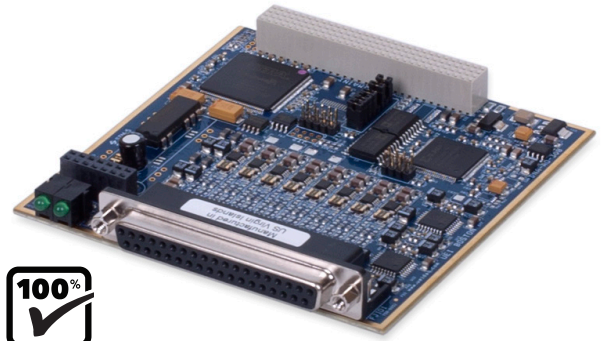


DNA/DNR-AO-308-350

16-bit, 8-Channel, ±10V, ±50 mA Analog Output Board

- DNA-AO-308-350 for use with "Cube" I/O chassis
- DNR-AO-308-350 for use with RACKtangle™ I/O chassis
- 8 independent DACs, 16-bit resolution
- ±10V output range, ±50mA per channel (max)
- 100kHz per channel max update rate
- Force/sense lines (improves output accuracy)
- Per-channel offset and gain calibration
- Simultaneous update across all channels

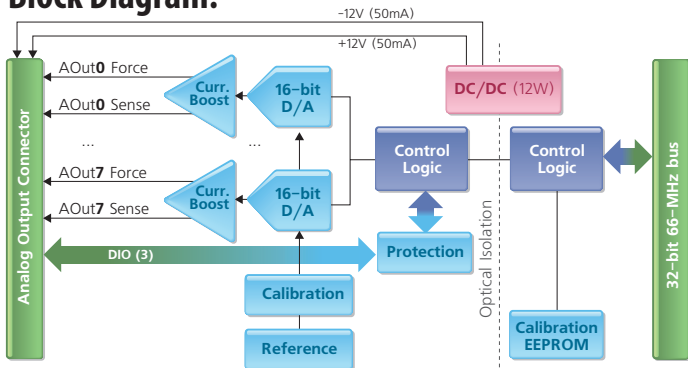


General Description:

The DNA-AO-308-350 and DNR-AO-308-350 are high-precision, true 16-bit, 8-channel high-current analog output boards for use with UEI's popular "Cube" and RACKtangle I/O chassis respectively. The boards offer per-channel digital offset and gain calibration, buffered output, excellent linearity, and low output noise. The DNA/DNR-AO-308-350 features current boosters that allows a maximum output current of ±50mA per channel and provides sense lines for better accuracy. The board is an ideal solution in high-accuracy data acquisition and control applications where current drive requirements exceed the more typical analog output ratings of ±5mA or ±10mA per channel. For best accuracy all available ground lines should be tied together. Since the maximum power consumption exceeds 4.5W, this layer may require the rear-mount fan (DNA-FANx).

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.

Block Diagram:

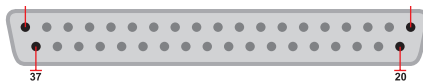


Pinout Diagram:

DB-37 (female)
37-pin connector:

AOUT0 SENSE	37	19	AGND
AGND	36	18	AOUT0
AOUT1	35	17	AOUT1 SENSE
AOUT2 SENSE	34	16	AGND
AGND	33	15	AOUT2
AOUT3	32	14	AOUT3 SENSE
AOUT4 SENSE	31	13	AGND
AGND	30	12	AOUT4
AOUT5	29	11	AOUT5 SENSE
AOUT6 SENSE	28	10	AGND
AGND	27	9	AOUT6
AOUT7	26	8	AOUT7 SENSE
AGND	25	7	AGND
DNC	24	6	DNC
AGND	23	5	AGND
DIO2	22	4	DIO1
AGND	21	3	DIO0
-12V (50mA) OUT	20	2	+12V (50mA) OUT
	1	1	AGND

Note: All analog grounds (AGND) should be tied together for better accuracy.



Technical Specifications:

Number of Channels	8
Resolution	16 bits
Max Update Rate: @ 16-bit resolution	100 kHz/chan (500kHz max aggregate)
Buffer Size	1K samples
Type of D/A	double-buffered
INL (no load)	±1 LSB (0.003%)
DNL (no load)	±1 LSB (0.003%)
Monotonicity Over Temperature	16 bits
Gain Linearity Error	0.002%
Gain Calibration Error	±150 µV
Offset Calibration Error	±100 µV
Offset Drift	5ppm/°C
Gain Drift	5ppm/°C
Output Range	±10V
Output Coupling	DC
Output Impedance	0.1Ω max
Current Drive	±50mA/channel
Capacitive Loads	1000 pF
Settling Time	10 µs to 16 bits
Slew Rate	10 V/µs
Isolation	350Vrms
Power Consumption ¹	1.5W - 11W
Physical Dimensions	3.875" x 3.875" (98 x 98 mm)
Operating Temp. (tested)	-40°C to +85°C
Operating Humidity	0 - 95%, non-condensing
Vibration IEC 60068-2-6	5 g, 10-500 Hz, sinusoidal
IEC 60068-2-64	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
MTBF	480,000 hours

