

Intel®-based-40 series UEIPACs

Intel®-based sixth generation embedded controller

Programmable Automation Controllers

- Powerful stand-alone embedded controller utilizing the Intel® x6425RE
- Supports both Windows 11 IoT and Rocky Linux 9.2 operating systems
- Quad-core Intel®, 64-bit processor
- 1.9 GHz, 20 W
- 8 GByte RAM, 32 GByte eMMC
- Two GigE Ethernet ports, supports IEEE-1588 TSN: 802.1AS, 802.1Qbv, 802.1Qav, 802.1Qbu
- Intel UHD 400 MHz, 60 Hz Display Port
- M.2 slot for NVMe SS drives up to 320 GByte (Call for available higher density SS Drives)
- TPM 2.0 Security
- Supports LabVIEW®, Matlab® and Simulink®
- Flexible: Over 90 I/O boards available



Available on UEIPAC 12-Slot RACK, FLATRACK and UEIPAC Cubes.

GENERAL DESCRIPTION

The UEIPAC -40 series offers an unprecedented combination of flexibility, high performance, low cost and small controller. The unit is an ideal solution in a wide variety of measurement and control applications. The UEIPAC is also an ideal solution for embedded DAQ applications, allowing systems to operate without the cost or additional space required by an external host computer.

ENHANCED CPU PERFORMANCE

The sixth generation (G6) CPU is based upon modern, Intel x6425RE series processors. This is the first Intel CPU we've used in the UEIPAC, and it not only adds higher CPU performance than previous releases, it also supports Windows (currently Windows 11 IoT). The new CPU joins the earlier CPUs in the UEIPAC family and all, including the G6, are covered by UEI's powerful 10-year availability guarantee. The G6 CPU is available with either a Rocky Linux 9.2 or Windows 11 IoT operating system. Additional operating systems (e.g. VxWorks, QNX are scheduled for future releases.)

NEW FEATURES OF THE G6 CPU (BEYOND CPU POWER)

- Built-in 400 MHz, 60 Hz DP (Display Port) interface
- 8 GByte RAM/32 GByte eMMC FLASH
- M.2 series I/O slot supports up to 320 GByte solid state drives

OTHER KEY CPU FEATURES

- Dual 1 Gigabit Ethernet ports
- 1 USB 3.0 and 1 USB 2.0 USB ports
- IEEE-1588 / PTP timing/synchronization interface
- Direct support of DNx series synchronization port
- Extensive diagnostics including power supply and temperature monitoring
- All standard UEI chassis environmental specifications
- 9–36 VDC power (universal AC adaptor also included)
- Low power <25 W in most configurations

Though the performance increase possible with the Intel CPU over previous versions of the UEIPAC is application dependent, in a typical application the Intel CPU power is approximately, 80x the original 8347 CPU, 20x the generation 5 SoloX CPU, and even 4 times the performance of the G5 Zynq CPU family.

At the present time the G6/Intel CPU is available on UEI's popular DNR-12, DNF-4 series RACKS and on our Cubes. In the future, we expect to offer the Intel CPU on our MIL series chassis.

TIME-SENSITIVE NETWORKING (TSN)

The G6 supports the TSN real-time Ethernet protocol that has become popular in many real-time control applications. In addition to

supporting the basic TSN protocol, the G6 also provides Microsoft's TCC (Time Coordinated Computing) protocol.

CYBERSECURITY

The G6 also supports powerful Cybersecurity tools as provided by the operating systems, including support for FIPS 140-2 Encryption and STIG/NIST 800-213. A TPM 2.0 chip is included for key storage.

COMING SOON: HIGH SPEED PCIe INTERFACE

A second generation Intel CPU (designated the -60 series) is being developed, with an auxiliary PCIe electrical interface. In the future, this interface will allow Intel based UEIPACs to interface to a new family of high speed I/O boards. A corresponding PCIe interface has been added to the DNR-12-1G-60 series chassis. (Note that the future generation of high speed I/O boards will be compatible with the existing revisions or the DNR chassis, but they will not be able to take advantage of the new PCIe data transfer performance.) The first of the new PCIe products are expected in 2025. Please contact UEI for further details on the capabilities of the new product offering.

