



*United
Electronic
Industries*



Introduction to UEI

Data Acquisition & Control Solutions

Version 1.2018



www.ueidaq.com

UEI - History

Founded in 1990 - Located in Boston

Focused on DAQ and Real-Time Control

Extensive software / “Open” OS support

All manufacturing in the USA

Focus on “Voice of the Customer”

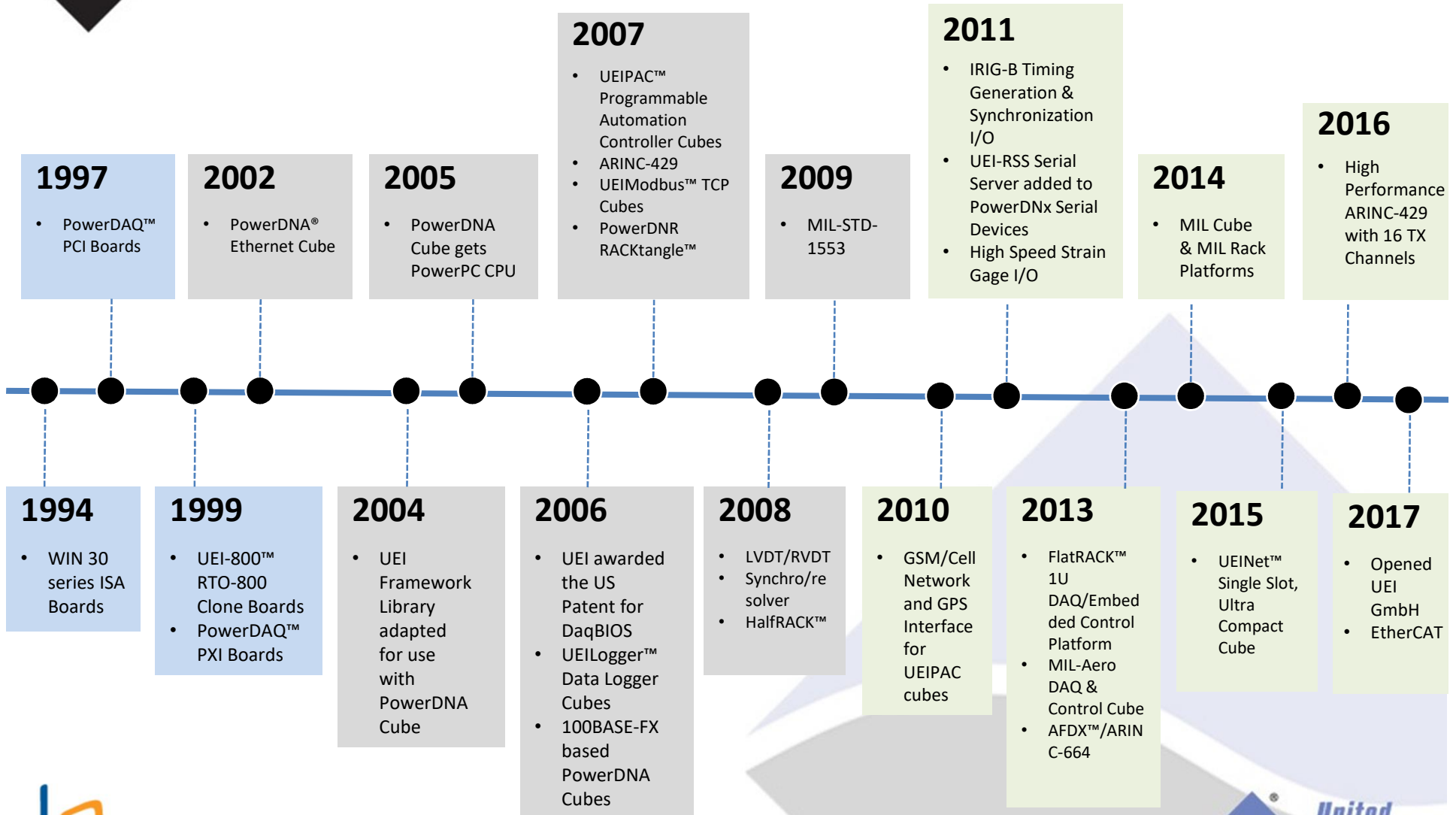


United Electronic Industries – Walpole, MA Headquarters

QUALITY & SERVICE EXCELLENCE



UEI Product Timeline



PowerDNA Family

RUGGED & FLEXIBLE I/O SYSTEM SOLUTIONS

- **PowerDNA®** (Distributed Networked Automation) chassis are Ethernet-based data acquisition (DAQ) interfaces, ideally suited for a wide variety of DAQ & control applications.
- Each chassis includes a CPU, real-time OS, Ethernet interface and slots allowing the installation of I/O boards.

Identify the wide variety of UEI chassis:



“DNA” = Cubes
MIL & Standard

“DNR” = Racks
MIL & RACKtangles™ Only



PowerDNA Cube Architecture

1 Slot Cube



3 Slot Cube



6 Slot Cube



MIL Cube



COMMON FEATURES

- SD card for UEIPAC, UEILogger, UEISim, UEIModbus deployment
- 9-36 V DC Input
- Diagnostic serial port
- SYNC port (board-to-board and cube-to-cube), IEEE-1588, IRIG support
- IPsec hardware encryption available
- LED Health / Status Indicators
- Up to 256 MB RAM, 128 MB Flash

COTS	I/O Board Slots	Ethernet	USB 2.0 (UEISIM, UEIPAC)	Fans	Power Notes	Non-Volatile Memory
Cube	3,6,7	10/100 Base T switch. AND Fiber	N/A	Optional	Molex, DB-15	SDHC up to 32GB
GigE Cube	1,3,6,7	2 indep. NICs GigE	Supported	Runs if T >40°C	Molex	SDHC up to 32GB, SSD up to 64GB
Mil-Cube	4	2 indep. NICs GigE	Supported	None	13 pin MIL - DTL-38999	SDHC up to 32GB, SSD up to 64GB

Cube Specifications

Compact: 4.1" x 4.1" x 4"

Supports:

- 175 A/D, 224 D/A, 336 DIO,
- 56 Serial (combination of 232/422/485)
- 112 ARINC-429
- IEEE-1588

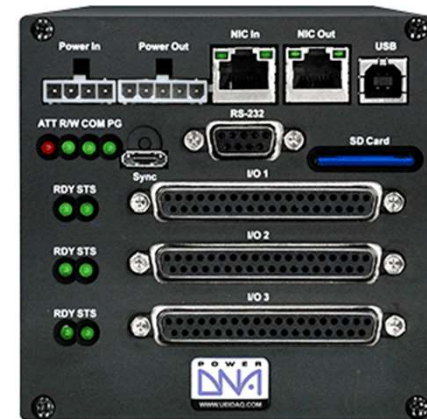
Extremely Rugged:

- Tested -40° to +85° C,
- 5g Vibration 100g Shock,
- MTBF > 34 years
- 120,000 FT
- Radiation tested for space applications

Low Power (PPC Series):

- <15 Watt per cube, AC, DC or battery powered

- **Easily Distributed:** 328 ft via Ethernet, 20 kM via Fiber
- **Universal DIN Rail / Flange Mounts**
- **Standard DB-37/62 pin**
- **Shielded cables (3,5,10,20 Ft.)**
- **1,3,4,6,7 Slot Versions**



PowerDNR RACK Architecture

6 Slot
HalfRACK



12 Slot RACKtangle



4 Slot FlatRACK



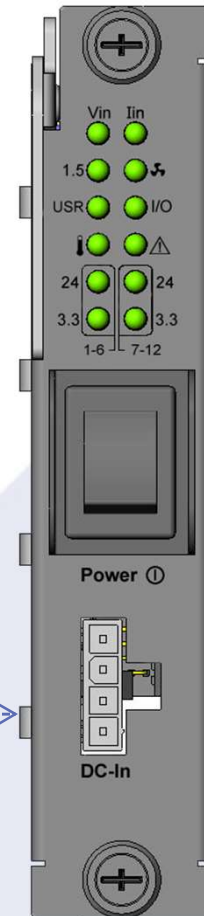
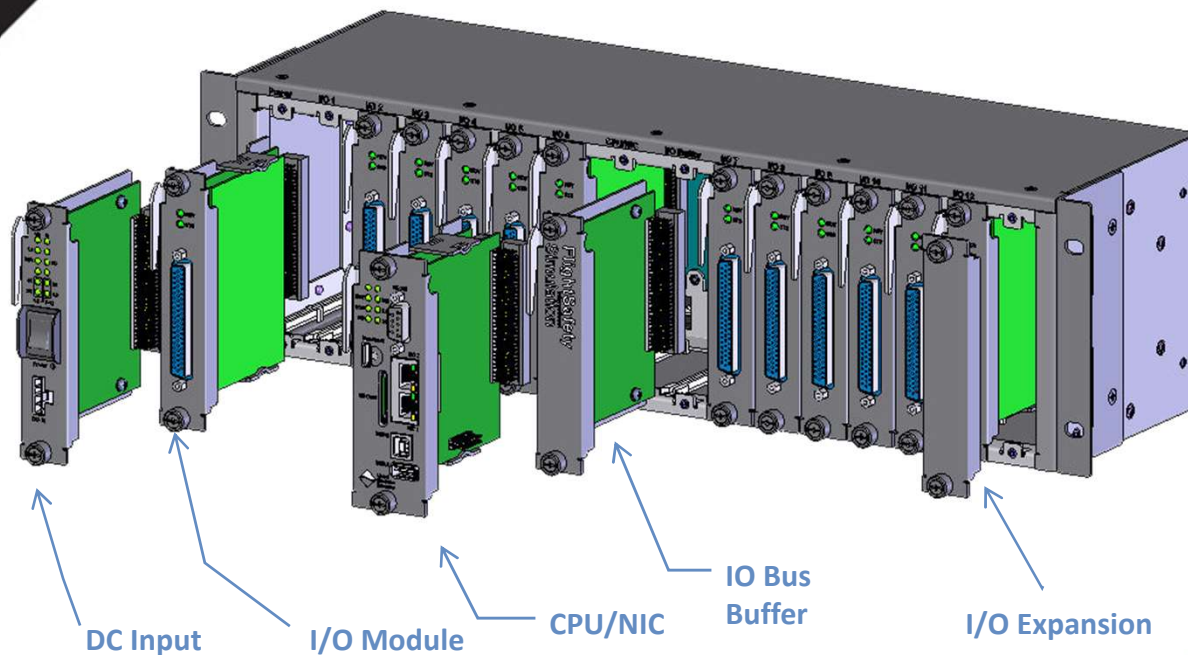
12 Slot MIL Rack

COMMON FEATURES

- Same hardware design as Cubes
- IPsec hardware encryption available
- Passive backplane with temp sensors
- CPU/NIC board same as GigE Cube (2 independent)
- 5g Vibration (MIL, Fanless), 3g Vibration (Fans), 100g Shock.
- Up to 256 MB RAM, 128 MB Flash
- IEEE-1588 support

COTS	Height	I/O Board Slots	USB 2.0 (UEISIM & UEIPAC)	Power Connector	Fans	Non-Volatile Memory
FlatRACK	1U	4	2 ports	Molex (AC option)	Run if T > 40°C	SDHC up to 32GB, SSD up to 64GB
Half RACKtangle	3U	6	2 ports	Molex	Run if T > 40°C	SDHC up to 32GB, SSD up to 64GB
RACKtangle	3U	12	2 ports	Molex	Run if T > 40°C	SDHC up to 32GB, SSD up to 64GB
Mil-RACK	4U	12	2 ports	13 pin MIL-DTL-38999	None	SDHC up to 32GB, SSD up to 64GB

RACKtangle Specifications



Ideal replacement for VME, VXI, PXI, SCXI, VPX

- **Dual Gigabit Ethernet**
 - 2 independent NIC ports, one control and one diagnostic
- **Independent DC power monitoring board**
- **Visual LEDs for 1.2V, 3.3V and 24V**
- **High channel count**
 - 300 Ain, 384 Aout, 576 DIO, 144 ARINC 429, 96 Serial

I/O Boards



Cube (DNA) I/O board



RACK (DNR) I/O Board

- The Cube and RACKtangle offer identical (electrically) I/O boards.
- Fully isolated I/O (350 Vrms)
- Built-in signal conditioning
- Software configurable
- Standard DB-37 or DB-62 connector
- Deployed in any combination

Diagnostic Tools – Guardian Advantage

GUARDIAN SERIES ADVANTAGE: On-board I/O Monitoring System

REAL-TIME DIAGNOSTICS



Open/Broken
Sensor Detection



Channel Self-Test without
Field Wiring Disconnection



Current/Voltage
Monitoring



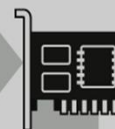
Circuit Breaker
Functionality

COMPLETE SELF-CHECK

FROM THE
CHASSIS



TO THE
BOARD



TO THE
CHANNEL

ELIMINATE HEADACHES



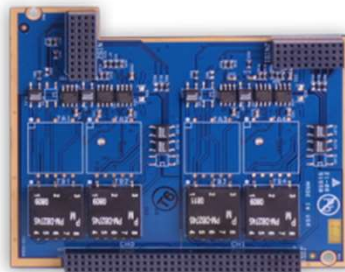
Save Time



Reduce Monitoring
Complexity



Lower Costs
(No External Test Equipment)



¡ Tu Sitio de Automatización !

