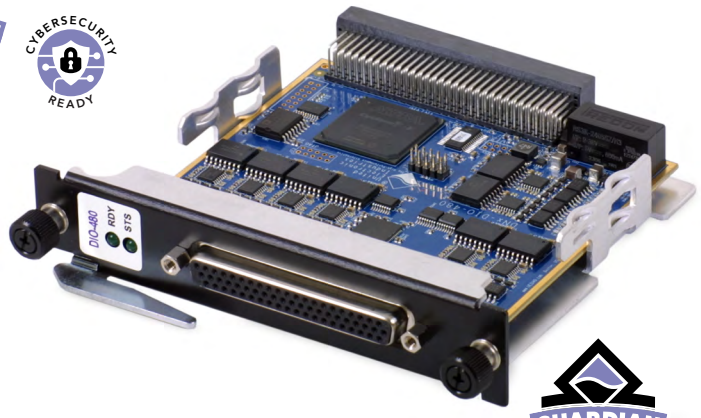
DNA/DNR/DNF-DIO-480

Universal 32 Channel DIO board

- DNA/DNR/DNF-DIO-480 for use in Cube, RACKtangle® and FLATRACK™ I/O chassis
- 32 reconfigurable digital input and output channels
- Each channel independently configurable as input/output
- 350 Vrms Isolation
- **Input Specs:**
  - Independently programmable input threshold to 55 V
  - 10 µS Change of State detection
  - Will read GND/Open, Vcc/Open or GND/Vcc configurations
  - 100 kHZ input rate
- **Output Specs:**
  - Outputs configurable from 0.6 - 55 VDC Industrial (TTL compatible)
  - Up to 25 kHz output rate (deployment dependent)
  - Source or Sink current outputs
  - 500 mA outputs with 16-bit PWM resolution
  - Guardian read-back of output voltage



DNx-DIO-480 is available for DNA Cube (shown), DNR RACKtangle and DNF FLATRACK chassis.

General Description:

The DNA/DNR/DNF-DIO-480 are universal digital I/O boards for use in UEI's Cube/RACKtangle/FLATRACK I/O chassis respectively. The board offers 32 independently configureable DIO channels that can be set as input or output, and are compatible with everything from 3.3V TTL levels to 55 V industrial signal levels.

Each of the 32-bits may be independently set as input or output. When configured as inputs, the logic level thresholds may be set with 275 mV resolution to 55 V.

The inputs have programmable pull up/down resistors that allow inputs to monitor contacts connected to a supply voltage or ground. Inputs are sensed with a 100 kHz A/D converter, so high and low voltage thresholds are programmable and allow change of state detection with 10 µs resolution. Digital input data may be streamed at 25 kHz, and to ensure no lost data the DIO-480 provides a 32-bit by 2048 FIFO. The digital input data may be streamed to FIFOs with timestamps which are generated at the start of the scan.

BENEFITS OF UEI'S GUARDIAN SERIES

✓	CIRCUIT BREAKER
✓	VOLTAGE MONITORING
✓	CURRENT MONITORING
✓	MONITOR SWITCHES

UEI's Guardian series boards include a sophisticated, 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

The outputs can be set as current sourcing (a switch between Vcc and the output), current sinking (a switch between Gnd and the output), push-pull (connect to Vcc or Gnd but not at the same time). The digital outputs can also be configured as flexible controller switch PWM and 16-bit pulse width resolution with soft-start. The PWM/soft-start parameters are selectable on a per-channel basis. The outputs are protected with 1.25 amp fast-blow fuses. A software controlled "circuit breaker" can be enabled to monitor and trip the switch at ~1 amp.