TECHNICAL SPECIFICATIONS

Standard Interfaces	
Ethernet	Two independent 1 Gbit ports
Distance from host	100 meters, maximum
Configuration/General	Diagnostic RS-232 port, requires CBL-DIAG cable
Synchronization	IEEE-1588 supported
Hardware Synchronization	Custom cable to sync multiple racks
Operating System	
Windows	Windows 11 IoT
Linux	Rocky Linux 9.2
Processor	
CPU	Intel x6425RE
Cores/Threads	4/4
Base CPU frequency	1.9 GHz
Turbo frequency	2.7 GHz (operating temperature limited)
Memory	
RAM	8 GByte
Cache L2	1.5 MB
On-board eMMC	32 GByte
NVMe PCIe	Supports optional 2 TB (2242, 2260 or 2280 sizes)
Additional functionality	
DP (Display Port)	Intel UHD graphics, 400 MHz, 4k@60 fps
USB	1x USB 3.0, 1x USB 2.0
TSN protocol	802.1AS, 802.1Qbv, 802.1Qav, 802.1Qbu
TCC support	Yes
TPM security support	TPM 2.0
Synchronization/Diagnostic port	Yes
Environmental	
Temperature (operating)	Tested to -40 °C to 70 °C
Temperature (storage)	-40 °C to 85 °C
Humidity	0 to 95%, non-condensing
Vibration	
IEC 60068-2-64	10–500 Hz, 3 g (rms), broad-band random
IEC 60068-2-6	10–500 Hz, 3 g, sinusoidal
Shock — 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
MTBF	TBD hours
Physical Dimensions	
UEIPAC 1200R	17.5" W x 5.25" D x 6.2" H (3U in a 19" rack)
UEIPAC 400F	17.5" W x 7.8" D x 1.75" H (1U in a 19" rack)
UEIPAC 600-1G	4.1" W x 5" D x 5.8" H
Power Requirements	
Voltage	9–36 VDC (AC adaptor included)
Power Dissipation	20 W at 24 VDC (not including I/O boards)
Power Monitoring	
I/O board power	All internal power supplies monitored to ±1% accuracy. All PS voltages may be read by API. LED annunciators indicate out of range
Input current	Monitored by host, API indicates overcurrent
Input voltage	Monitored by host, API indicates out of range

UEIPAC RACK LAYOUT

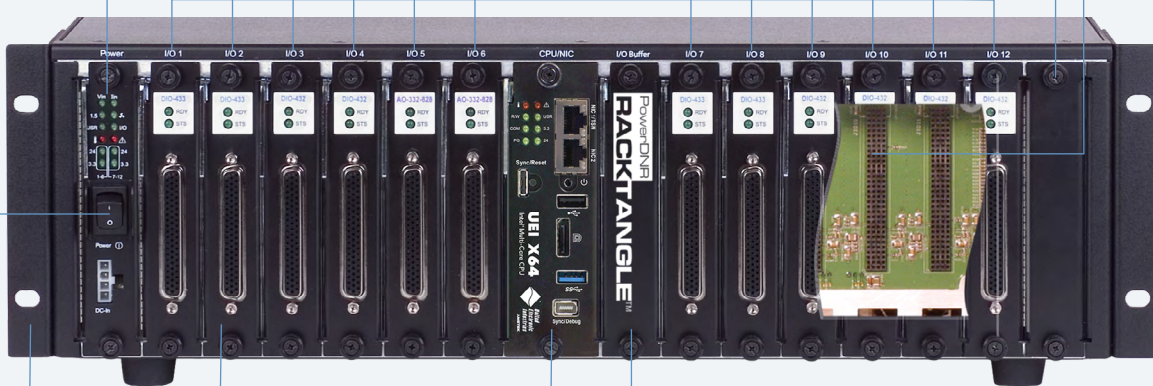
PROTECTED ON/OFF SWITCH The On/off switch is mounted within two metal shields which ensure the switch will not be inadvertently turned on or off.

POWER SUPPLY MODULE Power-In, 9–36 VDC either from the DNA-PSU-180 (included with the rack), a user-supplied source, or daisy chained from another DNR rack. All power supplies are monitored. Power supply status is supplied to the CPU module as well as displayed on annunciator LEDs.

I/O SLOTS The DNR rack provides 12 I/O slots. All combinations of DNR-series I/O boards are allowed, offering over literally trillions of possible configurations. DNR series I/O boards are fully plug-and-play. There is no hardware configuration required. It is recommended that empty slots be covered with blank panels (part number DNR-IO-FILLER available separately) to maintain air flow, reduce EMI, and protect the system from dust accumulation. 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.

DUAL RETENTION THUMB SCREWS Dual retention thumb screws ensure the DNR modules remain in their intended positions. A simple module ejector tab allows users to easily remove boards with one hand.

PASSIVE BACKPLANE The backplane of the standard DNR rack contains no active components. This means the DNR chassis itself offers an almost unlimited MTBF. All active components in a DNR system (except cooling fans) are on easily replaced boards.



UEIPAC 1200R
12 I/O Slots

FLEXIBLE MOUNTING The DNR-series racks include industrial quality rubber feet for table-top applications. The DNR-Bracket kit allows the rack to be mounted on any flat wall or surface or in a standard 19" rack (requires 3U spacing).

CPU AND NIC MODULE The DNR series controller and NIC interface are provided in the center slot. This configuration maximizes system noise immunity by reducing the maximum distance an I/O board may be from the CPU. In addition to providing the CPU, this module provides the two Network/Ethernet ports, the serial configuration port, the recessed reset button, and the inter-rack sync interface.

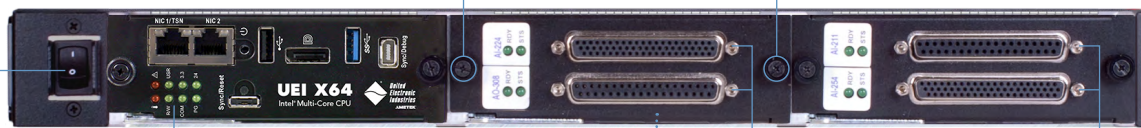
BACKPLANE BUFFER MODULE The DNR-Buffer-F module provides the interface between the CPU and the chassis backplane. In addition, the module provides a cooling fan for the CPU.