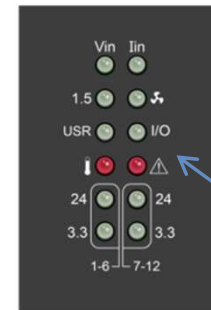


Chassis Start Up/Diagnostic Tools

- **POST** – Power on Self Test
- **System Readiness Check**
 - ✓ Firmware Version
 - ✓ Hardware Configuration
 - ✓ Start Up Diagnostics



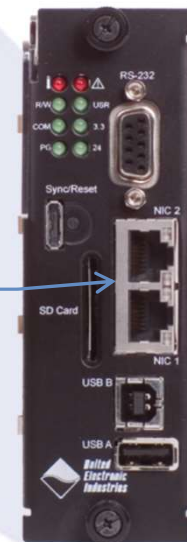
On Board Temperature Sensors



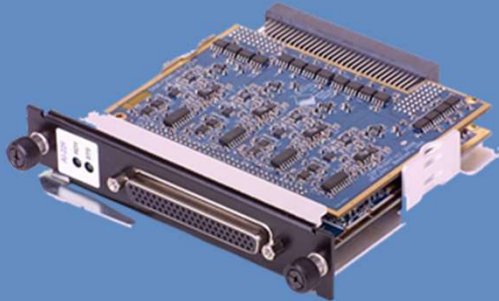
- Voltage
- Current
- BIT
- Fan

Dual Independent Ethernet Ports

- Control/Diagnostic
- Teamed/Bonded
- Internal Hour Meter



Board/Channel Start Up/Diagnostic Tools



- **Sensors** – Connected? Calibrated?
- **Digital Inputs** – Reasonable levels?
- **Digital Outputs** – Voltage present? Current?
- **Analog Outputs** – Voltage/Current in line

- **Built In Test**

- Software Disconnect from Field Wiring
- Test to GND or Reference

- **Voltage and Current Read Back**

- Short / Open Detection

- **Programmable Circuit Breaker**

- Retest, High / Low Limits

- **Programmable Logic Thresholds**

- Read Back – Analog Comparator

- **Open, Over Range Detection**

Analog Input

Board Type	Part Number (DNx-)	Number of Channels	Resolution (Bits)	Maximum Sample Rate (Channel) kS/sec	Maximum Sample Rate (Board) kS/sec	Simultaneous Sampling (no MUX)	Maximum Input Range	Minimum Input Range	Channel-to-Channel Isolation
General Purpose, Low Noise	AI-207	16	18	16	16	-	±10 V	±12.5 mV	-
High Speed, Simultaneous Sampling	AI-217	16	24	120	1000	✓	±10 V	±156 mV	-
High Density	AI-248-230	24	18	0.25	6	-	+32 / -2 V	+32/-2 mV	-
High Density, High Speed	AI-201-100	24/12	16	100	100	-	±15 V	±1.5 mV	-
High Speed, High Voltage	AI-205	4	18	250	1000	✓	±100 V	±100 mV	✓
High Speed, Fully Isolated	AI-218	8	24	120	480	✓	±10 V	±156 mV	✓
High Voltage, Fully Isolated	AI-228-300	8	24	120	480	✓	±300 V	±37.5 V	✓
Current Input	AI-202	12	16	16	16	-	±150 mA	±1.5 mA	-
0-20 / 4-20 mA Input	AI-204	24	18	1	24	-	0-20 mA	0-0.2 mA	-
Thermocouple - Fully Isolated	AI-212	12	24	1.5	18	✓	±2.048 V	±32 mV	✓
Thermocouple, High Resolution, High Density	AI-225	25	24	1	25	✓	±1.25 V	-	-
RTD / Resistance	AI-222	12	24	0.15	1.8	✓	40k ohm	100 ohm	✓
Strain/Bridge Input, Low Cost	AI-208	8	18	8	8	-	±10 V	±12.5 mV	-
Strain/Bridge Input, High Performance	AI-224	4	18	100	400	✓	±10 V	±78 mV	✓
ICE/IEPE Accelerometers	AI-211	4	24	125	500	✓	+25 / -13 V	±2.5 V	✓
LVDT / RVDT	AI-254*	4	16	5	20	✓	28 Vrms	2 Vrms	✓
Synchro / Resolver	AI-255*	2	16	4	8	✓	28 Vrms	2 Vrms	✓
Synchro / Resolver	AI-255-815*	2	16	4	8	✓	115 Vrms	5 Vrms	✓
LVDT / RVDT, Synchro / Resolver, High Drive	AI-256*	2	16	10	20	✓	28 Vrms	5 Vrms	✓



Guardian Series - Includes a variety of powerful diagnostic and BIT functionality.

*Also available as analog output.



Analog Output – General Purpose

Board Type	Part Number (DNx-)	Number of Channels	Update Rate (Channel) kS/sec	Update Rate (Board) kS/sec	Output Range (Volts)	Output Current Drive (mA)	Channel-to-Channel Isolation
General Purpose	AO-308	8	100	500	+/-10	+/-5	-
Fully Isolated With Readback	AO-318	8	10	80	+/-10	+/-10	✓
High Current	AO-308-350	8	100	800	+/-10	+/-50	-
High Density	AO-332	32	10	320	+/-10	+/-10	-
High Density With Readback	AO-333	32	10	320	+/-10	+/-10	-
Medium Voltage/Current	AO-308-352	8	100	800	+/-13.5	+/-13.5	-
High Voltage	AO-308-353	8	100	800	+/-40	+/-5	-
Current Output (0-20mA)	AO-308-020	8	100	800	-	0-20	-
Current Output (0-20mA), Isolated With Readback	AO-318-020	8	10	80	-	0-20	✓
Current Output (4-20mA)	AO-308-420	8	100	800	-	0-20	-
High Current Buffer (External)	DNA-STP-AO-200	8	-	-	+/-10	+/-250	-
High Current, High Voltage (External)	DNA-STP-AO-250	4	-	-	0-35	+/-250	-
High Voltage Amplifier (External)	PD-AO-AMP-115	16	-	-	+/-115	+/-10	-

Analog Output – Simulation

Board Type	Part Number (DNx-)	Number of Channels	Update Rate (Channel) kS/sec	Update Rate (Board) kS/sec	Output Range (Volts)	Output Current Drive (mA)	Channel-to-Channel Isolation
SIMULATED DEVICE/SENSOR							
Strain Gage Simulator, 120/350/1k Ohm	AO-358-120/350 or 1k	8 Bridges	5	40	N/A	N/A	-
Simulated LVDT / RVDT	AI-254	4	5 kHz exc	-	0 - 6.7 Vrms	65 mA	✓
Simulated Synchro / Resolver	AI-255	2	4 kHz exc	-	0 - 28 Vrms	1.2 VA	✓
Simulated S/R & RVDT/LVDT, High Drive	AI-256	2	10 kHz exc	-	0 - 19.8 Vrms	2.4 VA	✓
Transformer for AI-254	TRF-254-447	4	5 kHz	-	4.47:1 ratio	4.47:1 ratio	-
Transformer for AI-254	TRF-254-122	4	5 kHz	-	1.22:1 ratio	1.22:1 ratio	-
Simulated Thermocouple with CJC	TC-378	8	1 kHz	8 kHz	+/- 100 mV 16 bits	± 10 mA	✓
Simulated RTD	RTD-388	8	200 Hz	200 Hz	18-390 Ohm, 180-3900 Ohm, 7500 steps	± 4mA Input	✓

Digital I/O

Board Type	Part Number (DNx-)	Number of Channels	Input (kHz)	Output	Drive Capacity (Continuous/Peak)	Range (min V)	Range (max V)	Change of State
DISCRETE I/O								
Logic Level	DIO-403	48	10	20 kS/s	16 mA	2.5	5.5	✓
Sourcing Outputs, 3.3-36VDC Inputs	DIO-404	12 in/12out	100	100 kS/s	350 mA / 500 mA	3.3	36	✓
Sourcing Darlington Outputs, 5-36VDC Inputs	DIO-405	12 in/12out	1	1 kS/s	80 mA / 200 mA	5	36	✓
Sinking Outputs, 3.3-36VDC Inputs	DIO-406	12 in/12out	100	100 kS/s	1 A / 1.5 A	3.3	36	✓
DISCRETE INPUTS								
5-36 V DC Inputs	DIO-401	24	1	-	-	5	36	✓
0-32 V DC Inputs	DIO-448	48	1	-	-	-1	32	-
0-150 V AC/DC Inputs	DIO-449	48	1	-	-	-150	150	✓
DISCRETE OUTPUTS								
Sourcing Darlington Outputs	DIO-402	24	-	1 kS/s	80 mA / 200 mA	7	36	-
Solenoid Drive (Source/Sink), 3.3-36 V DC	DIO-416-32	32	-	0.125 kS/s	500 mA / 3.5 A	3.3	48	-
Sinking Outputs, 3-36VDC	DIO-432	32	-	1 kS/s	600 mA / 3.5 A	3.3	36	✓
Low-leakage, Sinking Outputs, 3-36VDC	DIO-432-800	32	-	1 kS/s	600 mA / 3.5 A	3.3	36	✓
Sourcing Outputs, 3-36VDC	DIO-433	32	-	1 kS/s	600 mA / 3.5 A	3.3	36	✓
Low-leakage, Sourcing Outputs, 3-36VDC	DIO-433-800	32	-	1 kS/s	600 mA / 3.5 A	3.3	36	✓
RELAY OUTPUTS								
Relay Outputs, Form C	DIO-452	12	-	0.125 kS/s	2 A	0	220 VDC / 250 VAC	-
Relay Outputs, Form C	DIO-462	12	-	0.125 kS/s	2 A	0	220V DC / 250 VAC	-
Solid State Relay Outputs, Form A (NO)	DIO-463	12	-	0.125 kS/s	2 A	0	51 VDC / 51 VAC	-
High Current Relay Outputs, Form C	DIO-470	10	-	0.125 kS/s	5 A	0	140 VDC / 150 VAC	-
Solid State Relay Outputs, Form A	DIO-430	30	-	1 kS/s	400 mA / 2 A	0	55 VDC / 55 VAC	-
MULTI-PLEXERS								
Multiplexer	DIO-440	Dual 2x20	-	500 Hz	600 mA / 2 A	0	55 VDC / 55 VAC	✓

Serial / CAN Bus

Communications Bus Protocol	Part Number (DNx-)	Physical Interface	Number of Channels	Transfer Rate	Notes	Channel-to-Channel Isolation
High Speed CAN	CAN-503	CAN 2.0	4	1 Mbit	J1939 and CAN .dbc support	✓
4-port serial	SL-501	RS-232/422/485	4	2 Mbaud	J1587/J1708, Interrogation Scheduler	✓
4-port high speed serial	SL-501-804	RS-232/422/485	4	4 Mbaud	J1587/J1708, Interrogation Scheduler	✓
HDLC/SDLC Synchronous	SL-504	RS-232/422/423/485	4	4 Mbaud	HDLC/SDLC TX/RX Synch.	✓
8-port serial	SL-508	RS-232/422/485	8	2 Mbaud	J1587/J1708, Interrogation Scheduler	✓
GP Synchronous Serial Communications	CT-602-804	RS-485/422	4	16 Mbaud	General Purpose	✓
Synchronous Serial Interface (SSI)	SL-514	RS-485/422	4	2.5 MHz	Master, Slave 3-32 bits, FIFO onboard	✓

Remote Serial Server available for all RS232/422/485 boards on Linux & Windows.