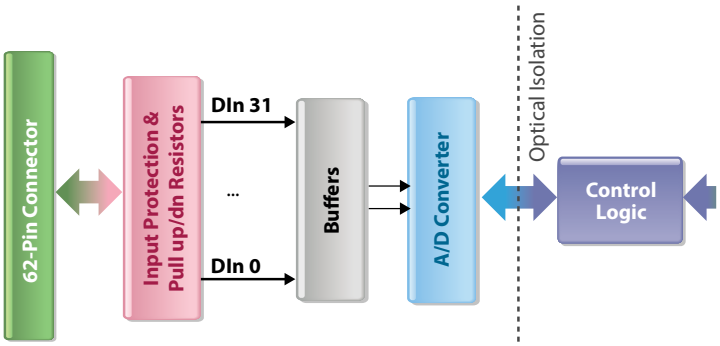
The board is supported by a variety of cable and screw terminal options certain to meet the needs of almost all users. For those wishing to create their own cables, all connections are through a standard 62-pin "D" connector allowing OEM users to build custom cabling systems with standard, readily available components.

The DNx-DIO-480 is supported by a complete software "suite" including support for Windows, Linux and all popular RTOS. Windows support is provided by the UEIDAQ Framework which includes a powerful software interface to Windows programming languages and DAQ applications including VISTAS, LabVIEW and MATLAB. An extensive factory written software suite is also provided for all popular "non-Windows" operating systems including Linux, VXworks, QNX, RTX, INtime and more. All software support includes extensive example programs that make it easy to cut-and-paste the I/O software into your applications.

Technical Specifications: (typical at 25°C ±5° C unless otherwise stated)

Industrial Digital I/O	
Channels / direction	32 bits independently selectable as input or output
Digital Input specifications	
Input range	0-55 VDC
Input high / low voltage	Programmable from 0-55 VDC
Input impedance	>1.1 MΩ
Input open circuit state	98 kΩ pull-up or pull-down resistors are software enabled
Input protection	±100 VDC
Input A/D sample rate	100 kHz
Digital input sample rate	100 kHz
Digital input FIFO	32 by 2048
Guardian input accuracy	Tempco: 15 ppm/°C
Change of state resolution 0-55 V	10 µS 275 mV
Input throughput	Up to 25 kHz depending on deployment
Digital Output specifications	
Configurations	Current sink/source, Ground/open or Vcc/open (Vcc is user provided in banks of 4 bits)
Output drive	500 mA per channel, continuous
Output protection	1.25 Amp fast-blow fuse on each output
Output voltage drop	< 600 mV at 500 mA (Including standard 3' cable)
Output Off impedance	>1.1 MΩ
Output Off leakage current	< 50 µA (with 55V input)
Output throughput	Up to 25kHz, depending on deployment
PWM output	0 to 100% in 0.0015% increments (16-bit resolution)
PWM cycle rate	Up to 10 kHz
Softstart programmability	Up to 10 seconds with 150 µS resolution
General and Environmental	
Isolation	350 Vrms, Isolation divided into 8 isolated banks of 4 bits.
Power Consumption	< 5 W (not including output loads)
Operating Temp. (tested)	-40 °C 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
MTBF	140,000 hours

Digital Input Block Diagram:

