



# DNx-AO-318-210

## 8-Channel Isolated ±10 mA D/A Board with BIT

- DNA-/DNR-/DNF-AO-318-210 for use in Cube/RACKtangle/FLATRACK I/O chassis
- 8 independent fully isolated 16-bit DACs
- Built-in-test functionality monitors output voltage and current
- 10 kHz per channel max update rate
- ±10 mA output range
- Simultaneous update across all channels



DNR-AO-318-210, RACKtangle version shown



### GENERAL DESCRIPTION

The DNA-AO-318-210, DNR-AO-318-210 and DNF-AO-318-210 are fully isolated, high-precision, 8-channel analog current output board compatible with UEI's popular Cube, RACKtangle and FLATRACK I/O chassis respectively. The boards offer full 16-bit resolution and guarantee monotonicity over the entire operating temperature range. Each DNx-AO-318-210 channel provides an output range of ±10 mA (sourcing) and is capable of up to 400 Ω. For applications requiring voltage outputs please refer to the DNx-AO-308 or DNx-AO-318 series boards.

The DNx-AO-318-210 provides extensive built-in-test diagnostics. An on-board A/D converter on each channel allows the user to monitor both output voltage and current. A solid state relay on each output allows the D/A channel to be disconnected from the field I/O so that a complete board self-test can be completed without driving the circuitry connected to the outputs. This relay in combination with the output

current and voltage sensing can also be set to disconnect the D/A output in the event of an external fault condition such as a short to ground or a DC power supply.

### BENEFITS OF UEI'S GUARDIAN SERIES

- ✓ **CIRCUIT BREAKER**
- ✓ **VOLTAGE MONITORING**
- ✓ **CURRENT MONITORING**
- ✓ **FIELD DISCONNECT**
- ✓ **TEMPERATURE MONITORING**

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](#)

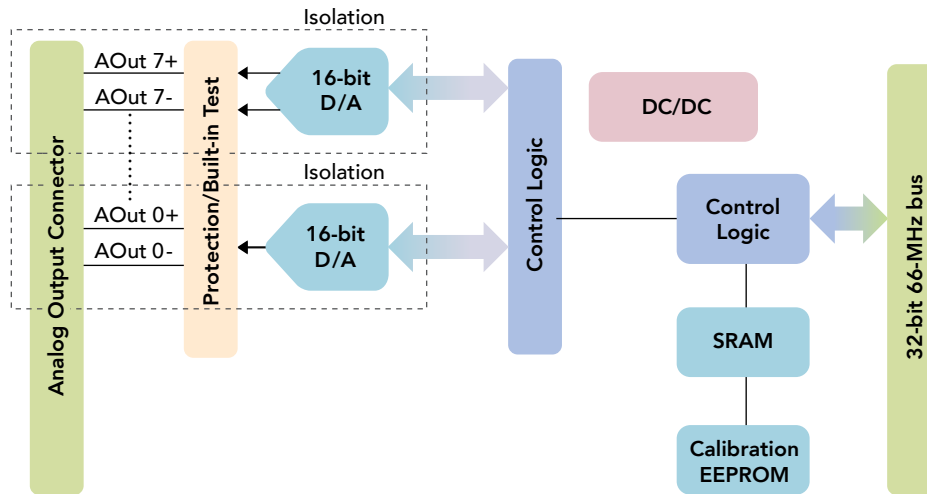
All 8 channels may be configured to update simultaneously, or they may be updated one at a time as data is written. A 1210 sample FIFO allows each D/A to be updated at up to 10 kHz with slightly derated accuracy, but without data loss. Double buffering the outputs combined with the use of low glitch D/As make the DNx-AO-318-210 an ideal solution for generating low frequency waveforms or providing highly accurate switched stimulus.

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 driver—supplies complete support for those creating applications in many popular programming languages, as well as data acquisition software packages such as LabVIEW and MATLAB/Simulink, ActiveX or OPC servers.

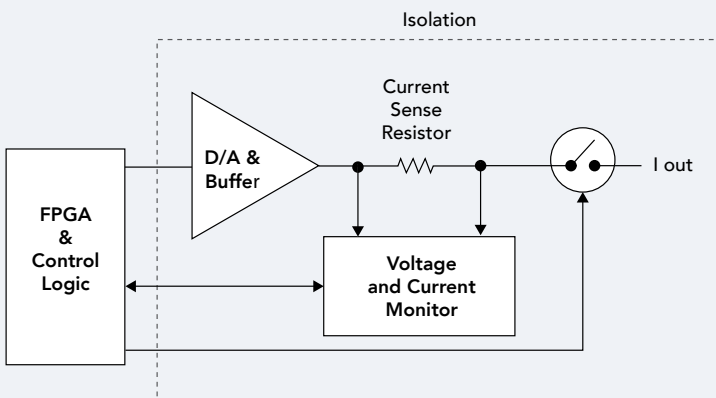
### TECHNICAL SPECIFICATIONS

Number of Channels	8
Resolution	16 bits
Maximum Update Rate	10 kHz/channel (80 kHz max aggregate)
Buffer Size	1K samples (each channel)
INL (no load)	Custom cable to sync multiple racks
DNL (no load)	±2 LSB (0.006%), typical
Monotonicity Over Temperature	16 bits guaranteed
Gain Linearity Error	0.002%
Gain Calibration Error	±10 µA typical
Offset Calibration Error	±10 µA typical
Offset Drift	15 ppm/°C, typical
Gain Drift	15 ppm/°C, typical
Output Range	±10 mA
Settling Time	500 µs to 16 bits
Load range	0 to 400 Ohms for full ±10 mA swing
Isolation	350 Vrms
Built-in Test	
Voltage accuracy	+/- 25 mV
Current accuracy	25 µA
On-board eMMC	32 GByte
Sample rate	Up to 6 Hz per channel total (3 Hz if both current and voltage are monitored)
Power Consumption	4.5 W not including output load
Operating Temperature (tested)	40°C to +85°C
Operating Humidity	0–95%, non-condensing
Vibration	
IEC 60068-2-6	5 g, 10-500 Hz, sinusoidal; 5 g (rms), 10-500Hz, broadband random
IEC 60068-2-64	10–500 Hz, 3 g, sinusoidal
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

## BLOCK DIAGRAM



## SIMPLIFIED OUTPUT SCHEMATIC



## PINOUT DIAGRAM

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

## CONNECTION OPTIONS

Part Number	Description
<a href="#">DNA-CBL-37S</a>	3 ft., 37-way, male to female, round shielded cable
<a href="#">DNA-STP-37</a>	Universal Screw Terminal Panel for DNX-series I/O
<a href="#">DNA-STP-37-DR</a>	Universal Screw Terminal for DNX-series I/O with DIN rail mounts
<a href="#">Extended Warranty</a>	Option to purchase UEI's extended 5 year warranty is available