

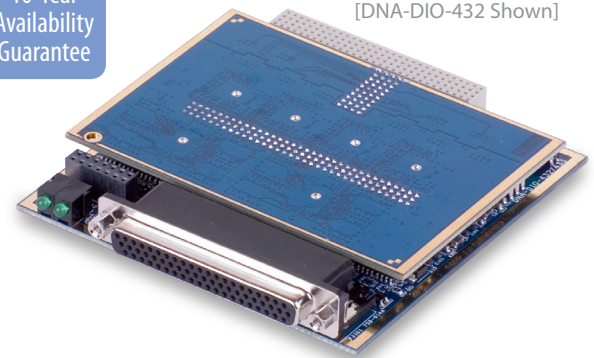
# DNA/DNR-DIO-432

## Guardian™ 32-Channel Industrial Digital Output Layer

### The Guardian Advantage

- Programmable overcurrent protection (50 mA to 1 A)
- Programmable overcurrent duration limits
- PWM based soft-start/stop reduces inrush current “shock”
- Monitors each channel’s output voltage and current allowing automatic detection of shorts/open and other system failures
- Unused outputs may be used as analog inputs
- PWM output for control of low speed, high current analog devices
- 600 mA per channel of continuous output (sink) current
- Wide 3.3 V to 36 V operating range
- Output throughput rate of 1 kS/sec

10-Year  
Availability  
Guarantee



DNA-DIO-432 boards are for use in “Cube” chassis while the DNR-DIO-432 is designed for use in RACKtangle™ chassis

## General Description:

The DNA/DNR-DIO-432 are 32 channel, digital output boards. The DNA-DIO-432 is compatible with UEI’s “Cube” series chassis, while the DNR-DIO-432 is designed for use in the RACKtangle I/O chassis. Electronically, they are identical. The boards are designed for use in a wide variety of applications. Each channel is configured as a current sink (see diagram on the following page) and switches voltages between 3.3 and 36 VDC. Each channel is rated for continuous operation at 600 mA with an output voltage drop of less than 550 mV. (The DNA-DIO-433 provides identical capability with current “sourcing” outputs.)

The DIO-432 is part of UEI’s Guardian series. It not only controls the digital outputs, it provides a unique output monitoring capability. An on-board 24-bit A/D converter monitors each channel’s output voltage and current. This allows the application to detect and flag short and open circuits as well as other “suspicious” behavior. The monitoring capability is also powerful diagnostic tool allowing a repair technician to quickly and accurately identify blown, or mis-wired channels. Channels not used as outputs may serve as analog inputs. With the output “On”, each channel will input current (0-600mA). Turn the output off, and it measures 0-36 VDC analog input signals with ±10 mV accuracy.

The Guardian advantage includes programmable overcurrent protection. The user may select the current and duration of overload (as short as 10 ms) required before the channel is shut down. Each board provides 350 Vrms isolation between the I/O and the cube and other installed I/O layers. The DNA-DIO-432 offers update rates up to 1 kHz and simplifies software writes by transferring all data in a single, 32-bit word.

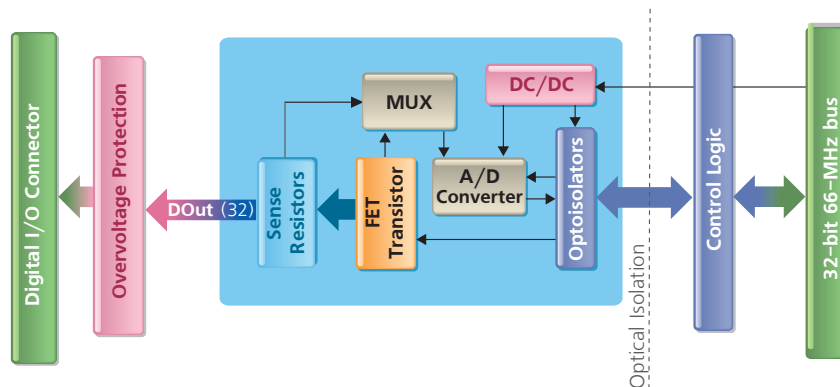
Each channel offers a pulse-width-modulated (PWM) “soft-start/stop” capability. This allows power to be applied/removed gradually, greatly increasing the reliability of devices like incandescent bulbs where thermal shock reduces life expectancy. The PWM may also used as an analog output control for low speed, high voltage/current applications.