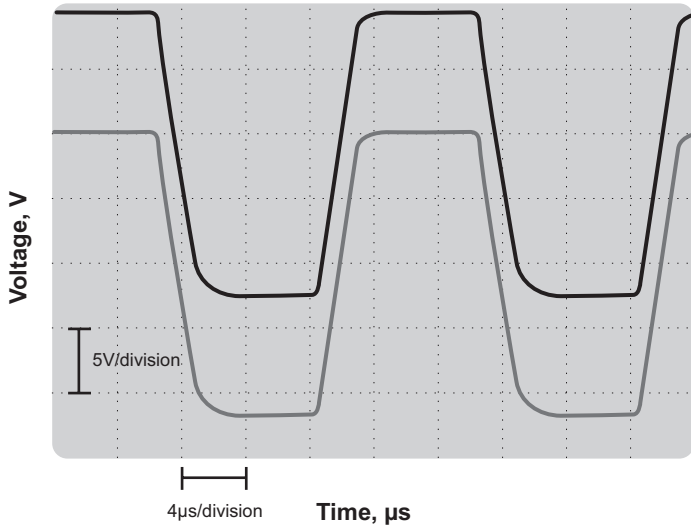
¹ If the total power consumption of the layer is over the 4.5W, the DNA-FANx rear-mount cooling fan is required. Refer to the Typical Performance Characteristics for more details.

Connection Options:

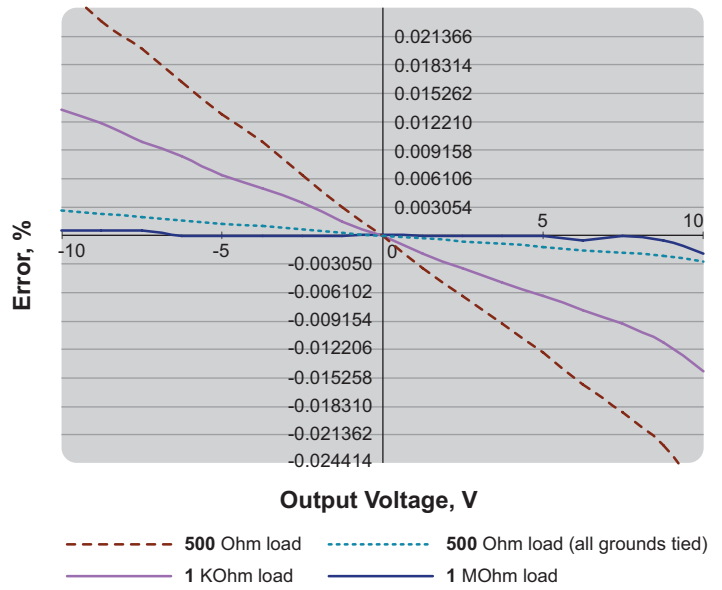
Terminal Panel	Cable	Description
DNA-STP-37	DNA-CBL-37S	DNA-CBL-37S shielded cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel
DNA-STP-37	DNA-CBL-37	DNA-CBL-37 ribbon cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel

Typical Performance Characteristics

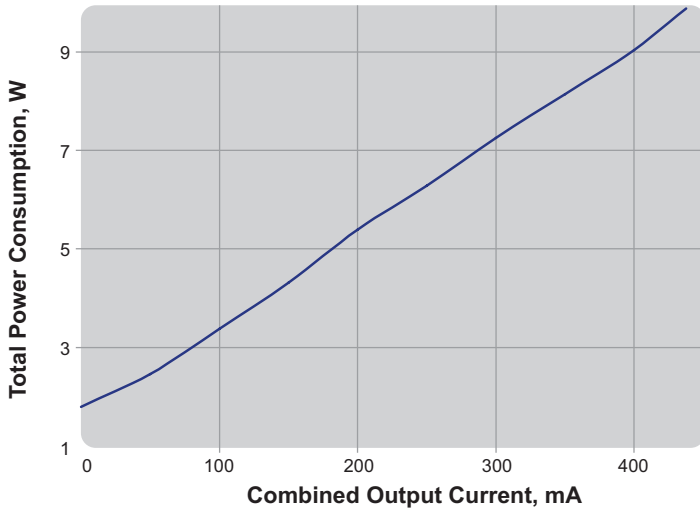
Full Scale (±10V) Output at 100kHz Per Channel
(800kHz aggregate rate)



Output Voltage Error vs. Voltage vs. Load
(±10V output range)



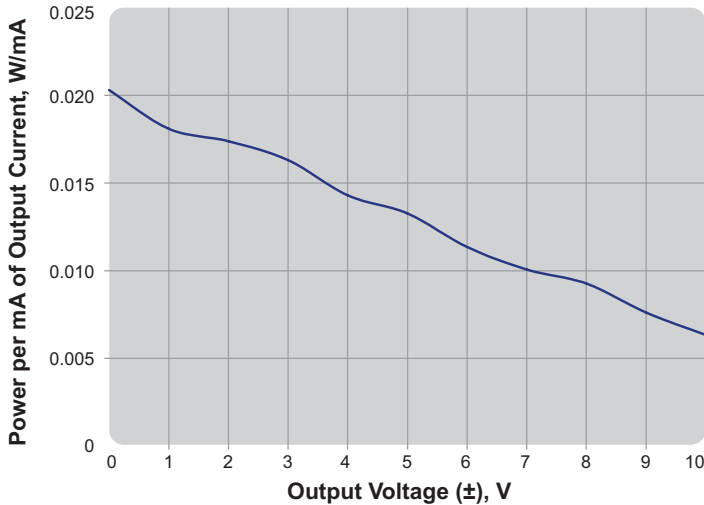
Power Consumption vs. Output Current
(Including complimentary ±15V (50mA max))



Conversion Factors

bits	Resolution	
	%	mV
12	0.024414	4.883
13	0.012207	2.441
14	0.006104	1.221
15	0.003052	0.610
16	0.001526	0.305

Internal Power Dissipation vs. Output Voltage



Note: Total internal power consumption = 1.5W + (Total output current x Power/mA at given voltage)