

DNR-MIL Series RACKtangles

12- Slot, Military Style I/O Rack

- Military/Rugged 38999 connectivity
- 100% COTS solution
- Supported by over 50 standard DNR-series I/O boards
- 5 g vibration, 100 g shock, sealed to IP66
- Dual GigE ports (control and diagnostic)
- Designed for MIL-STD-461/810/1275 compliance
- Extensive built-in system diagnostics
- PDNR, UEIPAC, UEISIM & UEIMODBUS configs.
- No rotary cooling devices
- Extensive software support including Windows, Linux, QNX, RTX and more
- VxWorks support available in embedded or hosted configurations.

10-Year
Availability
Guarantee



The new MIL series RACKtangle provides 12 I/O slots and uses standard DNR-series I/O boards (e.g. DNR-AI-217). It is available in the standard PowerDNR configuration or as a UEIPAC or UEISIM.

General Description

The DNR-MIL is the latest deployment of UEI's popular RACKtangle® architecture. Though the original RACKtangles are quite rugged, the DNR-MIL series takes ruggedness to the extreme. Designed for use in the toughest environments, the new RACKtangle is an ideal solution for military and aerospace deployments. The form factor is also ideal for a huge assortment of commercial applications including use on oil drilling platforms and refineries, heavy machinery, outdoor test stands and any other I/O application that will be exposed to the elements. All connectivity is through ROHS compliant 38999 connectors.

Electronically, the DNR-MIL RACKtangle is identical to the standard DNR series RACKtangle except for the added hold-up and protection circuitry added to the power supply inputs. (This power supply conditioning is required in order to meet MIL-STD-1275.) This means the DNR-MIL uses our standard DNR-series board (e.g. DNR-AI-217 or DNR-1553-553). With over 50 unique I/O boards and 12 slots available there's sure to be a configuration perfectly matching your application.

The new RACKtangle is designed to meet the most commonly required elements of MIL-STD-461 and -810 and is sealed to at least IP66/NEMA6 standards. All this is housed in a compact 17.5" x 8.125" x 7" chassis, weighing less than 22 pounds and typically consuming less than 40 Watts. In addition, no rotary cooling fans are used in the design which maximizes MTBF and mechanical reliability. All internal printed circuit boards are conformal coated to ensure the highest reliability.

The RACKtangle chassis is available in four different deployment options. In PowerDNA, UEIPAC, UEISIM and UEIMODBUS.

PowerDNA: DNR-MIL

In PowerDNA mode, the RACKtangle operates as a slave I/O device, running under the control of a host PC. All application code in this mode is created and run on the host. PowerDNR mode offers almost unprecedented software support including:

- All popular operating systems including Windows, Linux, VxWorks, QNX, RTX and InTime
- All popular programming languages including VB, VB.NET, C, C#, C++, JAVA
- All popular application packages including MATLAB, Simulink, LabVIEW, DasyLAB and more.

UEIPAC 1200-MIL

When deployed as a UEIPAC, the standard firmware running on a RACKtangle is replaced by either a Linux or VxWorks operating system. The user then writes the Linux/VxWorks application that runs on the RACKtangle. In this mode the RACKtangle can run fully stand-alone, or may be linked to a SCADA host via the Ethernet.

UEISIM 1200-MIL

Simulink users will appreciate the ability to build models in Simulink, compile them in Embedded Coder and then deploy them on the UEISIM hardware. It's an ideal platform for testing models on actual hardware. Once the model is proven, it can be deployed using the exact same hardware.

UEIMODBUS 1200-MIL

Users needing a compact, rugged Modbus TCP I/O slave will appreciate UEIMODBUS. The rugged, IP66/NEMA6 sealed MIL RACKtangle allows you to deploy your I/O system in the field, without any additional enclosure and protection.

The DNR-MIL platform is 100% COTS, made in the USA and supported by UEI's family of over 50 compatible analog, digital and interface I/O boards, including analog inputs up to 24-bits, thermocouples, RTDs, ICP/IEPE, ARINC-429/453/708, MIL-STD-1553, CAN, RVDT/LVDT, synchro/resolver, RS-232/422/485, strain gauge, quadrature encoder, high-voltage analog outputs (up to 115 VDC) with high drive analog output (up to 200 mA), function generator outputs and more.

Whether your application is on a ship or boat, in an aircraft, in a rocket, on an outdoor test cell, on an oil platform or simply going to be left outside and exposed to the elements, the DNR-MIL RACKtangle is an ideal solution. Of course if you need fewer I/O, you should consider the 4.45" x 6.75" x 7.35" DNA-MIL Cube which offers many of the same features and options, but offers slots for up to 4 I/O boards in a much smaller chassis.

