United Electronic Industries

CYBER-SECURITY ENABLED

2021 QUICK REFERENCE GUIDE

CHASSIS & I/O BOARD SPECIFICATIONS

INTRODUCING...

PANEL I/O 40-channel fully integrated I/O system

ZYNQ PROCESSOR Quad-core/ high performance CPU

THE BRICK Compact & rugged 4-channel I/O chassis

UEI COLLECTS REAL-WORLD DATA FOR THE AEROSPACE, ENERGY AND DEFENSE INDUSTRIES, ALLOWING OUR CUSTOMERS TO BUILD SMART SYSTEMS THAT ARE RELIABLE, FLEXIBLE AND RUGGED.

508-921-4600
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ueidaq.com

Build Your Perfect System with UEI

UEI has created a quick and easy way to build your perfect I/O system. We have identified 3 segments—chassis, I/O selection, and software/programming options—that allow you to assemble an ideal system for your application. Below is a graphical overview of each segment and what is included in the build process.

STEP 1 CHOOSE YOUR CHASSIS

CUBE & RACK CHASSIS

STEP 2 CHOOSE YOUR I/O

ANALOG INPUTS Vln, TCs, RTDs, Strain, ICP/IEPE, etc.	**ANALOG OUTPUTS** Vout to 115 VDC, 4-20 mA, etc.	**LOGIC LEVEL DIO**	**INDUSTRIAL & HIGH VOLTAGE DIO**	**DMM**	**AVIONICS** ARINC 429/708/453, MIL-1553, ARINC-664 Part 7, etc.	**SERIAL COM** Asynchronous & Synchronous
RVDT/LVDT SYNCHRO/RESOLVER Input and simulated out	**QUADRATURE, FREQUENCY/SPEED/PWM**	**IRIG/GPS/1588**	**CAN-BUS** Including J-1939 and .DBC	**WIFI & GSM** Wireless interfaces	**FUNCTION GENERATOR OUTPUTS**	**AND MORE**

STEP 3 CHOOSE YOUR SOFTWARE/PROGRAMMING

HOSTED

OSs

QNX, VxWorks, Linux, Windows 10

Plus most Open & Proprietary OSs

Software/Programming

C/C++, python, LabVIEW, Visual Studio, C#, MATLAB, AND MORE LANGUAGES

OR

STANDALONE/EMBEDDED

OSs

VxWorks, RealTime

Software/Programming

C/C++, SIMULINK, python

AND MORE LANGUAGES

Applications

OPC, EPICS, UEI IoT, Modbus, EtherCAT, VISTAS, iDDS

It's really that simple!

HOW WILL YOU DEPLOY YOUR APPLICATION?

Learn about our two modes of system deployment.

HOSTED APPLICATIONS

UEI offers **PowerDNA mode**, which allows our systems to operate as I/O slaves under control of a host PC or network.

This mode is ideal for applications such as:

- Laboratory Systems
- Flight & Ground Simulators
- Power Plant Simulator Test Systems
- Aerospace & Defense Test
- And more

In PowerDNA mode, you can use the following OSs and Programming Languages:

OSs

QNX, VxWorks, Linux, Windows 10

Plus most Open & Proprietary OSs

Software/Programming

C/C++, python, LabVIEW, Visual Studio, C#, MATLAB

And More Languages

STANDALONE/EMBEDDED APPLICATIONS

UEI offers **UEIPAC (Programmable Automation Controller) standalone/embedded mode** that does not require a tether to a PC or network.

This mode is ideal for applications such as:

- Hardware-in-the-loop Systems (HILs)
- System Integration Labs (SILs)
- Health Usage & Monitoring Systems
- Ground Control Systems
- In-Vehicle Test
- Engine Test Stands
- And more

In UEIPAC mode, you can use the following OSs and Programming Languages:

OSs

VxWorks, Linux **RealTime**

Software/Programming

C/C++, SIMULINK, python

And More Languages

UEIPAC is ivdeal for use with the following application packages:

OPC, EPICS, UEI IoT, Modbus, VISTAS, iDDS

UEI & FACE™

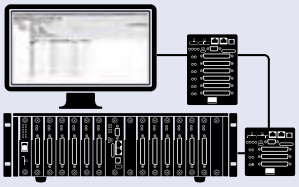
The FACE™ (Future Airborne Capability Environment) Consortium is a government/industry partnership that aims to define an open avionics environment, the FACE™ technical standard, for military avionics platforms. UEI COTS products are aligned with the FACE™ technical standard and within the FACE boundary, UEI utilizes RTI technology to participate in FACE systems via TSS—the transport services segment.

LEARN ABOUT UEIPAC SYSTEM CONFIGURATIONS: UEISIM, UEIMODBUS, UEIOPC-UA, UEI VISTAS, UEI iDDS, UEI IoT, UEI and EtherCAT.

Next Page

Get To Know UEI's System Configurations

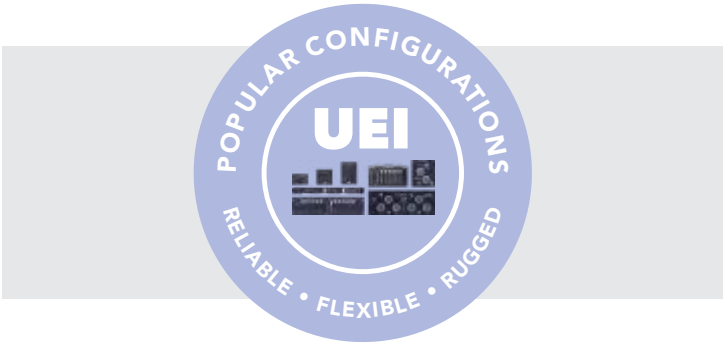
HOSTED.....PowerDNA Series



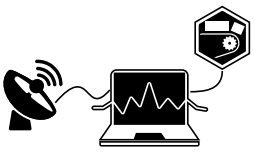
Acts as I/O slaves to a host PC to perform tasks the host commands. This configuration works well in both data acquisition and control applications. PowerDNA mode supports all popular operating systems, including Windows®, Linux®, QNX®, VxWorks®, InTime and more. PowerDNA also supports many popular application software including MATLAB®, LabVIEW® and more.

EMBEDDED.....UEIPAC Series

Standalone embedded controllers or data loggers. Build your application on a Linux PC, Windows PC using Cygwin, or on VxWorks machines. Once your code is developed, compile and download it to the UEIPAC to run standalone and/or to keep on your network to provide updates to your host. UEIPAC can also be used as a local control node tied to a host PC to execute local applications as directed by the host.



INTERNET OF THINGS UEI IoT



IoT is a networked system of interconnected physical objects that can share data with each other and cloud services for archiving and analysis. UEI's Linux-based PACs come preinstalled with Eclipse Mosquitto (MQTT) which implements the MQTT machine-to-machine (M2M) protocol. UEI also supports Helix Device Cloud, Amazon AWS IoT and Microsoft Azure. Available on embedded and OPC-UA platforms.

SIMULINK UEISIM Series

Easily run your Simulink models on real I/O. Build a standard Simulink application and then generate and compile code using Mathworks Embedded Coder. Run your models standalone or under supervisory control of the host PC. UEISIM creates a powerful solution for developing and tuning real-time (and non-real-time) applications including model verification, rapid prototyping, and HIL testing.

