## DNx-DIO-449

# 48-Channel 0-150V AC/DC digital input board with voltage monitoring and self test

- DNA-/DNR-/DNF-DIO-449 for use with Cube/RACKtangle™/ FLATRACK™ I/O chassis
- 0–50 VDC/150 VAC input range
- Sample rate of 1 kS/s
- Programmable input transition levels and hysteresis
- $\bullet$  Change of state detection with 200  $\mu S$  accuracy
- 350 VAC isolation
- Monitors contacts without external components
- Programmable debounce intervals

#### **Guardian Series Diagnostics**

- Analog voltage measurement on each channel
- Internal test signal injection for self-test

#### **General Description:**

The DNA/DNR/DNF-DIO-449 are 48 channel, high performance AC and DC digital input boards designed for use in a wide variety of digital monitoring applications. The DNA-, DNR-and DNF-DIO-449 are compatible with UEI's popular Cube, RACKtangle AND FLATRACK I/O chassis respectively. The board's inputs are divided into two, 24-bit ports, each of which presents its data in a 24-bit read. This simplifies programming and maximizes throughput. The board reads all 48 bits at sustained rates in excess of 1 kS/s. Automatic Change Of State (COS) detection is available with 200  $\mu$ S time stamp accuracy.

The "Guardian advantage" is a highly powerful diagnostic capability. A test signal injection capability is provided that allows the entire

> input hardware chain to be tested for proper functionality. The signal

> can also be used as a psuedo pull up/down so the board can monitor switch or contacts

> circuitry. In addition, the inputs are based on A/D

converters which allows

a diagnostic input mode

that monitors the actual

analog voltage at each

input. This capability

combined with the

board's ability to switch

capability

external

injection

without

GUARD	BENEFITS OF UEI'S GUARDIAN SERIES
$\checkmark$	VOLTAGE MONITORING
$\checkmark$	ONBOARD REFERENCE
$\checkmark$	MONITOR SWITCHES

UEI's Guardian series boards include asophisticated, reliable on-board monitoring system, allowing quick and easy system testing, sensor diagnostics monitoring and fault detection for rapid resolution in field or lab.

Learn more about UEI's Guardian series

a fixed reference voltage into each channel allows a complete and reliable self-test of each channel. The analog voltage measurement capability also allows a quick and accurate detection of short and open circuits as well as marginal or failing drive circuitry. The analog input capability is also a powerful installation and diagnostic 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 for DC inputs which may 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 over-voltage protected from -350 to +350 VDC, and against ESD.

Software is included, providing a comprehensive, yet easy-to-use API that supports all popular operating systems, including Windows, Linux,



The DNA-DIO-449 is designed for use in "Cube" I/O chassis, while the DNR-DIO-449 is for use in the RACKtangle™ chassis.

#### **Technical Specifications:**

Number of channels	48 digital inputs				
Port configuration	Two 24-bit ports				
Input range	-150 to +150VDC, 0 to 150 VAC (42–2500 Hz)				
Input gains	x1 default. Gains of x2, x5 and x10 are provided if higher resolution is required for lower voltageinput ranges				
Input high voltage	Programmable from 0 to 150 VDC/VAC (default: 12 VDC, 60 VAC)				
Input OFF voltage	Programmable from 0 to 150 VDC/VAC (default: 1.25 VDC, 15 VAC)				
Hysteresis (voltage input)	Programmable, 0 to 150 VDC/VAC (default 10.25 VDC/45 VAC)				
Input impedance	> 900 kΩ				
Input open circuit state	Programmable high or low via signal injection diagnostic stage. Each channel is independently programmable.				
Input FIFO	256 words				
Input Throughput Rate	1 kHz max (DC mode) 50 Hz max (AC mode)				
Change of state detection	Based on the change of one or more inputs				
COS timestamp accuracy	Accurate to 200 µS				
Voltage measurement and threshold voltage accuracy	DC: ± 50 mV (-150 VDC to 150 VDC), AC: ± 150 mVAC (0 VAC to 150 VAC)				
Input protection	±350 VDC and ESD				
Input Isolation	350 Vrms				
Power dissipation	2 W, maximum				
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	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	500,000 hours				

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:**



#### Single Channel Diagram:



### **Pinout Diagram:**



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

Rsvd - Reserved

#### **Ordering Guide:**

Part #	Description
DNx-DIO-449	48-Channel 0-150V AC/DC digital input board with voltage monitoring and self test
DNA-STP-62	62-channel screw terminal panel
DNA-CBL-62	2.5ft, 62-way round shielded cable
Extended Warranty	Option to purchase UEI's extended warranty (up to 10 years) is available

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