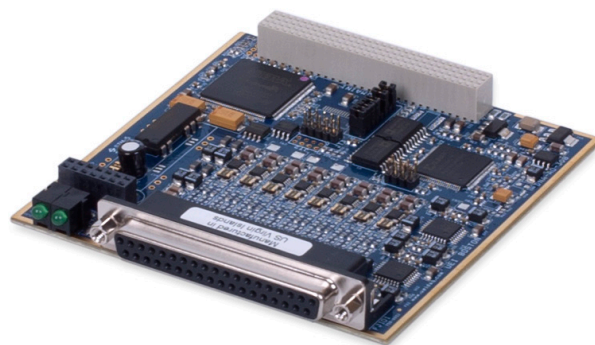


# DNA/DNR-AO-308-020

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

- DNA-AO-308-020 for use with "Cube" I/O chassis
- DNR-AO-3008-020 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

10-Year  
Availability  
Guarantee

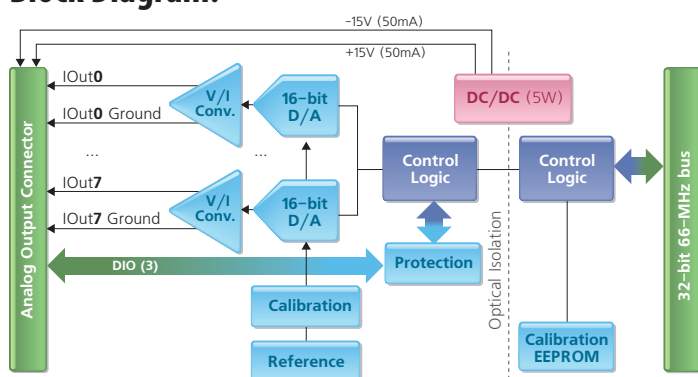


### General Description:

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).

The DNA/DNR-AO-308-020 supports the **UEIDaq Framework** Data Acquisition Software Library for Windows and provide support for all popular Windows programming languages and applications (e.g LabVIEW, DasyLab). The board is also fully supported by Linux and all popular RTOS including VxWorks, QNX and more. Please visit our website for more details.

### Block Diagram:

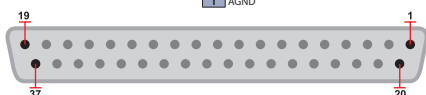


### Pinout Diagram:

DB-37 (female)  
37-pin connector:

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

Note: AOUTx = IOutx



### Technical Specifications:

Number of Channels	8
Resolution	16 bits
Max Update Rate: @ 16-bit resolution @ 12-bit resolution @ 9-bit resolution	100 kHz/channel (800kHz max aggregate) 200 kHz/channel (800kHz max aggregate) 400 kHz/channel (800kHz 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	±2.5 µA typical, ±25 µA max.
Offset Calibration Error	±2.5 µA typical, ±25 µA max.
Offset Drift	5ppm/°C
Gain Drift	5ppm/°C
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 <sup>1</sup>	0 to 350 Ohms for full 0-20 mA swing
Isolation	350Vrms
Power Consumption <sup>2</sup>	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

<sup>1</sup> Refer to the Typical Performance Characteristics for more details.

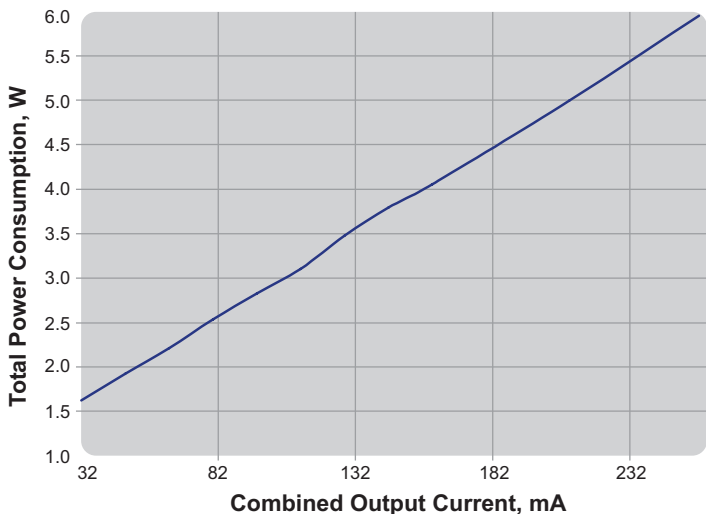
<sup>2</sup> If the total power consumption of the layer is over the 4.5W, the DNA-FANx rear-mount cooling fan is required. Refer to the Typical Performance Characteristics for more details.

