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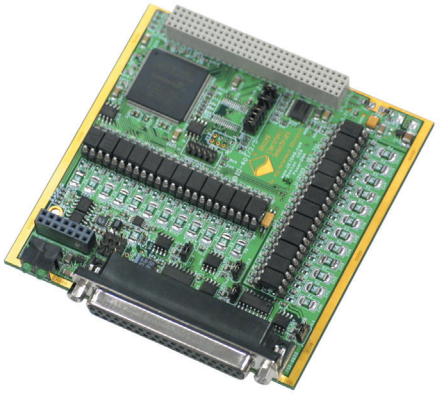
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DNA/DNR-DIO-402

24-Channel Industrial Digital Output Layer

- DNA-DIO-402 for use in "Cube" I/O chassis
- DNR-DIO-402 for use in RACKtangle™ I/O chassis
- 24 digital output channels
- Output lines protected with 100 mA resettable PTC fuse
- I/O throughput rate of 1kS/sec
- Outputs provide drive capability of 80 mA/channel
- Requires external 7-36V (24V nominal) power source

10-Year Availability Guarantee



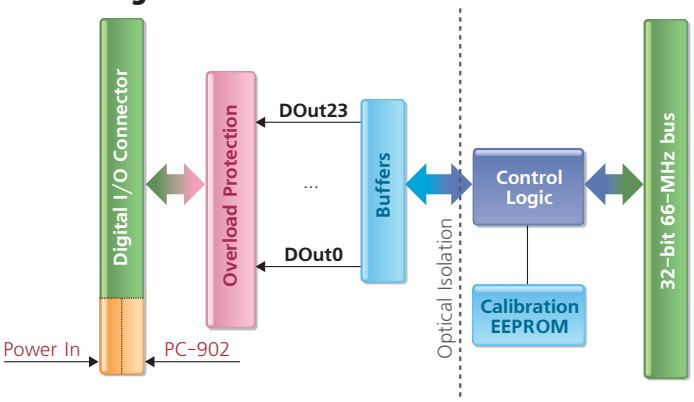
Supports **UEIDaq Framework** Data Acquisition Software Library for Windows. Linux and QNX drivers available. Visit our website for more details.

General Description:

The DNA/DNR-DIO-402 digital output are designed for applications requiring relatively low-speed, high-reliability isolated industrial digital I/O. The DNA-DIO-402 and DNR-DIO-402 are electrically identical and are designed for use in UEI's "Cube" and RACKtangle I/O chassis respectively. The DNA/DNR-DIO-402 features 24 digital output channels, I/O throughput rate of 1kHz, and offers 350Vrms isolation between layers. The layer can accept a wide range of user-supplied power sources (7 to 36V DC). In "Cube" based applications, the DNA-DIO-402 can also be powered internally using a DNA-PC-912 power conversion layer.

When a single DNA-PC-912 is used to power multiple DNA-DIO layers, total power consumption should not exceed 40W. Digital outputs on the DNA-DIO-402 are capable of driving up to 80mA per channel without sacrificing the performance, with peak current drive capability of 200mA (2 seconds max). All digital outputs are protected with 100mA PTC fuse and ESD/overvoltage protection device. If the total power consumption of DNA-DIO-402 layer is over the 4.5W, the DNA-FANx rear-mount cooling fan is required. The DNA/DNR-DIO-402 is an ideal output device in a wide assortment of PC based data acquisition and control applications.

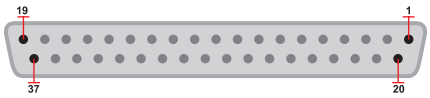
Block Diagram:



Pinout Diagram:

DB-37 (female)
37-pin connector:

VCC	37	19	VCC
DGND	36	18	VCC
DOUT23	35	17	DGND
DOUT21	34	16	DOUT22
DOUT20	33	15	DGND
DOUT18	32	14	DOUT19
DOUT17	31	13	DGND
DOUT15	30	12	DOUT16
DOUT14	29	11	DGND
DOUT12	28	10	DOUT13
DOUT11	27	9	DGND
DOUT9	26	8	DOUT10
DOUT8	25	7	DGND
DOUT6	24	6	DOUT7
DOUT5	23	5	DGND
DOUT3	22	4	DOUT4
DOUT2	21	3	DGND
DOUT0	20	2	DOUT1
		1	DGND



Note: Connect external power source to **VCC** pins. All VCC and at least 3 **DGND** pins should be used to supply external power.

