Ultra-Compact & Rugged
IP66 Rated 4-Slot I/O Chassis   UEIPAC BRICK4

KEY FEATURES

- 4 I/O Slots, with over 80+ I/O board options available.
- -40 °C to 85 °C and 100g Shock.
- IP66/NEMA 4.
- Sealed I/O connectors.
- Dual Ethernet connections through M12 connectors.
- Power over Ethernet, and/or multiple power inputs for redundancy.
- Support for Linux, VxWorks, Modbus, iDDS and VISTAS.
- Long-term product availability with UEI's industry leading 10-Year Availability Guarantee.
- 3-Year Standard Warranty, 5-Year Available.
- 100% COTS and made in the USA.

The new UEIPAC BRICK4 provides 4 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, including UEISIM, iDDS, UEIMODBUS and UEIOPC deployment options.

General Description

The UEIPAC BRICK4 is the latest deployment of UEI's popular RACKtangle® architecture. The IP66/NEMA 4 rating ensures it works in tough indoor or outdoor environments. The unit's footprint is extremely small and is ideal for a huge assortment of commercial and military applications, including jet engine test stands, flight line systems, oil drilling platforms and refineries, heavy machinery and any other areas that will be exposed to harsh elements.

The UEIPAC BRICK4 offers slots for 4 I/O boards, and with over 80 unique UEI I/O boards, there is sure to be a configuration matching your application. Sealed D-Sub I/O connectors ensure pinout compatibility with all of UEI's popular DNx-series I/O boards. Ethernet connections are made through standard M12 connectors, ensuring compatibility with industry standard cables. The DNR-BRICK4 may be powered via standard 4 pair PoE++ (802.3bt) compatible Ethernet ports. PoE supplies up to 55W, though the UEIPAC BRICK4 consumes less than 30W. Redundant power sources may be used via the 25-pin D-Sub connector, and the primary source is programmable. For non-POE applications, the chassis requires 9-36 VDC. An optional AC/DC power supply is available (DNA-PSU-60). Built-in power supply voltage monitoring offers health and usage monitoring. All this is housed in a 9.5" (wide), 7.06" (tall), 3.55" (deep) chassis, weighing approximately 7 pounds including I/O boards and typically consumes fewer than 25 Watts. Heat transfer from the internal electronics to the external chassis is designed such that no fans or rotary cooling is required. The lack of fans maximizes MTBF and mechanical reliability.

UEIPAC embedded deployment: The UEIPAC BRICK4 is electronically identical to the standard UEIPAC Series RACKtangle, and, as the unit is a UEIPAC deployment, it can run fully stand-alone and/or embedded. The standard firmware running on a traditional RACKtangle is replaced by either a Linux or VxWorks operating system. The user then writes the Linux/VxWorks application that runs on the UEIPAC BRICK4 hardware. For more information on the UEIPAC deployment, please see the specifications shown on the following page or visit the UEIPAC on our website.

Regardless of your application, the UEIPAC BRICK4 is an ideal solution for any I/O system that is going to be subjected to the elements or otherwise be exposed to either liquid or particulate contamination.

Deployment Options Overview

The UEIPAC BRICK4 is also available in different deployment options, including PowerDNR, UEISIM, UEI iDDS, UEIMODBUS and UEIOPC. More information on these deployment options can be found below.

PowerDNA **(DNR-BRICK4):** In PowerDNA mode, the chassis 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. PowerDNA mode offers almost unprecedented software support, including:

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

UEISIM **series:** Simulink users will appreciate the ability to use Simulink Coder to compile and deploy their models 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.

UEIPAC iDDS **series:** This deployment can be configured to run the rapidly growing family of iDDS products. iDDS provides an ideal solution for applications where data needs to be shared across various chassis and also has the advantage of vendor independence.

UEIMODBUS **series:** Users needing a compact, rugged Modbus TCP I/O slave will appreciate UEIMODBUS. The rugged, IP66/NEMA 4 sealed unit allows you to deploy your I/O system in the field, without any additional enclosure and protection.

UEIOPC **series:** A rugged and standalone OPC-UA server (not dependent on Windows), supporting the OPC-UA Historian functionality. System configuration is made easy by an intuitive, easy to use web/HTML interface.

Technical Specifications
UEIPAC BRICK4 is not field serviceable. Power supply not included.

Computer Interface	
Primary Ethernet Port	10/100/1000Base-T, M12 connector
Diagnostic Port*	10/100/1000Base-T, M12 connector
	*Alternatively can be teamed/bonded with primary port.
Power/Serial/Reset/Sync	RS-232, 25-pin D-Sub connector
USB Port	USB 2.0 fully supported
Synchronization Options	1. PTP client provides software implementation of IEEE-1588
	2. DNR-SYNC-1G series cables and boards provide both clock and trigger sync signals
	3. DNR-IRIG-650 board provides IRIG time synchronization

I/O Board Support	
Series supported	All DNR-series boards

Physical Dimensions	
4 I/O slots	9.5 " x 7.06" x 3.55"/ 7 lbs., Including I/O boards

