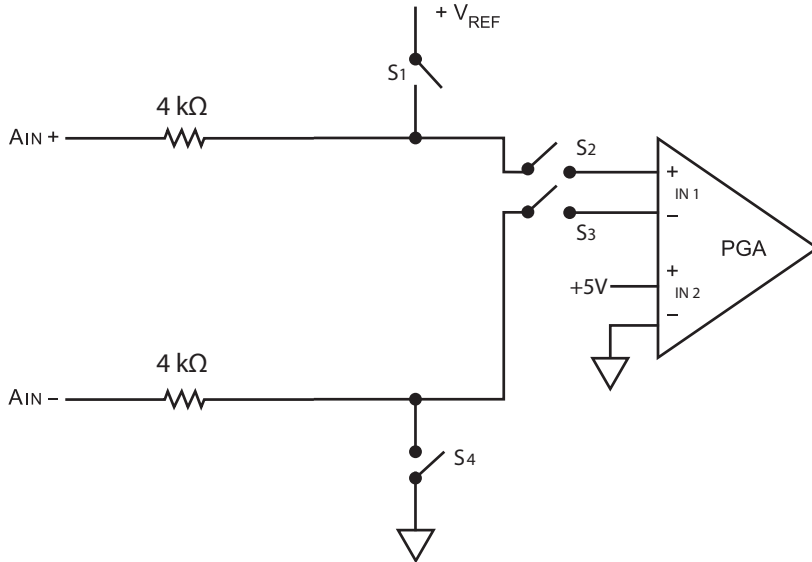
Technical Specifications:

Number of channels:	8 fully differential
ADC resolution / type	24 bits / SAR. (AD7766)
Sampling rate	120 kS/s per channel (max); 480 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)
Input INL error	< 0.004 % (40 ppm) max
Input impedance	10 MΩ ±1%
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
Isolation	350 Vrms (channel to channel and channel to chassis)
Digital I/O bits	8 (one per isolated A/D channel)
Digital I/O logic levels	Input: 5/3.3 V levels, Output: 3.3 V levels
Overvoltage protection	-40V to +40V (power on or off)
Power off leakage current	< 10 μA (-40V to +40V)
Power consumption	4.5 W 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	290,000 hours

Block Diagram:



Simplified input configuration:



Pinout Diagram:

DB-37 (female)
37-pin connector:

Aln 7-	1	20	Aln 7+
Gnd 7	2	21	DIO 7
Rsvd	3	22	Rsvd
Aln 6-	4	23	Aln 6+
Gnd 6	5	24	DIO 6
Aln 5-	6	25	Aln 5+
Gnd 5	7	26	DIO 5
Aln 4-	8	27	Aln 4+
Gnd 4	9	28	DIO 4
Aln 3-	10	29	Aln 3+
Gnd 3	11	30	DIO 3
Aln 2-	12	31	Aln 2+
Gnd 2	13	32	DIO 2
Aln 1-	14	33	Aln 1+
Gnd 1	15	34	DIO 1
Aln 0-	16	35	Aln 0+
Gnd 0	17	36	DIO 0
Rsvd	18	37	Rsvd
Rsvd	19		

Self-test theory of operation

Switches built into the front end of the DNx-AI-228 series allow a comprehensive self-test of the input stages, even while still connected to the field wiring. Switches between the input resistor voltage divider and input PGA (see S1 and S4 above) allow a fixed reference voltage to be connected to the PGA inputs. As the resistance between the reference and the field wiring is high, the reference easily overdrives any input signal generated by an external source allowing a direct and accurate reading of the reference.

In addition, the PGA utilized on the AI-228 series has two input channels. A secondary check of the input system may be conducted by setting the PGA input to read from the second input channel, which is connected to a 5 Volt reference.

Connection Options:

Part #	Description
DNA-CBL-37S	Shielded 37 conductor cable (3 foot standard, 1, 5, 10 and 20 foot lengths available)
DNA-CBL-37	Unshielded ribbon 37 conductor cable (3 foot length. Other lengths available on a special order basis)
DNA-STP-37	37 terminal screw terminal panel supports