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DNA/DNR-DIO-433-800

Guardian[™] 32-Channel Industrial Digital Output Board

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 current allowing
- automatic detection of shorts/open and other system failures · Low leakage outputs mean LED indicators look off, even
- when viewed through night-vision goggles
- PWM output for control of low speed, high current analog devices
- 600 mA per channel of continuous output (source) current
- Wide 3.3 V to 36 V operating range

General Description:

The DNA/DNR-DIO-433-800 are 32 channel, digital output boards designed for use in a wide variety of applications. The DNA-DIO-433-800 and DNR-DIO-433-800 are compatible with UEI's popular "Cube" and RACKtangle I/O chassis respectively. Each output channel is configured as a current source (see diagram on the next 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. Based on the popular DNx-DIO-433, the 433-800 provides lower leakage outputs. This is critical in simulator applications where LED indictors will be view through night vision devices as the 25 uA leakage in teh standard version is enough to make an LED look on.

As part of UEI's Guardian series the board not only controls the digital outputs, it provides a unique monitoring capability. An on-board 24-bit A/D converter monitors each channel's output current. This allows the application to detect 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. With the output "On", each channel will input current (0-600mA).

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-433-800 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, allowing power to be applied/removed gradually, greatly increasing the reliability of devices like incandescent bulbs where thermal shock reduces life expectancy. The PWM output may also be used to drive low speed, high current analog devices or may be used as a "dimmer".

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.

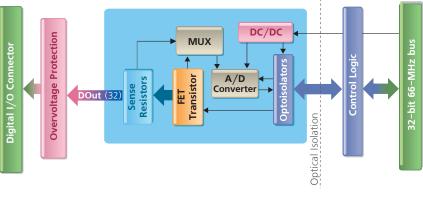


DNA-DIO-433-800 boards are for use in "Cube" chassis while the DNR-DIO-433-800 AND DNF-DIO-433-800 ARE designed for use in RACKtangle[™] chassis AND FLATRACK chassis respectively

Technical Specifications:

| Number of channels | 32 digital outputs | | | |
|---------------------------|---|--|--|--|
| Output configuration | Current source | | | |
| Output port configuration | Single 32-bit word | | | |
| Output Drive | 600 mA per channel continuous; | | | |
| | 3.5 A peak 10% Duty Cycle 100 ms max) | | | |
| Output ON voltage drop | < 500 mV @ 600 mA (Incl. std 3' cable) | | | |
| Output ON impedance | < 0.9 Ohm (Includes standard 3' cable) | | | |
| Output OFF impedance | > 1 Meg Ohm | | | |
| Output OFF leakage | < 1 µA | | | |
| Overvoltage protection | ±40 VDC (reverse current must be limited to | | | |
| | 1 A to prevent damage) | | | |
| Overcurrent protection | | | | |
| Current Limit | 50 mA - 2 A (user-programmable) | | | |
| Overload response time | 10-5000 ms (user programmable) | | | |
| Output Monitoring | | | | |
| Configuration | Multiplexed, one A/D | | | |
| 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 µS) | | | |
| Output Throughput Rate | 1 kHz max | | | |
| Power up / reboot state | Off | | | |
| Isolation | 350 Vrms | | | |
| Power dissipation | <2.5 W, not including power dissipated in | | | |
| | the output FETs | | | |
| 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 | 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 | 260,000 hours | | | |

Block Diagram:

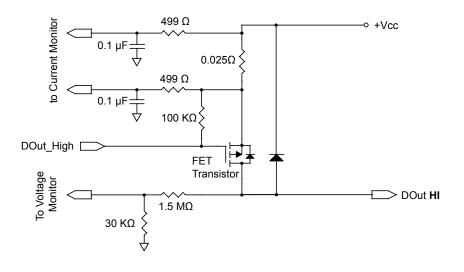


Connection Options:

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

Single Channel Diagram:

Simplified Output Channel Diagram



Pinout Diagram:

| 21 | | 1 SHIELD |
|----|-----------------|--------------|
| 42 | | 22 |
| 62 | • • • • • • • • | • |

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

Note: For rated performance all +Vcc pins should be connected to +Vcc.