# DNA/DNR-DIO-448

## Guardian™ 48-Channel Digital Input Layer

### The Guardian Advantage

- A/D allows voltage measurement on each input allowing quick and accurate diagnosis of short/open circuits as well marginal or failing drive circuitry.
- Sample rate of 1 kS/sec
- Programmable input transition levels
- Programmable hysteresis
- 350 VAC isolation
- Monitors contacts without external components
- Programmable debounce intervals

**10-Year Availability Guarantee**

[DNR--DIO-448 Shown]

The DNA-DIO-448 is designed for use in "Cube" I/O chassis while the DNR-DIO-448 is for use in the RACKtangle™ chassis.

## General Description:

The DNA/DNR-DIO-448 are 48 channel, high performance digital input boards designed for use in a wide variety of digital monitoring applications. The DNA-DIO-448 and DNR-DIO-448 are compatible with UEI's popular "Cube" and RACKtangle I/O chassis respectively. The board's inputs are divided into two, 24-bit ports, each of which presents its data in a single 24-bit write. This simplifies programming and maximizes throughput. The board reads all 48 bits at sustained rates in excess of 1 kS/second. Each channel is configured with a 33 kOhm pull up/down resistor. This makes the board an ideal solution for monitoring contact closures as well as standard voltage inputs. The pull-up/pull-down resistors are configured by connecting the "PLEVEL" pins on the I/O connector to Vcc or ground.

The "Guardian advantage" is an innovative A/D input approach allowing the board to offer incredible input flexibility. A diagnostic input mode monitors the actual analog voltage at each input, allowing quick and accurate detection of short and open circuits as well marginal or failing drive circuitry. The analog input capability is also a powerful installation, diagnostic and data acquisition tool.

The board offers programmable logic thresholds and hysteresis over the full input range. Thresholds and Hysteresis are independently programmable on each channel. The board supports user programmable debouncing intervals which may also be set on each channel independently with durations between 5 and 500 ms. Each board provides 350 Vrms isolation between the I/O and the cube and other installed I/O layers. All inputs are overvoltage protected from -25 to +75 VDC, and against ESD.

Software included with the DNx-DIO-448 provides a comprehensive yet easy to use API that supports all popular operating systems including Windows, Linux, real-time operating systems such as QNX, RTX, VXworks and more. Finally, the UEIDAQ Framework supplies complete support for those creating applications in Windows based data acquisition software languages and application packages such as LabVIEW, MATLAB/Simulink, DASYLab or any application which supports ActiveX or OPC servers.

## Technical Specifications:

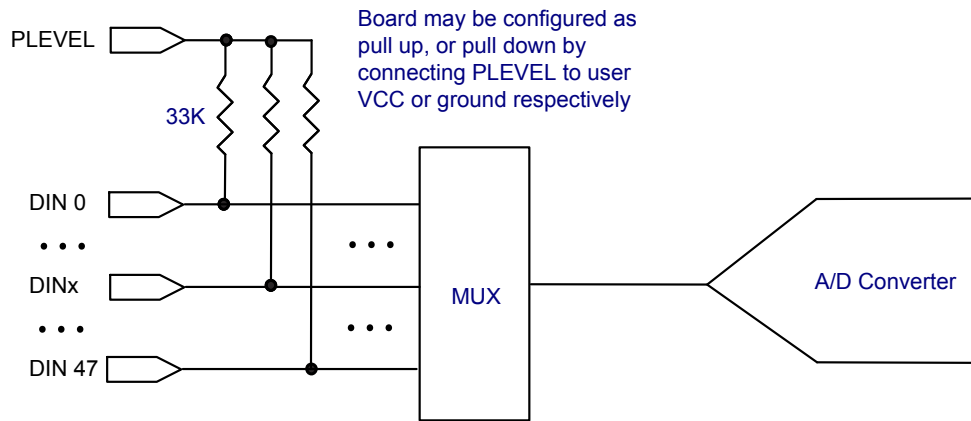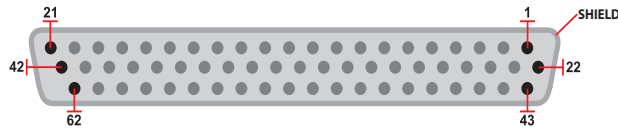| | |
|---|---|
| Number of channels | 48 digital inputs |
| Port configuration | Two 24-bit ports |
| Input range | -1 VDC to +32 VDC |
| Input high voltage | Programmable from 0 to Vcc (default: 12 V @ Vcc = 28 VDC) |
| Input OFF voltage | Programmable from 0 to Vcc (default: <1.25 V @ 28 VDC) |
| Hysteresis (voltage input) | Programmable, 0 to Vcc (default 10.25 VDC) |
| Input impedance | > 33 k Ohm. |
| Input open circuit state | Programmable high or low via 33 kOhm pull up/pull down. Each pull up/down selection sets the configuration for 24 channels) |
| Input FIFO | 256 words |
| Input Throughput Rate | 1 kHz max |
| Diagnostic voltage measurement and threshold voltage accuracy | ± 25 mV (-1 VDC to 30 VDC), ± 150 mV (30 VDC to 32 VDC), (Source impedance ≤ 100 Ohm) |
| Input protection | - 25 to + 75 V, and ESD |
| Input Isolation | 350 Vrms |
| Power dissipation | 2 W |
| Operating Temp. Range | Tested -40 to +85 °C |
| Operating Humidity | 95%, non-condensing |
| Vibration    IEC 60068-2-6            IEC 60068-2-64 | 5 g, 10-500 Hz, sinusoidal 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 | 550,000 hours |

## Block Diagram:
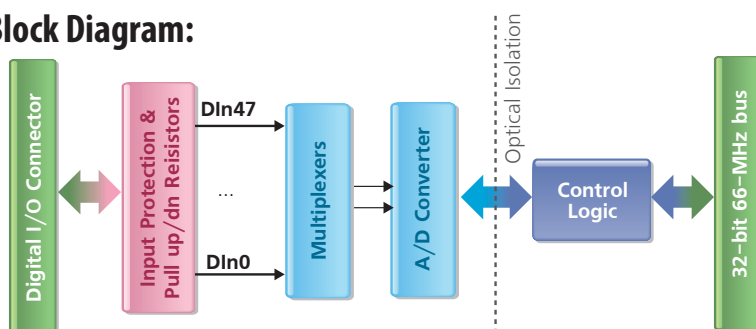


## Connection Options:

| 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:



PLEVEL

33K

Board may be configured as pull up, or pull down by connecting PLEVEL to user VCC or ground respectively

DIN 0
• • •
DINx
• • •
DIN 47

MUX

A/D Converter

## Pinout Diagram:



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

NC - No Connection
Rsvd - Reserved