MODBUS UEIModbus Series

Perfect I/O system to run from your Modbus TCP host. The UEIModbus is compatible with all popular Modbus host applications and software. The UEIModbus communicates with a host computer or PLC over Modbus TCP. This flexibility allows you to configure one or more chassis to match the specific I/O requirements of your application, especially those for industrial applications.

OPC-UA UEIOPC-UA Series

Run as a standard OPC-Unified Architecture server as defined in IEC 62541. As such, it is supported by a huge number of currently available applications packages, written in-house and by third party developers. The UEIOPC-UA is an ideal solution in a wide variety of oil & gas, HVAC, machine health monitoring as well as host of other industrial control and monitoring functions. Support included for Data Access, Alarms and Historians.

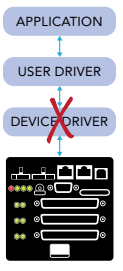
EtherCAT DNA-ECAT Series

Use powerful and flexible UEI I/O In your deterministic EtherCAT control projects. Our fully certified EtherCAT Slaves are supported on all of our industrial chassis. Other key specifications include built-in watchdog timers, safe state default conditions, and cable redundancy. Offers unparalleled channel density (i.e. I/O channels per cubic foot).

VISTAS Virtual Interoperable Simulation Tests of Avionics

VISTAS enables avionics equipment to be easily accessed and controlled remotely through ethernet. In turn, this also allows for equipment to be emulated with I/O devices. Our VISTAS implementation runs on virtual or hybrid test benches improving schedules and quality while reducing overall cost. The physical hardware can be remote to the bench using VISTAS as a virtual bridge.

iDDS Plug and Play DAQ



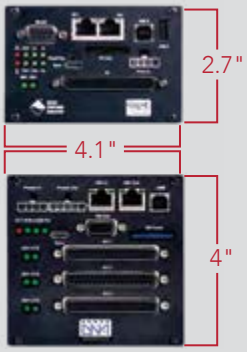
iDDS (Instrumentation Data Distribution Service) is an embedded common application protocol for "plug and play" DAQ instruments. UEI is one of the very select companies that offer iDDS compatibility. Our standalone embedded system using iDDS allows lower cost and shorter integration costs because publishers/subscribers share a common framework and code is written in a common interface definition language. Our wide array of I/O and avionics boards and extensive software support make your testing safer, faster, easier, and more cost-effective.

CHASSIS OVERVIEW

PowerDNA
CUBE ARCHITECTURE

6 SLOT CUBE
Up to 160,000 hours

1 SLOT CUBE
160,000 hours



3 SLOT CUBE
Up to 300,000 hours

7 SLOT CUBE
Up to 160,000 hours

Common Features

- 1, 2, 3, 4, 6 or 7 available I/O slots
- 9-36 V DC Input
- Diagnostic serial port
- SYNC port, 1588 (board-to-board and cube-to-cube)
- -40° C to 85° C
- 5g Vibration,100g Shock, 120,000 ft
- SSD, Encryption Hardware
- LED Health / Status Indicators
- USB
- 10/100/GigE or Fiber

THE **CUBE** IS THE IDEAL SOLUTION WHEN YOUR APPLICATION CALLS FOR MAXIMUM RUGGEDNESS IN THE SMALLEST POSSIBLE PACKAGE.

Wireless Ready (GSM, CDMA, WiFi)
All UEI Chassis are wireless-ready, except for MIL Series. Inquire further with your UEI representative.

PowerDNR
RACKtangle® ARCHITECTURE

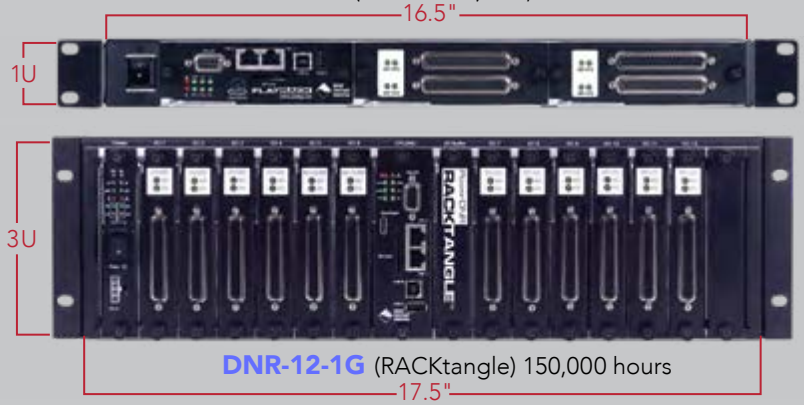
Common Features

- 4, 6 or 12 I/O boards
- Passive backplane with temp sensors
- Extensive built-in test & diagnostics
- 3g Vibration, 50g Shock, 70,000 ft
- -40° C to +70° C
- USB
- 2 independent GigE NICs
- SSD, Encryption Hardware

THE **RACKtangle** IS DESIGNED TO ALLOW YOUR SYSTEM TO BE QUICKLY & EASILY RECONFIGURED.

DNR-6-1G (HALF RACKtangle)
130,000 hours

DNF-4-1G (FLATRACK) 130,000 hours



DNR-12-1G (RACKtangle) 150,000 hours

UEI's Cube, RACKtangle® and FLATRACK™ I/O chassis are compact and rugged data acquisition (DAQ) interfaces, ideally suited for a wide variety of industrial, military, aerospace, energy, laboratory DAQ and control applications. Each Cube/RACKtangle chassis includes a CPU, a real-time OS, Ethernet interface and slots allowing the installation of I/O boards. All our boards are compatible with all of our chassis options. With more than 80 I/O boards available, we're sure to have just what you need. UEI supports all popular Windows, Linux and Real-time operating systems. Our software suite provides a simple, universal API, and supports all common programming languages. Our Cube/RACKtangle chassis fully support an extensive array of application packages, including LabVIEW, MATLAB, Simulink and more.

Please note that PowerDNA® (Distributed Networked Automation) refers to our unique chassis. Cubes are designated with a "DNA" prefix, RACKtangles a "DNR" prefix, and FLATRACK a "DNF" prefix. UEINet™ is our single slot cube. "MIL" designates a chassis designed to meet military-grade specifications MIL-STD-704/1275/461/810.