Technical Specifications:

Number of channels	24 digital outputs			
Drive Capacity	80 mA per channel continuous; 200 mA per channel maximum peak			
Output FIFO	1024 samples			
Output High Voltage:	@7V	@12V	@24V	@36V
	6V	11.2V	22.8V	34.1V
Output Low Voltage:	10kΩ pull-down resistor to ground			
Output Protection	100mA resettable PTC fuse			
Internal Sampling Rate	2 kHz			
I/O Throughput Rate	1 kHz max			
Power Requirements (VCC)	7-36V (24V nominal) - external source or DNA-PC-912 internally			
No-load Power Consumption (all outputs driving logic 0)[2]	@7V	@12V	@24V	@36V
	0.4W	0.5W	0.7W	1.5W
No-load Power Consumption (all outputs driving logic 1)[2]	@7V	@12V	@24V	@36V
	1.0W	1.5W	3.0W	4.5W
Physical Dimensions	3.875" x 3.875" (98 x 98 mm)			
Operating Temp. Range	Tested -40 to +85 °C			
Operating Humidity	0 - 95%, non-condensing			
Isolation	350Vrms			
MTBF (Hours)	>600,000			

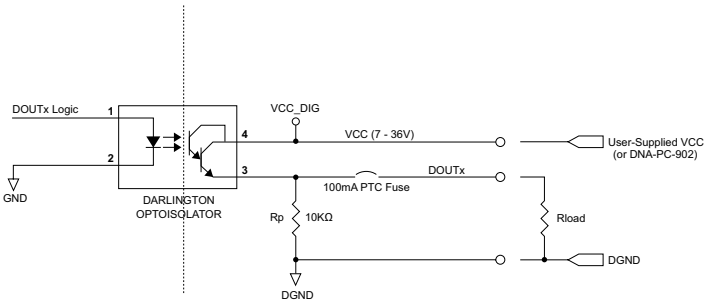
[2] DNA-DIO-402 may require a cooling fan (DNA-FANx) attached to a Cube's enclosure when heavily loaded or powered from VCC > 24V DC. Refer to "Power consumption vs. output current" graph for more details.

Connection Options:

Cable	Screw Terminal Panel	Description
DNA-CBL-37S	DNA-STP-37	Shielded cable connection to 37-way terminal panel.
DNA-CBL-37	DNA-STP-37	Ribbon cable connection to 37-way terminal panel.

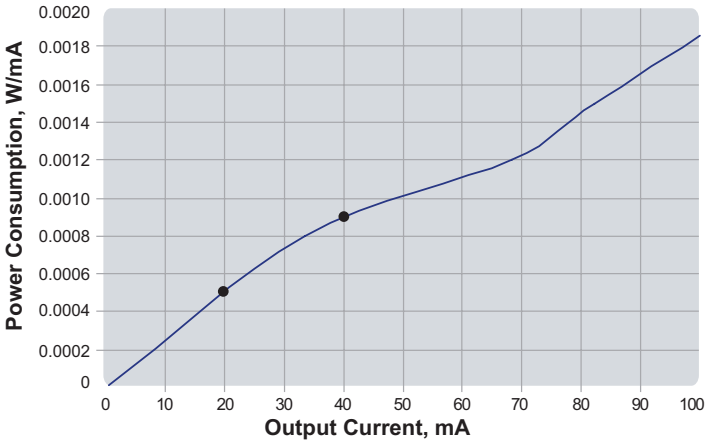
Single Channel Diagram:

Simplified Output Channel Diagram



Power Consumption:

Power Consumption vs. Output Current



Total Layer Power Consumption Example:
(All outputs driving Logic High)

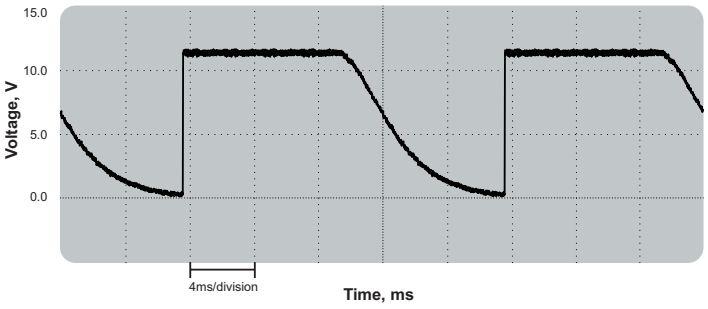
- VCC = 24V
- 2 outputs @ 40mA (0.009 W/mA)
- 10 outputs @ 20mA (0.005 W/mA)

P = 3.0W + ((2 x 40) x 0.009) + ((10 x 20) x 0.005) = **4.72W**

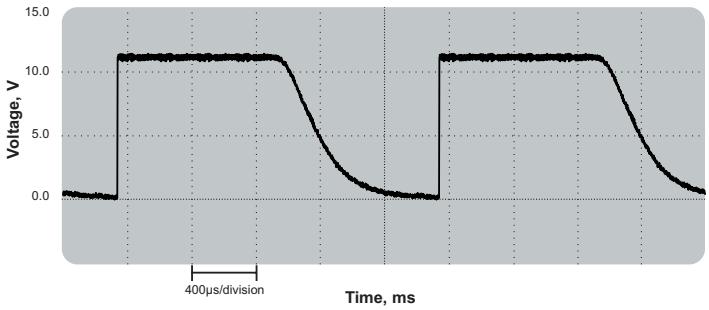
If the total power consumption of DNA-DIO-402 layer is over the 4.5W, the DNA-FANx rear-mount cooling fan is required.

Falling Edge:

5.1ms - Falling Edge of a Single Output Channel at 50Hz (No-Load Output[4])



406µs - Falling Edge of a Single Output Channel at 500Hz (200Ohms-Load Output)



[4] A pull-down resistor (Rp 10KΩ) on the output is added to provide stable signal level when driven with Logic "0", but it can't guarantee that output voltage will drop to 0V. That - will be achieved with user load.

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