Technical Specifications

DNR-MIL (Power DNA mode)

Computer Interface		PPC _x -1G series GigE RACKtangles
Primary Ethernet Port	10/100/1000Base-T, 38999 connector	
Diagnostic Port	10/100/1000Base-T, 38999 connector	
Config/Serial Port	RS-232, 38999 connector	
Sync	1. DNR-SYNC-1G series cables and boards provide both clock and trigger sync signals. 2. DNR-IRIG-650 board provides IRIG and GPS time synchronization	
I/O Board Support		
Series supported	All DNR-series boards	
Processor/system		
CPU	Freescale 8347, 400 MHz, 32-bit	
Memory (RAM)	256 MB	
Memory (Flash)	32 MB	
Host Communications		
Distance from host	100 meters max, CAT5 cable	
Ethernet data transfer rate	20 megabyte per second	
Analog data transfer rate	>6 megasample per second. Capable of sustained transfer in any RACKtangle	
DMAP I/O mode	update >1,000 I/O channels at 4 kHz, guaranteed	
Physical Dimensions / Weight		
12 I/O slots	DNR-MIL: 17.5" x 8.1" x 7.0" / 22 lbs.	
Environmental*		
Electrical Isolation	350 Vrms	
Temp (operating)	-40 °C to 70 °C	
Temp (storage)	-40 °C to 85 °C	
Humidity	0 to 95%, non-condensing	
Vibration		
(IEC 60068-2-64)	MIL-STD-810G plus the IEC specs below	
(IEC 60068-2-6)	10–500 Hz, 5 g (rms), Broad-band random	
(IEC 60068-2-6)	10–500 Hz, 5 g, Sinusoidal	
Shock		
(IEC 60068-2-27)	MIL-STD-810G plus the IEC stds below	
	100 g, 3 ms half sine, 18 shocks at 6 orientations;	
	30 g, 11 ms half sine, 18 shocks at 6 orientations	
Altitude	70,000 feet, maximum	
EMI / RFI	Designed to meet MIL-STD-461	
Power Requirements		
Voltage	9 - 36 VDC (115/220 VAC adaptor available)	
Power	12 Watts (not including I/O boards)	
Power Quality requirement	Designed to meet MIL-STD-1275	
Reliability		
MTBF	>100,000 hours	

UEIPAC 1200-MIL

Computer Interface		PPC _x -1G series GigE RACKtangles
Primary Ethernet Port	10/100/1000Base-T, 38999 connector	
Diagnostic Port*	10/100/1000Base-T, 38999 connector *Alternatively can be teamed/bonded with primary port.	
Config/Serial Port	RS-232, 38999 connector	
USB Port	USB 2.0 fully supported	
Synchronization Options	1. DNR-SYNC-1G series cables and boards provide both clock and trigger sync signals. 2. DNR-IRIG-650 board provides IRIG and GPS time synchronization 3. PTP client provides software implementation of IEEE-1588	
I/O Board Support		
Series supported	All DNR-series boards	
Software / Operating System		
Embedded OS	Linux, kernel 2.6.x (VxWorks Available)	
Real-time support	Xenomai RTOS support	
Dev Language	C/C++, Eclipse IDE support,	
Dev Environments	Linux PC or Cygwin Windows environment	
EPICS CAS interface	Yes	
SNMP Library	Yes	
OS royalties	none	
Processor/system		
CPU	Freescale 8347, 400 MHz, 32-bit	
Memory	256 MB (128 MB avail for application SW)	
FLASH memory	32 MB (16 MB available for user apps)	
SD card interface	SD cards up to 32 GB	
USB drive interface	Standard USB 2.0 port	
Physical Dimensions		
12 I/O slots	17.5" x 8.1" x 7.0" / 22 lbs.	
Environmental		
Electrical Isolation	350 Vrms	
Temp (operating)	-40 °C to 70 °C	
Temp (storage)	-40 °C to 85 °C	
Humidity	0 to 95%, non-condensing	
Vibration		
(IEC 60068-2-64)	MIL-STD-810G plus the IEC specs below	
(IEC 60068-2-6)	10–500 Hz, 5g (rms), Broad-band random	
(IEC 60068-2-6)	10–500 Hz, 5 g, Sinusoidal	
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(IEC 60068-2-27)	MIL-STD-810G plus the IEC stds below	
	100 g, 3 ms half sine, 18 shocks at 6 orientations;	
	30 g, 11 ms half sine, 18 shocks at 6 orientations	
Altitude	70,000 feet, maximum	
EMI / RFI	Designed to meet MIL-STD-461	
Power Requirements		
Voltage	9 - 36 VDC (115/220 VAC adaptor available)	
Power	12 Watts (not including I/O boards)	
Power Quality requirement	Designed to meet MIL-STD-1275	
Reliability		
MTBF	>100,000 hours	