CHASSIS OVERVIEW CONTINUED

Rugged/Sealed Chassis
RACKtangle® ARCHITECTURE

4 SLOT DNA-MIL
(MIL-CUBE)
130,000 hours

12-SLOT DNR-MIL
(MIL-RACK)
130,000 hours

6-SLOT DNR-MIL-6
(MIL-RACK)
130,000 hours

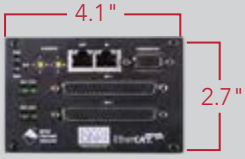
4-SLOT BRICK
(DNR-BRICK)
130,000 hours

- Military/Rugged 38999 connectivity
- 100% COTS solution
- Supported by over 80 standard DNA-series I/O boards
- 5g vibration, 100g shock, sealed to IP66
- GigE ports (control and diagnostic)
- Designed for MIL-STD-461/1275/704/810 compliance
- Extensive built-in system diagnostics
- Compatible with all PowerDNA and PowerDNR boards & software
- Extensive software support including Windows, Linux, QNX, INtime and more
- VxWorks support available in embedded or hosted configurations

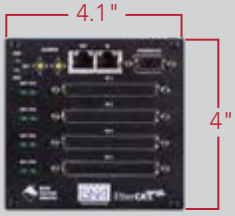
EtherCAT
CUBE ARCHITECTURE

For your high channel count, rugged EtherCAT requirements

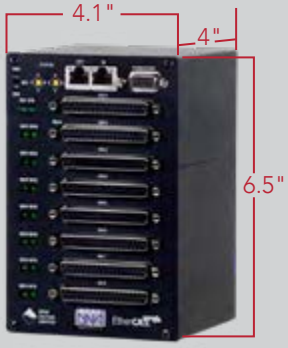
EtherCAT Conformance tested



DNA-ECAT-200
(2 SLOT ETHERCAT BASED I/O CUBE)
>350,000 hours
- Up to 96 I/O channels



DNA-ECAT-400
(4 SLOT ETHERCAT BASED I/O CUBE)
>350,000 hours
- Up to 192 I/O channels

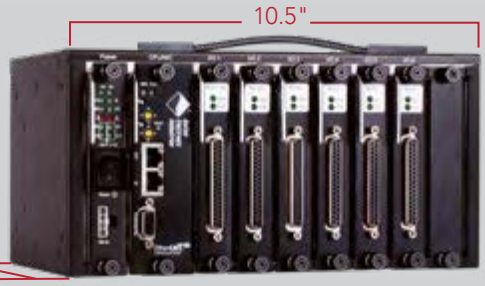


DNA-ECAT-800
(8 SLOT ETHERCAT BASED I/O CUBE)
>350,000 hours
- Up to 384 I/O channels

Common Features
- Fully EtherCAT compliant
- Flexible enough to match your application
- 9-36 VDC Input
- -40° C to 85° C
- 5g Vibration, 100g Shock, 120,000 ft
- 1 kHz update rates
- LED Health / Status Indicators
- Standard 100BaseT EtherCAT Interface
- 350 Vrms Isolation

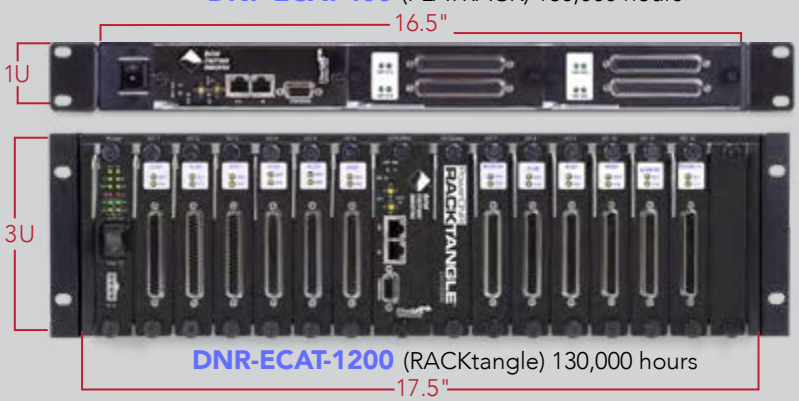
THE FLEXIBLE **ECAT SERIES** SUPPORTS ALL ETHERCAT MASTERS SO YOU CAN BUILD YOUR PERFECT SYSTEM.

EtherCAT
RACKtangle® ARCHITECTURE



DNR-ECAT-600 (HALF RACKtangle) 160,000 hours

DNF-ECAT-400 (FLATRACK) 130,000 hours



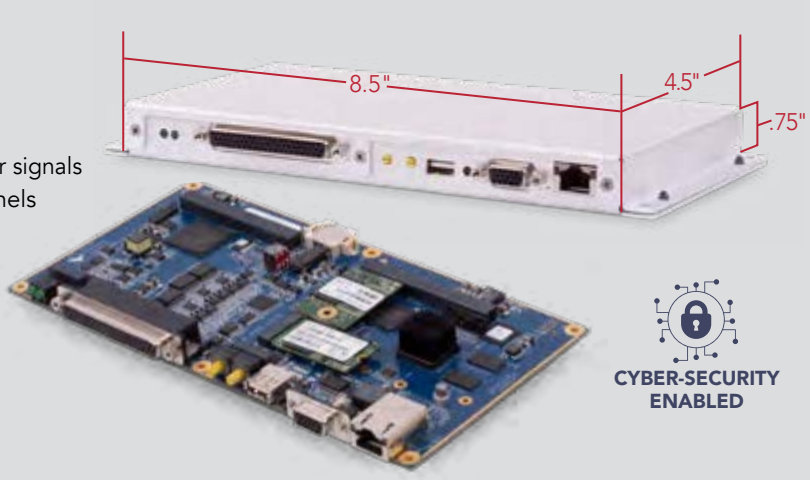
DNR-ECAT-1200 (RACKtangle) 130,000 hours

Multifunction Panel I/O Interface

(UEI-PIO-1010)

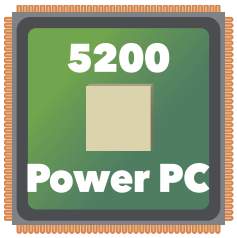
40-Channel Fully Integrated I/O System

- Compact all-in-one I/O system—designed to be placed close to your signals
- Easily embed in equipment—ideal for instruments and control panels
- Integrated SoloX/i.MX ARM A9 processor
- Rugged—5g Vibe, 100g Shock, -40°C to +85 °C
- 16 analog inputs, 2 analog outputs, 20 DIO, 2 frequency I/O, RS-232/422/485 and I²C ports
- Single board control, or distributed acquisition and control
- 100% compatible with UEI's entire product line
- Designed for Aerospace and Industrial voltage levels, up to 80 V
- Can add 2 additional boards



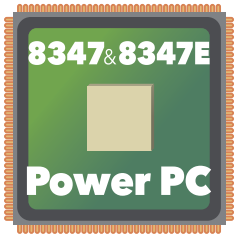
CYBER-SECURITY ENABLED

PROCESSOR OVERVIEW



5200 Processor

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

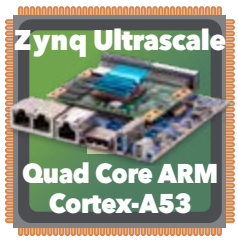


8347 & 8347E Processors

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

SoloX Processor

- SoloX/i.MX6 A9/M4
- 2 Independent 1000BaseT Ethernet
- RS-232, USB 2.0, HDMI, M.2 PCIe
- 1 GB RAM, 8 GB Flash
- MicroSD to 32 GB, SSD,M.2 SSD up to 320 GB*
- 5 Watts, IEEE 1588, Wireless via M.2 card