Counter / Timer

Counter/timer function	Part Number (DNx-)	Type	Number of Channels	Clock Rate	Notes	Channel -to- Channel Isolation
High Speed Counter/Timer	CT-601	32 Bits	8	66 MHz	Debouncing on Ext Clock & Gate	-
Differential Counter/Timer	CT-602	32 Bits	4	66 MHz	RS-422/485 Logic Levels	✓
Quadrature Encoder Input	QUAD-604	A,B, & Z inputs	4	16.5 MHz	Buffered or Single Point Readings	-
Universal Speed Input	VR-608	50 mV - 250 V p-p	8	300 kHz	4 Freq Out, Double/Low Tooth	✓
IRIG Timing Gen & Synch	IRIG-650	A/B/E/G type	1	1, 5, 10 MHz	On-board GPS Receiver	✓
Precision Timing Interface	CT-651	ICD-GPS-060	4	1 PPS	Slaved or Free run/Fix wheel	✓

Avionics

Protocol	Part Number (DNx-)	Type	Number of Channels	Transfer Rate	Notes	Channel -to- Channel Isolation
1553 (Dual Redundant)	1553-553	2 Ports	2	1 Mbaud	Bus Cont, Remote Term, or BM	✓
ARINC-429	429-566	6 TX / 6 RX	12	12.5/100 kHz	Williamsburg V1 Support	-
ARINC-429	429-512	12 RX	12	12.5/100 kHz	Williamsburg V1 Support	-
ARINC-429	429-516	16 TX	16	12.5/100 kHz	256 labels/ch on-board scheduler	✓
ARINC-615	429-XXX	Up to 16	16	12.5/100k baud	Williamsburg for Airborne & Portable Data Loader	✓
ARINC-708/453	708-453	2 TX / 2 RX	4	1 Mbaud	Weather or Ground Prox Radar, WXPB	✓
ARINC-825	CAN-503	4 Ports	4	83.3-1000 kb	Sensors, Actuators	✓
AFDX & ARINC-664	AFDX-664	2 Ports	2	100,000 kb	Dual Redundant or Independent	-
ARINC-615A	AFDX-664	2 Ports	2	100,000 kb	Airborne & Portable Data Loader for Ethernet	-
CSDB	CSDB-509	8 TX / 8 RX	8	12.5/100 kHz	11 bit, character and frame clocks	✓
M272/PRF/PIM	CT-602-808	M272 and PRF/PIM	1	1 Mbaud	Hellfire Missile Interface	N/A

UEI – I/O Boards

WIRELESS

Wireless Protocol	Part Number (DNx-)	Type	Number of Channels	Transfer Rate	Notes	Channel -to- Channel Isolation	MTBF
Wireless (GSM, CDMA, WIFI)	CAR-550	PCle Mini Compatible	1	-	For GigE UEIPAC Cubes	-	300,000
GPS Receiver and IRIG I/O	IRIG-650	Passive or Active Antenna	1	-	Time Derived From GPS/IRIG String	-	275,000
GPS Receiver Module	DNA-GPS	Garmin 16 Series	1	1 PPS	-	-	200,000

POWER SUPPLIES

Output Voltage	Part Number (DNx-)	Number of Channels	Output V	Current (Max)	Notes	Channel -to- Channel Isolation	MTBF
10 V	PC-910	1	+/- 10	1.5 A	Isolation Current/Voltage Feedback	-	150,000
15 V	PC-911	1	+/- 15	1.2 A	Isolation Current/Voltage Feedback	-	150,000
24 V	PC-912	1	+/- 24	1.6 A	Isolation Current/Voltage Feedback	-	150,000
45 V	PC-913	1	+/- 45	0.4 A	Isolation Current/Voltage Feedback	-	150,000
MIL-704/1275	PC-922	Internal	-	-	MIL-STD-704/1275/461 Power Conditioner	-	150,000

UEI – I/O Boards

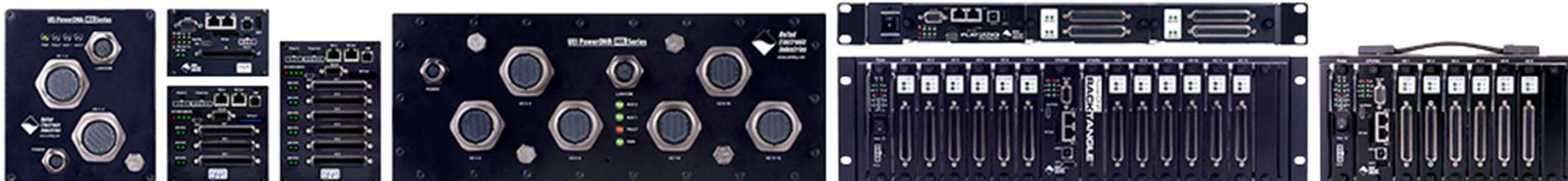
RECONFIGURABLE

Board Type	Part Number (DNx-)	Connection	Notes	FPGA
Reconfigurable FPGA	PL-820	2x 62 Pin	104 DIO Pins, JTAG Connections	MAX10 / Cyclone II
FPGA Baseboard	PL-60x	37 or 62	Connection to custom daughter card	Cyclone III

INSTRUMENTS

Board Type	Part Number (DNx-)	Number of Channels	Update Rate (Channel)	Ranges	Type	Current	Channel -to- Channel Isolation	MTBF
6.5 Digit DMM	DMM-261	1	100 Hz	+/- 300VDC, +/-100mVDC, +/-200 Vrms, +/-125 mVrms, 100 MΩ to 10 Ω	VDC, VAC, IDC, IAC and Resistance	+/-2A AC/DC, +/-1mA AC/DC	✓	300,000
Function / Arbitrary Waveform Generator	AO-364	4	150 kHz	+/-12V	Sine, Square, Triangle, Trapezoid, AWFG	+/-12mA	✓	290,000

The PowerDNA Family – 5 deployment options



Tethered/Slaved to Host PC over Ethernet
application runs on host

1 PowerDNA

Standalone Data Logger
application created on PC, runs on standalone Cube

2 UEILogger

Standalone / Embedded I/O
application runs on Cube/RACKtangle

3 UEIPAC

Simulink / HIL
application created in Simulink runs on Cube/RACKtangle

4 UEISIM

Industrial Process Control
application server MODBUS TCP, OPC-UA, EtherCAT

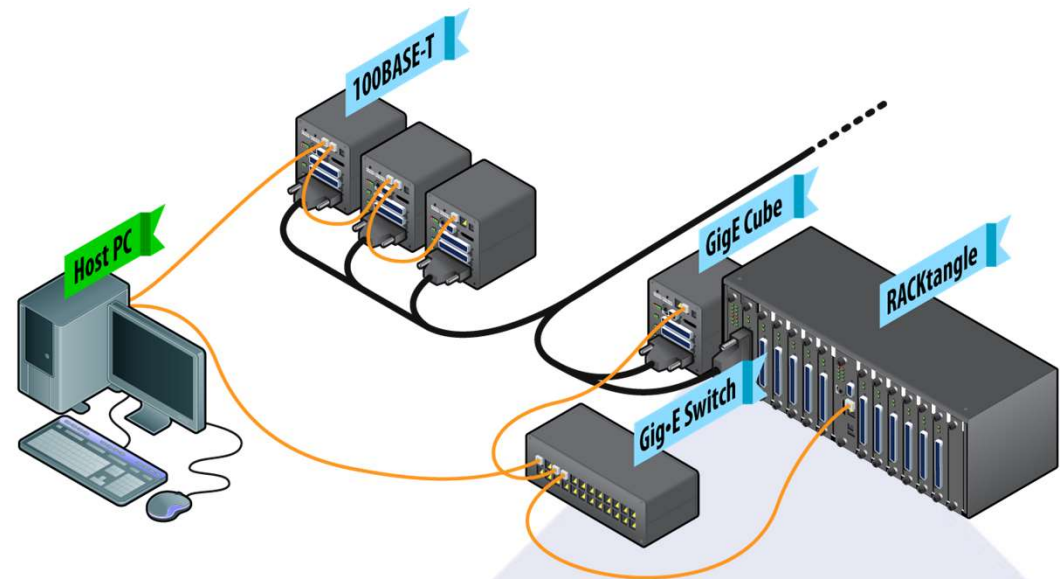
**5 UEIModbus/UEIOPC-UA/
EtherCAT**

PowerDNA/PowerDNR

Hosted/Tethered

Features:

- Standard Network Interface: (1000BaseT, 100BaseT or 100BaseFx)
- Supports Cubes and RACKs
- IEEE-1588 Synchronization Support
- Flexible: Use any of the 60+ I/O boards
- High Performance: Scan/update 1000 I/O points in < 250 μ S
- **Low Cost: Cubes starting under \$1000**
- Excellent Software Support
- All popular operating systems (e.g. Windows, Linux, QNX, VxWorks)
- All popular programming languages
- All popular applications (LabVIEW, MATLAB)



UEI Logger

Features:

- Easy-to-use, no programming required
- Supports Cubes Only
- Use any of the 40+ DNA series I/O boards
- Program via Ethernet or load application from SD Card
- Store data to 32 GB SD Card
- up to 100 kS/s, spread across all sampled channels.
- **Cubes starting at under \$1500**
- Download data over Ethernet, Wireless, Cell network or simply remove the SD Card



Unique Features:

- Logs 1553, Serial, CAN and ARINC 429 data
- Automatic conversion into engineering units
- Also functions as a standard PowerDNA Cube

UEIPAC LINUX / VxWorks

(Programmable Automation Controller)

Features:

- Standalone operation minimizes cost and power (no need for host PC)
- Hardware-timed IEEE-1588 Support
- Up to 256MB RAM and 128MB Flash
- Up to 64GB SSD
- IPsec hardware encryption
- Supports all chassis with any of the 60+ I/O boards



Linux Kernel 3.4.6 with Xenomai RT extensions (from Kernel.org)

- Open source, write the application in C on a Linux PC or Windows PC in Cygwin environment
- Logger source code, Shared data protocol for HMI

Wind River VxWorks 6.9.x RTOS – BSP Supplied

- Supports NIC TEAMING (1000 Base T only - GigE)

Typical applications:

- Embedded machine health monitors
- Hardware “in-the-loop” control
- Unmanned Land/Sea/Underwater/Air vehicles
- Flight test, control and alarm annunciators
- Rugged portable control applications

Simulator applications:

- Local control of smaller modules, Emulating existing I/O systems

WIND RIVER



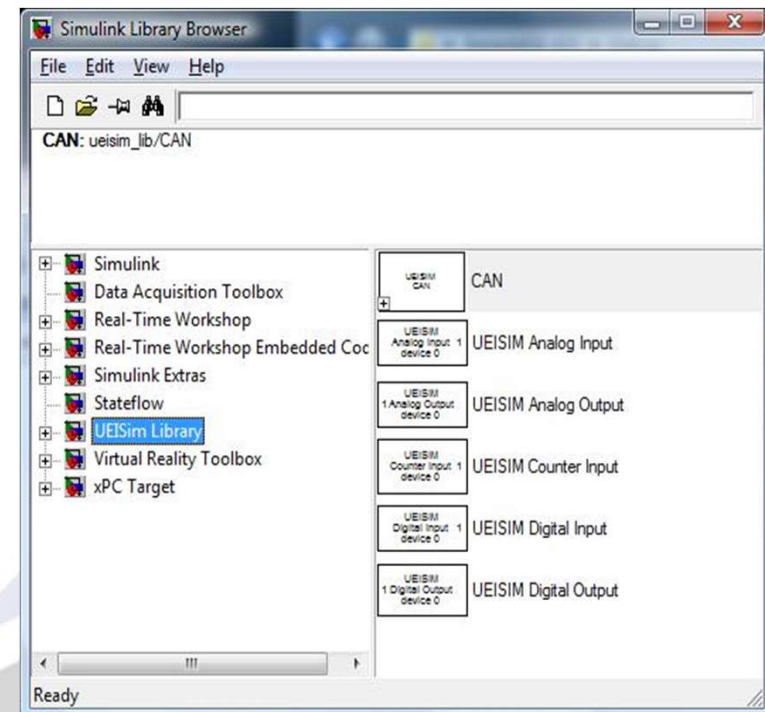
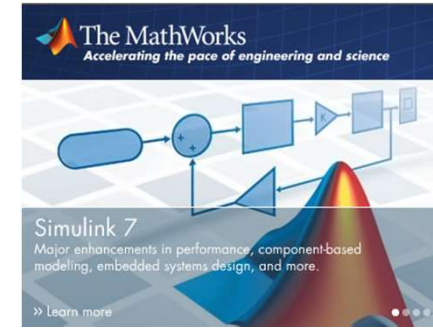
UEISIM - Simulink I/O target

Features:

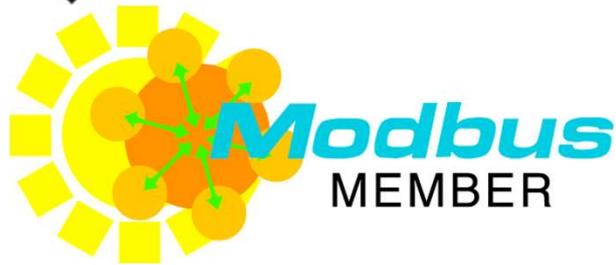
- Simulink/embedded coder hardware interface
- Based on UEIPAC with 3.4.6 Kernel and Xenomai real-time extensions
- Supports cubes and racks
- Standalone and “monitored” operation
- Remote GUI operation
- Up to 5 kHz update rates
- Flexible: Use any of the 60+ I/O boards