**Also available in the
UEIMODBUS Configuration!**

Technical Specifications

UEISIM 1200-MIL

Computer Interface		PPCx-1G series GigE RACKtangles
Primary Ethernet Port		10/100/1000Base-T, 38999 connector
Diagnostic Port		10/100/1000Base-T, 38999 connector
Daisy chain output		n/a
Optional Interface		n/a
Config/Serial Port		RS-232, 38999 connector
USB Port		USB 2.0 fully supported
Sync		DNR-SYNC-1G series cables and boards provide both clock and trigger sync signals
I/O Board Support		
Series supported		All DNR-series boards
Software Requirements		
MATLAB		Version 2007b or greater
Simulink		Version 7.0 or greater
Real-Time Workshop		Version 7.0 or greater
Software / Operating System		
Embedded OS		Linux, kernel 2.6.x, Xenomai RTOS support
Dev Language		C
Dev Environments		Simulink / RTW with Cygwin environment on a Windows PC
Processor/system		
CPU		Freescall 8347, 400 MHz, 32-bit
Memory		256 MB (128 MB available for application SW)
SD card interface		SD cards up to 32 GB
USB drive interface		Standard USB 2.0 port
Physical Dimensions		
12 I/O slots		17.5" x 8.1" x 7.0" / 22 lbs.
Environmental		
Electrical Isolation		350 Vrms
Temp (operating)		-40 °C to 70 °C
Temp (storage)		-40 °C to 85 °C
Humidity		0 to 95%, non-condensing
Vibration		
(IEC 60068-2-64)		MIL-STD-810G plus the IEC specs below
(IEC 60068-2-6)		10–500 Hz, 5 g (rms), Broad-band random
		10–500 Hz, 5 g, Sinusoidal
Shock		
(IEC 60068-2-27)		MIL-STD-810G plus the IEC stds below
		100 g, 3 ms half sine, 18 shocks at 6 orientations;
		30 g, 11 ms half sine, 18 shocks at 6 orientations
Altitude		70,000 feet, maximum
EMI / RFI		Designed to meet MIL-STD-461
Power Requirements		
Voltage		9 - 36 VDC (115/220 VAC adaptor available)
Power		12 Watts (not including I/O boards)
Power Quality requirement		Designed to meet MIL-STD-1275
Reliability		
MTBF		>100,000 hours

Cables, Connectors and screw-terminal panel accessories.

Connectors

All connections to the DNR-MIL are made through standard, COTS, nickel plated 38999 connectors. I/O board connections are made through 128-pin connectors where each I/O board utilizes up to 62 of the 128 pins. The Ethernet, USB, diagnostic Serial, Sync, and hardware reset connections are via 37-pin connectors. Power supply and an auxiliary synch bus connections are through a 13-pin connector.

Cables

Though most customers will design custom cables for their deployed systems, customers working on prototypes and/or those building "one of" systems may desire the ability to connect to the DNR-MIL using more traditional, commercial connections (e.g. RJ-45 for the Ethernet ports).

For these customers UEI offers a complete array of cables and screw terminal panels that will provide direct access to all signals routed in and out of the chassis.

LAN/Power Cables

DNA-CBL-LAN-06 Communications cable

6 foot cable connecting the 37-pin LAN/COM/USB port connector to standard commercial connectors. Ethernet ports come out to RJ-45, the serial port to a DB-9 and the USB ports to standard USB jacks.

DNA-CBL-1315-03 Power supply cable

Connects the 13-pin power/sync connector to a standard female DB-15 connector.

I/O board cables

Each 128 pin I/O 38999 connector provides the I/O connectivity for two I/O slots within the DNR-MIL. UEI I/O boards utilize either 37- or 62-pin D connectors and these connectors are mapped as follows.

The left I/O slot (even slot #) maps to pins 1-62 on the 128 pin 38999. The right I/O slot (even slot #) is mapped to pins 65-126 on the 38999. Note that the 37-pin based boards simply do not use pins 38-62. For this reason, most applications can standardize on 62-pin cables and screw terminal panels and simply ignore "no connection" pins. The exception to this is the STP boards that have been specifically designed for use with 37-pin boards (e.g. DNA-STP-207TC). For these boards 37-pin are also available. Also, as some I/O slots may not be utilized in a given application, cables with a single 37-pin or 62-pin D connector are also available.

The following cables provide the same I/O connectivity as the standard, commercial DNA-CBL-37S and DNA-CBL-62 series cables.

DNA-CBL-12862-05: 5 ft male 128-pin 38999 to 2x DB-62M

DNA-CBL-12837-05: 5 ft male 128-pin 38999 to 2x DB-37F

DNA-CBL-6237M-05: 5 ft male RoHS 128-pin 38999 to 1x DB-37F and 1x DB-62M

DNA-CBL-62M-03: 3 ft male 128-pin 38999 to 1x DB-62M

DNA-CBL-37M-03: 3 ft male 128-pin 38999 to 1x DB-37F

Screw Terminal Panels

DNA-STP-37 Standard 37-pin screw terminal panel, suitable for use with all 37-pin I/O boards and cables.

DNA-STP-62 Standard 62-pin screw terminal panel, suitable for use with all 62-pin I/O boards and cables.

DNA-STP-3762 Standard 37-pin screw terminal panel, providing both 37- and 62-pin connectors and suitable for use with any combination of I/O board.