Zynq Ultrascale Processor

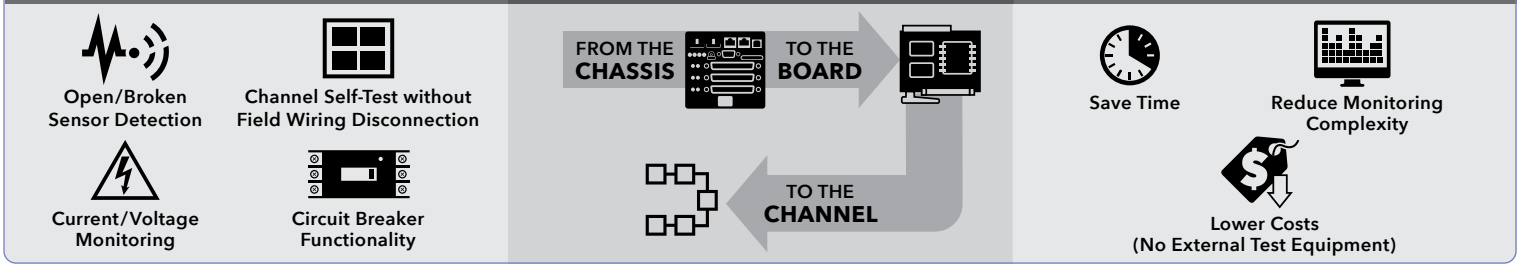
- Available on all UEIPAC systems
- Quad-core ARM Cortex-A53, 64-bit processor
- User programmable Xilinx FPGA
- 4 GB, 64-bit DDR, 8 GB Flash
- Three GigE ports, supports IEEE-1588
- Full HD Video Output
- M.2 slot for NVMe SS drives up to 512 GB

CYBER-SECURITY READY

Secure Boot, Secure OS, Secure Tools • Hardware Assured NVRAM Protection

*The SD cards and SSD devices used are not built by UEI. As we do not control the source, we cannot offer our 10-year availability guarantee.on these devices.

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



SPECIFICATIONS

Processor	Part Number (DNx-)	Memory	Connectivity	Non-volatile Memory	Notes	MTBF
5200 Power PC	DNA-FPPCx	128 MB RAM, 4 MB Flash	Fiber 10/100Base-T, Switch	SD Card	3.5 Watts	>300,000
8347 PowerPC	-1G-02	256 MB RAM, 32 MB Flash	USB2.0 2 GigE (Independent)	SD Card, Flash, SSD	7 Watts, IEEE 1588	>160,000
Encrypted 8347	-1G-03	256 MB RAM, 128 MB Flash	USB2.0 2 GigE (Independent)	SD Card, Flash, SSD	7 Watts, IEEE 1588, Hardware Encryption	>160,000
SoloX/i.MX6 Cortex A9 ARM	-1G-11 -1G-12	1 GB RAM, 8 GB Flash	2 GiGE (Independent), USB 2.0, HDMI, M.2 PCIe	MicroSD, SSD, M.2	5 Watts, IEEE 1588, Wireless via M.2 card	>160,000
Quad Core ARM Cortex-A53 Zynq	-1G-33	4 GB, 64-bit DDR, 8 GB Flash	3 GigE ports, supports IEEE-1588	Optional M.2 SSD cards up to 512 GB	12 Watts (not including I/O boards)	>140,000

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	MTBF
General Purpose, Low Noise	AI-207	16	18	16	16	-	± 10 V	± 12.5 mV	-	>600,000
High Speed, Simultaneous Sampling	AI-217	16	24	120	1000	✓	± 10 V	± 156 mV	-	275,000
High Density	AI-248-230	24	18	0.25	6	-	+ 32/ - 2 V	± 32 mV	-	550,000
High Density, High Speed	AI-201-100	24/12	16	100	100	-	± 15 V	± 1.5 mV	-	600,000
High Speed, High Voltage	AI-205	4	18	250	1000	✓	± 100 V	± 100 mV	✓	>600,000
High Speed, Fully Isolated	AI-218	8	24	120	480	✓	± 10 V	± 156 mV	✓	290,000
High Voltage, Fully Isolated	AI-228-300	8	24	120	480	✓	± 300 V	± 37.5 V	✓	290,000
Current Input	AI-202	12	16	16	16	-	± 150 mA	± 1.5 mA	-	>600,000
0-20/4-20 mA Input	AI-204	24	18	1	24	-	0-20 mA	0-0.2 mA	-	>500,000
Thermocouple – Fully Isolated	AI-212	12	24	1.5	18	✓	± 2.048 V	± 32 mV	✓	230,000
Thermocouple, High Resolution, High Density	AI-225	25	24	1	25	✓	± 1.25 V	-	-	520,000
RTD/Resistance	AI-222	12	24	0.150	1.8	✓	40k Ω	100 Ω	✓	230,000
Strain/Bridge Input, Low Cost	AI-208	8	18	8	8	-	± 10 V	± 12.5 mV	-	>600,000
Strain/Bridge Input, High Performance	AI-224	4	18	100	400	✓	± 10 V	± 78 mV	✓	260,000
ICP/IEPE Accelerometers	AI-211	4	24	125	500	✓	+ 25/ - 13 V	± 2.5 V	✓	250,000
LVDT/RVDT	AI-254*	4	16	5	20	✓	28 Vrms	2 Vrms	✓	275,000
Synchro/Resolver	AI-255*	2	16	4	8	✓	28 Vrms	2 Vrms	✓	275,000
Synchro/Resolver	AI-255-815*	2	16	4	8	✓	115 Vrms	5 Vrms	✓	275,000
LVDT/RVDT, Synchro/Resolver, High Drive	AI-256*	2	16	10	20	✓	28 Vrms	5 Vrms	✓	275,000
Digital Multimeter (DMM)	DMM-261	1	6.5 digit	Range Dependent	Range Dependent	n/a	300 VDC 3 ADC 100 MΩ	30 mVDC 1.5 mADC 10 Ω	✓	300,000

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

*Also functions as simulated 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	MTBF
General Purpose	AO-308	8	100	500	+/- 10	+/- 5	-	480,000
Fully Isolated With Readback	AO-318	8	10	80	+/- 10	+/- 10	✓	480,000
High Current	AO-308-350	8	100	800	+/- 10	+/- 50	-	480,000
High Density	AO-332	32	10	320	+/- 10	+/- 10	-	400,000
High Density	AO-332-828	28	10	280	+/- 10	+/- 10	-	400,000
High Density With Readback	AO-333	32	10	320	+/- 10	+/- 10	-	400,000
Medium Voltage/Current	AO-308-352	8	100	800	+/- 13.5	+/- 13.5	-	480,000
High Voltage	AO-308-353	8	100	800	+/- 40	+/- 5	-	480,000
Current Output (0–20 mA)	AO-308-020	8	100	800	-	0 - 20	-	480,000
Current Output (Sourcing) Isolated with Readback	AO-318-020	8	10	80	-	0 - 20	✓	480,000
Current Output (Sourcing) Isolated with Readback	AO-318-024	8	10	80	-	0 - 24	✓	480,000
Current Output (Sinking) Isolated with Readback	AO-319-420	8	10	80	-	4 - 20	✓	480,000
Current Output (4 – 20 mA)	AO-308-420	8	100	800	-	4 - 20	-	480,000
Function Generator/AWFG	AO-364	4	150	600	+/- 12	+/- 10	✓	290,000
High Current Buffer (External)	UEI-STP-AO-200	8	-	-	+/- 10	+/- 250	-	200,000
High Current, High Voltage (External)	DNA-STP-AO-250	4	-	-	0 - 35	+/- 250	-	200,000
High Voltage Amplifier (External)	PD-AO-AMP-115	16	-	-	+/- 115	+/- 10	-	100,000