Ideal for:

- Hardware “in-the-loop” control
- Development and system tuning
- Production deployment

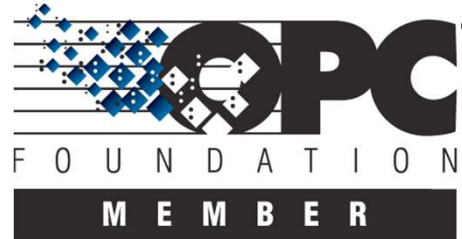


UEIModbus /UEIOPC-UA/EtherCAT



CONFIGURATION:

- Modbus TCP



CONFIGURATION:

- OPC-UA (No windows host required)
- Data Access
- Historical Data Access



CONFIGURATION:

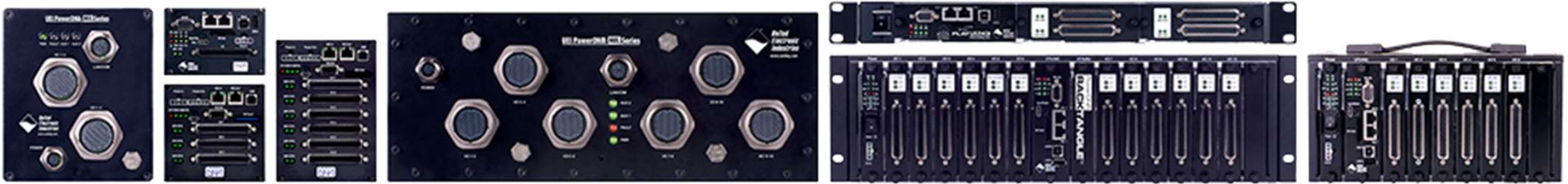
- Fully compatible TwinCAT and other popular EtherCAT software

UEIModbus, UEIOPC-UA, & EtherCAT Features:

- Industry standard Modbus® TCP, OPC-UA, & EtherCAT Interfaces
- Stand Alone Servers
- Flexible! Select the I/O to match your application
- Over 60 different I/O Boards available
- Web-based Configuration
- And more!

Software/Programming

WORK HOW YOU NEED TO WITH UEI!



UEI SUPPORTS MOST POPULAR OSs, PROGRAMMING LANGUAGES AND APPLICATIONS, INCLUDING:

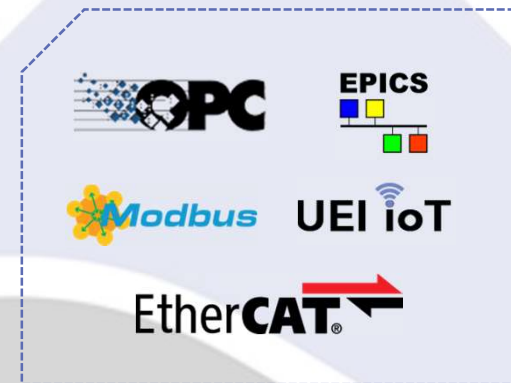
Operating Systems



Languages



Applications

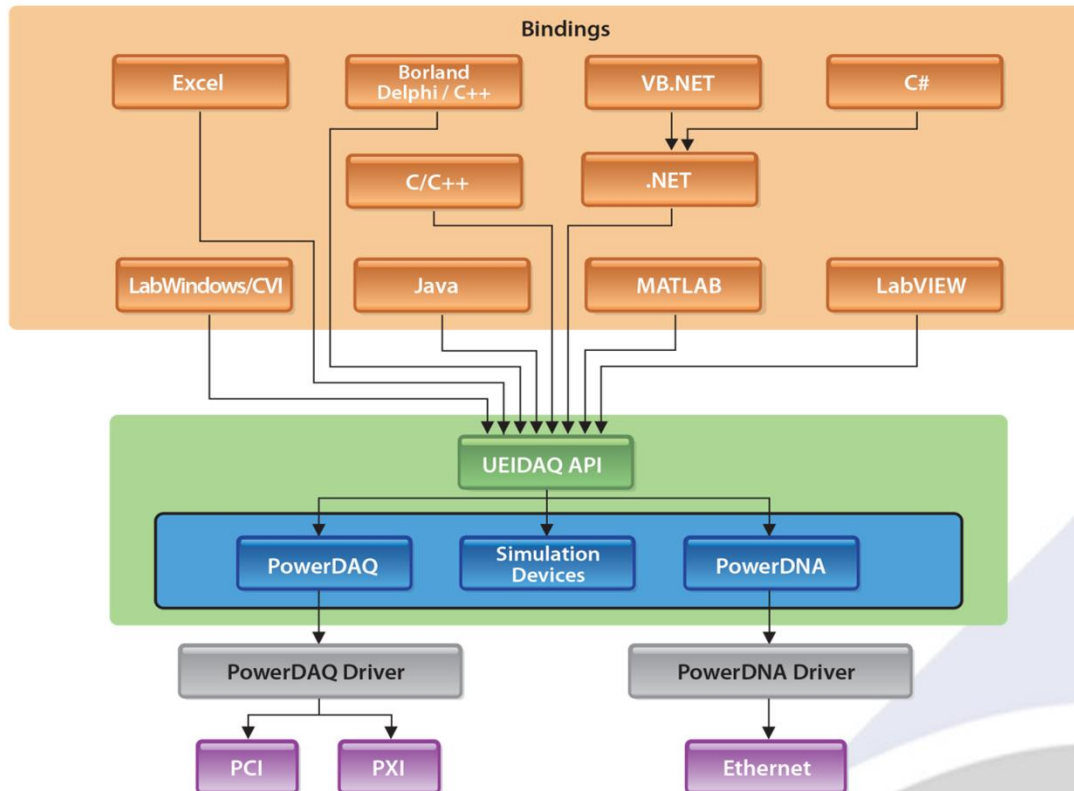


PowerDNA Software Suite

- Supports all popular operating systems
- No license fee – open source
- Examples with source code for all boards
- Includes PowerDNA Explorer
- Create XML code using our Session Manager
- Can be downloaded at www.ueidaq.com/download at no charge
- Includes simulated I/O for Windows
 - Ain, Aout, DIO, Serial, Arinc, 1553
 - Test the software before getting the hardware
- Full-function hardware regression suite testing

PowerDNA Software Suite

WINDOWS: 32/64-bit XP, Vista, 7, 8, 10 [Hosted Systems]
UEIDAQ Framework Library Architecture



LINUX & REALTIME
Operating Systems/Extensions

Supported Platforms

QNX

Linux

RTX

VxWorks

INtime

RealTime Embedded Systems

Supported Platforms

Linux [w/Xenomai]

Simulink

VxWorks

Try it now with our simulation driver:

www.ueidaq.com/download

ONE DRIVER / ONE API

SINGLE SOFTWARE SOLUTION FOR ALL POWERDNA I/O

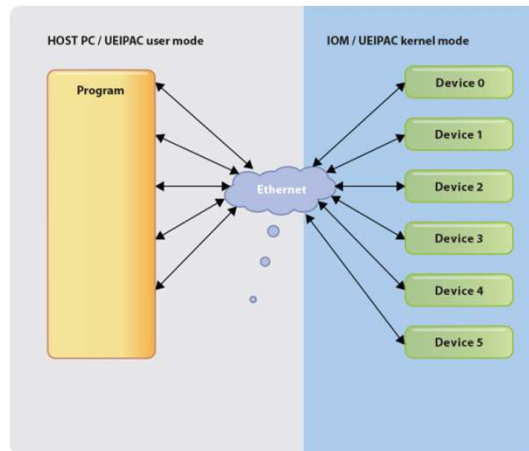
Mix and match different I/O data types in one API!

- Analog and Digital I/O may be mixed with serial/communications/avionics I/O all running in real-time using the same API!
- Diagnostic port runs simultaneously in non real-time while real-time port is in use.



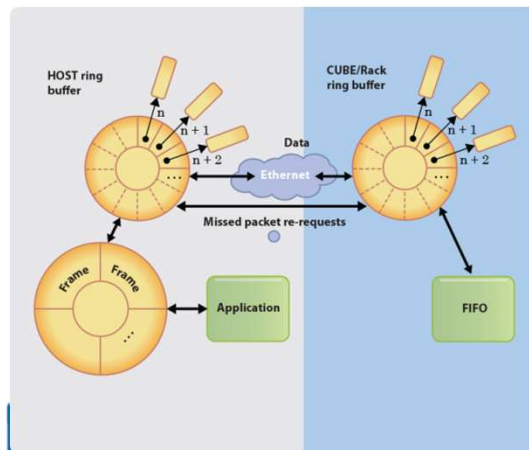
Software Modes of Operation

Software “modes” to match your application



Point by point / polled I/O

- Simple monitoring and control applications where perfect timing and high sample rates are not required.



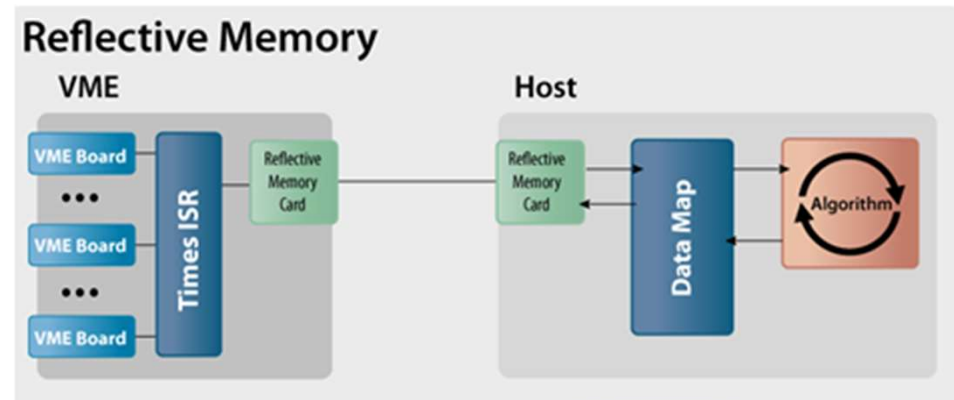
Advanced Circular Buffer (ACB) : Streaming data continuously

- For high speed data acquisition and/or waveform generation up to 250 kHz A/D, 100 kHz D/A
- Guaranteed timing and no data gaps

Real Time Data Sharing

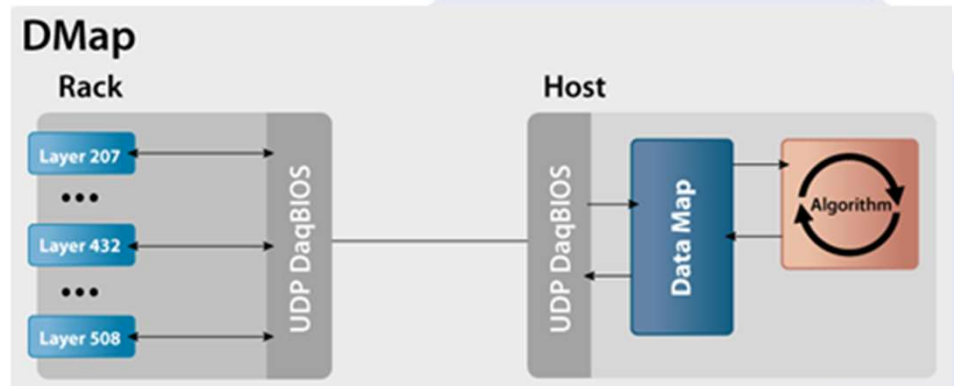
Reflective Memory

- Share data between independent systems in a deterministic manner
- Connection uses fiber optic cables
- Requires a card in every system, including host

