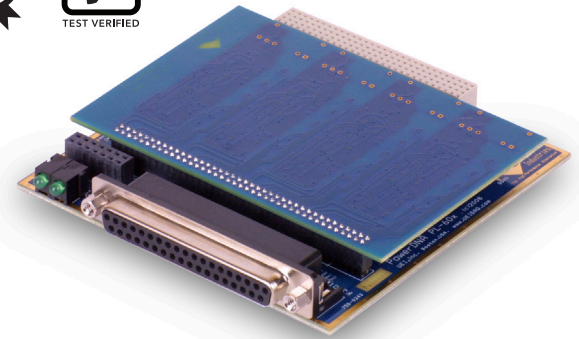


DNA/DNR-SL-501

RS-232/485 Serial Communications Interface

- DNA-SL-501 for use in "Cube" I/O chassis
- DNR-SL-501 for use in RACKtangle™ I/O chassis
- 4 independent ports with custom baud rates per port
- Arbitrary baud rate selection (0.01% accuracy)
- Max speed of 256 Kb/s for RS-232 and 2 Mb/s for RS-485
- J1587/J1708 support included
- Each port is software-configurable as RS-232 or RS-485
- Completely independent bit rate settings for every port
- 350 V isolation between ports, ports and circuitry; 15 kV ESD
- Compatible with RS-422 networks when used in RS-485 mode



General Description

The DNA-SL-501 and DNR-SL-501 are 4-port serial communications layers for UEI's popular "Cube" and RACKtangle I/O chassis respectively. The boards offer fully isolated serial interfaces, software-configurable as RS-232 or RS-485. DNA/DNR-SL-501 supports up to 2 Mbit/s transfer speed in RS-485 mode or up to 256 Kb/s in RS-232 mode. A special version of the board, designated as the DNx-SL-501-804 supports baud rates up to 4 Mbit/s. The boards use a 16550C UART emulation on each port (FIFO mode only) and support half- and full-duplex mode over RS-485.

The DNA/DNR-SL-501 is compatible with RS-422 networks when used in RS-485 mode. The layer provides 200Ω software-selectable TX and/or RX termination for RS-485 communications. The DNA/DNR-SL-501 is an ideal solution for connecting serial based data acquisition devices to the Ethernet as well as interfacing to a wide variety of serial based devices and legacy DAQ systems. In addition to standard serial I/O features, the DNx-SL-501 offers a series of additional functions. These functions include:

- Fully customizable baud rates generated by programmable PLL on per-channel basis from 300baud to 2Mbaud
- Programmable inter-character delay (required to drive/simulate some avionics instruments)
- Programmable inter-frame delay (used to schedule frames at different rate)
- Automatic repeat of the last frame if new data is not sent from the host on time (required to keep "inop" flag happy on many avionic devices)
- None/Even/Odd/Space/Mark parity in 8-bit mode and per-symbol programmable in 9-bit mode
- Automatic in-hardware or software flow control
- Asynchronous event mode with loop closure in 100us (for avionics expecting immediate reply)
- Echo suppression in half-duplex mode (for 422 mode)
- Timeout programmable in 10us, 100us or 1ms intervals

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.

Finally, the DNx-SL-501-804 includes the UEI-RSS, remote serial server. The RSS allows the SL-501 slots to be configured as standard "Com" ports in both Windows and Linux environments.

Technical Specifications:

General Serial Specifications

Number ports	4
Serial Interfaces	RS-232, RS-485(RS-422), per-port software-configurable
Max. speed:	
RS-232	256 Kb/s
RS-485	2 Mb/s (A special version of the product, the DNx-SL-501-804 supports up to 4 Mb/s)
Baud rate selection	Any rate from 300 baud to 2 Mbaud, with 0.01% accuracy
Supported Modes:	
RS-232	
RS-485	half- and -full-duplex
RS-232/485 Transceiver	MAX3160E (w/ fail-safe RS-485 RX termination)
UART Controller	16550C emulation (w/ extended parity control)
Protection	350 V channel-to-channel; 15 kV ESD protection
Power Consumption	2-5 W (RS-485 mode with max current drive)
Operating Temperature	Tested -40 to +85 °C
Operating Humidity	0 - 95%, non-condensing