UEIPAC FLATRACK LAYOUT

PROTECTED ON/OFF SWITCH The On/off switch is mounted within two metal shields which ensure the switch will not be inadvertently turned on or off.

DUAL RETENTION THUMB SCREWS Dual retention thumb screws ensure the DNF modules remain in their intended positions. A simple module ejector tab allows users to easily remove boards with one hand.

I/O SLOTS The FLATRACK provides 4 I/O slots. All combinations of DNF-series I/O boards are allowed, offering over literally trillions of possible configurations. DNF series I/O boards are fully plug-and-play. There is no hardware configuration required. 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.



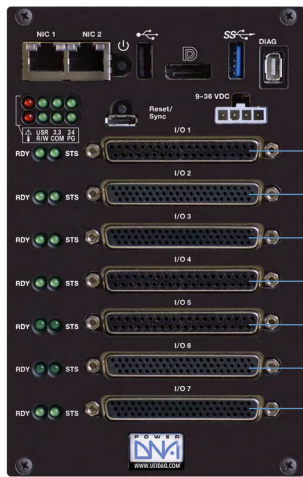
UEIPAC 400F 4 I/O Slots

CPU AND NIC MODULE The DNF series controller and NIC interface provides the two Network/Ethernet ports, the serial configuration port, the recessed reset button, and the inter-rack sync interface.



PASSIVE BACKPLANE The backplane of the FLATRACK contains no active components. This means the chassis itself offers an almost unlimited MTBF. All active components in a FLATRACK system (except cooling fans) are on easily replaced boards. It is field replaceable, but should it require replacement we recommend you return the unit to UEI for service.

UEIPAC CUBE LAYOUT



CPU AND NIC MODULE The DNA series controller and NIC interface provide a USB 3.0 and a USB 2.0 USB port, a Display Port, a IEEE-1588/PTP timing/synchronization interface, an M.2 slot for NVMe SS drives up to 320 GByte, and the recessed reset button.

I/O SLOTS The UEIPAC 600-1G Cube at left provides 6 I/O slots (1-slot, 3-slot and 7-slot versions are also available). All combinations of DNA-series I/O boards are allowed, offering over literally trillions of possible configurations. DNA series I/O boards are fully plug-and-play. There is no hardware configuration required. 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.

UEIPAC 600-1G
6 I/O Slots



UEIPAC 100-1G
1 I/O Slot



UEIPAC 300-1G
3 I/O Slots

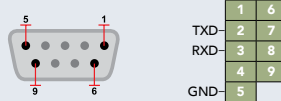


UEIPAC 700-1G
7 I/O Slots

CBL-SX6-DIAG (optional diagnostic serial port cable)

This cable brings the diagnostic RS-232 port on the CPU board out to a standard female DB-9 connector. Though the diagnostic port provides access to a wealth of boot-time information and configuration/set-up tools, most customers will never need to use it. For this reason, we have made the cable an optional purchase. However, though you certainly will not need a cable per chassis, we do recommend users purchase one or two of these cables for the development lab. Note that we do keep these cables in stock so should you need one in the future, it could be overnighted to you.

Serial/RS-232 female DB9, cable is 1 m long



ORDERING GUIDE All chassis include: Universal AC power supply, Ethernet cable and pre-installed Windows 11 IoT or Rocky Linux 9.2 OS.

Chassis Type		CPU		SSD		Cooling		Software Deployment	
UEIPAC	600-1G	-	40	-	00	-	00	-	WN
CUBES 600-1G* 6 available I/O slots (1-slot, 3-slot and 7-slot versions are also available) *Fanless (NRC) option available.		40 Quad-Core Intel® x6425RE		00 NO SS Drive M3 320 GByte SS Drive 40 40 GByte SS Drive		00		WN Windows 11 IoT deployment LX Rocky Linux 9.2 deployment Boot Software Location The unit is designed to boot directly from on-board QSPI memory, and mount RFS from the 8 GByte FLASH.	
RACKS 1200R 12 available I/O slots 400F-AC FlatRACK, 1U rack mountable 4 slot chassis, 100-240 VAC power 400F-DC FlatRACK, 1U rack mountable 4 slot chassis, 9-36 VDC power		FOR EXAMPLE 6-slot GigE Cube with an Intel® CPU, 320 GByte M.2 SSD, in Windows 11 IoT deployment mode would be: UEIPAC 600 - 1G - 40 - 00 - 00 - M3 - 00 - WN							

ADDITIONAL OPTIONS

Part Number	Description
CBL-SX6-DIAG	Diagnostic cable. Connects diagnostic RS-232 connector on the CPU module to standard
DNA-SSD-40-M2	40 GByte M.2 solid state drive for UEI Intel® processor chassis
DNA-SSD-320-M2	320 GByte M.2 solid state drive for UEI Intel® processor chassis
Extended Warranty	Option to purchase UEI's extended 10 year warranty is available