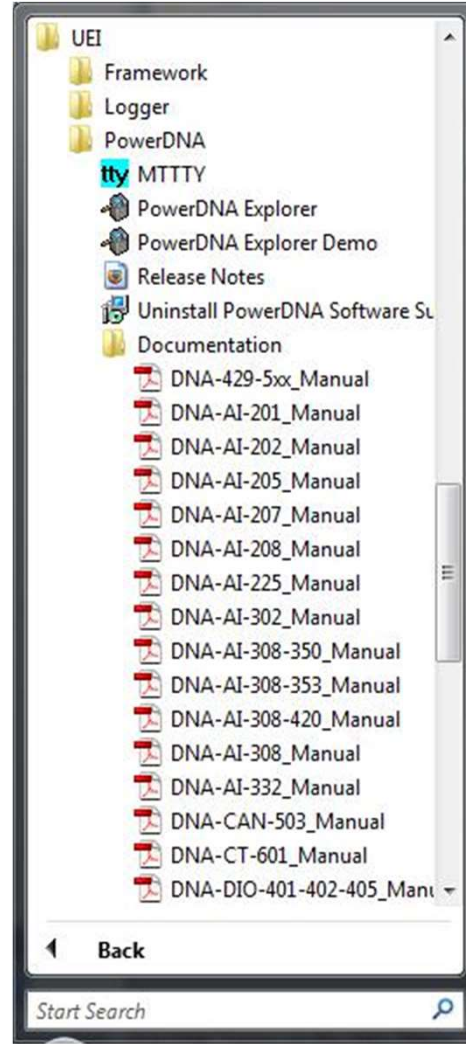
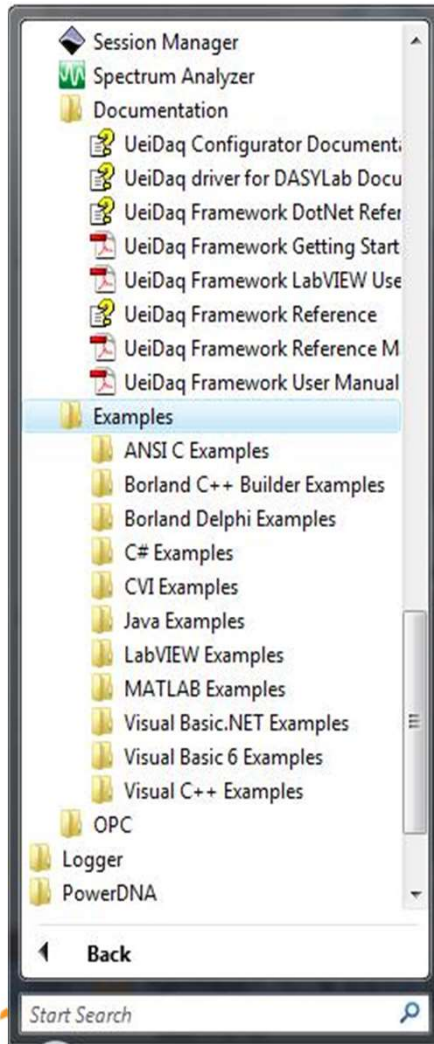


Software solution: DMAP

- Uses UDP based shared memory that can be updated deterministically
- Connection is using GigE
- No other HW required
- Update @ 4+kHz, for 1000+ ch
- Arbitrary number of chassis



Extensive examples and docs included



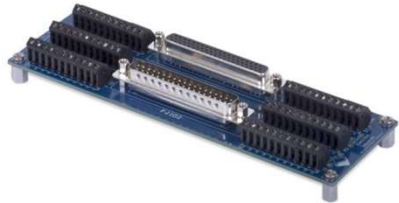
- All software and hardware manuals
- Technician maintenance manuals for DNA and DNR
- Spectrum Analyzer Software
- SolidWorks files available

Commissioning / Debug



DB37 or DB62 only

- ITT M24308 series 37 and 62 pin dSub connectors



Cables 3,5,10,20 ft

- Right Angle Available



STP37, STP62, STP3762 (with DIN)

TADP Board

- In line, Jumper in / out

PowerDNA Explorer

- Software, wiring and configuration tool

PowerDNA Explorer

Host PC

- IOM-45616
- IOM-37852
- IOM-47766
- IOM-54130
- IOM-30123
- IOM-374591
- IOM-55055**

Name: IOM-55055

Model: 3012 (DNR-12-1G, Gigabit Ethernet)

FW Ver: 4.0.0.1

S/N: 0055055

MAC: 00:0C:94:00:D7:0F

IP 1: 192.168.100.114 ↔

IP 2: 192.168.100.102 ↵

Mode: Configuration

Power Layer

2.5V DNR	2.53 V	2.5V NIC	2.52 V
3.3V DNR	3.32 V	3.3V NIC	3.30 V
24V DNR	24.24 V	24V NIC	24.00 V
Input voltage	22.62 V	1.5V source	1.56 V
1.2V source	1.28 V	Fan voltage	7.88 V
Input current	1.75 A	Temperature 1	25.00 °C
Temperature 2	31.00 °C		

CPU/NIC Layer

2.5V DNR	2.52 V	3.3V DNR	3.32 V
V capacitor	0.02 V	24V DNR	23.87 V
Input voltage	23.74 V	1.5V source	1.56 V
1.2V source	1.25 V		

Host PC

- IOM-38047
 - [0] DIO-432
 - [1] AI-207**
 - [2] 429-566

Model: AI-207

Info: A-In, 16 differential channels

S/N: 0043961

Mfg. Date: Oct 1, 2008

Cal. Date: Nov 11, 2008

Base Addr.: 0xA0010000

IRQ: 2

Enabled

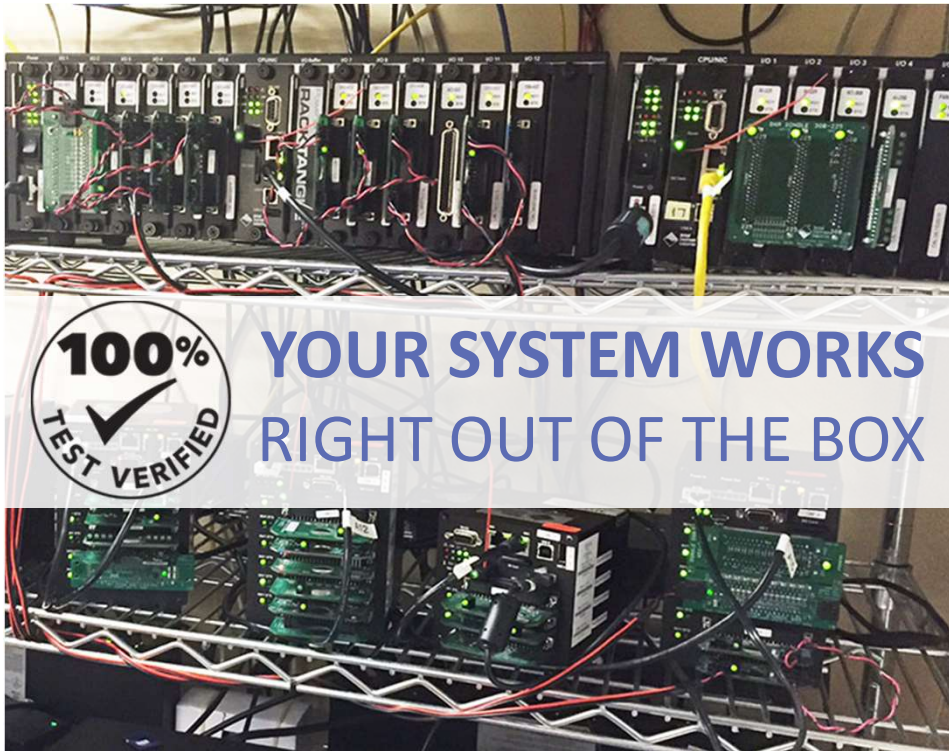
Input Range: -10...+10 V

	Name	Value
AIn0	Analog Input0	
AIn1	Analog Input1	
AIn2	Analog Input2	
AIn3	Analog Input3	
AIn4	Analog Input4	
AIn5	Analog Input5	
AIn6	Analog Input6	
AIn7	Analog Input7	
AIn8	Analog Input8	
AIn9	Analog Input9	
AIn10	Analog Input10	
AIn11	Analog Input11	
AIn12	Analog Input12	
AIn13	Analog Input13	
AIn14	Analog Input14	
AIn15	Analog Input15	

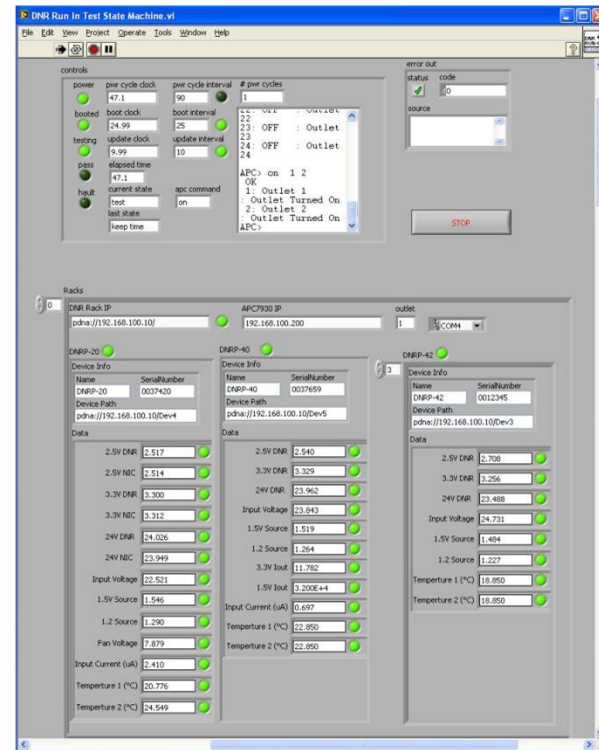
- Written in Java
- Can create an audit report for each cube/rack



Manufacturing Burn-in



**YOUR SYSTEM WORKS
RIGHT OUT OF THE BOX**



- Racks are power-cycled 760 times in 24 hours
- Special load boards stress bus / every socket
- All data is logged
- Loop back test adapters for every I/O board



Long-Term Availability Guarantee



UEI guarantees the availability of all products for a minimum of 10 years!

Quality

- ISO 9001:2008
- 100% Burn In
- Returns <0.04%
- 95% on Time Delivery
- 2-4 weeks COTS

Warranty

- 3-year warranty on all products
- 5 -year warranty on all military grade products

See UEI in Action! UEI's Video Page

Video Library



Email

Why UEI?: Rugged, reliable, extensible products, backed by a 10-year Availability Guarantee



Email

How Does UEI Support the Space Industry?: Our full suite of control, test and monitor solutions



Email

LabVIEW & UEI—Interfacing with an ARINC-429 Bus: Easily interface with our ARINC-429 DAQ



Email

UEI ARINC-429 Capabilities (Part 2): Covering UEI's ARINC-429 FIFO and Scheduler features



Email

UEI Net™ MIL-STD-1553 Avionics Gateway System: Host or embedded control; Linux, VxWorks



Email

UEI's ARINC-429 Capabilities (Part 1): Our DNA/DNR-429-5xx family is fully ARINC 429 compliant



Email

Cube In Space: UEIPAC tested and ready for shock, vibe, radiation of the space environment



Email

UEI & Pacer Comet 4: UEI's Cube on the Air Force's Pacer Comet 4 Engine Test Stand



Email

UEI Controls Marine Landing Craft: MIL Rack Chassis offers rapid, bullet proof deployment



Email

UEI helping the Space Industry: Robust, dependable DAQ/control systems for launching and landing



Email

Control/Monitoring options, Part 2: Independent monitoring/control via .NET, LabVIEW, and browser



Email

How to deploy your SIMULINK model on UEI Hardware: Build and deploy a Simulink model

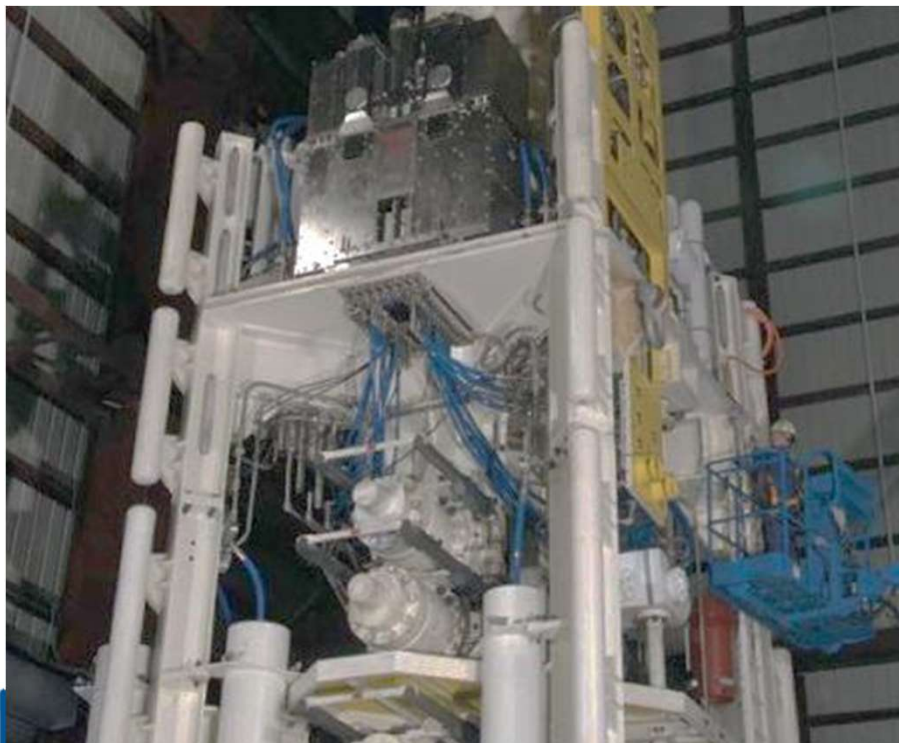
You'll learn about:

- UEI Products
- Software applications
- Start up guides
- Industry specials
- Webinars
- How-To Tutorials
- And more!

www.ueidaq.com/videos

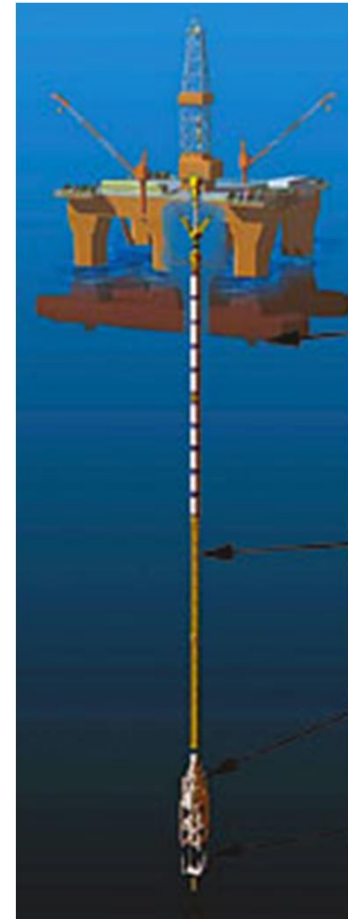
Applications

Blow Out Preventers



Logicbus

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Dynamically positioned semi

Thrusters hold rig on location

Drilling riser

LMRP – latches drilling riser to BOP

BOP at the seafloor

United
Electronic
Industries

Ground Launch Control Systems



Marine Landing Craft

Control & Command Systems

- Rehost for obsolescence & dependability on 75 LCAC marine crafts
- TRL9 redundant craft command & control system (system that is designed not to fail)
- Analog & Digital I/O, RS-485, MIL-STD-1553 and more requirements

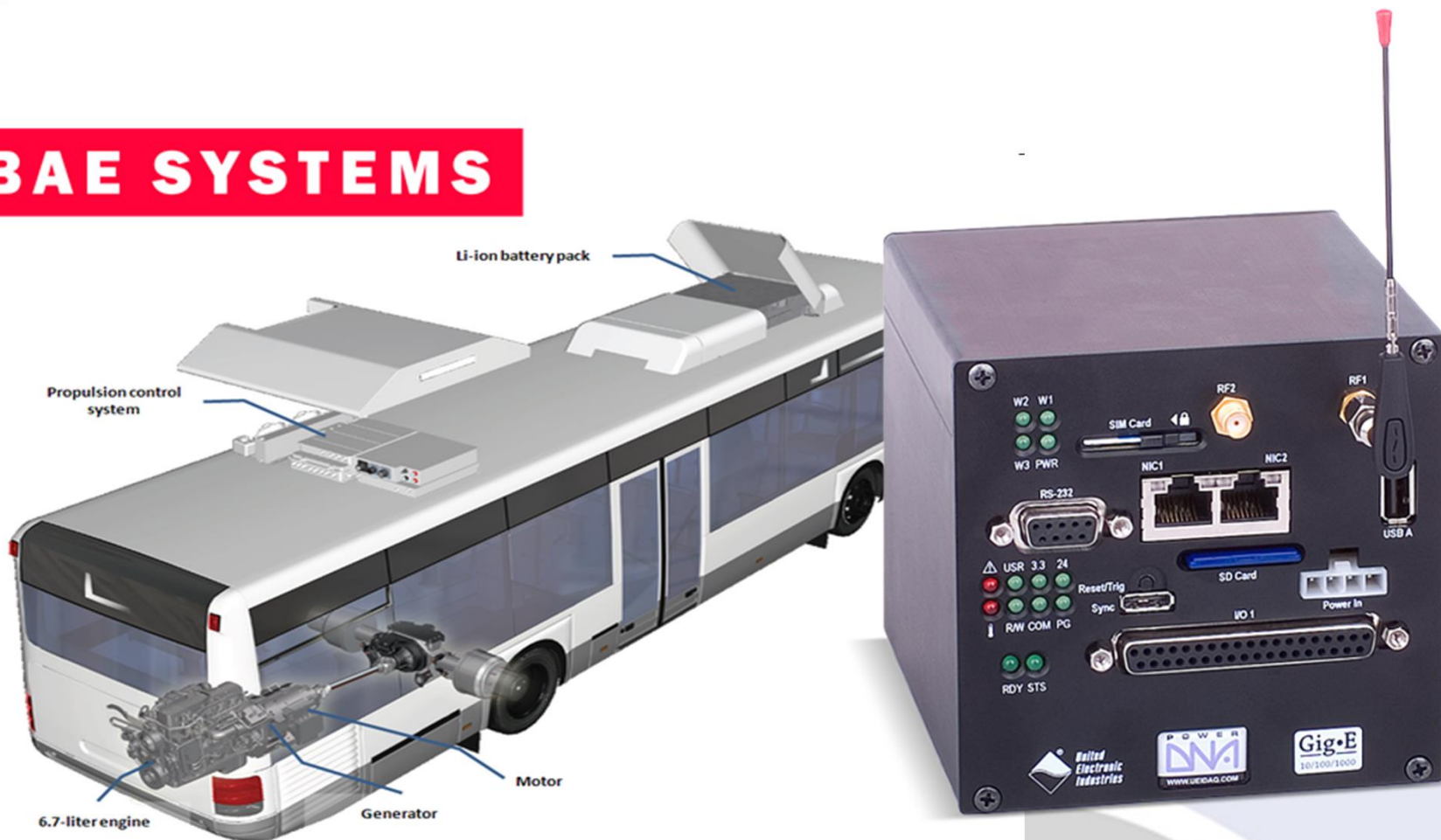


NAVY'S LCAC

LANDING CRAFT AIR CUSHION VEHICLE

Hybrid Bus Engine Monitoring: GSM & WiFi

BAE SYSTEMS



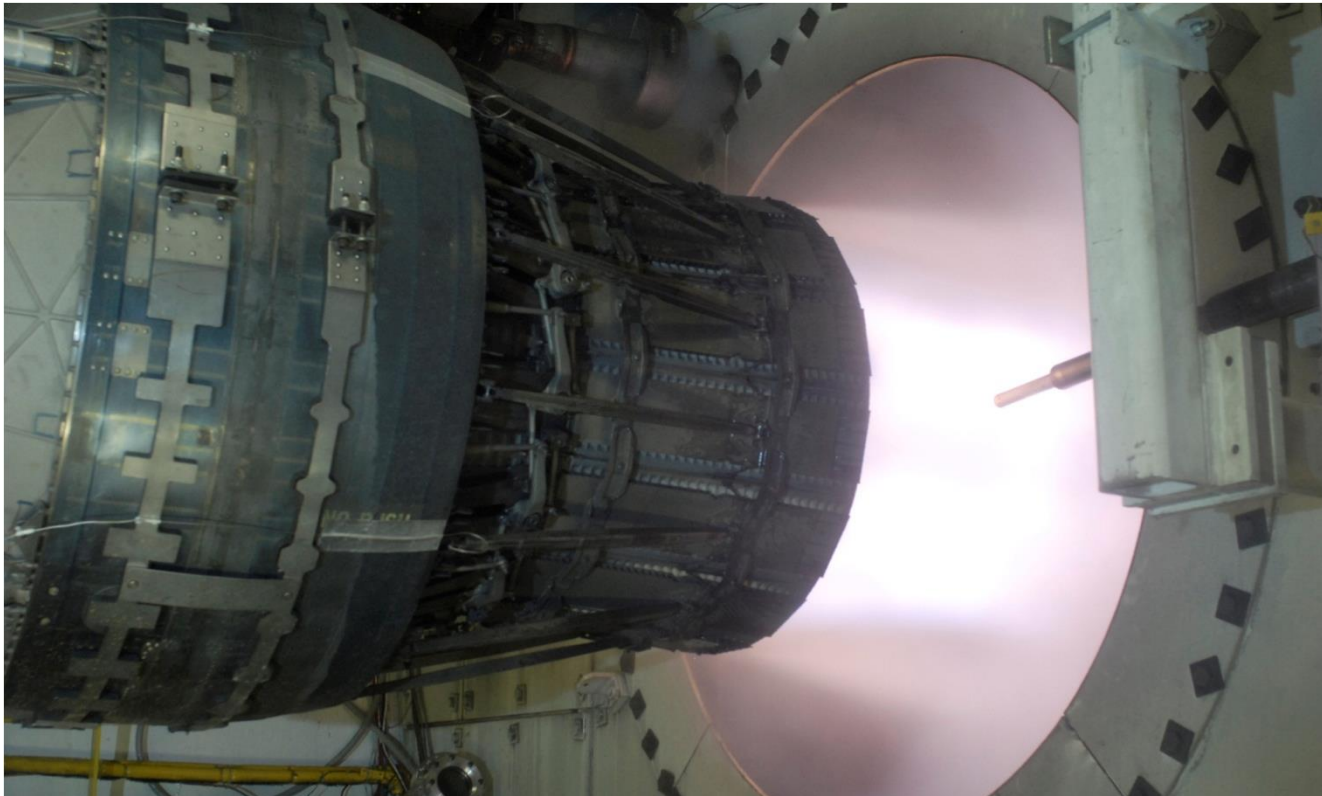
Flight Test



Cessna Flight Data Recorder



Jet Engine Test

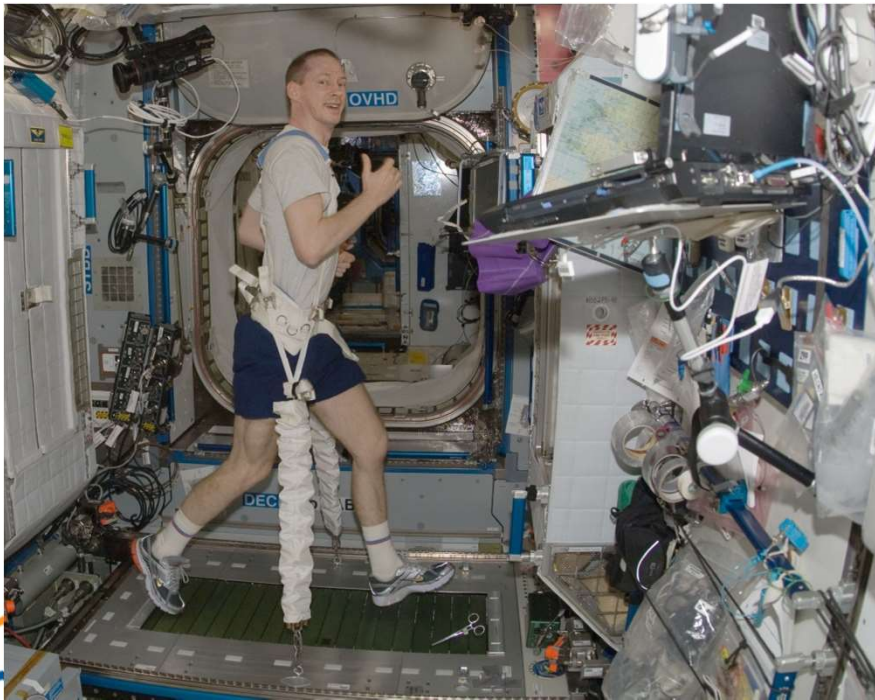
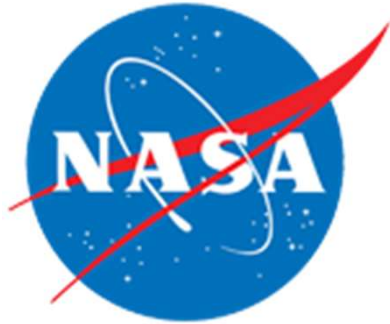


