

# DNx-AO-333

## 32-channel, 16-bit analog output board with analog voltage readback

- DNA-/DNR-/DNF-AO-333 for use with Cube/RACKtangle™/FLATRACK™ I/O chassis
- 32 independent 16-bit DACs
- On-board A/D converters monitor analog output voltages
- 10 kHz per channel max update rate
- $\pm 10$  V output range,  $\pm 10$  mA per channel
- Per-channel offset and gain calibration
- Simultaneous update across all channels (if desired)



DNx-AO-333 shown here.

### General Description:

The DNx-AO-333 is a high density, high-precision, 32-channel analog voltage output board. It offers full 16-bit resolution and guarantees monotonicity over the entire operating temperature range. Utilizing an innovative per-channel digital offset and gain calibration, initial gain and offset errors are limited to  $\pm 450$   $\mu$ V and  $\pm 305$   $\mu$ V respectively. Each DNx-AO-333 channel provides an output range of  $\pm 10$  V and is capable of driving  $\pm 10$  mA. For applications requiring higher output current, please refer to the [DNx-AO-308-350](#) layer.

As part of UEI's Guardian series, the board's built-in diagnostics provides on-board A/D converters, allowing

each analog output voltage to be monitored and confirmed. This powerful and yet simple tool sets the DNx-AO-333 apart from most D/A boards.

All 32 channels may be configured to update simultaneously, or they may be updated one at a time as data is written. A 1024 sample FIFO allows each D/A to be updated at 10 kHz without data loss. Double buffering the outputs combined with the use of low glitch D/As make the DNx-AO-333 an ideal solution for generating low frequency waveforms or providing highly accurate switched stimulus. The board also offers a digital input bit which may be used as a trigger or as a general purpose input. A digital output bit is also provided.

Software included with the DNx-AO-333 provides a comprehensive yet easy to use API that supports all popular Windows programming languages as well as supporting programmers using Linux and most real-time operating systems including QNX, RTX, RT Linux, VXworks and more. Finally, the UEIDAQ Framework supplies complete support for those creating applications in data acquisition software packages such as LabVIEW, MATLAB/Simulink, DASyLab or any application which supports ActiveX or OPC servers.

### Technical Specifications:

<b>Analog Outputs</b>	32 channels
Resolution	16-bits
Maximum Update Rate:	10 kHz/channel (320 kHz max aggregate)
FIFO Buffer Size	1024 samples
INL (no load)	$\pm 4$ LSB (0.012%)
DNL (no load)	$\pm 1$ LSB (0.003%)
Monotonicity	16 bits guaranteed over temperature
Gain Calibration Error	$\pm 450$ $\mu$ V, typical
Offset Calibration Error	$\pm 305$ $\mu$ V, typical
Offset Drift	5ppm/ °C
Gain Drift	5ppm/ °C
Output Range	$\pm 10$ V
Output Impedance	0.1 $\Omega$ , typical
Current Drive	$\pm 10$ mA/channel
Settling Time	50 $\mu$ s to 16 bits
Slew Rate	1 V/ $\mu$ s
Power up state	0 V $\pm 10$ mV
<b>Output Monitoring</b>	
Accuracy	$\pm 2.44$ mV
Sample/Update rate	All 32 channels read in 2.4 seconds
Digital I/O	1 digital input, 1 digital output (logic level)
Isolation	350 Vrms
Power Consumption	2.0 W–3.0 W (not including output loads)
Operating Temperature (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), 10-500 Hz, broad-band random
Shock IEC 60068-2-27	50 g, 3 ms half sine, 18 shocks @ 6 orientations 30 g, 11 ms half sine, 18 shocks @ 6 orientations
MTBF	400,000 hours



#### BENEFITS OF UEI'S GUARDIAN SERIES

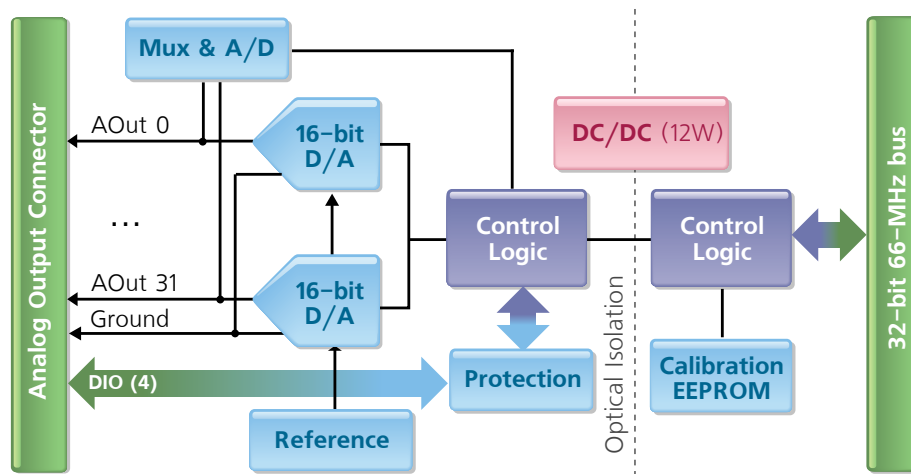


##### VOLTAGE MONITORING

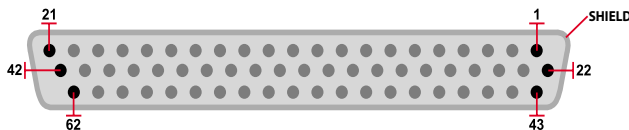
UEI's Guardian series boards include a sophisticated, reliable on-board monitoring system, allowing quick and easy system testing, sensor diagnostics monitoring and fault detection for rapid resolution in field or lab.

[Learn more about UEI's Guardian series](#)

## Block Diagram:



## Pinout Diagram:



Pin	Signal	Pin	Signal	Pin	Signal
1	Gnd	22	AOut 0	43	Gnd
2	AOut 1	23	Gnd	44	AOut 2
3	Gnd	24	AOut 3	45	Gnd
4	AOut 4	25	Gnd	46	AOut 5
5	Gnd	26	AOut 6	47	Gnd
6	AOut 7	27	Gnd	48	AOut 8
7	Gnd	28	AOut 9	49	Gnd
8	AOut 10	29	Gnd	50	AOut 11
9	Gnd	30	AOut 12	51	Gnd
10	AOut 13	31	Gnd	52	AOut 14
11	Gnd	32	AOut 15	53	Gnd
12	AOut 16	33	Gnd	54	AOut 17
13	Gnd	34	AOut 18	55	Gnd
14	AOut 19	35	Gnd	56	AOut 20
15	Gnd	36	AOut 21	57	Gnd
16	AOut 22	37	Gnd	58	AOut 23
17	Gnd	38	AOut 24	59	Gnd
18	AOut 25	39	Gnd	60	AOut 26
19	AOut 28	40	AOut 27	61	AOut 29
20	DIn 0	41	Gnd	62	AOut 30
21	DOut 0	42	AOut 3		

## Ordering Guide:

Part #	Description
<a href="#">DNx-AO-333</a>	32-channel, 16-bit analog output board with analog voltage readback
<a href="#">DNA-STP-62</a>	3ft, 37-way round shielded cable
<a href="#">DNA-CBL-62</a>	2.5ft, 62-way round shielded cable
<a href="#">DNA-STP-3762</a>	Universal Screw Terminal Panel for DNx-Series I/O
<a href="#">DNA-STP-62-DR</a>	Universal Screw Terminal Panel for DNx-Series I/O
<a href="#">Extended Warranty</a>	Option to purchase UEI's extended warranty (up to 10 years) is available