UART Controller

Base Clock	66 MHz, 24 MHz, custom
FIFO Size	2048 (input and output)
Error Detection	interrupts-based, 4 per port
Dedicated Port Interrupts	UART interrupt, Timeout interrupt, TX/RX FIFO interrupt

General and Environmental

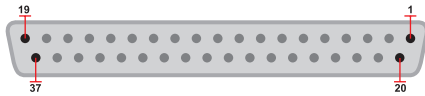
Isolation	350 Vrms port-to-port and port-to-chassis
Power Consumption	2.0 W (not including output loads)
Operating Temp. (tested)	-40 °C to +85 °C
Operating Humidity	95%, non-condensing
Vibration IEC 60068-2-6	5 g, 10-500 Hz, sinusoidal
IEC 60068-2-64	5 g (rms), 10-500 Hz, broad-band random
Shock IEC 60068-2-27	100 g, 3 ms half sine, 18 shocks @ 6 orientations 30 g, 11 ms half sine, 18 shocks @ 6 orientations
MTBF	350,000 hours
Altitude	120,000 FT

Pinout Diagram:

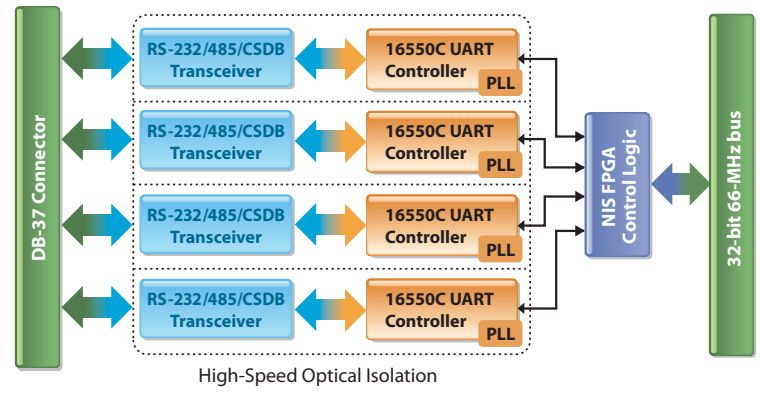
DB-37 (female)
37-pin connector:

J1	DB-9*	RS-232	RS-485
19	3	TXD1	TX1-
37	2	RXD1	TX1+
18	7	RTS1	TX1+
36	8	CTS1	RX1-
17	6	-	-
35	5	GND1	GND1
16	4	-	-
34	1	-	-
15	9	-	-
33	3	TXD2	TX2-
14	2	RXD2	RX2+
32	7	RTS2	TX2+
13	8	CTS2	RX2-
31	6	-	-
12	5	GND2	GND2
30	4	-	-
29	9	-	-
11	1	-	-
29	9	-	-
10	3	TXD4	TX4-
28	2	RXD4	RX4+
9	7	RTS4	TX4+
27	8	CTS4	RX4-
8	6	-	-
26	5	GND4	GND4
7	4	-	-
25	1	-	-
6	9	-	-
24	3	TXD3	TX3-
5	2	RXD3	RX3+
23	7	RTS3	TX3+
4	8	CTS3	RX3-
22	6	-	-
3	5	GND3	GND3
21	4	-	-
2	1	-	-
20	9	-	-
1	-	-	-

GNDx: Isolated ground for the corresponding serial port
TXDx/RXDx: RS-232: Transmit/Receive
RTSx/CTSx: RS-232: request to Send/Clear to Send
TXx+/TXx-: RS-485: Transmit pair
RXx+/RXx-: RS-485: Receive pair
 - no internal connection



Block Diagram



Options:

Part #	Description
DNA-CBL-COM	1ft. DB37 cable split into four DB9 connectors