### Connection Options:

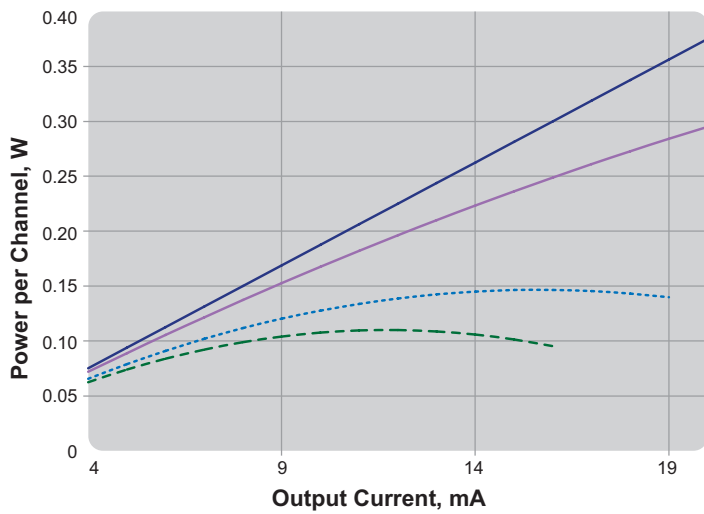
Terminal Panel	Cable	Description
DNA-STP-37	DNA-CBL-37S	DNA-CBL-37S shielded cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel
DNA-STP-37	DNA-CBL-37	DNA-CBL-37 ribbon cable connects the DNA/DNR-AO-308 to the 37-way DNA-STP-37 screw terminal panel

## Typical Performance Characteristics

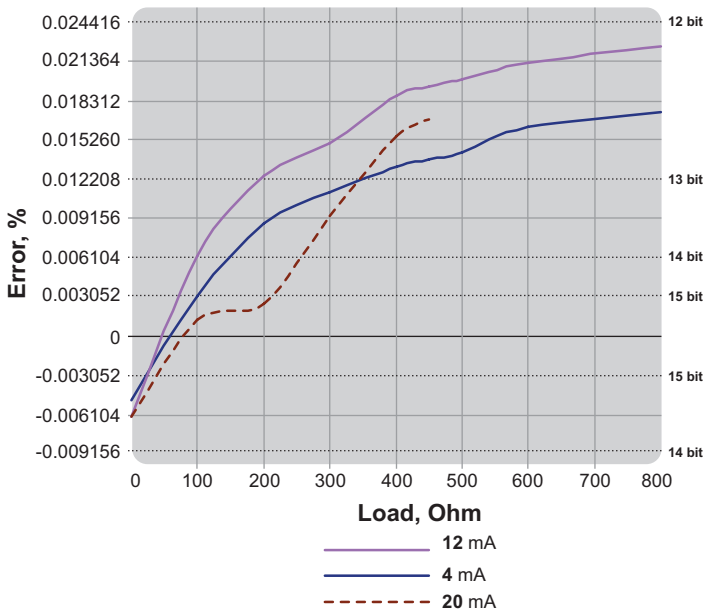
**Power Consumption vs. Output Current**  
(Including complimentary  $\pm 15V$  (50mA))



**Internal Power Dissipation vs. Output Current**  
(Single channel)



**Output Current Error vs. Current vs. Load**



**Conversion Factors**

Resolution		
bits	%	$\mu A$
10	0.097656	15.625
11	0.048828	7.813
12	0.024414	3.906
13	0.012207	1.953
14	0.006104	0.977
15	0.003052	0.488
16	0.001526	0.244