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NETWORK

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ISA Expo 2005
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AI-SRVR Provides Connectivity Between ARCNET® and Ethernet Networks



The AI-SRVR is designed with many additional features including 256 separate ARCNET receive buffer mailboxes, a resident web server that provides status information, and a DLL for Windows 2K/XP clients that is given to facilitate communication.

Customers frequently ask us to route messages between ARCNET and Ethernet networks, however, there is no standardized method to accomplish this task. That's why Contemporary Controls has designed a connectivity device that solves the problem of allowing data to pass between ARCNET and Ethernet networks.

The AI-SRVR provides connectivity between ARCNET and Ethernet networks, allowing a client on the Ethernet side access to nodes on the ARCNET side. The AI-SRVR operates as an ARCNET server by executing communication requests from an Ethernet client. Any number of Ethernet TCP/IP clients can initiate requests to any node on an ARCNET network. The AI-SRVR will receive ARCNET packets and send the data to Ethernet clients or reverse the process for transmitted packets.

Both ARCNET and Ethernet are data link technologies. Each has different medium access methods, frame sizes, and link layer protocols. With Ethernet, the most recognized transport layer protocol is TCP/IP, but ARCNET is normally found in embedded applications that do not use TCP/IP. ARCNET also does not employ a universal application layer so it is best to query ARCNET by examining raw packets. The Ethernet client interprets the meaning of the raw packets. This enables any ARCNET network to be queried by an Ethernet client regardless of the application layer protocol being used with ARCNET.

Configuration of the AI-SRVR is achieved through an EIA-232 serial port. The Ethernet IP address and ARCNET node address are set in this fashion. Once configured, a resident web server can be accessed to determine the operational status of the AI-SRVR.

This device can also function in the "AI-PROXY" mode. When used in this mode, the AI-SRVR allows ARCNET devices on separate networks to communicate directly over an Ethernet network. One AI-SRVR is required for each ARCNET device as each AI-SRVR acts as a "proxy" for one ARCNET device. The local AI-SRVR sends received ARCNET packets over the Ethernet to a remote AI-SRVR for re-transmission on the remote ARCNET network. ARCNET nodes on separate ARCNET networks will be able to communicate over a wired or wireless Ethernet network.

The AI-SRVR has power connectors similar to the AI Series of hubs. The unit can be powered from a wide range of low-voltage AC or DC power sources and provisions exist for redundant power connections. Four models are available, each for a type of physical ARCNET network. Versions exist for coaxial bus, twisted-pair bus and EIA-485 AC- or DC-coupled networks. Each unit is priced at \$995. Availability is scheduled for end of June. For more information on the AI-SRVR, go to the data sheet at: <http://www.arcccontrol.com/pdf/TD0002000D.pdf>. You may also contact our R&D Manager, Bennet Levine, at blevine@ccontrols.com.



Projects from the Past—Reflecting on Contemporary Controls' 30 Years in Business

PDP-8 Auxiliary Memory Module

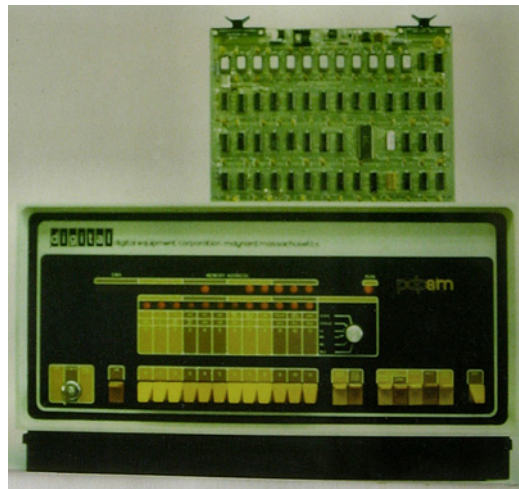
During 1978, one of our customers approached Contemporary Controls with an interesting problem. They needed more memory for their fully-loaded Digital Equipment Corporation PDP-8 minicomputer for storing text documents.

Our customer was using DEC minicomputers for a front-end text editing system to phototypesetters. The DEC computers used expensive core-memories and the proposal was to use solid-state memory for storing the text data from wire service stories and reporter articles. Dumb terminals would attach to the minicomputers. The problem was that the complete memory space of the DEC computer was already used by the operating system and application programs. The only address space left was I/O space and even that space was limited. The proposal was to use recently introduced 16K x 1 dynamic memory chips and an Intel DRAM controller to handle transparent refresh of the dynamic RAMs.

The bus width of the PDP-8 was 12 bits wide so twelve chips would provide a whopping 16 thousand words of read/write memory disguised as I/O. To minimize the I/O addressing requirements, a stack architecture and a pointer were implemented in hardware. Continuous writing to a particular I/O address would increment a pointer in memory speeding up data transfers. The I/O cycle on the PDP-8 was actually faster than a core memory cycle.

DEC provided a great service to the industry by writing the *PDP-8 Small Computer Handbook* which described the intricacies of interfacing peripherals to the bus. The book provided details on bus loading, memory, and I/O bus timing. This book must have launched many computer careers for young engineers wanting to learn about computers.

The Auxiliary Memory Module was designed and built and saw many years of service before PCs replaced minicomputers in text editing systems.



The PDP-8 minicomputer incorporated a bus architecture. The Auxiliary Memory Module plugged into a spare slot on the bus. The same concept was adopted by PCs.

Improving Network Performance With Rate Control

The latest managed-switch firmware from Contemporary Controls is Version 3.26 and includes Rate Control—just one of several new features that can improve traffic flow on a port-by-port basis.

Rate Control allows fine adjustment of bandwidth usage of ingress and egress ports by both traffic rate and type.