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

ANALOG OUTPUT–SIMULATION

Board Types	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	MTBF
SIMULATED DEVICE/SENSOR								
Strain Gage Simulator, 350 Ω	AO-358-350	8 Bridges	5	40	N/A	N/A	-	300,000
Simulated LVDT/RVDT	AI-254	4	5 kHz exc	-	0 - 6.7 Vrms	65 mA	✓	275,000
Simulated Synchro / Resolver	AI-255	2	4 kHz exc	-	0–28 Vrms	1.2 VA	✓	275,000
Simulated S/R & LVDT/RVDT, High Drive	AI-256	2	10 kHz exc	-	0 - 19.8 Vrms	2.4 VA	✓	275,000
Transformer Coupler for AI-254	TRF-254-447	4	5 kHz	-	4.47:1 ratio	4.47:1 ratio	-	-
Transformer Coupler 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	✓	250,000
Simulated RTD 100 ohm	RTD-388-100	8	200 Hz	200 Hz	23-390 Ω, 7500 steps	+/- 4 mA Input	✓	>400,000
Simulated RTD 1k ohm	RTD-388	8	200 Hz	200 Hz	180-3900 Ω, 7500 steps	+/- 4 mA Input	✓	>400,000

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

DIGITAL I/O

Board Type	Part Number (DNx-)	Number of Channels	Input (kHz)	Output kS/sec	Drive Capacity (Continuous/ Peak)	Range (min V)	Range (max V)	Change of State	MTBF
DISCRETE I/O									
Logic Level	DIO-403	48	10	20	16 mA	2.5	5.5	✓	>600,000
Sourcing Outputs, 3.3–36 VDC Inputs	DIO-404	12 in/12 out	100	100	350 mA/500 mA	3.3	36	✓	375,000
Sourcing Darlington Outputs, 5–36 VDC Inputs	DIO-405	12 in/12 out	1	1	80 mA/200 mA	5	36	✓	>600,000
Sinking Outputs, 3.3–36 VDC Inputs	DIO-406	12 in/12 out	100	100	1 A/1.5 A	3.3	36	✓	375,000
DISCRETE INPUTS									
5–36 VDC Inputs	DIO-401	24	1	-	-	5	36	✓	>600,000
0–32 VDC Inputs	DIO-448	48	1	-	-	-1	32	-	550,000
0–150 V AC/DC Inputs	DIO-449	48	1	-	-	-150	150	✓	500,000

Board Type	Part Number (DNx-)	Number of Channels	Input (kHz)	Output (kS/sec)	Drive Capacity (Continuous/ Peak)	Range (min V)	Range (max V)	PWM	MTBF
DISCRETE OUTPUTS									
Sourcing Darlington Outputs	DIO-402	24	-	1	80 mA/200 mA	7	36	-	>600,000
Solenoid Drive (Source/Sink), 3.3–36 VDC	DIO-416-32	32	-	0.125	500 mA/3.5 A	3.3	48	-	130,000
Sinking Outputs, 3–36 VDC	DIO-432	32	-	1	600 mA/3.5 A	3.3	36	✓	260,000
Low-leakage, Sinking Outputs, 3–36 VDC	DIO-432-800	32	-	1	600 mA/3.5 A	3.3	36	✓	260,000
Sourcing Outputs, 3–36 VDC	DIO-433	32	-	1	600 mA/3.5 A	3.3	36	✓	260,000
Low-leakage, Sourcing Outputs, 3–36 VDC	DIO-433-800	32	-	1	600 mA/3.5 A	3.3	36	✓	260,000
RELAY OUTPUTS									
Solid State Relay Outputs, Form A	DIO-430	30	-	1	400 mA/2 A	0	55 VDC/55 VAC	-	600,000
Relay Outputs, Form C	DIO-452	12	-	0.125	2 A	0	220 VDC/250 VAC	-	275,000
Relay Outputs, Form C	DIO-462	12	-	0 .125	2 A	0	220 VDC/250 VAC	-	260,000
Solid State Relay Outputs, Form A (NO)	DIO-463	12	-	0.125	2 A	0	51 VDC/51 VAC	-	260,000
High Current Relay Outputs, Form C	DIO-470	10	-	0.125	5 A	0	140 VDC/150 VAC	-	275,000

MULTIPLEXERS								
Board Type	**Part Number (DNx-)**	**Number of Channels**	**Relay Type**	**Output**	**Drive Capacity Continuous/ Peak**	**Maximum On/Off Resistance**	**Range (Max V)**	**Channel-to-Channel Isolation**	**MTBF**
3 to 1 Routing Board	MUX-414/418	14/18	SSR	300 Hz	2 A/3 A	200 mΩ/10^8 Ω	60 VDC	✓	>400,000
26 Channel 170 Vrms MUX	MUX-461	26/13 – 2/4 wire	Reed	4 Hz	0.5 A	500 mΩ/10^10 Ω	170 Vrms	✓	180,000

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

MULTIFUNCTION I/O MultiFunction Analog and Digital board DNx-MF-101

ANALOG INPUT

Type	Number of Channels	Resolution (Bits)	Maximum Sample Rate (Channel) kS/sec	Maximum Sample Rate (Board) kS/sec	Maximum Input Range	Minimum Input Range	MTBF
General Purpose, Medium Voltage	16 SE, 8 diff	18	2	16	80 V	0.156 V	300,000

ANALOG OUTPUT

Type	Number of Channels	Resolution (Bits)	Update Rate (Channel) kS/sec	Update Rate (Board) kS/sec	Voltage Output Mode Range	Current Output Mode Range (mA)	MTBF
General Purpose Voltage or Current	2	16	2	4	+/- 10 V, +/-5 V @5 mA	0–20, 4–20, -1–22	300,000

DIGITAL I/O

Type	Number of Channels	Input (kHz)	Output (kS/sec)	Drive Capacity	Range (min V)	Range (max V)	Notes	MTBF
Industrial Voltage	16	1	1	500 mA	3.3	55	Inputs: Programmable PU/PD, thresholds Outputs: Sink or Source, PWM control	300,000
Logic Level	4	1	1	5 mA	3.3	5	Direction set in groups of 2	300,000

SERIAL/CAN BUS

Type	Number of Channels	Transfer Rate	Notes	MTBF
RS-232/422/485	1	2 Mbaud	2048 word FIFO, Interrogation Scheduler	300,000
I²C	1	100k, 400k, 1 Mbit	Master, Slave, Bus Monitor	300,000

COUNTER/TIMER

Type	Number of Channels	Clock Rate	Notes	MTBF
32 Bit	2	66 MHz	Counter In/Out can be connected to any Digital In/Out	300,000

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

PANEL I/O 40-Channel, Fully Integrated I/O System UEI-PIO-1010

ANALOG INPUT

Type	Number of Channels	Resolution (Bits)	Maximum Sample Rate (Channel) kS/sec	Maximum Sample Rate (Board) kS/sec	Maximum Input Range	Minimum Input Range	MTBF
General Purpose, Medium Voltage	16 SE, 8 diff	18	2	16	80 V	0.156 V	300,000