U.S. AIR FORCE

Tinker Air Force Base – Pacer Comet 4



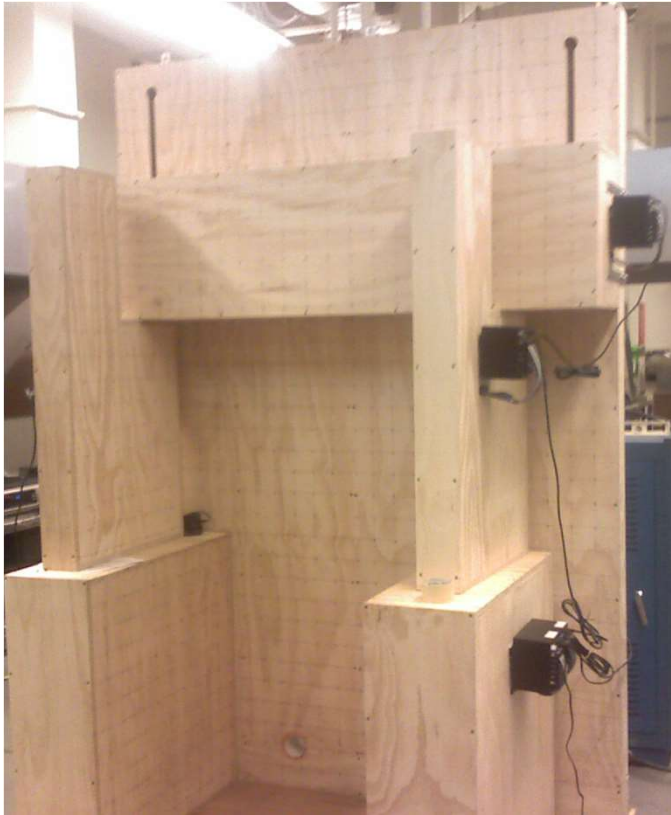
Space Station Treadmill



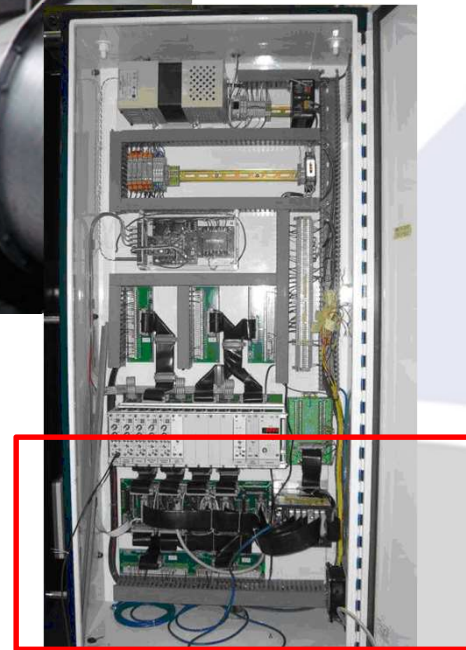
¡ Tu Sitio de Automatización !



Appliance Testing (2100 TCs)



Automotive/Dynamometer



HORIBA



Indy Racing



McLaren
APPLIED TECHNOLOGIES

Logicbus
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**United
Electronic
Industries**

Flight Simulators

FlightSafety
international



UEI Clients



BAE SYSTEMS



Honeywell



HORIBA

J.F. Taylor, Inc.



UEI Clients



JOHN DEERE

KRATOS



communications

LOCKHEED MARTIN



McLaren
APPLIED TECHNOLOGIES



Mettlers Incorporated



NORTHROP GRUMMAN



Raytheon

**Rockwell
Collins**



Rolls-Royce



Sikorsky

A United Technologies Company

TEXTRON

THALES



**SIMULATION
+ TRAINING**
A Textron Company



Whirlpool
CORPORATION



¡ Tu Sitio de Automatización !



**United
Electronic
Industries**

UEI Clients - Europe



¡ Tu Sitio de Automatización !

UEI Is Your I/O Specialist

UEI is flexible and open to meet all your OEM requirements

- Custom board development is available
- All development done in-house
- All manufacturing in the USA

History of long-term availability of products

- 20+ years

QUESTIONS? PLEASE CONTACT:



Name

Title

United Electronic Industries

27 Renmar Ave, Walpole MA, 02184

(O)

(F)

(E)

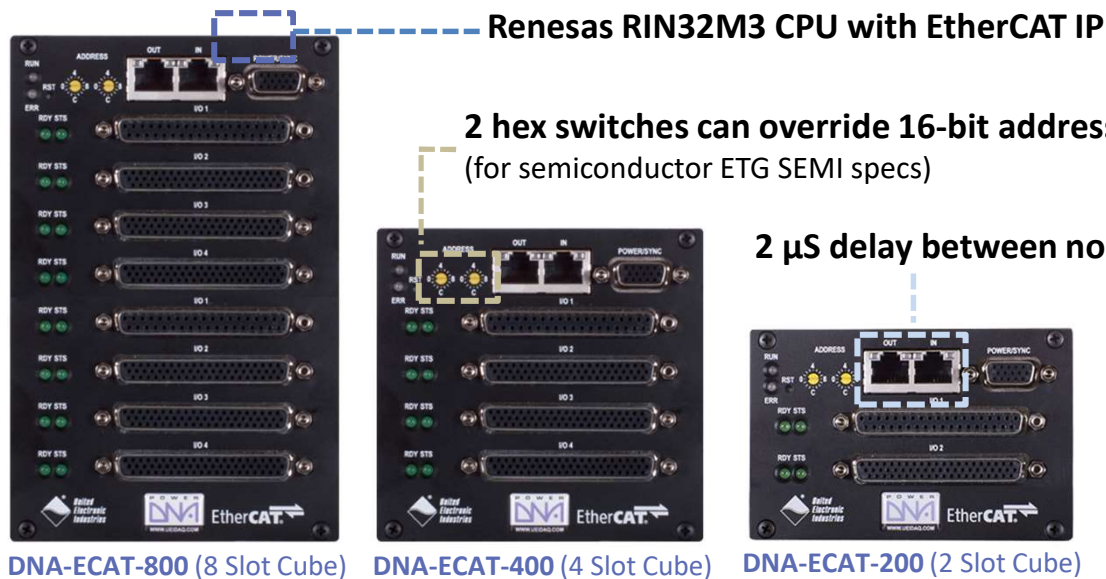
Supplemental Slides

INCLUDES:

- EtherCAT
- Synchronization Overview
- Processor Overview
- IPsec overview
- MIL Series: Expanded
- Developing Custom I/O Boards
 - Open FPGA based architecture
- UEIPAC VxWorks BSP

UEI EtherCAT Solution – Hardware Overview

STANDARD DNA-ECAT FEATURES:



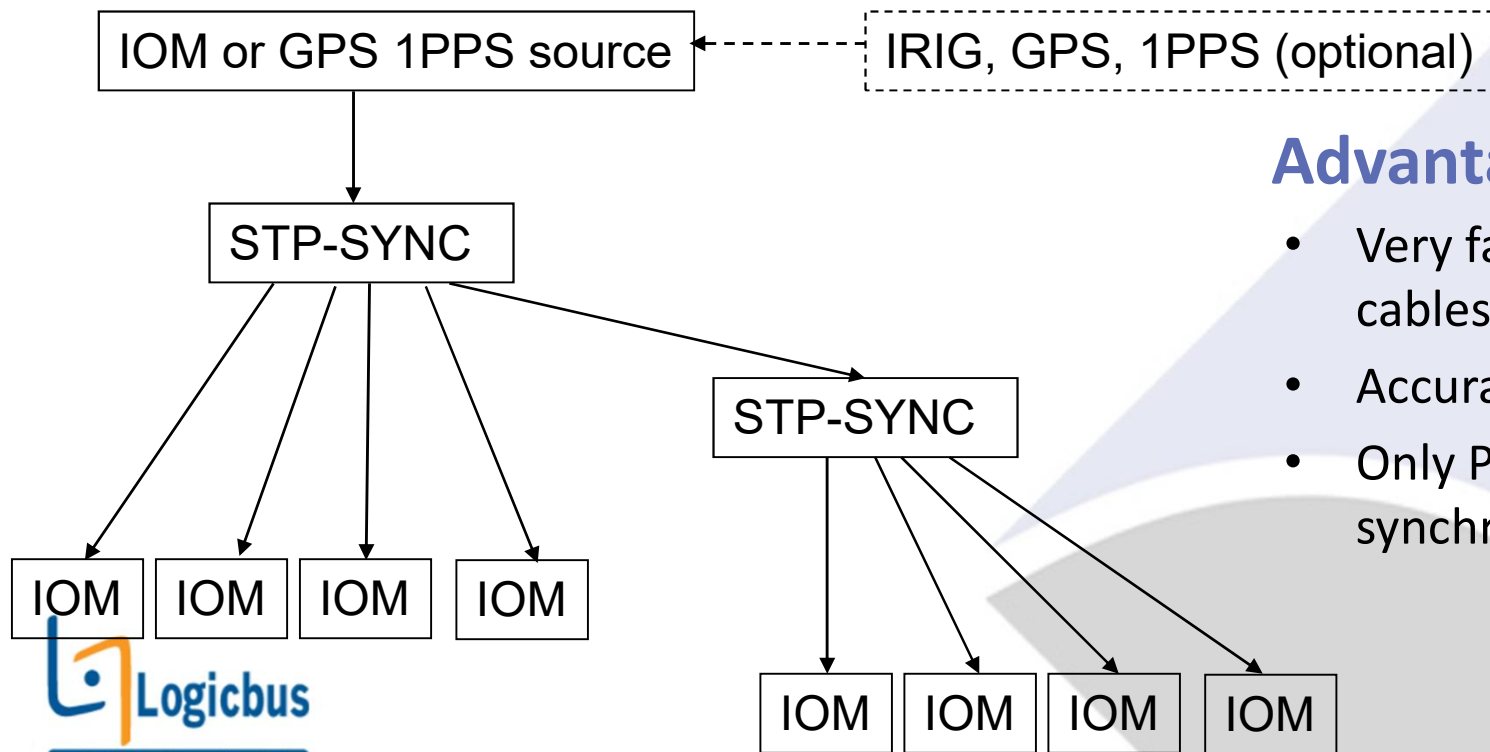
Compatible with
PowerDNA
product line

- UEI VendorID is 0x554549
- Up to 5 kHz scan rates
- Over 60 different I/O cards
- Wide input power range:
9 to 36 VDC
- 192 A/D, 256 D/A, 384 DIO
- 4" x 4.1" x 6.6"
- Industrial temperature range:
-40 C to 85° C
- Rugged: 5g vibration, 100g shock
- DIN rail or flange mount
- Built-in diagnostics



Synchronization – 1PPS

- Simplest to implement – very accurate over short distances
- Requires extra CAT5e cable, all cubes or racks must be connected through STP-SYNC
- Skews at longer cable lengths
- Available in both PowerDNA and UEIPAC modes



Advantages

- Very fast with short cables
- Accuracy up to +/-100ns
- Only PTP and 1PPS and synchronize scans

Synchronization – IEEE-1588

Precision Time Protocol (PTP)

- Hardware-timed for faster, more accurate timing
- Master-slave architecture
 - Grandmaster sends synchronization information to other clocks in network
 - Boundary clocks send synchronization information from Grandmaster network to other networks
- Timestamps corrected by transparent clocks to account for network latency
- Available in both PowerDNA and UEIPAC modes



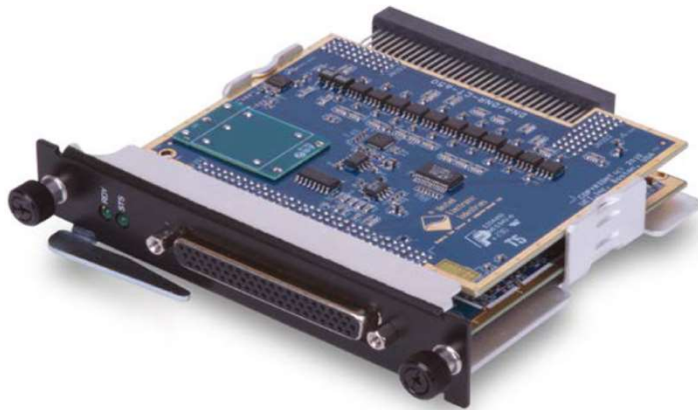
Advantages

- Good for distributed networks
- No additional cabling required
 - Runs over Ethernet
- Accuracy up to +/-300ns
- Only PTP and 1PPS and synchronize scans

Synchronization – IRIG-650 Layer

IRIG Timing Generation and Synchronization Board

- DNx-IRIG-650 is a IRIG-A, -B, -E, or -G timing interface
- IRIG output allows cube to provide timing signals
- IRIG input allows cube to synchronize with external IRIG sources
- Direct GPS input (active antenna)
- 10MHz time based or external 10MHz

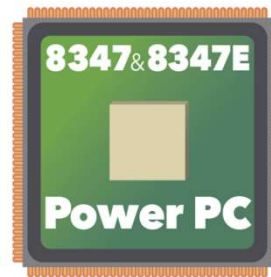


Processors



5200 Processor

- On all DNA-PPCx products
- Fiber or Copper
- 10/100BaseT Ethernet
- Lowest Power
- Same Software API



8347 & 8347E Processors

- Available for all chassis
- 2 Independent 1000BaseT Ethernet
- Options for 256 MB RAM, 128 MB Flash
- 8, 32 GB SD Cards
- 8, 16, 64 GB SSD Options
- IEEE 1588 Synchronization