The default condition is for all messages to pass at 100 Mbps. The rate parameter is measured in bit rates that can be as low as 128 kbps.

A web browser screen allows you to select the traffic types for rate limiting. The frame types you can control are broadcast, multicast, unicast, destination lookup fail, and MAC control frame.

By specifying a MAX Bit Rate, you set the maximum bandwidth level for the types of messages selected. Types not selected can use 100% of the port's available bandwidth. Choosing all types for control allows you to manage the total bandwidth of the port. Selecting broadcast only effectively creates a broadcast storm control that has a selectable maximum bandwidth setting.

Rate Control can be a useful feature for limiting communications from an unknown network. For example, when interconnecting your office and control networks.

For more information, investigate the managed switch of interest at www.ccontrols.com.

“The People Are the Most Memorable”



A look into Contemporary Controls’ history takes us to the employee who has celebrated 19 years of service. From being the receptionist in 1986 to her current position as office manager, this environment has allowed Eleanor Lupescu to broaden her knowledge and skills and be compelled to excel in all her responsibilities.

Eleanor has witnessed many changes during her employment, but the most memorable experiences can’t be forgotten. “It’s the wonderful people I’ve come to know and love,” smiles Eleanor. “We work as a team. We are the Contemporary Controls family.” Today, she still remains a close friend to many of the former employees.

Shows Highlight Broad Use of Ethernet

BuilConn 2005 (building automation conference) and Hannover Fair (industrial automation) both heralded the big push for Ethernet to become the de facto standard. At both shows there was a strong emphasis on Ethernet being the glue that interconnects manufacturers’ products and also supplying a channel to communicate to other vendors’ products.

There are many differences and similarities between the two industries. Power requirements tend to be different with BAS folks using 24 VAC, while the IA group is more likely to use DC because many sensor devices require it. The BAS system typically needs a response time in “seconds” whereas the IA systems need it in “milliseconds.”

So what are the commonalities? The biggest is the need to provide information to management. Both industries need to get the data that is trapped in all of its controllers to the people that can use it and make meaningful decisions.

To sum up, more and more solutions will rely on Ethernet because of its many benefits. The future of Ethernet continues to expand as new functionality is added to switch or router products and even at the plug and play level as speed goes from 10 to 100 to 1000 Mbps. The evolution of Ethernet will continue in both industries.

Contemporary Controls Signs Technology Development Agreement with Weidmüller Subsidiary Heyfra Electronic GmbH

An integral part of the Weidmüller Group’s philosophy is ongoing enhancements to their customer’s requirements. In doing so, this Germany-based group has acquired a majority interest in Heyfra Electronic GmbH (HEG) of Eisleben, Germany in order to further its technology development. Heyfra is a business partner with Contemporary Control Systems Inc. (CCSI) headquartered in Downers Grove, Illinois, USA. Both CCSI and Heyfra design and manufacture adapters, hubs, switches, media converters, routers and analyzers for worldwide distribution in applications ranging from robotics to telecommunications.

CCSI met HEG during their participation in the 1998 Trans-Atlantic Small Business Initiative (TASBI) Matchmaking Conference sponsored by the Chicago Manufacturing Center (CMC). This program paired Chicago-area manufacturers with European companies to form lasting partnerships for the mutual benefit of sharing information, developing and promoting products, and services for economic strength.

The relationship between CCSI and HEG has flourished throughout the years—first as a technology partner developing CAN and Industrial Ethernet products and second as a joint venture partner with the establishment of Contemporary Controls GmbH (CCG). Joint technology development is intended to maximize the effort in developing new products while reducing the time to market. New technologies will continue to be shared between the two companies.

As part of the agreement, CCSI has acquired the Heyfra shares in Contemporary Controls GmbH and will, therefore, become a wholly-owned subsidiary of CCSI. Contemporary Controls GmbH will continue to operate in Eisleben, Germany serving German-speaking countries.

“Industrial Ethernet is a key future technology. The acquisition of Heyfra, as a widely acclaimed expert in this field, represents a further milestone in the development of the Weidmüller Group and is the next logical step in the optimization of our portfolio. The cooperation with Contemporary Controls in particular—which we aim to intensify with regard to R&D projects—will enable us to tap the tremendous market potential of the Ethernet sector. With our acquisition of Heyfra, Weidmüller has significantly strengthened its position in the growing Industrial Ethernet market; this new know-how will benefit above all our customers,” said Thomas H. Hagen, CEO of the Weidmüller Group.

CCSI President, George Thomas commented by saying, “Weidmüller has an excellent reputation in the industrial marketplace and can provide additional resources to Heyfra, benefiting our joint development efforts. There is no limit to the technology opportunities with Industrial Ethernet.”



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Contemporary Control Systems, Inc.
2431 Curtiss Street
Downers Grove, IL 60515 USA

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Product Interest Literature

NEW



AI-SRVR ARCNET Server to Ethernet Client

ARCNET AI-USB Active Hub

CTRLink Industrial Ethernet Catalog



US fax back and e-mail:
1-630-963-0109
info@ccontrols.com

UK fax back and e-mail:
+44 (0)24 7641 3923
info@ccontrols.co.uk

Germany fax back and e-mail:
+49 (0)341 520359-16
info@ccontrols.de

China fax back and e-mail:
+86 512 68095966
info@ccontrols.com.cn

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News

- Contemporary Controls marries ARCNET and Ethernet networks with its newly released AI-SRVR product.
- Go back in time to when the company faced a challenging problem in 1978 with a customer's PDP-8 minicomputer—part of the many projects of the past.
- Read this month's Tech Update to learn how rate control can improve traffic flow.

For your automation networking solutions visit: www.ccontrols.com