ANALOG OUTPUT

Type	Number of Channels	Resolution (Bits)	Update Rate (Channel) kS/sec	Update Rate (Board) kS/sec	Voltage Output Mode Range	Current Output Mode Range (mA)	MTBF
General Purpose Voltage or Current	2	16	2	4	+/- 10 V, +/-5 V @5 mA	0–20, 4–20, -1–22	300,000

DIGITAL I/O

Type	Number of Channels	Input (kHz)	Output (kS/sec)	Drive Capacity	Range (min V)	Range (max V)	Notes	MTBF
Industrial Voltage	16	1	1	500 mA	3.3	55	Inputs: Programmable PU/PD, thresholds Outputs: Sink or Source, PWM control	300,000
Logic Level	4	1	1	5 mA	3.3	5	Direction set in groups of 2	300,000

SERIAL/CAN BUS

Type	Number of Channels	Transfer Rate	Notes	MTBF
RS-232/422/485	1	2 Mbaud	2048 word FIFO, Interrogation Scheduler	300,000
I²C	1	100k, 400k, 1 Mbit	Master, Slave, Bus Monitor	300,000

COUNTER/TIMER

Type	Number of Channels	Clock Rate	Notes	MTBF
32 Bit	2	66 MHz	Counter In/Out can be connected to any Digital In/Out	300,000

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

SERIAL/CAN BUS

Communications Bus Protocol	Part Number (DNx-)	Physical Interface	Number of Channels	Transfer Rate	Notes	Channel-to-Channel Isolation	MTBF
High Speed CAN	CAN-503	CAN 2.0	4	1 Mbit	J1939 and CAN .DBC support	✓	350,000
I²C/SMBus	I2C-534	I²C	4	100k, 400k, 1M bit	Guardian read-back of master transmissions confirms validity of transmit data	✓	350,000
4-port Serial	SL-501	RS-232/422/485	4	2 Mbaud	J1587/J1708, Interrogation Scheduler	✓	350,000
4-port High Speed Serial	SL-501-804	RS-232/422/485	4	4 Mbaud	J1587/J1708, Interrogation Scheduler	✓	350,000
8-port Serial	SL-508	RS-232/422/485	8	1 Mbaud	J1587/J1708, Interrogation Scheduler	✓	290,000
HDLC/SDLC Synchronous	SL-504	RS-232/422/423/485	4	4 Mbaud	HDLC/SDLC TX/RX Synch.	✓	350,000
Synchronous Serial Interface (SSI)	SL-514	RS-485/422	4	2.5 MHz	Master, Slave 3-32 bits, FIFO onboard	✓	350,000
GP Synchronous Serial Communications	CT-602-804	RS-485/422	4	16 Mbaud	General Purpose	✓	350,000

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

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

COUNTER/TIMERS

Counter/timer function	Part Number (DNx-)	Type	Number of Channels	Clock Rate	Notes	Channel -to-Channel Isolation	MTBF
High Speed Counter/Timer	CT-601	32 Bits	8	66 MHz	Debouncing on Clock & Gate Inputs	-	350,000
Differential Counter/Timer	CT-602	32 Bits	4	66 MHz	RS-422/485 Logic Levels	✓	350,000
Quadrature Encoder Input	QUAD-604	A,B, & Z inputs	4	16.5 MHz	Buffered or Single Point Readings	-	350,000
Universal Speed Input	VR-608	50 mV - 250 V p-p	8	300 kHz	4 Freq Out, Double/Low Tooth	✓	180,000
IRIG Timing Gen & Synch	IRIG-650	A/B/E/G type	1	1, 5, 10 MHz	On-board GPS Receiver	✓	240,000
Precision Timing Interface	CT-651	ICD-GPS-060	4	1 PPS	Slaved or Free Run/Fix Wheel	✓	350,000

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	+/- 300 VDC, +/- 30 mVDC, +/- 300 Vrms, +/- 500 mVrms, 100 MΩ to 10 Ω	VDC, VAC, IDC, IAC and Resistance	+/- 3 A AC/DC +/- 1.5 mA AC/DC	✓	300,000

Board Type	Part Number (DNx-)	Number of Channels	Relay Type	Output	Drive Capacity Continuous/ Peak	Maximum On/Off Resistance	Range (max V)	Channel -to-Channel Isolation	MTBF
Multiplexer	MUX-414/418	14/18	SSR	300 Hz	2 A/3 A	200 mΩ/10^8 Ω	60 VDC	✓	>400,000

Board Type	Part Number (DNx-)	Number of Channels	Update Rate (Channel)	Ranges	Type	Current	Channel -to-Channel Isolation	MTBF
Multiplexer	MUX-461	26 2-wire or 13 4-wire	4 Hz	+/- 170 Vrms +/- 0.5 A	2-wire voltage 2-wire current 2 or 4-wire resistance	+/- 0.5 A	✓	180,000
Function/Arbitrary Waveform Generator	AO-364	4	150 kHz	+/- 12 V	Sine, Square, Triangle, Trapezoid, AWFG	+/- 10 mA	✓	290,000

AVIONICS I/O

Protocol	Part Number (DNx-)	Type	Number of Channels	Transfer Rate	Notes	Channel -to-Channel Isolation	MTBF
1553 (Dual Redundant)	1553-553	2 Ports	2	1 Mbaud	Bus Cont, Remote Term, or BM	✓	275,000
ARINC-429	429-566	6 TX/6 RX	12	12.5/100 kb	Williamsburg V1 Support	-	470,000
ARINC-429	429-512	12 RX	12	12.5/100 kb	Williamsburg V1 Support	-	470,000
ARINC-429	429-516	16 TX/24 RX	24	12.5/100 kb	256 labels/ch on-board scheduler, 2k I/O FIFO/Channel	✓	470,000
ARINC-615	429-XXX	Up to 16	16	12.5/100k baud	Williamsburg for Airborne & Portable Data Loader	✓	470,000
ARINC-708/453	708-453	2 TX/2 RX	4	1 Mbaud	Weather or Ground Prox Radar, WXPD	✓	275,000
ARINC-825	CAN-503	4 Ports	4	83.3-1000 kb	Sensors, Actuators, Software Timing – Transport Only	✓	350,000
ARINC-664 Part 7	ARINC-664	2 Ports	2	100 Mbaud	Dual Redundant or Independent	-	130,000
ARINC-615A	ARINC-664	2 Ports	2	100 Mbaud	Airborne & Portable Data Loader for Ethernet	-	130,000
CSDB	CSDB-509	8 TX/8 RX	8	12.5/100 kHz	11 bit, character and frame clocks	✓	290,000

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

POWER SUPPLIES

Output Voltage	Part Number (DNx-)	Number of Channels	Output V	Current (Max)	Notes	Fully Isolated	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-921-D	Internal	-	-	MIL-STD-704/1275/461 Power Conditioner	✓	150,000

RECONFIGURABLE

Board Type	Part Number (DNx-)	Connection	Notes	FPGA
Reconfigurable FPGA	PL-820	2x 62 Pin	104 DIO Pins, JTAG Connections	MAX10 / Cyclone II

APPLICATION BRIEFS

BAE SYSTEMS HYBRID BUS ENGINE MONITORING

CHALLENGE

Provide real-time streaming of vehicle data for preventative maintenance in order to maximize fleet efficiency.

