

UEI Application Notes:

Environmental / CSA Test Stand Automation

App Note #016



***United
Electronic
Industries***

Environmental / CSA Test Stand Automation – Application:

A major appliance manufacturer needed to automate the measurement of temperature in an oven test stand. This sounds like a very simple system, and conceptually it is. However, the system requires monitoring over 1700 thermocouples. The current, manual method of monitoring the temperature requires up to four technicians monitoring a bank of digital panel meters and making manual entries into a test log. This is inefficient, error prone and makes it difficult to prepare the data for presentation, analysis and archiving.

Using the PowerDNA DNA-PPC8 Cubes in conjunction with the DNA-AI-207 analog input board, the system is completely implemented in 18 Cubes. The Cubes are distributed around the test chamber, minimizing the length of thermocouple wire required. The built-in single port Ethernet switch provides in the PowerDNA Cube allows the Ethernet to be daisy chained from one cube to the next. This means the entire system may be implemented using a single Ethernet port on the host computer.

Software for this particular system was written using the UEIDAQ Framework. The Framework provides a powerful, yet simple set of drivers that may be called from all popular pro-

gramming languages and applications packages (e.g. LabVIEW, MATLAB) and supports not only Windows/Vista, but also Linux and most popular Real-Time operating systems including QNX, RTX and XPC.

The system required to monitor and log 1728 thermocouples is shown below:

Product	Description / Usage
DNA-PPC8	Ethernet based PowerDNA Cubes with 6 available I/O slots. The UEIDAQ Framework software is included with the purchase of the DNA-PPC8
DNA-AI-207	16 channel, 18-bit analog input board with an additional channel dedicated to Cold-Junction Compensation measurement. Provides TC and CJC measurement
DNA-CBL-37S	8-channel counter timer boards are used as counters to monitor the quadrature encoder input signals.
DNA-STP-207TC	Screw Terminal Panel provides interconnection to the TCs as well as a Cold Junction temperature sensor mounted in a large isothermal block.

Environmental / CSA Test Stand Automation – UEI Products Used:



DNA-PPC8

The PowerDNA® (Distributed Networked Automation) Cube is a compact, rugged, Ethernet based DAQ interface. Its flexibility allows you to configure one or more cubes to match the specific I/O requirements of your application. The PowerDNA Cube is ideally suited for a wide variety of industrial, aerospace and laboratory data acquisition and control applications.



DNA-AI-207

The DNA-AI-207 layer features 16 differential input channels with maximum sampling rate of 1kS/s per channel, wide range of gains, 18-bit resolution, and $\pm 10V$ input range.



DNA-CBL-37S

3ft, 37-way round shielded cable with thumb screws



DNA-STP-207TC

Screw Terminal Panel provides interconnection to the TCs as well as a Cold Junction temperature sensor mounted in a large isothermal block.

About PowerDNA:

The PowerDNA Cube is supported by all popular Windows, Linux and Real-time operating systems. Our UEIDAQ Framework provides a simple and universal API and supports all common programming languages. The Cube is also fully supported by an extensive array of application packages including LabVIEW, MATLAB, DASyLab and more.

About UEI:

Founded in 1990, UEI is a leader in the computer based data acquisition and control industry. Serving customers world-wide, UEI products based upon PCI, PXI, ISA and Ethernet interfaces offer unequaled performance as well as flexibility. We are committed to providing the highest quality hardware, software and services, enabling engineers and scientists to interface data-acquisition and control hardware to the real world. Through our state-of-the-art technologies we serve the needs of individual researchers and developers as well as OEMs.



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