Environmental	
Electrical Isolation	350 Vrms
Temp (operating)	-40 ℃ to 85 ℃
Temp (storage)	-40 ℃ to 85 ℃
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), Broad-band 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
IP Rating	IP66/NEMA 4 sealed
Altitude	70,000 feet, maximum
EMI / RFI	Designed to meet MIL-STD-461, CE, FCC Part 15, Subpart B

Power Requirements	
Voltage	PoE++ (IEEE 802.3bt) power with redundant power input, 9 - 36 VDC (115/220 VAC adaptor available)
Power	10 Watts (not including I/O boards)
Power Quality requirement	Fully compliant with all CE requirements

Reliability	
MTBF	>130,000 hours (not including I/O boards)

Software / Operating System	Option 02/03 (with 8347 CPU)	Option 11 (with SoloX/ARM CPU)
Embedded OS	Linux, kernel 4.9.x or VxWORKS v6.9	4.9.88 kernel based Real-time Linux
Real-time support	Linux RT, VxWORKS	Linux RT
Dev Language	C/C++, Eclipse IDE support	C/C++, or Python, Eclipse IDE support
Dev Environments	Linux PC or Cygwin Windows environment	Linux PC or Cygwin Windows environment
EPICS CAS interface	Yes (Linux version)	Yes
SNMP Library	Yes	Yes
OS royalties	None	None

Processor/System	Option 02/03 (with 8347 CPU)	Option 11 (with SoloX/ARM CPU)
CPU	Freescale 8347 / 8347E, 400 MHz, 32-bit	SoloX / i.MX6 Cortex A9 ARM 1 GHz
Memory	256 MB	1 GB
FLASH memory	32 MB, CPU option 02 128 MB, CPU option 03	8 GB
Solid State Hard Drive	Up to 16 GB	Up to 16 GB, up to 1 TB in M.2 slot
M.2 PCIe slot (internal, non-removable installed at factory)	-	1 slot for 42-20, 60-20, or 80-20 cards
µSD/SD card interface (internal, non-removable, installed at factory)	SD up to 32 GB	µSD up to 32 GB

UEIPAC BRICK4 Interface

A I/O Board Slots
4 D-Sub connectors allow for connection to all DNR series I/O boards through standard cables. Boards installed in the I/O slots perform the various analog, digital and communications functions you need for your specific application. Your signals may be connected directly to the I/O boards via your custom cabling or take advantage of our wide variety of easy-to-use, external screw terminal panels. Boards ordered with the DNR-BRICK4 are factory installed.

B Power/Diagnostic/Sync/Reset Connector
Vin1/Vin2 - redundant power input, Synch IN0/IN1 for synching, triggering   and reset, and can be used for automatic IP address selection. RS-232 for Diagnostics.

C NIC 1 / PoE++ Connector
M12 connector provides the interface to the NIC1, GigE port as well as the unit's PoE++ (802.3bt) connections.

D Communication Status LEDs
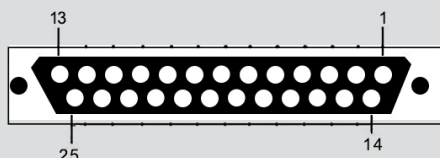These LEDs monitor communications.

E NIC 2 Connector
M12 connector provides the interface to the NIC2, GigE port.

F USB Port
USB connector provides the interface to the USB 2.0 port.

## Power/Diagnostics/Sync/Reset connector (25-pin DBF)

PIN	Signal	PIN	Signal	PIN	Signal	PIN	Signal
1	Sync Gnd	8	VIn1 Gnd	14	Sync IN0	20	VIn2 9-36 VDC
2	Sync Gnd	9	rsvd	15	Sync IN1	21	VIn1 9-36 VDC
3	Sync Gnd	10	rsvd	16	Sync IN2/Reset	22	rsvd
4	Sync Gnd	11	rsvd	17	Sync Out0	23	rsvd
5	Sync +5V	12	RS-232 RX	18	Sync Out1	24	RS-232 Gnd
6	Sync +5V	13	RS-232 Gnd	19	Sync Out2	25	RS-232 Gnd
7	VIn2 Gnd						

Notes:

1. Please do not connect anything to rsvd pins.

2. Sync IN0/IN1 can be used to automatically select the system's IP addresses. The unit can be set to boot with one of three IP addresses determined by the states of IN0/IN1. This allows the unit's IP address to be controlled by the installation. This allows multiple units to be installed on the same network at separate IP addresses without requiring any reprogramming of the units.

3. VIn1 and VIn2 are isolated with diodes that allow redundant power supplies to power VIn1 and VIn2. If either power supply fails, or drops below ~0.5V relative to the other supply, that diode will cease conducting and the other power supply will provide power. In single power supply applications, it is recommended that VIn1 is connected to VIn2, and VIn1 Gnd to VIn2 Gnd.

4. To simplify connections to the power/diagnostic/sync/reset connector, UEI offers the optional DNR-BRICK4-DIAG kit. Please see details on the following page.