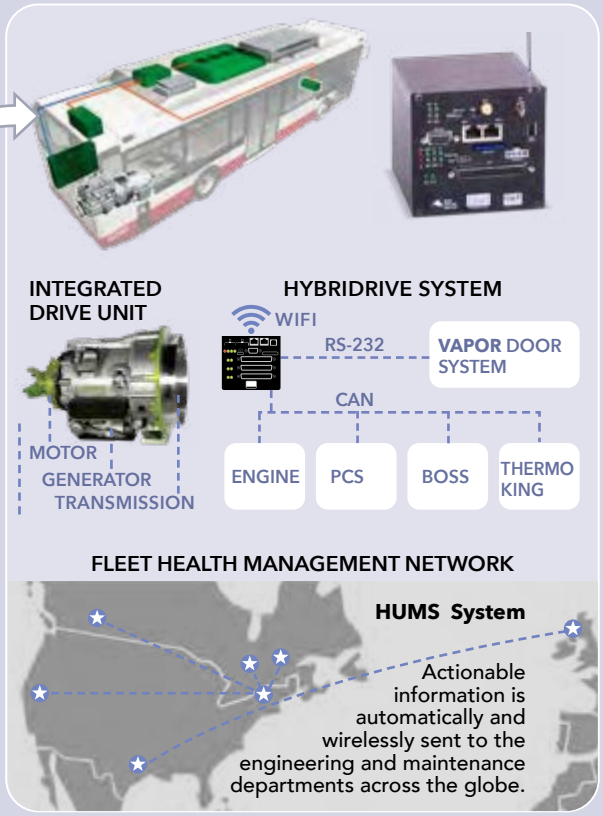
SOLUTION

Rugged and compact in-vehicle data acquisition system, wirelessly connected to Fleet Health Management Network.

RESULTS

Improved vehicle uptime and reduced maintenance costs of up to 13%.

BONUS BAE has sold thousands of these buses across the world, expanding their business globally.



U.S. AIR FORCE ENGINE TEST CELL

CHALLENGE

Improve reliability and maintainability of engine test cell to meet rising demand and reduced budget.

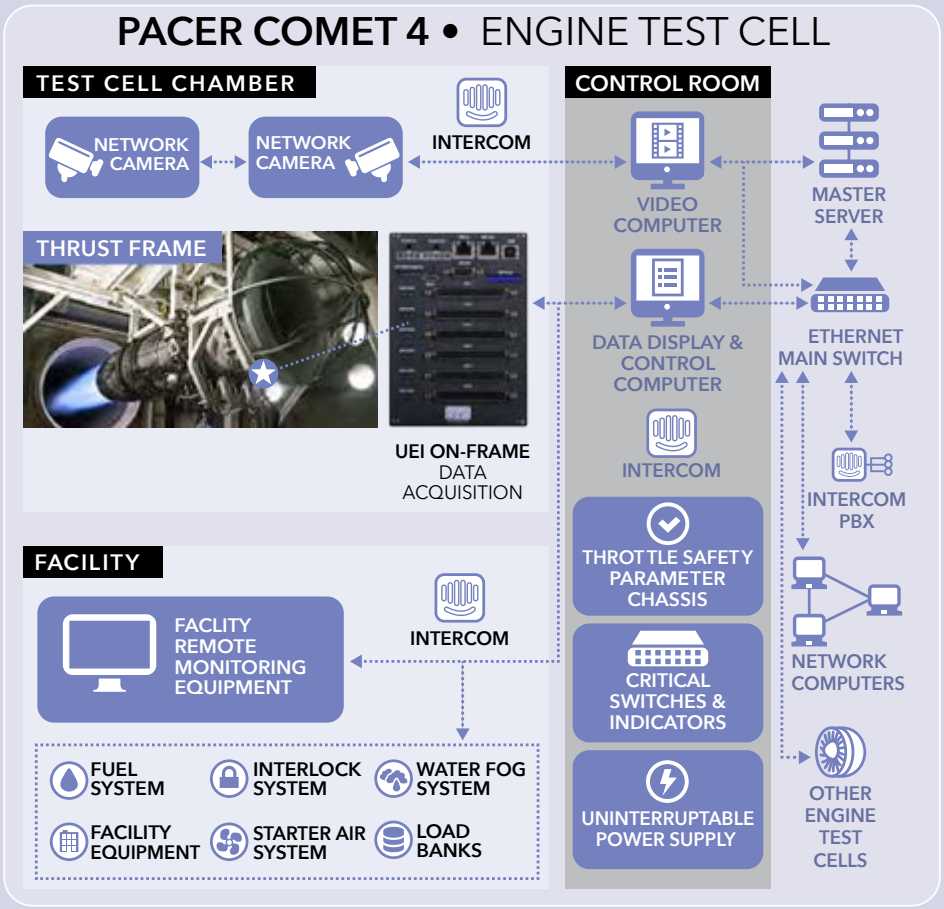
SOLUTION

Modular, rugged, Ethernet based remote DAQ system.

RESULTS

Maximized test cell uptime, simplified maintenance, and reduced failures, thus meeting schedules and containing costs.

BONUS The maintenance and repair operation became much more streamlined. No more re-wiring the engine for each test—the hardware travels with the engine!



UEI COLLECTS REAL-WORLD DATA FOR THE AEROSPACE, ENERGY AND DEFENSE INDUSTRIES, ALLOWING OUR CUSTOMERS TO BUILD SMART SYSTEMS THAT ARE RELIABLE, FLEXIBLE AND RUGGED.

FlightSafety international FLIGHT SIMULATORS

CHALLENGE

Alleviate supply chain headaches of building commercial and military simulators due to product obsolescence and too many suppliers, all while improving the efficiency of their engineering team.

SOLUTION

Co-designed over a dozen products on standardized UEI reliable, rugged, flexible platform, consolidated three systems into one (combined DAQ and avionics) while significantly reducing cabling/wiring and costly system inspections.

RESULTS

Saved 10's of millions of dollars through greater production and operational efficiencies. Use of our Guardian data kept them up 99% of the time.

BONUS Saved 1000's of hours to install and maintain, simplified procurement process, increased system reliability, mitigated obsolescence, increased uptime, and improved time to market.

SPACEX LAUNCH PAD CONTROL

CHALLENGE

Replace ground support equipment with more robust, reliable, scalable solutions, and remove obsolescence issues. Eliminate backlog in commercial business and risks of losing the space race.

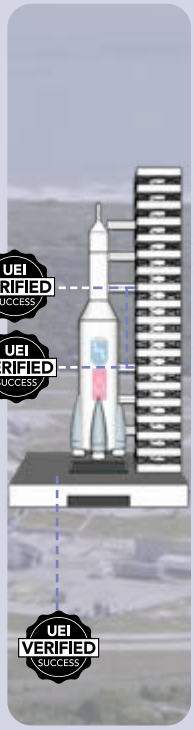
SOLUTION

UEI changed the architecture of their launch pads, moving from a centralized control system to a distributed system with self-diagnostic capabilities from each node to the control valves.

RESULTS

With these highly distributed, self-checking systems, U.S. based manned flight is a reality!

BONUS SpaceX is back leading the private space race, from satellite constellations to manned flight.



