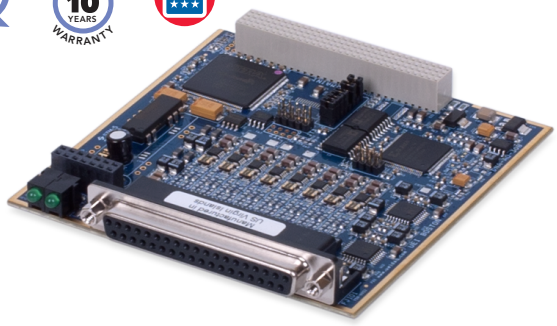
DNA/DNR-AO-308-020

16-bit, 8-Channel, 0-20mA Current Analog Output Board

- DNA-AO-308-020 for use with "Cube" I/O chassis
- DNR-AO-308-020 for use with RACKtangle™ I/O chassis
- 8 independent DACs
- 16-bit resolution
- 100kHz per channel max update rate
- 0-20mA current output
- Per-channel offset and gain calibration
- Simultaneous update across all channels

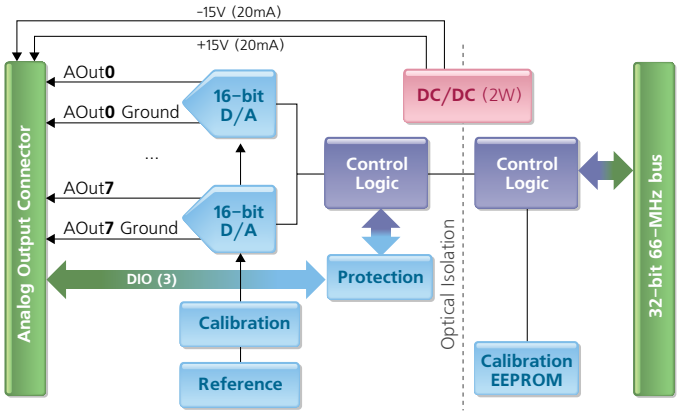


General Description

The DNA/DNR-AO-308-020 are 16-bit, 8-channel current-output boards for use with UEI's Cube/RACKtangle I/O chassis respectively. The boards provide per-channel digital offset and gain calibration, buffered output, excellent linearity, and low output noise. The DNA/DNR-AO-308-020 features the industry standard 0-20mA output range. This layer may be used in variety of industrial data acquisition and control applications to interface with the sensors that comply with 0-20mA standard. Since the maximum power consumption exceeds 4.5W, this layer may require the rear-mount fan (DNA-FANx).

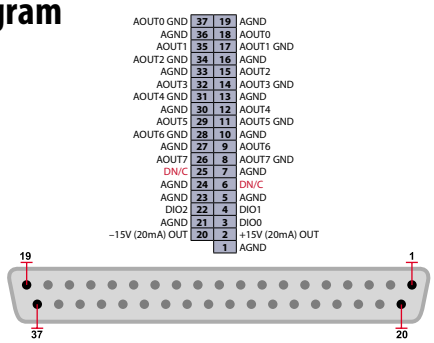
Software is included, providing a comprehensive, yet easy-to-use API that supports all popular operating systems, including Windows, Linux, and most real-time operating systems—such as QNX, Intime, VXworks, and more. Additionally, the UEIDAQ Framework—an even higher level Windows driver—supplies complete 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:



Technical Specifications: (Typical specs at 25 °C ±5 °C)

Number of Channels	8
Resolution	16 bits
Max Update Rate: @ 16-bit resolution	100 kHz/channel (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	±20 µA typical, ±50 µA max.
Offset Calibration Error	±20 µA typical, ±50 µA max.
Offset Drift	±10 µV/°C
Gain Drift	5ppm/°C
Output Range	Output Range 0-20mA
Output Coupling	DC
Output Impedance	0.1Ω max
Capacitive Loads	500 pF
Settling Time	10 µs to 16 bits
Load range[1]	0 to 600 Ohms for full 0-20 mA swing
Isolation	350Vrms
Power Consumption[2]	1.8W - 6W
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* *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	480,000 hours

[1] Refer to the Typical Performance Characteristics for more details.

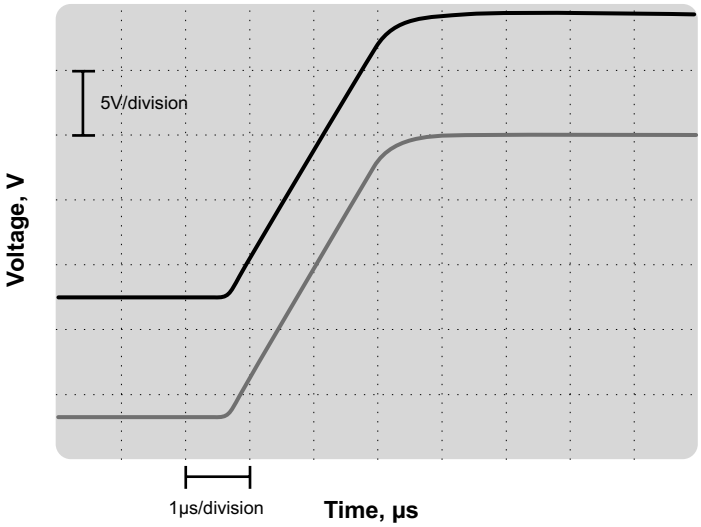
[2] If the total power consumption of the layer is over the 4.5W, the DNA-FANx rear-mount cooling fan is required. Refer to the Typical Performance Characteristics for more details.

