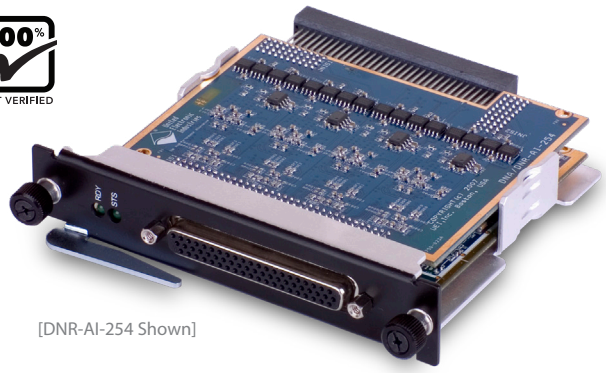
DNA/DNR-AI-254

4-Channel LVDT/RVDT Interface

- DNA-AI-254 for use with "Cube" chassis
- DNR-AI-254 for use with RACKtangle™ I/O chassis
- 4 LVDT/RVDT input channels or simulated outputs
- Also ideal for eddy current/inductive displacement sensors
- 16-bit resolution
- 4, 5 and 6-wire device support
- 2 to 6.7 Vrms programmable excitation per channel
- 100 Hz to 5 kHz excitation frequency range
- Up to 50 mA excitation current
- Fully Isolated (Chan to Chan and Chan to Cube)



[DNR-AI-254 Shown]

General Description

The DNA-AI-254 and DNR-AI-254 are four channel LVDT/RVDT input and output simulation boards for UEI's powerful data acquisition and control Cubes and RACKtangle I/O racks respectively. The boards are ideally suited for a wide variety of rotational and linear motion measurements in many industries. The boards also offer a unique LVDT/RVDT simulated output capability designed to provide stimulus in avionics test and simulator applications. Each of the four channels on the board may be configured as either an input channel with excitation or as an output/simulator.

The 4 input channels are compatible with 4-, 5- and 6-wire LVDT/RVDT configurations. The board's high precision circuitry combined with each channel's independent 16-bit A/D converters allow an overall measurement accuracy of better than 0.1%. The inputs may be read at rates up to one times the excitation frequency, though to increase noise immunity the default sample rate is one-tenth the reference frequency.

Each channel provides an independent excitation output user programmable from 2 to 6.7 Vrms at frequencies from 50 to 5,000 Hz. The excitation output is capable of driving currents up to 50 mA, suitable for driving primary impedances as low as 90 ohms at excitations up to 6 Vrms.

The DNA/DNR-AI-254 also provides up to 4 channels of simulated LVDT/RVDT output that are ideal for driving simulator inputs or for use in testing LVDT/RVDT measurement products. The outputs each accept an independent excitation signal and offer 2, 3 or 4 wire outputs with 16-bit resolution and an overall accuracy of better than 0.1%. Each channel is capable of driving up to 50 mA at 6.7 Vrms without external buffering.

The DNA/DNR-AI-254 offers 350 Vrms of isolation between channels as well as between the I/O connections and the Cube. Like all UEI "Cube" and RACKtangle compatible I/O boards, the DNA/DNR-AI-254 offers operation in harsh environments and Cube systems have been tested to 5g vibration, 50g shock, -40 to +85 °C temperatures and altitudes up to 70,000 feet.

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.

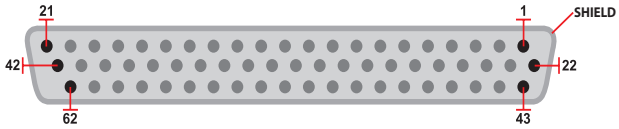
Technical Specifications:

Inputs	
Number of channels	4
Configuration	Supports all common input/excitation configurations (e.g. 4, 5 and 6-wire)
Resolution	16-bit
Accuracy	0.1%
Input Impedance	100 kOhm
Maximum input voltage	28 Vrms (requires external excitation above 6.7 Vrrms)
Excitation Frequency	100 Hz to 5.0 kHz, programmable with 1 Hz resolution, ±1.0 % overall accuracy
Excitation Voltage	2-6.7 Vrms, programmable with 0.05 Vrms resolution, ±0.1% overall accuracy
Excitation Drive	50 mA at 6.7 Vrms, 65 mA at 6 Vrms
Primary Impedance	90 Ohm min at 6 Vrms (or less) 200 Ohm, min at 10 Vrms
Update rate	Up to 1 times the excitation frequency. The default rate is 1/10 the excitation frequency
Simulation Outputs	
Number of channels	4
Configuration	2-, 3- or 4-wire
Resolution	16-bit
Output Accuracy	0.1%
Output Voltage	2 to 6.7 Vrms (3-wire simulated outputs requiring greater than 3.35 VRMS will require an external transformer coupler. For larger outputs please see the DNx-AI-256)
Output Drive Current	50 mA max
General Specifications	
Operating temperature	Tested -40 °C to +85 °C
Vibration	5g (operating)
Shock	100g (operating)
Humidity	0 to 95%, non-condensing
Altitude	120,000 ft
MTBF	275,000
Power consumption	8.2 Watt, (at maximum excitation drive)

Ordering Guide

Part Number	Description
DNA-AI-254	High Performance Four Channel LVDT/RVDT Input and Simulator Output
DNA-STP-62	62 conductor screw terminal panel
DNA-CBL-62	62 conductor shielded cable

Pinout Diagram:



	Pin	Signal	Pin	Signal	Pin	Signal
	1	Rsvd	22	Gnd	43	P1-
	2	P2+	23	P2-	44	P1+
Chan 0	3	Rsvd	24	n/c	45	Gnd
	4	S1+	25	S1-	46	Rsvd
	5	S2+	26	S2-	47	n/c
	6	Gnd	27	Rsvd	48	Rsvd
	7	P1+	28	P1-	49	Rsvd
Chan 1	8	P2+	29	P2-	50	Rsvd
	9	S1+	30	S1-	51	Gnd
	10	S2+	31	S2-	52	Rsvd
	11	Rsvd	32	n/c	53	P1-
	12	P2+	33	P2-	54	P1+
Chan 2	13	Rsvd	34	Gnd	55	Gnd
	14	S1+	35	S1-	56	Rsvd
	15	S2+	36	S2-	57	n/c
	16	Gnd	37	Rsvd	58	Rsvd
	17	P1+	38	P1-	59	n/c
Chan 3	18	P2+	39	P2-	60	Rsvd
	19	Rsvd	40	Gnd	61	S1-
	20	S2+	41	S2-	62	S1+
	21	Rsvd	42	n/c		

Notes:

--------Dashed Line represents the isolation barrier between channels

S1+ and S1- differential input pair connect to secondary 1

S2+ and S2- differential input pair connect to secondary 2

All inputs have 400 kOhm impedance to ground and do not require an external ground reference

P1+ and P1- represent the output of two independent D/A converters. They may be used together to provide a differential output pair, thus doubling the available output voltage. They may also be used independently as two single-ended D/A outputs. P1+ and P1- are usually connected to the LVDT/RVDT primary

P2+ and P2- represent the output of two independent D/A converters. They may be used together to provide a differential output pair, thus doubling the available output voltage. They may also be used independently as two single-ended D/A outputs. P2 outputs are not typically connected in LVD/RVDT measurement systems, but may be used to simulate the S2 secondary coil when the unit is used as a LVDT/RVDT simulator.