The DNA-DIO-432 is fully supported by the UEIDAQ Framework which provides a simple and complete software interface to all popular programming languages, operating systems and data acquisition and control applications (e.g. LabVIEW, DASyLab, MATLAB).

## Technical Specifications:

Number of channels	32 digital outputs
Output configuration	Current sink
Output port configuration	Single 32-bit word
Output Drive	600 mA per channel continuous; 3.5 A peak (100 mS max)
Output ON voltage	< 550 mV @ 600 mA (incl. std 3’ cable)
Output ON impedance	< 0.9 Ohm (including std 3’ cable)
Output OFF impedance	> 1 Meg Ohm
Output OFF leakage	< 25 µA
Overvoltage protection	±40 VDC (reverse current must be limited to 1 A to prevent damage)
Overcurrent protection	
Current Limit	50 mA - 2 A
Overload response time	10-5000 ms (user programmable)
Output Monitoring	
Configuration	Multiplexed
Voltage Accuracy	±10 mV max (sampled at 2 Hz)
Current Accuracy	±1 mA, max (sampled at 10 Hz)
Soft-Start/Stop duration	256 µS to 5 seconds
Steady State PWM output	0 to 100% in 0.4% increments. (Minimum period is 256 µSec)
Output Throughput Rate	1 kHz max
Power up / reboot state	Off
Power dissipation	< 2 W, not including output switches
Isolation	350 Vrms
Operating Temp. Range	Tested -40 to +85 °C
Operating Humidity	95%, non-condensing
Vibration IEC 60068-2-6	5 g, 10-500 Hz, sinusoidal
IEC 60068-2-64	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	260,000 hours

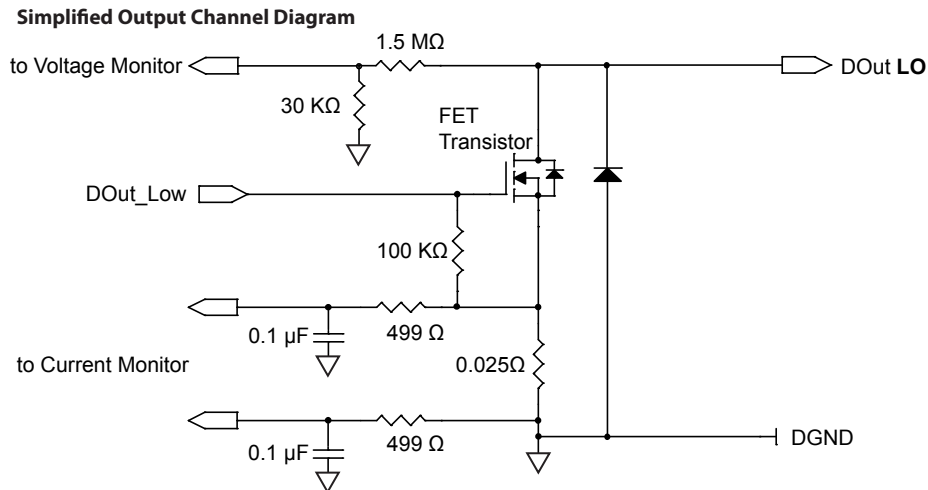
## Block Diagram:



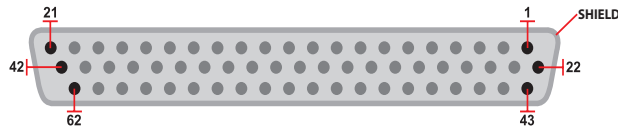
## Connection Options:

Terminal Panels	Matching Cable	Description
DNA-STP-62	DNA-CBL-62	Connects all I/O signals to easy to use screw terminals

## Single Channel Diagram:



## Pinout Diagram:



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

**Note:** For rated performance all ground pins should be connected to the external ground.