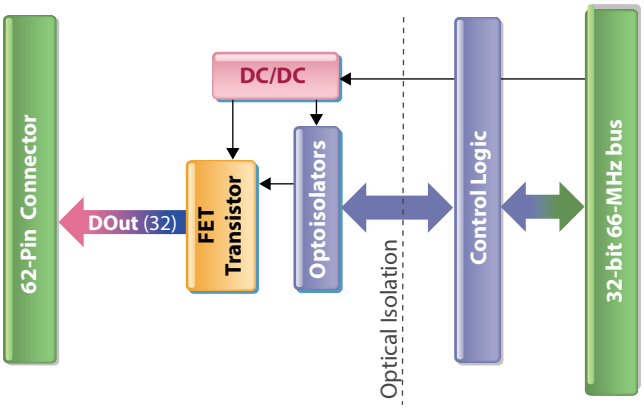


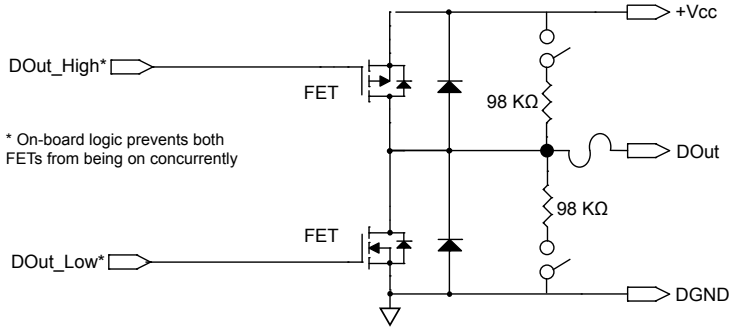
Notes: To provide proper output functionality with Vcc left open, a 2 MΩ resistor is connected to an internal 60 V power supply. With neither pull-up/down resistors enabled and the output off, a DMM measurement of the Vcc pin will read approximately +60V. This will not impact functionality with pull-up/down resistors.

VCC—PROVIDED IN BLOCKS OF 4 CHANNELS
Dout and DIn share the same pin on the I/O connector

DIO-0	DIO-4	DIO-8	DIO-12
DIO-1	DIO-5	DIO-9	DIO-13
DIO-2	DIO-6	DIO-10	DIO-14
DIO-3	DIO-7	DIO-11	DIO-15
DIO-16	DIO-20	DIO-24	DIO-28
DIO-17	DIO-21	DIO-25	DIO-29
DIO-18	DIO-22	DIO-26	DIO-30
DIO-19	DIO-23	DIO-27	DIO-31

Digital Output Block Diagram:

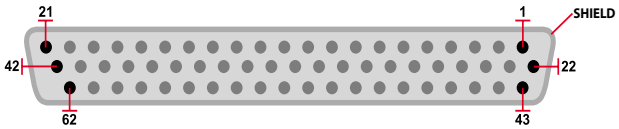




Notes: Vcc is provided in blocks of 4 channels. To provide functionality with Vcc left open, a 2 MΩ resistor is connected to an internal 60 V power supply.

Pinout Diagram:

DB-62 (female)



Pin	Signal	Pin	Signal	Pin	Signal
1	DIO 0	22	Gnd	43	Gnd
2	DIO 1	23	Vcc 0-3	44	DIO 2
3	DIO 3	24	Gnd	45	VCC 0-3
4	DIO 4	25	Vcc 4-7	46	DIO 5
5	DIO 6	26	Gnd	47	DIO 7
6	DIO 8	27	Vcc 8-11	48	DIO 9
7	DIO 10	28	Gnd	49	DIO 11
8	DIO 12	29	Vcc 12-15	50	DIO 13
9	DIO 14	30	Gnd	51	DIO 15
10	DIO 16	31	Gnd	52	Gnd
11	DIO 17	32	Vcc 16-19	53	DIO 18
12	DIO 19	33	Gnd	54	Vcc 16-19
13	DIO 20	34	Vcc 20-23	55	DIO 21
14	DIO 22	35	Gnd	56	DIO 23
15	DIO 24	36	Vcc 24-27	57	DIO 25
16	DIO 26	37	Gnd	58	DIO 27
17	DIO 28	38	Vcc 28-31	59	DIO 29
18	DIO 30	39	Gnd	60	DIO 31
19	reserved	40	Gnd	61	TTL DOUT 0
20	TTL DOUT 1	41	TTL (3.3VDD)	62	TTL DIN 0
21	TTL DIN 1	42	TTL Gnd		

Notes

Signals are isolated in three groups:

DIO is referenced to DGnd. Use Gnd as the return for DIO-n and Vcc n-m.

Vcc n-m is the user-supplied Vcc for industrial DO channels n-m. The digital outputs are divided into 8 groups of 4. If you desire to provide a Vcc for the digital output to switch on/off, you have the option of using more than one drive voltage.

TTL-DIO Shares a seperate GND from the DIO 0-31 signals. TTL-VDD is a 3.3V output capable of sourcing up to 60 mA.

Ordering Guide:

Part #	Description
DNx-DIO-480	Universal 32 channel DIO board
DNA-CBL-62	2.5ft, 62-way round shielded cable
DNA-STP-62	62-channel screw terminal panel
Extended Warranty	Option to purchase UEI's extended warranty (up to 10 years) is available