

UEI-HUMS1

UH-1N Health & Usage Monitoring System

- Military/Rugged 38999 connectivity
- 100% COTS solution based on UEI's UEIPAC 800-MIL
- Tested to DO-160 and MIL-STD-810
- 5 g vibration, 100 g shock, sealed to IP66
- Dual GigE ports supporting bonded/teamed redundancy
- Designed for MIL-STD-461/1275 compliance
- Compact design fits in compartment under UH-1N floor
- MTBF > 27,000 hours
- No rotary cooling devices
- I/O configured specifically for UH-1N
- Keyed/clocked I/O connectors
- 10 year availability guarantee



The UEI-HUMS1 provides 8 I/O slots and uses standard DNR-series I/O boards (e.g. DNR-AI-255).

General Description

The UEI-HUMS1 is a powerful Health and Usage Monitoring systems based on UEI's COTS UEIPAC 800-MIL 8-slot I/O chassis. The unit includes 8 I/O boards selected specifically to match the UH-1N application. The specific I/O boards included in the UEI-HUMS1 are:

Slot 1	DNR-DIO-449	48 bit digital input board
Slot 2	DNR-AI-255	2 channel synchro/resolver board
Slot 3	DNR-AI-228-300	16 channel, isolated HV A/D board
Slot 4	DNR-AI-255	2 channel synchro/resolver board
Slot 5	DNR-429-566	12 channel ARINC-429 interface
Slot 6	DNR-AI-255	2 channel synchro/resolver board
Slot 7	DNR-AI-248-230	24 channel A/D board
Slot 8	DNR-VR-608	8 channel rotational speed board

All the required software for the above boards is included with the UEI-HUMS1 and its Linux operating system. The unit has been tested to MIL-STD-810 as well as DO-160. It has also been designed to meet the most commonly required elements of MIL-STD-461, -704 and -1275 and is sealed to at least IP66/NEMA6 standards. All this is housed in a compact 17.5" W x 8.125" D x 7" H chassis, weighing less than 20 pounds and typically consuming less than 30 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 UEIPAC 1200-MIL chassis on which the UEI-HUMS1 is based is the latest deployment of UEI's popular DNR-MIL RACKtangle® architecture. However, the UEI-HUMS1 is based on a smaller version that includes 8 slots instead of the UEIPAC 1200's 12 slots. The smaller size allows the UEI-HUMS1 to be mounted under the UH-1N's floor without interfering with the various control rods that extend through the area.

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 chassis 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, shipboard control, 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 series is identical to the standard DNR Series RACKtangle, except for 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).

When deployed, the UEI-HUMS1 runs an application on a Linux operating system. This allows unit to both run standalone control operations as well as running as part of a SCADA system controlled and/or monitored by an external host computer. The VxWorks application, in conjunction with the unit's dual Ethernet ports, allows the link to the host PC to be implemented in a fully redundant network.

The DNR-MIL platform is 100% COTS, and supported by UEI's family of over 90 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/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 chassis on which the UEI-HUMS1 is based is an ideal solution. Of course if you need fewer I/O, you should consider the 4-slot 6.2" W x 8.7" D x 7.1" H 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

UEI-HUMS1

Computer Interface	
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.
Configuration/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 synchronization 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 (VxWorks optional)
Real-time Support	RT Linux or Xenomai supported
Development Language	C/C++, Eclipse IDE support,
Development Environments	Standard Linux tools
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)
USB Drive Interface	Standard USB 2.0 port
Physical Dimensions	
12 I/O slots	17.5"W x 8.1"D x 7.0"H, 20 lbs.
Environmental	
Electrical Isolation	350 Vrms
Temperature (operating)	-40 °C to 70 °C
Temperature (storage)	-40 °C to 85 °C
Humidity	0 to 95%, non-condensing
Vibration	MIL-STD-810G plus the IEC specs below
(IEC 60068-2-64)	10–500 Hz, 5 g (rms), broadband random
(IEC 60068-2-6)	10–500 Hz, 5 g, Sinusoidal
Shock	MIL-STD-810G plus the IEC stds below
(IEC 60068-2-27)	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	<30 W operating including I/O boards
Power Quality requirement	Designed to meet MIL-STD-1275
Reliability	
MTBF	>27,360 hours

Optional Cables, Connectors and screw-terminal panel accessories

Connectors

All connections to the UEI-HUMS1 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 off” 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/synch 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.