CYBER SECURITY READY



- Hardware Encryption Engine optional
- Hardware Assured NVRAM Protection

Processor	Part Number	Memory	Connectivity	Non-volatile Memory	Notes	MTBF
5200 PowerPC	DNA-PPCx	128 MB RAM, 4 MB Flash	RS-232, 10/100Base-T, Switch	SD Card	3.5 Watts	>300,000
5200 PowerPC	DNA-FPPCx	128 MB RAM, 4 MB Flash	RS-232, Fiber 10/100Base-T, Switch	SD Card	3.5 Watts	>300,000
8347 PowerPC	All -1G	128 MB RAM, 32 MB Flash 256 MB Optional RAM	RS-232, USB2.0 2 GigE (Independent)	SD Card, Flash SSD	7 Watts, IEEE 1588	>160,000
Encrypted 8347	All -1G	256 MB RAM, 128 MB Flash	RS-232, USB2.0 2 GigE (Independent)	SD Card, Flash SSD	7 Watts, IEEE 1588, Hardware Encryption	>160,000
Renasas	DNA-ECAT	-	RS-232, 2 100Base-T	N/A	4 Watts, EtherCAT	>350,000

IPsec Encryption

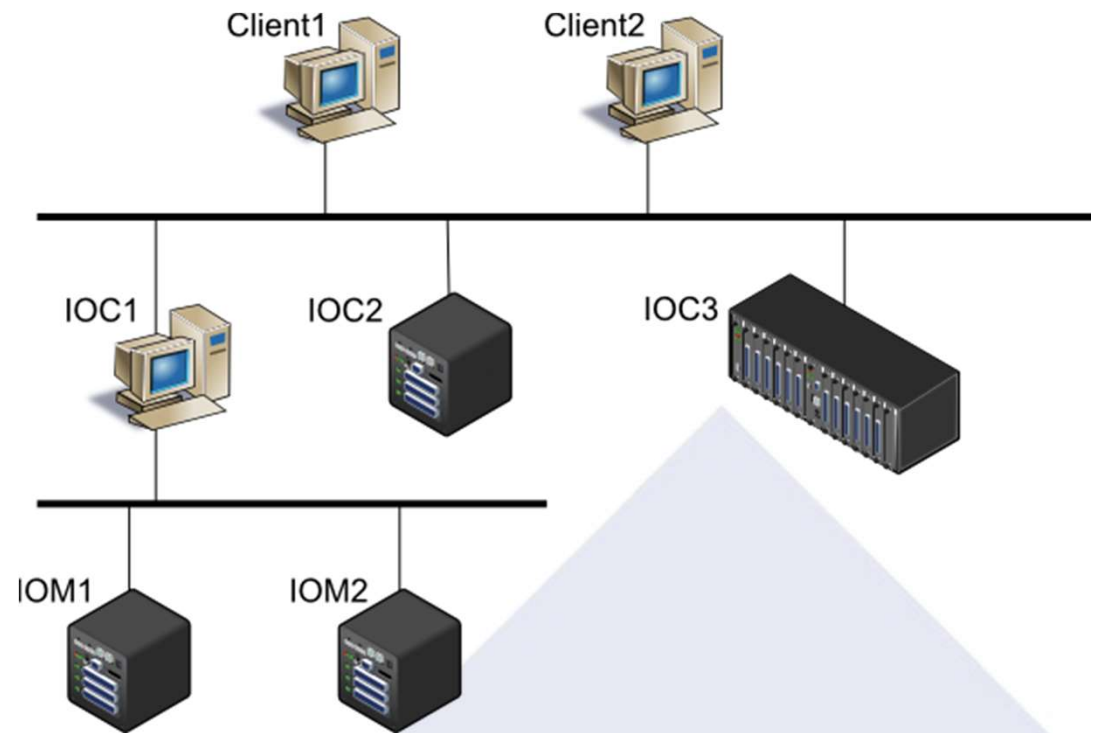
Internet Protocol Security (IPsec)

- Hardware encryption – faster, less load on software
- Network encryption that encrypts and authenticates packets sent over a network
- Supported by Linux, rolling out for UEIPACs running Linux
- Available for UEIPAC mode



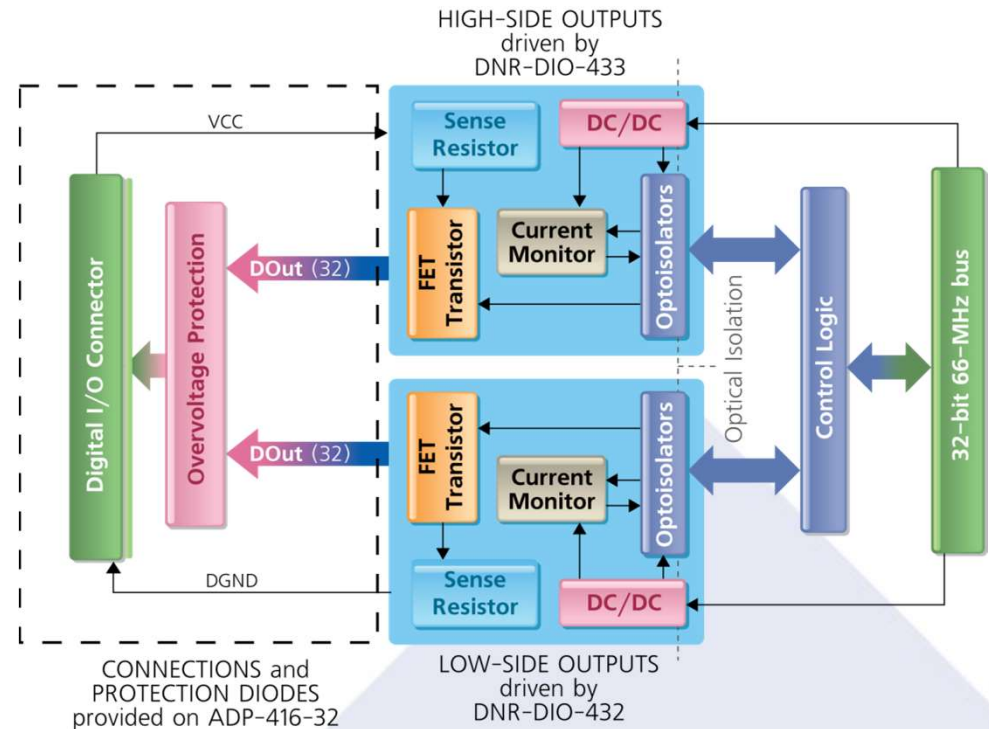
EPICS - Experimental Physics and Industrial Control System

- Supports both PowerDNA and UEIPAC I/O families
- Supports both RACKtangle and Cube form factors
- Included in our standard software distribution. There is no need to purchase or download any additional software for EPICS support.



Solenoid Control – DIO-416-32

- High-side FETs provided by DNR-DIO-433
- Low-Side FETs provided by DNR-DIO-432
- Protection diodes & interconnects provided by ADP-416-32
- Built-in output current and voltage monitoring
- 500 mA continuous, 1 A peak current capacity
- Low (<25 μ A) off leakage



DNx-MIL for mission critical LRUs

- **All COTS:**
 - 60+ COTS DNx series I/O boards
 - VxWorks, QNX, Linux, Windows support
- **Extremely rugged designed to:**
 - MIL-STD-810G Environmental
 - MIL-STD-461F Electrical
 - MIL-STD-704/1275 Power
- **Dual Redundant Ethernet teamed/bonded**
- **Extended Diagnostics:**
 - Annunciator LEDs, Internal hour meter
 - Temperature, Power, BIT
- **Simplified Development:**
 - Terminal block to standard serial/power/Ethernet connectors
 - Cables from 38999 to our standard 37/62 connectors
 - Easily Distributed: 100 meters via Ethernet



DNx-MIL for mission critical LRUs

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Dual Redundant Ethernet teamed/bonded

Extended Diagnostics:

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Simplified Development:

- Terminal block to standard serial/power/Ethernet connectors
- Cables from 38999 to our standard 37/62 connectors
- Easily Distributed: 100 meters via Ethernet

For Secure Mil Applications we need to add:

- Jumpers
- FPGA Board: Blow Fuse (bob: Erik needs a datasheet)
- Extreme heat / no fans allowed
 - *American cheese cube or rack*
- IA statement
- Statement regarding Memory is wiped out when power is disconnected



Developing Custom I/O Boards

Hellfire missile simulator:

DNx-CT-602-808.

- 4 channels: isolated, independent
- Differential inputs/outputs at RS-422/485 logic levels
- 10 Counting modes with 32-bit prescaler
- Supports SSI communication protocol
- Programmable data word and frame synch length

Strain gage simulator:

DNx-AO-358

- 8 channels: isolated outputs
- Full or Half/Quarter bridge configurations
- 120, 350, 1000 Ohm configurations
- +/-15 V Excitation Range (AC or DC)

Special input range, high density A/D board:

DNx-AI-248-230

- 24 channels: isolated, differential inputs
- -2 to +32 V input range (Gains: 1, 10, 100, 1000)
- 250 Hz per channel

Function Generator / AWFG board:

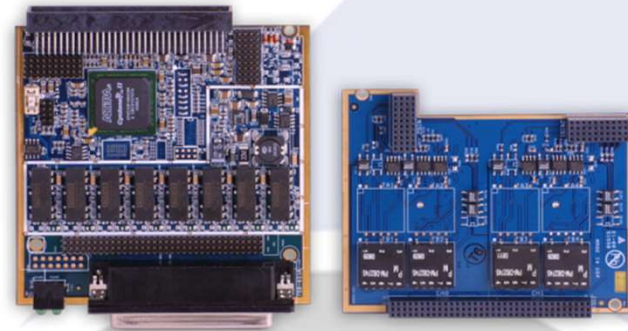
DNx-AO-364

- 4 channels: isolated, independent outputs
- +/-12 VDC, 10mA output drive
- Sine, Square/Pulse, Triangle/Trapezoid, DC, AWFG
- Output frequency 1mHz to 150 kHz

WIFI / CELL / GPS interface:

DNx-CAR-550

- Supports GSM and CDMA
- External access for carrier SIM/UIM card
- 2 external RF/Coax connectors



UEIPAC VxWORKS BSP

•Version 6.9

- Long History
- Well Tested / Supported

•High Performance

- All of our boards
- Small Footprint
- Tuned for determinism and responsiveness

•Extremely Reliable

- Deterministic
- Safety, Security Certifications
- Redundant Ethernet – Teaming/Bonding



New I/O Interfaces

Analog Input

- AI-204
- DMM-261

Features:

24 ch 18 bit 0-20 mA, 4-20mA, +/-25 mA 1 kHz
1 ch 6.5 digit DMM – VDC, VAC, IDC, IAC, and Resistance

Analog Output

- TC-378
- RTD-388

Thermocouple Simulator board - 8 ch, 16 bit
RTD Simulator board - 8 ch, 18-360 Ohm, 180-3900 Ohm

Digital I/O

- DIO-440

Two independent 2x20 multiplexers 55VAC/VDC, 400mA

Serial

- SL-514

4 ch RS-422/485, 2.5 MHz Transfer Rate, onboard FIFO

Avionics

- 429-516
- CSDB-509

16 TX ARINC 429 channels
8 ch CSDB support – 12.5/100 kHz, 11 bit framing

Power Supply

- PC-910

+/-10V 1.5A Power Supply

Software

- IEEE-1588
- SSD Support
- EtherCAT

1588 Support
Supported for UEIPAC 1G
Lower Cost EtherCAT support



¡ Tu Sitio de Automatización !

United
Electronic
Industries

Roadmap

Analog Input

- O'Scope

Features:

Tbd

Interfaces

- Multifunction board

Analog I/O and DIO on the same board

Software

- RT Linux

RT Linux support for UEIPAC

CPU

- DNx-PPCx-4G

Onboard memory, multi-core ARM processor, video out, 1588 built in

Contact

Customer Support

- Monday through Friday
8:00 to 13:00 Hrs. and 14:00 to 18:00
- E-mail
 - Information: info@logicbus.com
 - Sales: sales@logicbus.com
 - Support: soporte@logicbus.com
 - Purchase Orders: orders@logicbus.com

Phones

- Customers in Mexico
 - Line 1 / Fax: (33)-3854-5975
 - Line 2: (33)-3823-4349
 - Line 3: (55) -8995-3820

Customers in Latin America and Spain Line 1 to 3 is added (+52)
- Customers in USA
 - Line 4: (619)-616-7350

Location

- Mexico
 - Av. Alcalde # 1822
 - Col. Miraflores
 - CP 44270, Guadalajara Jal. Mexico
- USA
 - 1043 Broadway Ste # 103
 - Chula Vista, CA 91911