Connection Options:

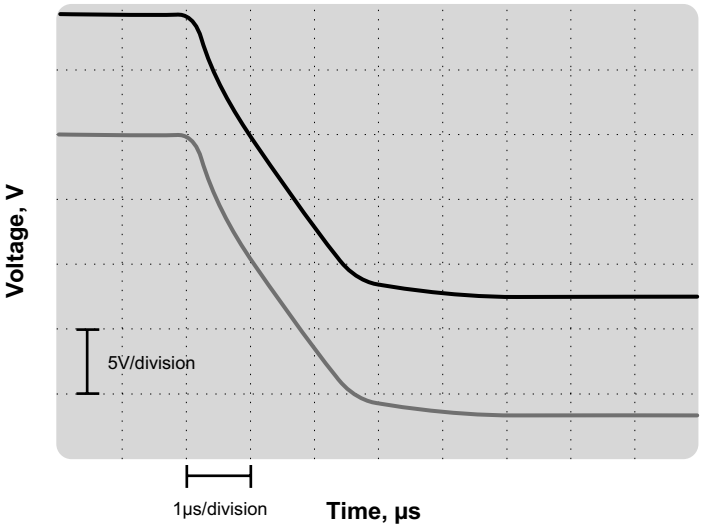
Terminal Panel	Cable	Description
DNA-STP-37	DNA-CBL-37S	DNA-CBL-37S shielded cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel
DNA-STP-37	DNA-CBL-37	DNA-CBL-37 ribbon cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel

Typical Performance Characteristics

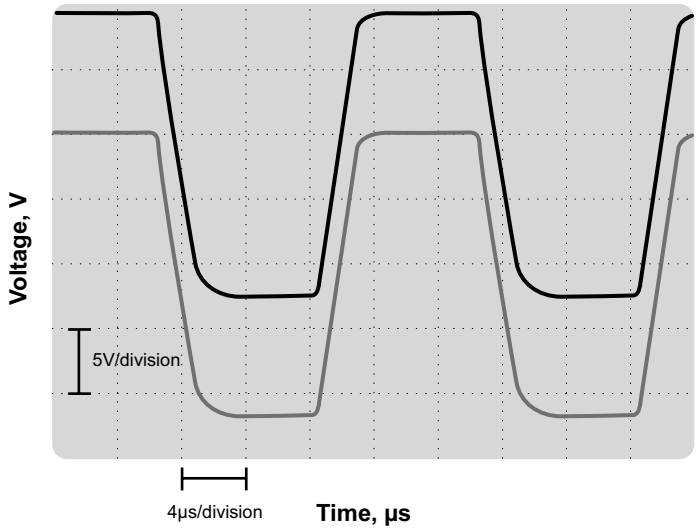
2-Channel Rising Edge Settling Time at Full Scale (±10V)
(5.34µS, expected to be <10µS)



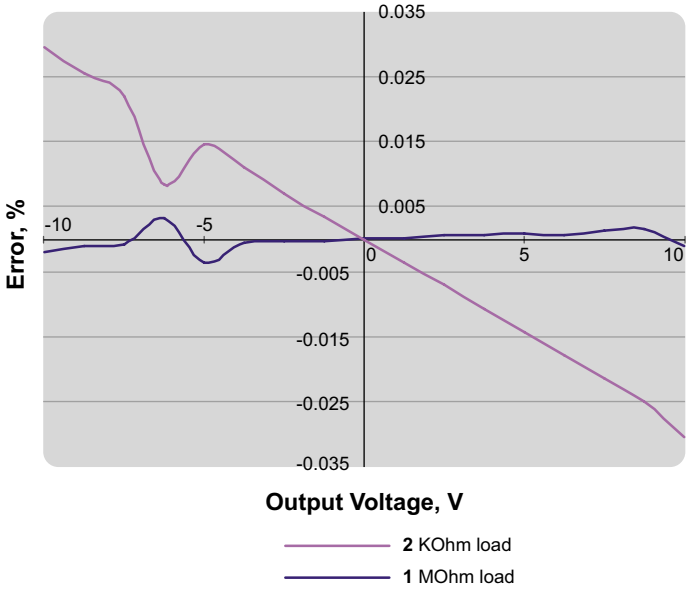
2-Channel Falling Edge Settling Time at Full Scale (±10V)
(6.1µS, expected to be <10µS)



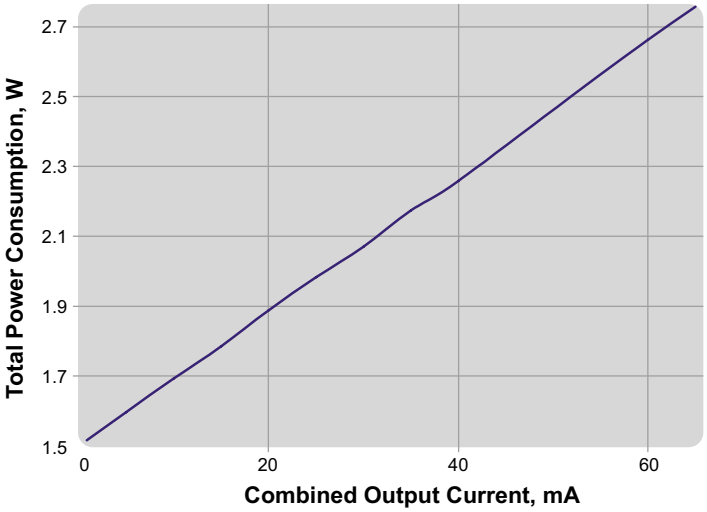
Full Scale (±10V) Output at 100kHz Per Channel
(800kHz aggregate rate)



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



Power Consumption vs. Output Current
(Including complimentary ±15V (20mA max))



Conversion Factors

Resolution		
bits	%	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