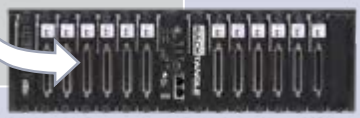
BLUE ORIGIN ROCKET ENGINE & LAUNCH VEHICLE TEST

CHALLENGE

Consolidating custom and COTS DAQ and Control hardware into one platform to accelerate development, minimize maintenance, and deliver programs on time.

SOLUTION

Co-developed COTS hardware based on standardized UEI modular, embedded platform, with a single software API, for HIL/SIL/ Engine Test applications.



RESULTS

Offloaded obsolescence management, improved test capability, and reduced development time critical to winning the Space Race.

BONUS 3 New COTS I/O Boards Developed! Including the RTD Simulator and Thermocouple Simulator.

All the Accessories You Need to

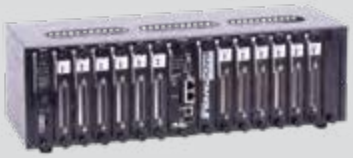
CUBE, RACK & MIL CHASSIS: AVAILABLE OPTIONS

DIN RAILS, BRACKETS/CLIPS

FLANGES

EXTENDER BRACKETS

CONFORMAL COATING



FANLESS RACKS

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1553 Cables

Cables

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Interconnect Boards

DON'T SEE WHAT YOU NEED?

We most likely have it! Contact your UEI representative today.

Complete **Your Perfect I/O System**

SCREW TERMINAL ACCESSORY PANEL

Board Type	Part #	Board Specific	Number of Channels	Connection	Included with Board
37-channel Input Panel	DNA-STP-37	Any 37 pin connections	-	37	-
37-channel Input Panel - DIN Rail Mount	DNA-STP-37-DR	Any 37 pin connections	-	37	-
62-channel Input Panel	DNA-STP-62	Any 62 pin connections	-	62	-
62-channel Input Panel - DIN Rail Mount	DNA-STP-62-DR	Any 62 pin connections	-	62	-
Universal 37/62 Channel	DNA-STP-3762	37/62 pin connections	-	37/62	-
78-channel Input Panel - DIN Rail Mount	DNA-STP-78-DR	Any 78 pin connections	-	78	-
Universal Analog Input Panel	DNA-STP-AI-U	DNx-AI-207/217, DNx-AI-225	16 and 25	37/62	-
37-way Terminal Panel with CJC Sensor	DNA-STP-37CJC	DNx-AI-207	16	37	-
Thermocouple Input Panel	DNA-STP-AI-207TC	DNx-AI-207	16	37	-
Strain Gage Input Panel	DNA-STP-AI-208	DNx-AI-208	8	37	-
Thermocouple Input Panel	DNA-STP-AI-212	DNx-AI-212	12	37	✓
High Current Input Panel	DNA-STP-37HC	DNx-DIO-470	10	37	-
Serial 8-port Input Panel	DNA-STP-508	DNx-SL-508	8	62	-
Accelerometer Input Panel	DNA-STP-211	DNx-AI-211	4	37	✓
Sync Connection Panel	DNA-STP-SYNC-1G	All	Up to 6 chassis	STP, BNC, DNA-CBL-SYNC-RJ	-
Screw Terminal/Interconnect with CJC Compensation	DNA-STP-TC-378	DNx-TC-378	-	37	-
Debug Adapter for 37 pin boards	DNA-TADP-37	All	-	37	-
Debug Adapter for 62 pin boards	DNA-TADP-62	All	-	62	-

Loop Back Test Adaptors: Call UEI

CABLES

Cable Description	Part #	Shielded	Lengths (Ft)	For Use With
RS-232 port to female DB-9 connector	CBL-SX6-DIAG	✓	3	-11/-12 SoloX CPU Board
37-way, round cable (Male-Female)	DNA-CBL-37S	✓	1, 3, 5, 10, 20	All I/O boards with 37-pin connectors
37-way, flat ribbon cable (Male-Female)	DNA-CBL-37	-	3	All I/O boards with 37-pin connectors
Right angle 37-way, round cable (Male-Female)	DNA-CBL-37RA	✓	3	All I/O boards with 37-pin connectors
Special 37-way, high current (5 A) cable	DNA-CBL-37HC	✓	3, 6, 12	DNx-DIO-470
62-way, round shielded cable (Male-Male)	DNA-CBL-62	✓	2.5, 6, 10, 20, 40	All I/O boards with 62-pin connectors
Right angle 62-way, round shielded cable (Male-Male)	DNA-CBL-62RA	✓	3	All I/O boards with 62-pin connectors
78-way, round shielded cable (Male-Female)	DNA-CBL-78	✓	5	All I/O boards with 78-pin connectors
MIL Male 128-pin 38999 to 1x DB-37F	DNA-CBL-37M-03	✓	3	DNx-MIL chassis
MIL Male 128-pin 38999 to 1x DB-62M	DNA-CBL-62M-03	✓	3	DNx-MIL chassis
MIL Male 128-pin 38999 to 1x DB-37F and 1x DB-62M	DNA-CBL-6237M-3	✓	3	DNx-MIL chassis
MIL Male 128-pin 38999 to 2x DB-37F 38999	DNA-CBL-12837-5	✓	5	DNx-MIL chassis
MIL Male 128-pin 38999 to 2x DB-62M 38999	DNA-CBL-12862-5	✓	5	DNx-MIL chassis
MIL Power connector cable	DNA-CBL-1315-03	✓	3	DNx-MIL chassis
MIL LAN/Serial/Sync connector cable	DNA-CBL-LAN-06	✓	6	DNx-MIL chassis
BNC connections for Clock/IRIG & 1553	DNA-CBL-650	✓	2	DNx-IRIG-650 (Included with board)
Male 62-pin to four MIL-STD-1553 connectors	DNA-CBL-1553-553	✓	1	DNx-1553-553 (Included with board)
10-32 UNF Coaxial to Std Full-Size BNC cable/Adaptor	DNA-CBL-BNC	✓	3	DNx-AI-211
37-way to 4 single Serial ports, round shielded cable	DNA-CBL-COM	✓	1.5	DNx-SL-501, DNx-CAN-503, DNx-I2C-534
Cube Synchronization Cable	DNA-CBL-SYNC-10	✓	10	DNR/DNF series racks and PPCx-1G Cubes

Typical Products Lead Time Is 2 Weeks with UEI

UEI HAS YOU COVERED! A brief word on our warranties and guarantees to ensure your peace of mind

UEI is so confident in the dependability of our hardware that our standard warranty is **3 years**. Additional warranty available up to **5 years**.

UEI guarantees the availability of all chassis & I/O products for a minimum of **10 years**. Should we obsolete a part, we give you a 10 year runway.

UEI DAQ IS IDEAL FOR A WIDE VARIETY OF APPLICATIONS

HARDWARE IN THE LOOP (HIL)

HEALTH USAGE & MONITORING (HUMS)

SYSTEM INTEGRATION LABS (SIL)

ENGINE TEST

DETERMINISTIC CONTROL WITH ETHERCAT

HYBRID TEST BENCHES AND SILs WITH VISTAS

DISTRIBUTED ENGINE TEST SYSTEMS WITH iDDS

SIMULATORS & TRAINERS

GROUND SUPPORT EQUIPMENT (GSE)

FLIGHT LINE MONITORING

EMBEDDED CONTROL & LOGGING

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