UEIPAC BRICK4 Footprint
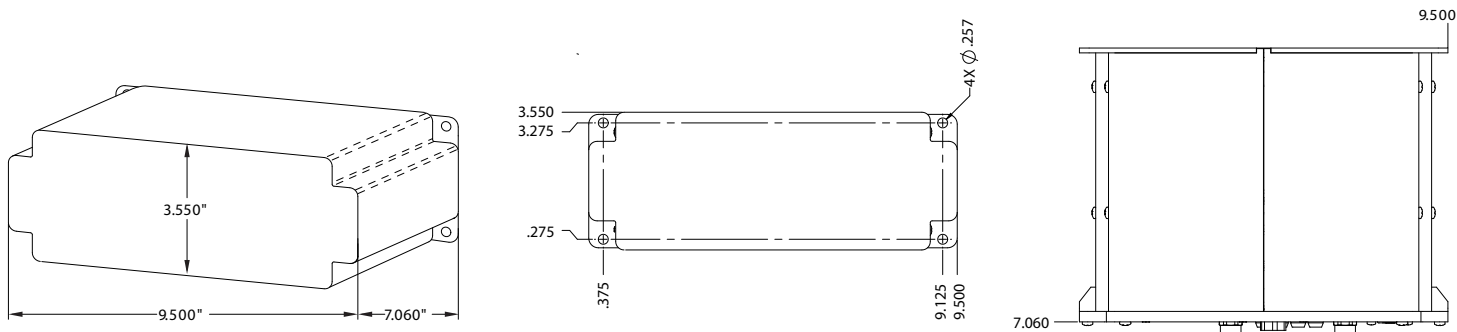
Ordering Guide: (All chassis include pre-installed Linux OS.)

UEIPAC BRICK4

*CPU Configuration

02	- Standard 8347 CPU board supports:
	  • IEEE-1588
	  • Solid-state hard drives
	  • 256 MB of RAM

03	- Upgraded CPU board adds:
	  • IEEE-1588
	  • Solid-state hard drives
	  • 8347E CPU includes hardware accelerator for encryption
	  • 128 MB of Flash, 256 MB of RAM

11	- SoloX/ARM CPU board adds:
	  • 4.9.88 kernel based Real-time Linux
	  • 8 GB of Flash, 1 GB of RAM
	  • M.2 PCIe slot (internal) for 42-20, 60-20, or 80-20 cards

Software Deployment options

PA	- Standard UEIPAC Linux deployment
ID	- iDDS (UEI iDDS) deployment option
SM	- Simulink (UEISIM) deployment option
MB	- Modbus (UEIModbus) deployment option
OP	- OPC-UA (UEIOPC-UA) deployment option
VS	- UEIPAC VISTAS deployment
VX	- UEIPAC VxWorks deployment

SD / µSD Card**

00	- No SD card
S8	- 8 GB SD card
32	- 32 GB SD card
M8	- 8 GB µSD card
M3	- 32 GB µSD card

Solid State Hard Drive**

| 08 | - Includes 8 GB SS Drive |
| 16 | - Includes 16 GB SS Drive |

*Default Boot Software Location

-02 CPUs: If an SSD is installed, the CPU boots from SSD. Otherwise it boots from the SD card.

-03 CPUs: The CPU boots from FLASH memory

-11 CPUs: The CPU boots from FLASH memory

** SD/µSD and solid-state hard drives are factory installed. Field removal/installation is not recommended.

For example, a standard UEIPAC BRICK4 with 8347 PowerPC, an 8 GB SS Drive, no SD card in standard PAC mode would be:

UEIPAC BRICK4 - 02 - 08 - 00 - PA

DNR-STP-BRICK4

The optional DNR-STP-BRICK4 (shown above) provides easy connections to the 25-pin D-Sub diagnostic/power/sync connector. Power (for non POE or backup) connections are provided via standard UEI power supply Molex connectors. RS-232 connections are through a 9-pin D-Sub connector while sync connections are provided via a RJ-50 connector. Please see the accessories section below for order info.

Accessories

Part Number	Description
DNR-BRICK4-DIAG	Diagnostic kit includes DNR-STP-BRICK4 interconnect board plus 25-pin and 9-pin cables
DNR-STP-BRICK4	Diagnostic board provides simple connection to the 25-pin Power/Diagnostics/Sync/Reset connector
DNA-CBL-25MM6	6 foot cable connects the 25-pin Power/Diag/Sync/Reset connector to the DNA-STP-BRICK4 board.
DNA-DB9MF-CBL	9-pin interconnect cable connects DNA-STP-BRICK4 board to standard 9-pin serial ports
DNA-PSU-60	Optional AC/DC 60 W power supply (The DNR-BRICK4 chassis requires 9-36 VDC power. It does not include an AC/DC power adaptor.

Software including SDK and Board Support Packages (Only one toolkit is required, regardless of the number of UEIPACs deployed)

Part Number	Description
UEIPAC VxW BSP *(Software Only)*	VxWorks Board Support Package (BSP) allows you to program your UEIPAC applications in VxWorks
UEIPAC-Linux TK *(Software Only)*	UEIPAC Linux Programmer's Toolkit for -02/03 PowerPC
UEIPAC-Linux SX-TK *(Software Only)*	UEIPAC Linux Programmer's Toolkit for -11/12 ARM/SoloX